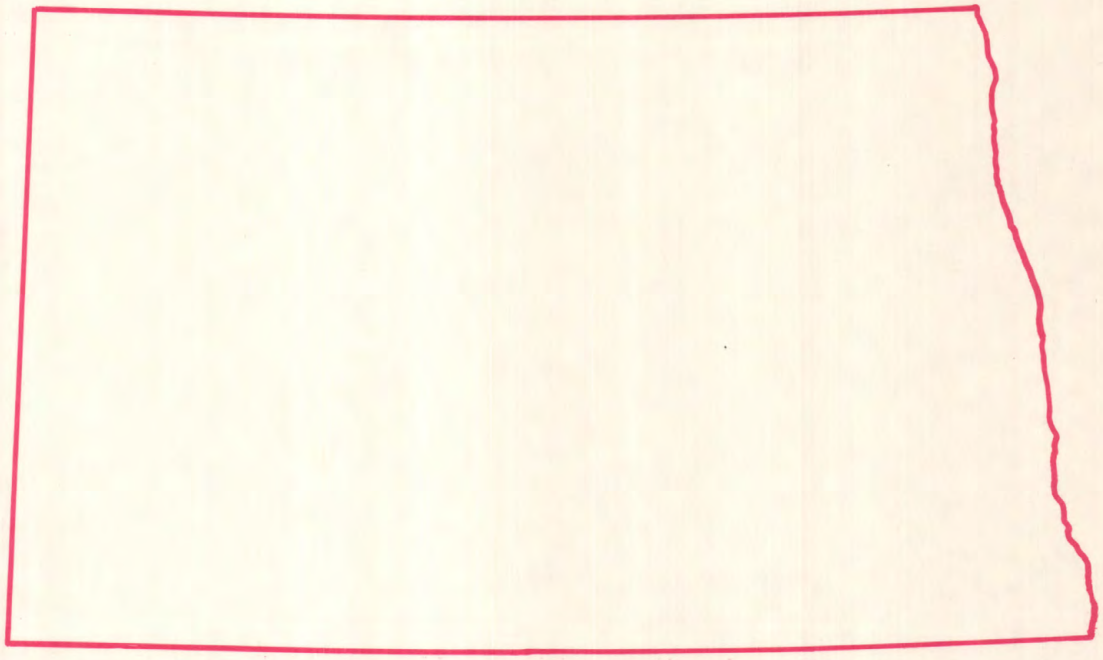
Water Resources Data North Dakota Water Year 1987



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT ND-87-1
Prepared in cooperation with the State of North Dakota
and with other agencies

CALENDAR FOR WATER YEAR 1987

1986

OCTOBER

S	M	T	W	T	F	S
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1987

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SEPTEMBER

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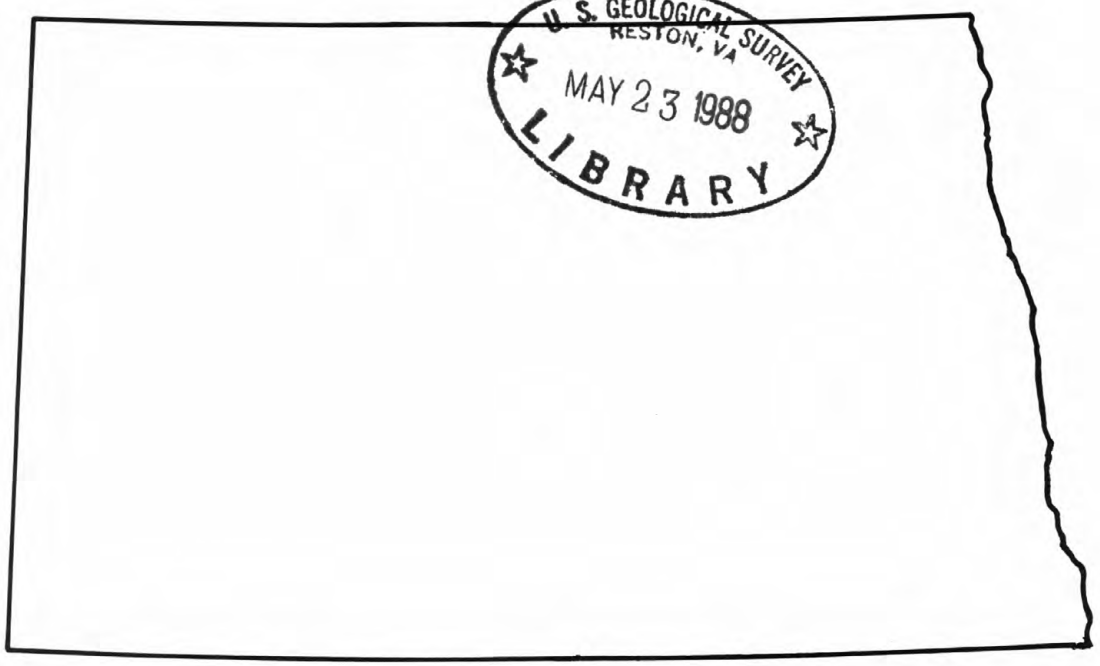
Water Resources Data North Dakota Water Year 1987

by R.E. Harkness, N.D. Haffield, and G.L. Ryan



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT ND-87-1
Prepared in cooperation with the State of North Dakota
and with other agencies

DEPARTMENT OF THE INTERIOR

DONALD PAUL HODEL, SECRETARY

U.S. GEOLOGICAL SURVEY

Dallas L. Peck, Director

For information on the water program in North Dakota write to
District Chief, Water Resources Division
U.S. Geological Survey
821 East Interstate Avenue
Bismarck, North Dakota 58501-1199

1988

PREFACE

This volume of the annual hydrologic data report of North Dakota is one of a series of annual reports that documents 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 quality of water 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.

This report is the culmination of a concerted effort by dedicated personnel of the U.S. Geological Survey who collected, compiled, analyzed, verified, and organized the data, and who typed, edited, and assembled the report. In addition to the authors, who had primary responsibility for assuring that the information contained herein is accurate, complete, and adheres to U.S. Geological Survey policy and established guidelines, the following individuals contributed significantly to the collection, processing, and tabulation of the data:

Bismarck District Office

L.L. Albright	R.W. Gauger	S.W. Norbeck	M.J. Voigt
L.A. Cottengaim	T.A. Gleich	M.C. Pokladnik	J.E. Wagner
B.T. Dowhanik	J.D. Heidt	K.M. Rowland	G.B. Wald
V.M. Dressler	C.S. Helgesen	B.A. Sether	E.A. Wesolowski

Grand Forks Field Headquarters

K.L. Boespflug
S.I. Nordby
R.A. Pewe
W.R. Westensee

Dickinson Field Headquarters

B.A. Bartsch
S.L. Binstock
D.L. Ellenbecker
G.J. Klug

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16. Abstract (Limit: 200 words)

Water-resources data for the 1987 water year for North Dakota consist of records of stage, discharge, and water quality of streams; stage, contents, and water quality of lakes and reservoirs; and water levels and water quality of ground-water wells. This report contains discharge records for 104 gaging stations; stage only records for 22 gaging stations; contents and/or stage for 15 lakes and reservoirs; peak flow data for 17 crest-stage gages; water-quality data for 102 gaging stations, 4 lakes, 13 crest-stage gages, 50 wells; and water levels for 31 observation wells. These data represent that part of the National Water Data System operated by the U.S. Geological Survey and cooperating State, Federal, and local agencies in North Dakota.

17. Document Analysis a. Descriptors

*North 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.

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ERRATA

References to "1986" or "-86" for figures 4-7, 16b-18, and table 1 above should be "1987" or "-87".

[Letter after station name designates type of data: (d) discharge, (e) elevation, gage height, or contents, (c) chemical, (m) microbiological, (t) water temperature, (s) sediment, (r) radiochemical, (p) pesticides]

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MC HENRY COUNTY
Well 480913100372501, Local number 154-077-18CCC 376-379
MC LEAN COUNTY
Well 474026100583201, Local number 148-081-03AAB 376-379
Well 474444101064902, Local number 149-082-12BAB2 376-379
MOUNTRAIL COUNTY
Well 475840102295001, Local number 152-092-19AAB 376-379
OLIVER COUNTY
Well 471613101035402, Local number 144-082-27BBB2 380-381
PIERCE COUNTY
Well 475139099484801, Local number 151-072-36AAA1 380-381
Well 475225100075501, Local number 151-074-27BBC 380-381
SHERIDAN COUNTY
Well 472337100285501, Local number 145-077-09ADD 380-381
STARK COUNTY
Well 465755102410701, Local number 140-095-08AAA 380-381

PRECIPITATION SITES, FOR WHICH CHEMICAL QUALITY DATA ARE PUBLISHED

PEMBINA COUNTY
Site 484714097442301, Icelandic State Park 382
STUTSMAN COUNTY
Site 470732099140204, Woodworth 385

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 North 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 U.S. Geological Survey, the data are published annually in this report series entitled "Water Resources Data - North Dakota."

This report series includes records of stage, discharge, and water quality of streams; stage, contents, and water quality of lakes and reservoirs; and water levels in and quality of water from ground-water wells. This volume contains records for water discharge at 104 gaging stations; stage only at 22 gaging stations; contents and/or stage at 15 lakes and reservoirs; water quality at 102 gaging stations, 4 lakes, 13 crest-stage gages, and 50 wells; and water levels in 31 observation wells. Also included are data for 17 crest-stage partial-record stations. Locations of these sites are shown on figures 1, 2, and 3. Discharge measurements were made at several miscellaneous partial-record stations and data are included for 2 precipitation-chemistry stations. These data represent that part of the National Water Data System collected by the U.S. Geological Survey and cooperating State and Federal agencies in North Dakota.

This series of annual reports for North 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 North 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 5 and 6." 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 ground-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 U.S. Geological Survey, Books and Open-File Reports, Federal Center, Building 810, Box 25425, Denver, CO 80225.

Publications similar to this report are published annually by the U.S. 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 ND-87-1." 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 the back of the title page or by telephoning (701) 255-4011, extension 610.

COOPERATION

The U.S. Geological Survey and agencies of the State of North Dakota have had cooperative agreements for the collection of streamflow records since 1903, ground-water levels since 1937, and water-quality records since 1946. Organizations that assisted in collecting the data in this report through cooperative agreement with the Survey are: North Dakota State Water Commission, Vernon Fahy, Chief Engineer; North Dakota Public Service Commission, Dale V. Sandstrom, President; Lower Heart River Water Resources District, R.E. Sylvester, Chairman; Oliver County Board of Commissioners, Emil Hintz, Chairman; City of Dickinson, A.E. Baumgartner, Mayor.

Assistance with funds or services was given by the U.S. Army Corps of Engineers for 25 streamflow-gaging stations, 19 river-stage stations, 4 reservoir stations, 3 crest-stage stations, and 18 wells; the U.S. Bureau of Reclamation for 3 streamflow-gaging stations, 2 reservoir stations, water-quality at 11 streamflow stations, and 2 stations on reservoirs; the U.S. Fish and Wildlife Service for 4 streamflow-gaging stations, water-quality at 11 stations, daily sediment at 6 stations, and 1 continuous water-quality monitoring station; the International Joint Commission of the U.S. State Department for 11 streamflow-gaging stations and 1 reservoir; the U.S. Soil Conservation Service for 1 streamflow-gaging station and 1 crest-stage gage; and other U.S. Department of Interior agencies concerned with the Missouri River basin for 6 streamflow-gaging stations, 1 reservoir station, 3 river stage stations, 3 continuous water quality monitoring stations, and 8 water-quality sampling stations.

Certain stations are maintained under agreement with Canada and the records are obtained and compiled in a manner equally acceptable to both countries. Most of these are designated as "international gaging stations".

Organizations that provided data are acknowledged in station descriptions.

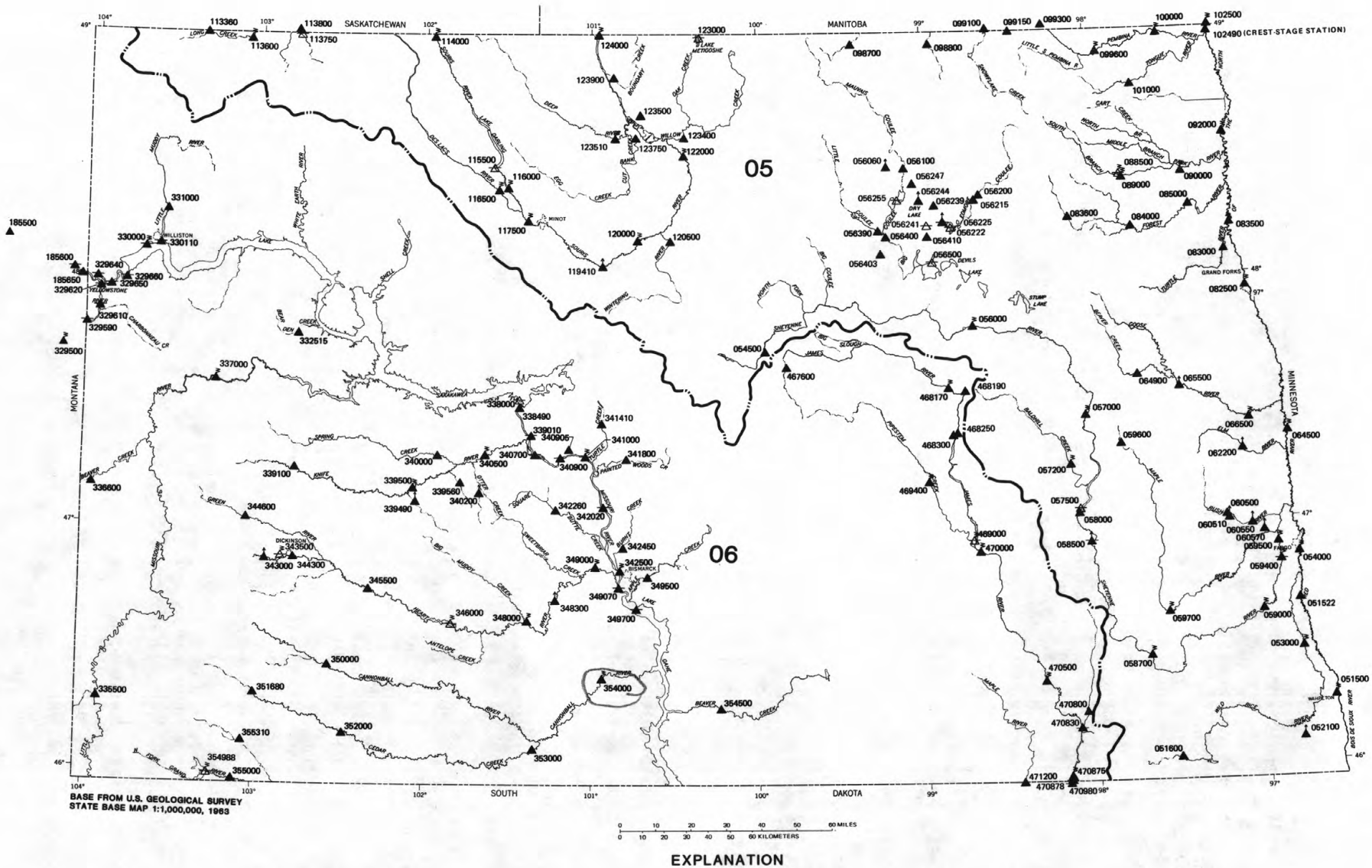

Figure 1.--Location of active surface-water gaging stations.

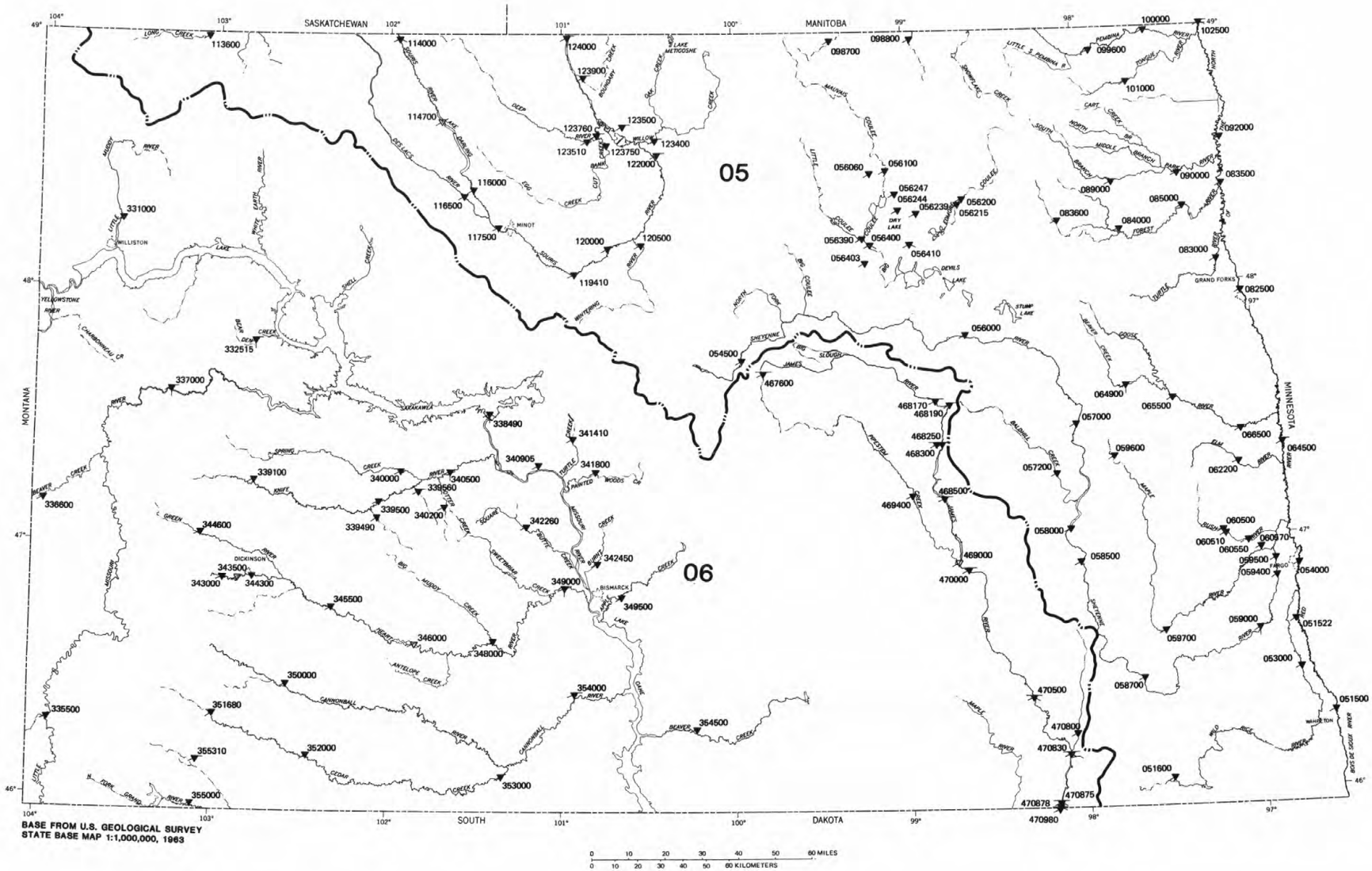

Figure 2.--Location of active surface-water-quality stations.

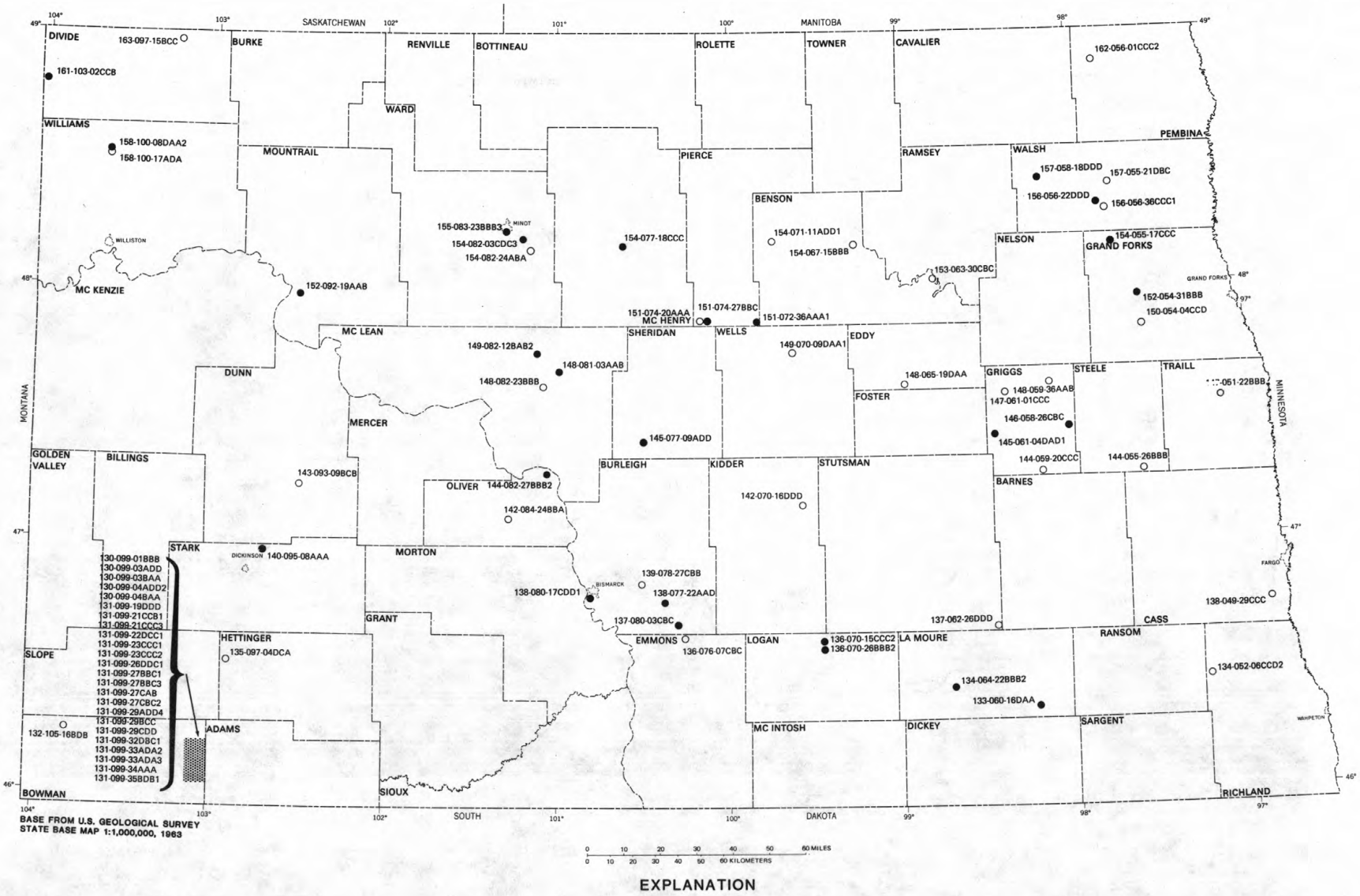

Figure 3.--Location of selected ground-water observation wells.

SUMMARY OF HYDROLOGIC CONDITIONS

Climate

In North Dakota, the average annual precipitation ranges from about 15 inches in the western part of the State to about 20 inches in the eastern part of the State. Three-fourths of this precipitation generally occurs during April through September. Greatest normal monthly precipitation for the entire State occurs in June. Normal, as related to meteorological data in this report, is an average value of meteorological data for the reference period 1951 through 1980. Precipitation during the 1987 water year was about 0.5 inch less than normal in the northwest and southeast areas of the State and about 3 inches greater than normal in the southwest, central, and northeast parts of the State. Meteorological data were obtained from publications of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service (U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service, 1986, 1987, Climatological data, North Dakota: Asheville, North Carolina, v. 95, no. 10-12, v. 96, no. 1-9).

National Weather Service data also indicate that average temperatures across the State were near normal, within about 3 °C (about 5 °F), except for 5 months during the water year. November temperatures were about 3 to 6 °C (about 5 to 10 °F) less than normal. December and April temperatures were about 3 to 6 °C (about 5 to 10 °F) greater than normal, and January and February temperatures were about 6 to 8 °C (about 10 to 15 °F) greater than normal. Although January and February temperatures were greater than normal, they were characterized by above freezing day-time temperatures and below freezing night-time temperatures during the first half of each month. The last 2 weeks of January and February were very cold. The average statewide temperature for March was slightly less than 0 °C (32 °F), but record high temperatures, greater than 20 °C (about 70 °F), occurred during the first week of March in the southwest division of the State as defined by the National Weather Service. Temperatures at the end of March and beginning of April rose quickly until reaching the April average temperature of about 10 °C (50 °F).

A comparison of 1987 water year monthly precipitation with normal precipitation in the nine National Weather Service divisions in North Dakota is shown in figure 4. Precipitation in all nine National Weather Service divisions in North Dakota during the usually dry fall and winter months of October through February was less than normal with two exceptions. Greater-than-normal precipitation for November was recorded statewide due to a blizzard that blanketed the State with snow during the second week November. Cold arctic air that accompanied the storm caused subfreezing temperatures for 2 weeks after the blizzard. The second exception occurred in mid-to-late February when storms deposited snow, with a water equivalent of 2 to 6 inches, along a line from south-central to northeastern North Dakota. The greatest accumulations were in the lower Red River basin in the northeast corner of the State.

The record high temperatures that had contributed to spring runoff in the southwest division of the State in early March ended abruptly during the second week of the month. During mid-March the temperature moderated and a storm deposited 12 to 18 inches of snow, with a water equivalent of 1 to 1.5 inches, across the western one-half of the State. A storm the following week deposited as much as 20 inches of snow in the extreme southwest corner of the State, and as much as 1.5 inches of rain occurred in the remainder of the State.

The warm temperatures in late March and throughout April caused almost complete melting of the snowpack by mid-April. Most areas of the State received little or no measurable precipitation in April. The dry weather prevailed until mid-May, when rainfall totaled more than 3 inches in some areas. The central Red River Valley (between Fargo and Grand Forks) and the southwest corner of the State received the largest amount of rainfall and the northwest area received the least.

June, which usually has the greatest normal monthly statewide precipitation, averaged 1 to 2 inches below normal. However, July had the greatest statewide total monthly precipitation for the water year; precipitation ranged from 1 to 3 inches greater than normal.

August precipitation was near normal. The most significant rainfall occurred on August 14 in the vicinity of Minot, N. Dak. A very narrow band of heavy rainfall extended northeast from Minot to the Canadian border. Street flooding was reported in Minot, and 7 inches of rain was reported near Willow City, 60 miles northeast of Minot.

Precipitation during September was 0.5 to 1 inch below normal statewide. Most reporting locations in the western two-thirds of the State recorded less than 0.5 inch of precipitation.

Streamflow

The greatest mean monthly discharge of North Dakota rivers generally is coincident with snowmelt runoff. Because springtime temperatures usually are higher in the southwest than in the northeast parts of the State, snowmelt usually begins on the Missouri River tributaries in western North Dakota and proceeds from west to east across the State. The hydrographs of mean monthly discharge for the period of record shown in figure 5 verify this trend. For example, the largest mean monthly discharge for Bear Den Creek (in the west-central National Weather Service division) occurs in March, whereas the largest mean monthly discharge for the remaining stations occurs in April. Mean monthly discharge for March is almost as large as the mean monthly discharge for April at the Cedar Creek near Haynes and Beaver Creek at Linton gages, further substantiating the general trend for snowmelt to occur from west to east in North Dakota.

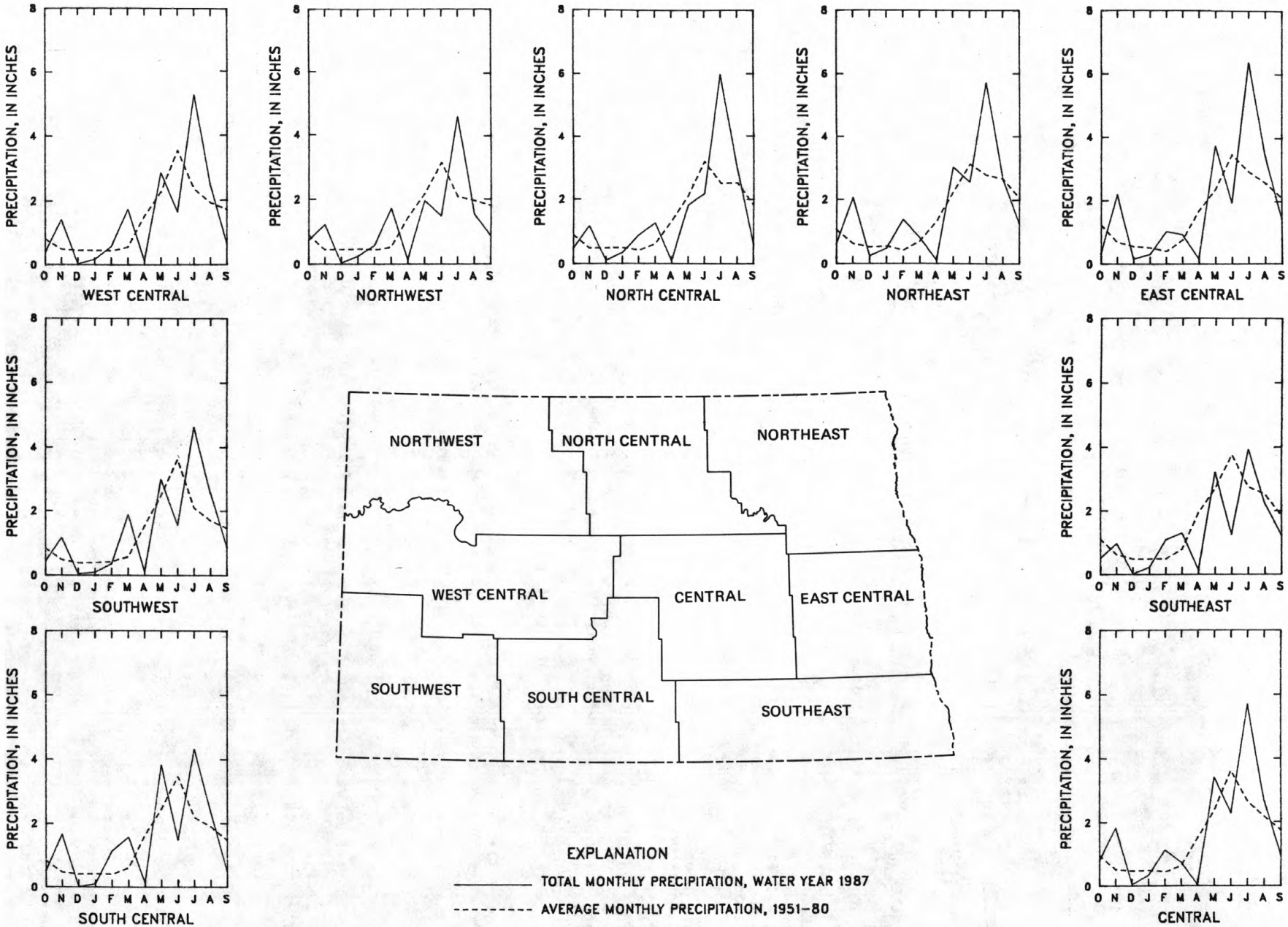

Figure 4.--Comparison of total monthly precipitation, water year 1987, to normal precipitation, 1951-80 average.

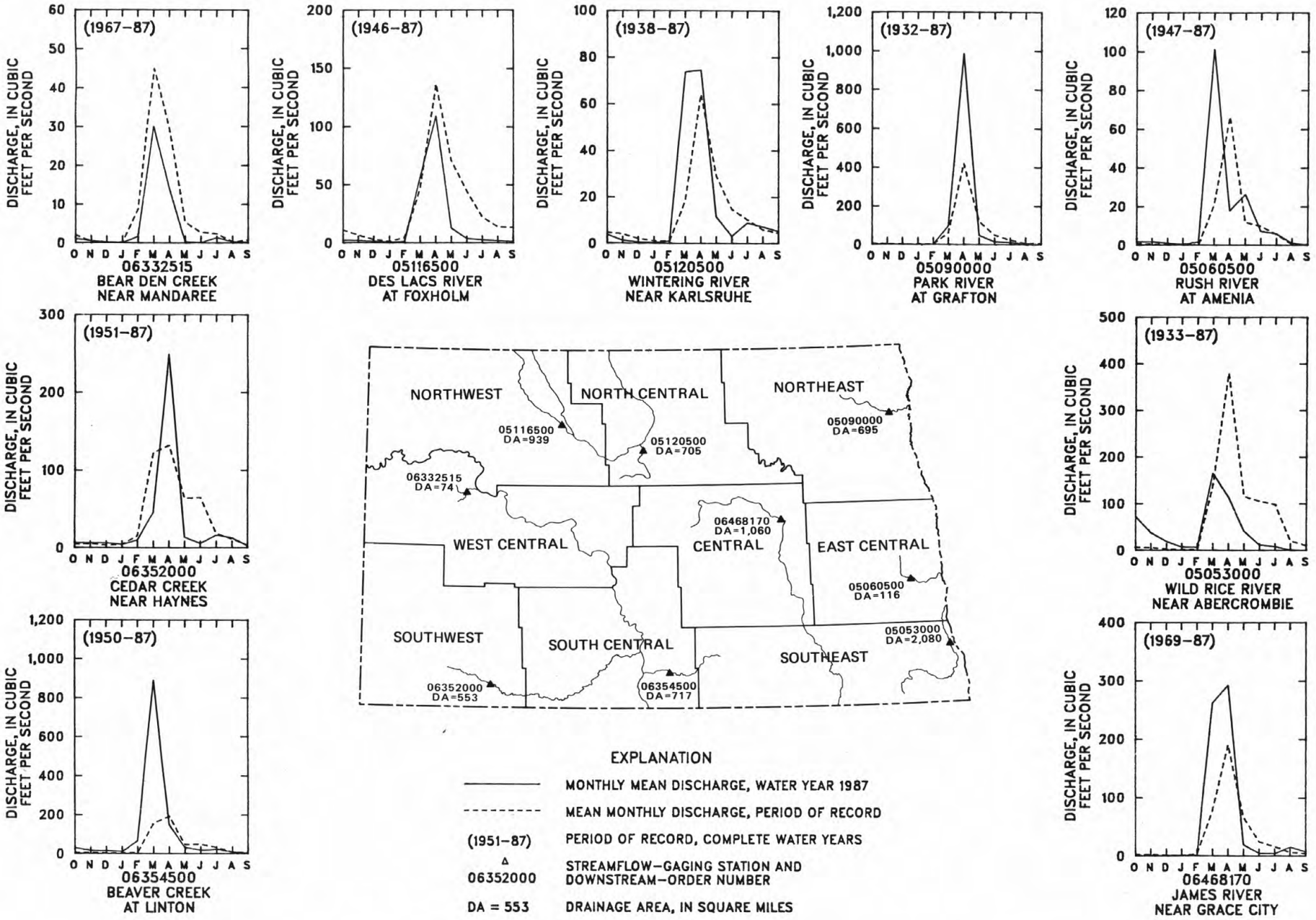

Figure 5.--Comparison of monthly mean discharge during water year 1987 to mean monthly discharge for the period of record.

Hydrographs of the monthly mean discharges for the Wild Rice River near Abercrombie, in the southeast part of the State, and Bear Den Creek near Mandaree and the Des Lacs River at Foxholm, in the northwest part of the State, show less discharge during the 1987 water year than mean monthly discharge for the period of record. However, as noted on page 5, the northwest and southeast corners of the State had less than normal precipitation during the 1987 water year; thus, it is expected that discharge would be less than average.

The largest monthly mean discharge for Beaver Creek at Linton (fig. 5) occurred in March, 1 month earlier than it occurred at Cedar Creek near Haynes. A storm in mid-March deposited snow over both basins. Another storm occurred the following week; this time the precipitation was rain, except in the extreme southwest corner of the State (including the Cedar Creek drainage basin), which received snow. The snowpack in the Beaver Creek basin was rapidly melted by the rain, resulting in the largest peak discharge since 1952. Discharge in Cedar Creek near Haynes peaked in early April, as temperatures moderated, the snow melted slowly and resulted in a less significant peak flow.

Wintering River near Karlsruhe and James River near Grace City both had monthly mean discharges for March and April that were greater than the period of record mean monthly discharges (fig. 5). That the March monthly mean discharge is approximately equivalent to the April monthly mean discharge for each station is a function of the timing of the runoff event near the end of March and beginning of April rather than the duration of the event.

Discharge of Park River at Grafton peaked in April as temperatures increased enough to melt the snowpack. Although the monthly mean discharge for April was considerably larger than the mean monthly for the period of record, flow decreased rapidly and the situation was reversed for May. This reversal probably is the result of a combination of storage in upstream reservoirs and lack of significant precipitation in April.

Discharge following the snowmelt period decreased rapidly. By May, monthly mean discharge was less than the period of record mean monthly discharge at all nine gaging stations shown in figure 5, except for the Rush River in the east-central National Weather Service division. Heavy rains in May in the central Red River Valley increased the Rush River discharge until the monthly mean discharge exceeded the period of record mean monthly discharge. None of the other hydrographs in figure 5 show an increase in monthly mean discharge from April to May.

A comparison of the precipitation graphs (fig. 4) and the discharge hydrographs (fig. 5) for the months of March and April shows that, although April precipitation was almost nonexistent statewide, most of the discharge during the 1987 water year occurred during March and April. Basin storage of precipitation, in the form of snow and ice, combined with low evapotranspiration and low infiltration due to frozen ground, resulted in above-normal spring discharge throughout most of the State. In contrast, July precipitation averaged 2 to 3 inches greater than normal, but most of the discharge hydrographs shown in figure 5 show little or no hydrologic response. This lack of response is due to low soil moisture, which contributed to greater amounts of infiltration than when the ground was frozen, and to greater amounts of evapotranspiration than during the early spring. Most of the above-normal precipitation in July either infiltrated into the ground or was lost to evapotranspiration rather than flowing overland to streams and rivers.

Although it is possible to make many conclusions about the hydrologic conditions of the State by using the precipitation and streamflow data presented in figures 4 and 5, respectively, sound hydrologic judgment should be exercised. For example, one could infer that Bear Den Creek, which drains 74 square miles of the west-central division, would have a large discharge in July because precipitation averaged almost 3 inches greater than normal for that month. However, the data for this station presented in figure 5 indicate that the largest discharge actually occurred in March, probably due to snowmelt runoff. The variability of rainfall intensity and distribution should be considered when making conclusions of hydrologic response to rainfall on small basins. In the case of Bear Den Creek, it is possible that heavy rainfalls did not occur within the basin. Discrepancies also may be caused by the different reporting period for the period-of-record mean values for data used in the two figures. The precipitation data uses a 30-year reference period from 1951 to 1980; but the mean monthly discharges are computed using data for the period of record at each streamflow-gaging station--21 years, 1967-87, in the case of Bear Den Creek near Mandaree.

Chemical Quality of Streamflow

Water quality at any particular site is dependent upon many factors, including the source of streamflow and the composition of the rocks over which it flows; therefore, water quality varies considerably across the State. During periods of low flow, when the major part of flow is derived from ground-water inflow, dissolved-solids concentrations are relatively large, reflecting the mineralized character of the ground-water inflow. Specific conductance commonly is used as a measure of the relative degree of mineralization or salinity of water and consequently is often used as an indicator of the suitability of water for irrigation and other uses. The U.S. Salinity Laboratory (U.S. Salinity Laboratory Staff, 1954, diagnosis and improvement of saline and alkali soils: U.S. Department of Agriculture Handbook 60, 160 p.) has developed an index using specific conductance as an indicator of salinity hazard in water used for irrigation. The specific conductance and corresponding salinity hazard are as follows: low hazard, less than 250 microsiemens; medium hazard, 250 to 750 microsiemens; high hazard, 750 to 2,250 microsiemens; very high hazard, 2,250 to 5,000 microsiemens.

Table 1.--Comparison of specific-conductance measurements made during water year 1987 with period of record

[Specific-conductance values are in microsiemens per centimeter at 25 °Celsius]

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Period of record	Water year 1987
05082500 Red River of the North at Grand Forks (period of record, water years 1949, 1956-87)														
Mean	510	581	604	569	548	483	458	556	545	492	498	485	516	575
Maximum	690	750	976	870	850	746	747	702	699	640	621	674	976	700
Minimum	399	440	468	275	400	305	200	325	348	280	360	340	200	350
Number of values	62	35	44	42	38	71	146	80	70	67	49	43	747	12
Measured values water year 1987	690	--	600	550	--	475	700 545 650	685	590	550	580	490	--	--
05114000 Souris River near Sherwood (period of record, water years 1970, 1972-87)														
Mean	1070	1270	1630	1740	1630	1270	620	771	1010	1030	974	1060	1130	1230
Maximum	1470	1880	2230	2770	2200	2180	1280	1160	1340	1420	1300	1240	2770	1900
Minimum	710	925	1250	1280	540	200	277	345	520	540	128	755	128	420
Number of values	25	22	14	21	21	27	38	19	23	20	26	16	272	10
Measured values water year 1987	1150	1750	--	1900	1660	--	420 770	1140	1210	--	1120	1160	--	--
06337000 Little Missouri River near Watford City (period of record, water years 1972-87)														
Mean	1960	1990	2890	2400	1220	938	1390	1800	1590	1820	1770	1750	1730	1670
Maximum	3100	2610	5000	3350	2030	1750	2700	3100	2710	3000	2520	2390	5000	2550
Minimum	720	740	1730	1500	640	400	515	850	800	1080	1000	900	400	710
Number of values	15	14	9	8	5	20	17	15	16	13	17	12	161	7
Measured values water year 1987	1240	--	2380	2550	--	--	710	1860	--	1150	--	1820	--	--
06354000 Cannonball River at Breien (period of record, water years 1950, 1971-87)														
Mean	1660	2190	2580	2410	1770	876	1100	1770	1630	1560	1510	1660	1640	1800
Maximum	2130	3070	3290	3800	3710	3100	2260	2930	3020	3000	2800	2300	3800	2670
Minimum	903	1600	284	680	190	190	300	481	610	570	975	730	190	671
Number of values	18	17	17	21	21	34	31	19	19	18	19	19	253	11
Measured values water year 1987	1740	2100	2360	2670	2290	671	1330	1230	--	--	1590 1790	2050	--	--
06470500 James River at LaMoure (period of record, water years 1957-87)														
Mean	843	894	1150	1380	1320	643	518	778	796	762	741	870	844	627
Maximum	1130	1220	1550	1700	1720	1350	919	1210	1180	1280	1140	1210	1720	1060
Minimum	480	540	890	340	700	185	160	500	170	170	485	480	160	210
Number of values	28	16	11	25	12	28	37	22	25	18	19	27	268	9
Measured values water year 1987	900	--	960	1060	--	210	410 440	540	--	550	570	--	--	--

Maximum values of specific conductance are observed during the fall and winter months, when the flow is primarily from ground-water inflow. As streamflow increases from increased runoff, the concentration of constituents in solution decreases, while other materials that tend to be carried in suspension, such as sediment, increase. The variability in water quality is greatest during the spring, when there is a considerable quantity of overland runoff from snowmelt. Minimum values of specific-conductance are observed during this period; the minimum value is dependent on the quantity of runoff that is available for dilution.

Values of specific-conductance measured at selected sites on major rivers and tributaries in the State during the 1987 water year and means, maximums, and minimums by month for the period of record at those sites, are shown in table 1. During the 1987 water year, the specific-conductance value measured during October at the Red River of the North at Grand Forks exceeded the October maximum monthly specific conductance at that station for the period of record. No other new extreme values were measured for the five stations tabulated in table 5. The Red River of the North is the least mineralized major river in North Dakota. Minimum specific-conductance values generally are measured during the spring snowmelt period. Larger specific-conductance values observed during other periods of the year reflect contributions from tributaries that receive inflow from more mineralized ground water and from tributaries that flow through glacial drift which contains more soluble minerals than the lacustrine sediments through which the Red River of the North flows. Specific-conductance values measured in water year 1987 indicate that a medium salinity hazard for irrigation use existed throughout the year.

The dissolved-mineral content of Souris River water is derived mostly from leaching of morainal deposits in Saskatchewan, Canada. The specific-conductance values measured during the 1987 water year at the Souris River near Sherwood were well within range of measured values for the period-of-record for each respective month. Levels of salinity hazard for irrigation use were high during water year 1987 except during the snowmelt runoff period in early April.

Specific-conductance values generally are lower during snowmelt periods because the snow contains only small amounts of dissolved constituents and has a relatively short contact time with surficial sediments prior to reaching the river channel. Because ground-water contributions to streamflow are limited, the river may be nearly dry at times. Increased specific-conductance values at low flows generally reflect evaporative concentration. Salinity hazard for irrigation use was medium during April 1987 and high to very high during the remainder of the water year.

As with the Little Missouri River, ground-water contributions to the Cannonball River also are limited. Increased specific-conductance values generally reflect the effects of evaporation. Salinity hazard for irrigation use was high to very high during 1987, except during March, when snowmelt runoff caused salinity hazards in the river to decrease to medium levels.

Specific-conductance values at the James River at LaMoure are stabilized slightly by regulation of flows from Jamestown Reservoir. Small releases from the reservoir maintain low flows downstream of the reservoir at specific-conductance values very near those in the reservoir. Upstream from the reservoir, the James River frequently goes dry, and specific-conductance values increase because of evaporation. During water year 1987, salinity hazard for irrigation use at LaMoure was high during the fall and winter low-flow months, low during the snowmelt runoff period in March, and medium during the remainder of the year. Following the snowmelt period, releases from Jamestown reservoir maintain higher flows throughout the summer, resulting in lower salinity hazard for irrigation during that time period.

Ground-Water Levels

Water-levels measured during the 1987 water year and the average of monthly water levels for the period of record for well 134-052-06CCD2 in Richland County and well 140-095-08AAA in Stark County are shown in figures 6 and 7, respectively. Ground-water levels at the beginning of the 1987 water year (see fig. 6 and 7) were higher than average because statewide precipitation in the prevous month, September 1986, was greater than normal. The National Weather Service (written commun., 1986) reported that soil moisture conditions were "***very wet to saturated***" throughout most of the State at the end of September 1986.

Because of the variable precipitation conditions that existed during the 1987 water year and and the typical lag in response of the water table to short-term changes, it is difficult to interpret the data shown in figures 6 and 7. The water-level fluctuations in the Richland County well (fig. 6) appear to follow the typical pattern of rises during the wet spring months and general declines during the rest of the year. However, the lack of precipitation in April apparently resulted in less rise in the water level than normally might be expected. Also the less than normal precipitation in June apparently resulted in a larger decline in water level than normally might be expected for the month of June.

Water levels in the Stark County well (fig. 7) did not change significantly from October through March. No appreciable increase in water level occurred in March or April, perhaps due to the combination of the high water level and lack of precipitation in April. The less than normal precipitation in April probably is the reason for the decrease in water level from April to May. Similarly, the greater than normal precipitation in July appears to have increased the ground-water level from slightly below the average of monthly water levels for July to above the average for August.

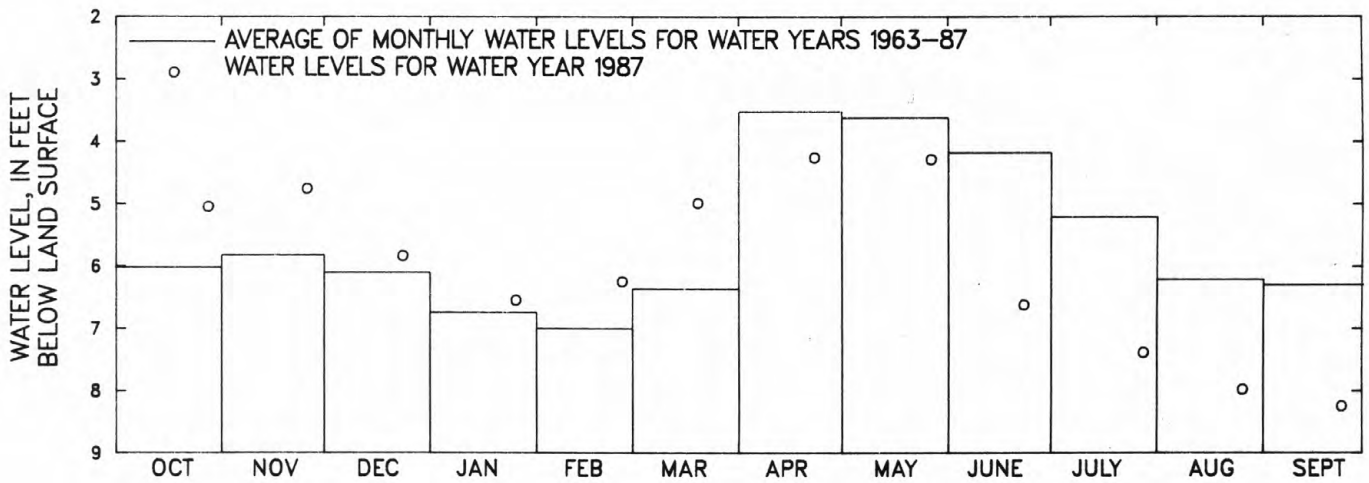

Figure 6.--Water levels in well 134-052-06CCD2 completed in Sheyenne Delta aquifer, Richland County, compared with period-of-record average of monthly water levels. Location of well is shown in figure 3.

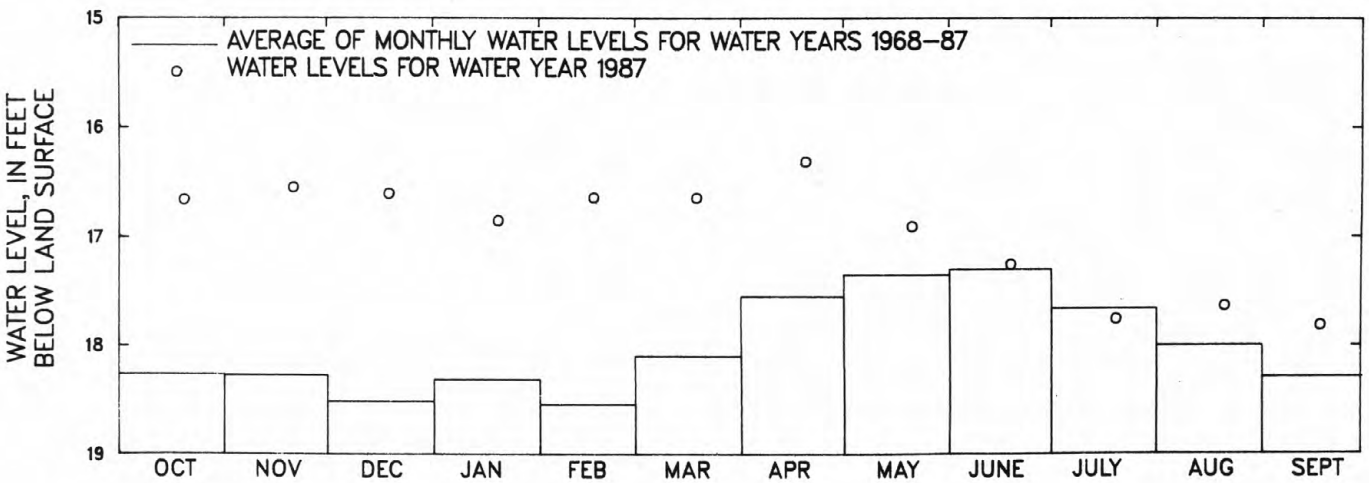

Figure 7.--Water levels in well 140-095-08AAA completed in Sentinel Butte aquifer, Stark County, compared with period-of-record average of monthly water levels. Location of well is shown in figure 3.

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 national or regional water-quality planning and management. The 500 or so sites in NASQAN generally are 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, (2) to aid in the description of the areal variability of water quality in the Nation's rivers, (3) to detect changes or trends with time in the pattern of occurrence of water-quality characteristics, and (4) to provide 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.

EXPLANATION OF THE RECORDS

The surface-water and ground-water records published in this report are for the 1987 water year that began October 1, 1986, and ended September 30, 1987. 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 1, 2, and 3. 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 stream site 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 systems 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 North Dakota, for water-quality stations where streamflow or water level are not collected on a regular basis.

Downstream Order System

Since October 1, 1950, the order of listing hydrologic-station records in U.S. Geological Survey reports is in a downstream direction along the main stream. All stations on a tributary entering upstream from a mainstream station are listed before that station. A station on a tributary that enters between two mainstream 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 indention in the "List of Stations" in the front of this report. Each indention represents one rank. This downstream order and system of indention shows 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 that may be established; hence, the numbers are not consecutive. The complete eight-digit number for each station, such as 06342500, which appears just to the left of the station name, includes the two-digit part number "06" plus the six-digit downstream-order number "342500." 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 fig. 8).

Local Well Numbers

In order to compare data for wells in other publications in North Dakota, such as the county ground-water studies, the wells in this report also are numbered according to a system based on the location in the public-land classification of the U.S. Bureau of Land Management. The system is illustrated in figure 9. The first number denotes the township north of a base line, the second number denotes the range west of the fifth principal meridian, and the third numeral denotes the section in which the well is located. The letters A, B, C, and D designate, respectively, the northeast, northwest, southwest, and southeast quarter section, quarter-quarter section, and quarter-quarter-quarter section (10-acre tract). For example, well 139-049-15ADC is in the SW¼SE¼NE¼ sec. 15, T. 139 N., R. 049 W. Consecutive terminal numbers are added if more than one well is recorded within a 10-acre tract.

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 and end-of-day contents commonly are published for such stations, they are referred to as "daily stations."

By contrast, partial records are obtained through discrete measurements without using a continuous stage-recording device and pertain only to a few flow characteristics, or perhaps only one. The nature of the partial record is indicated by table titles such as "Crest-stage partial records," or "Low-flow partial records." Records of miscellaneous discharge measurements or of measurements from special studies, such as low-flow seepage studies, may be considered as partial records. Locations of all complete-record and crest-stage partial-record stations for which data are given in this report are shown in figure 1.

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 relationships 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 relationship 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 adopted by the U.S. 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.

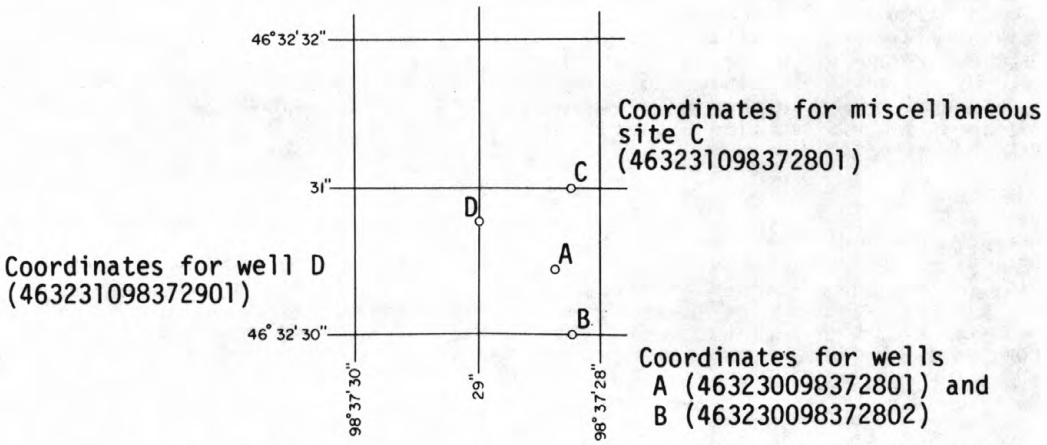

Figure 8.--System for numbering wells and miscellaneous sites (latitude and longitude).

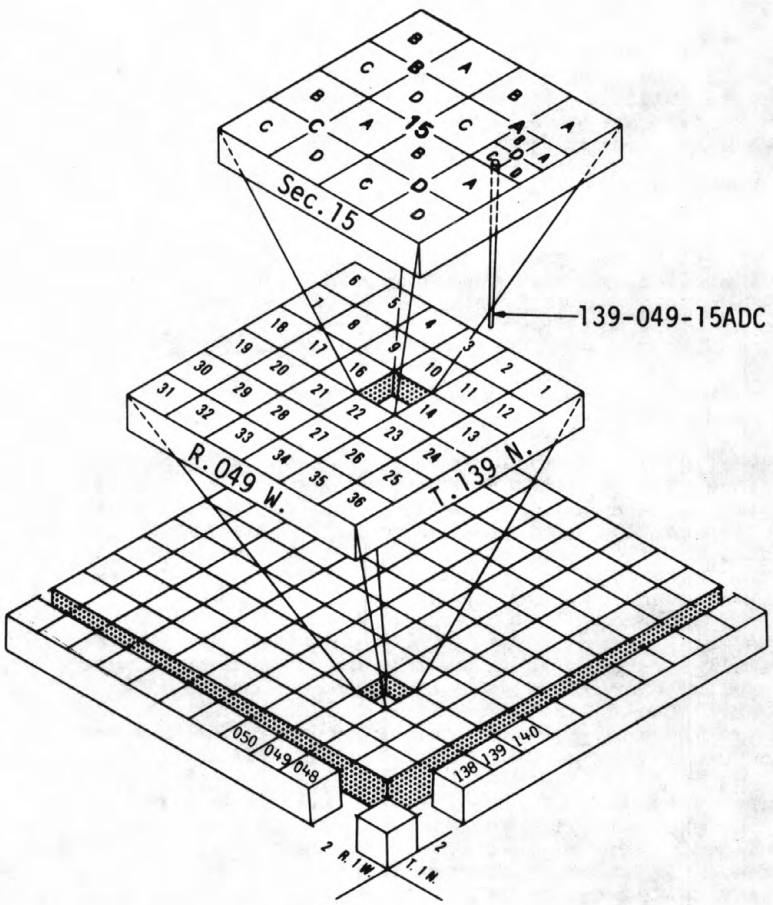

Figure 9.--System for numbering wells and miscellaneous sites (township and range).

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 relationship 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 relationship changes because of deposition of sediment in a lake or reservoir, periodic resurveys may be necessary to redefine the relationship. Even when this is done, the contents computed may become increasingly in error as the lapsed time since the last survey increases. Discharges over lake or reservoir spillways are computed from stage-discharge relationships 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 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 RECORDS.--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 will either be identified by date in this paragraph of the station description for water-discharge stations or flagged in the daily-discharge table. (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 U.S. 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 offices whose addresses are given on the back of the title page of this report 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.

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 usually 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.

Data for crest-stage stations and measurements at miscellaneous sites are presented in two tables following the information for continuous-record sites.

Identifying Estimated Daily Discharge

Estimated daily-discharge values published in the water-discharge tables of annual State data reports are identified either by flagging individual daily values with the letter symbol "e" and printing a table footnote, "e-Estimated," or by listing the dates of the estimated record in the REMARKS paragraph of the station description.

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 their true values; "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 cubic foot per second; to the nearest tenth between 1.0 and 10 cubic feet per second; to whole numbers between 10 and 1,000 cubic feet per second; and to three significant figures for more than 1,000 cubic feet per second. 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.

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 is on file in the North Dakota District Office. Also, most of the daily mean discharges are in computer-readable form and have been analyzed statistically. An example of a computer listing of annual peak discharges for the Knife River at Hazen, N. Dak., gaging station (06340500) is shown in figure 10. An example of the computer generated Log-Pearson Type III annual peak-flow frequency analysis for these data, following the U.S. Water Resources Council guidelines in Bulletin 17B, is shown in tabular form by figure 11 and shown graphically by figure 12.

Usually data users are interested in comparing current streamflow to long-term averages. Examples of statistics computed for monthly mean discharges for the Knife River at Hazen are shown in figures 13 and 14.

Current flow data at U.S. Geological Survey gaging stations are available upon request, usually within less than one month following retrieval of the recorded data from the field site. After primary analysis the data are available in a computer format that shows hourly water level fluctuations, adjustments required for accurate computation of daily flows, and other details of the record analysis (see fig. 15). In this "primary computation" form, the data are considered provisional and subject to revision until published.

Many other statistics and data formats are available upon request. The information generally is available on a timely basis at no charge to the user; however, large requests or those specifically tailored to individual data-user's needs may be provided at a nominal fee. Information on the availability of the unpublished information or on the results of statistical analyses of the published records may be obtained from the office whose address is given on the back of the title page of this report.

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 one 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 2.

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.

STATION 06340500 KNIFE RIVER AT HAZEN, ND

AGENCY: USGS
STATE: 38
COUNTY: 057
DISTRICT: 38

STATION LOCATOR
LAT. LONG.
471706 1013726

DRAINAGE AREA: 2240.00 SQ MI
CONTRIBUTING DRAINAGE AREA: 2240.00 SQ MI
GAGE DATUM: 1712.35 (NGVD)
BASE DISCHARGE: 1500.00 CFS

WATER YEAR	DATE	PEAK DISCHARGE (CFS)	DISC CODES	GAGE HEIGHT (FT)	GH CODES	MAX GAGE HEIGHT (FT)	DATE	GH CODES
1930	02/21/30	3070.00		23.20	1			
1931	09/22/31	1450.00		11.60				
1932	06/14/32	1300.00		11.10				
1933	03/17/33	2200.00		14.50				
1938	07/05/38	7540.00		23.00				
1939	03/24/39	9300.00		24.47				
1940	07/29/40	1150.00		10.92				
1941	06/09/41	4110.00		20.23				
1942	06/07/42	3120.00		17.10				
1943	03/26/43	26500.00		26.30				
1944	04/03/44	8010.00		23.39				
1945	03/15/45	8690.00		23.99				
1946	03/03/46	3500.00		19.30	1			
1947	06/25/47	6000.00		21.70	2	21.95	03/25/47	1
1948	03/24/48	7070.00		23.62	1			
1949	04/06/49	7760.00		23.30	2	24.10	04/03/49	1
1950	04/17/50	22700.00		25.93				
1951	03/30/51	9000.00		25.36	1			
1952	04/07/52	20200.00		25.83				
1953	06/14/53	3440.00		17.31				
1954	04/08/54	3880.00		18.06				
1955	03/13/55	1400.00	2	11.35				
1956	03/21/56	6630.00		23.76	1			
1957	03/01/57	1590.00		12.49	1			
1958	03/28/58	3500.00	2	19.82	1			
1959	03/24/59	4930.00		20.14				
1960	03/27/60	7230.00		23.13	1			
1961	03/03/61	488.00		9.62	12	9.72	03/02/61	1
1962	05/31/62	3860.00		17.48				
1963	06/10/63	1050.00		9.63				
1964	06/18/64	5170.00		20.17				
1965	04/15/65	3330.00		15.99				
1966	06/24/66	35300.00		27.01				
1967	03/25/67	7980.00		23.88				
1968	03/06/68	1800.00		18.37	1			
1969	04/07/69	11800.00		24.75				
1970	05/11/70	8180.00		23.83				
1971	03/17/71	4320.00		18.79	1			
1972	03/15/72	19000.00		26.17	1			
1973	03/02/73	3900.00		21.44	1			
1974	03/03/74	1350.00		14.28	1			
1975	05/01/75	6600.00		22.60	2	23.37	04/24/75	1
1976	03/19/76	3000.00		18.00	1			
1977	06/19/77	1200.00		9.75	2	11.69	03/11/77	1
1978	03/27/78	11000.00		25.10	1			
1979	04/18/79	5440.00		20.26				
1980	06/15/80	1620.00		10.58				
1981	02/18/81	900.00		9.92	1			
1982	03/31/82	10500.00		25.14	1			
1983	03/13/83	5300.00		23.00	1			
1984	03/21/84	2500.00		14.50	1			
1985	05/13/85	1540.00		10.10				
1986	03/04/86	8800.00		24.00				
1987	03/23/87	8550.00		23.80				

Figure 10.--Example of computer printout of annual peak discharges for the period of record on the Knife River at Hazen.

PGM J407 VER 3.7
(REV 11/5/81)

U. S. GEOLOGICAL SURVEY
ANNUAL PEAK FLOW FREQUENCY ANALYSIS
FOLLOWING WRC GUIDELINES BULL. 17-B.

RUN-DATE 3/23/88 AT 1905 SEQ 1.0001

OPTIONS IN EFFECT -- PLOT BCPU LGPT NODB PPOS NORS EXPR CLIM

STATION - 06340500 /USGS KNIFE RIVER AT HAZEN, ND 1930-1987 06340500 /USGS

I N P U T D A T A S U M M A R Y

-- YEARS OF RECORD -- SYSTEMATIC	HISTORIC	HISTORIC PEAKS	GENERALIZED SKEW	STD. ERROR OF GENERAL. SKEW	SKEW OPTION	GAGE BASE DISCHARGE	USER-SET OUTLIER CRITERIA HIGH OUTLIER	LOW OUTLIER
54	0	0	-0.400	--	WRC WEIGHTED	0.0	--	--

********* NOTICE -- PRELIMINARY MACHINE COMPUTATIONS. *********
********* USER RESPONSIBLE FOR ASSESSMENT AND INTERPRETATION. *********

WCF134I-NO SYSTEMATIC PEAKS WERE BELOW GAGE BASE. 0.0
WCF195I-NO LOW OUTLIERS WERE DETECTED BELOW CRITERION. 323.9
WCF163I-NO HIGH OUTLIERS OR HISTORIC PEAKS EXCEEDED HHBASE. 60229.0

ANNUAL FREQUENCY CURVE PARAMETERS -- LOG-PEARSON TYPE III

	FLOOD BASE DISCHARGE	FLOOD BASE EXCEEDANCE PROBABILITY	LOGARITHMIC MEAN	LOGARITHMIC STANDARD DEVIATION	LOGARITHMIC SKEW
SYSTEMATIC RECORD	0.0	1.0000	3.6451	0.4055	-0.054
W R C ESTIMATE	0.0	1.0000	3.6451	0.4055	-0.139

ANNUAL FREQUENCY CURVE ORDINATES -- DISCHARGES AT SELECTED EXCEEDANCE PROBABILITIES

ANNUAL EXCEEDANCE PROBABILITY	W R C ESTIMATE	SYSTEMATIC RECORD	'EXPECTED PROBABILITY' ESTIMATE	95-PCT CONFIDENCE LIMITS FOR W R C ESTIMATES LOWER	UPPER
0.9950	352.8	380.1	300.8	207.3	525.8
0.9900	457.4	484.8	406.5	281.0	661.2
0.9500	916.9	937.2	874.2	630.3	1228.4
0.9000	1317.3	1327.6	1271.5	954.7	1705.8
0.8000	2026.7	2017.7	1991.8	1550.7	2543.0
0.5000	4513.1	4453.6	4513.1	3653.6	5580.9
0.2000	9746.6	9714.4	9901.2	7762.1	12756.7
0.1000	14400.8	14534.9	14852.0	11146.9	19793.3
0.0400	21639.7	22258.0	22752.4	16124.9	31562.8
0.0200	28013.6	29254.8	30159.5	20317.3	42551.9
0.0100	35220.7	37360.7	38686.3	24904.9	55534.9
0.0050	43312.7	46682.5	49013.0	29908.0	70697.8
0.0020	55458.7	61065.0	63679.8	37191.8	94423.8

Figure 11.--Example of computer printout for annual peak flow frequency analysis on the Knife River at Hazen.

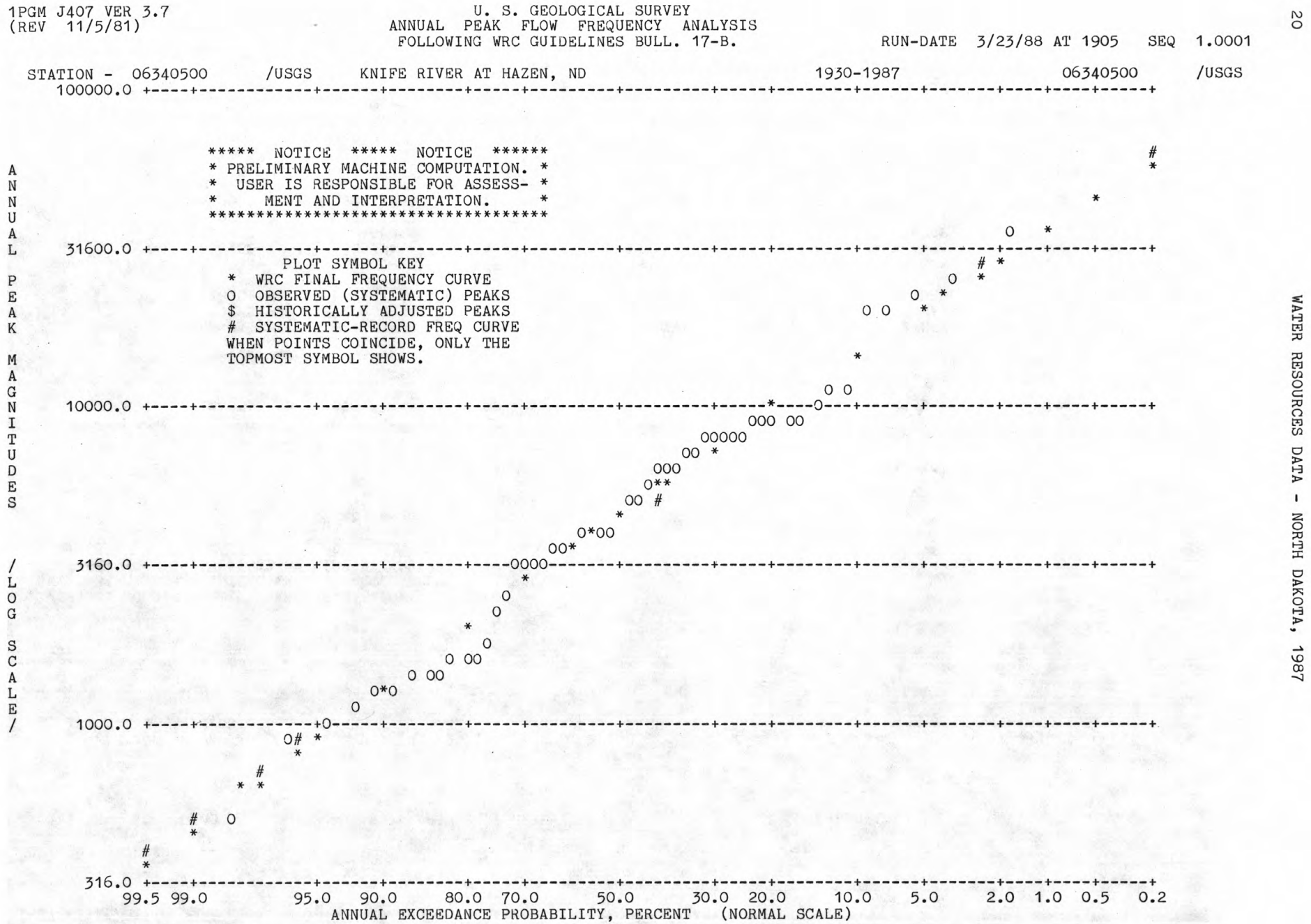

Figure 12.--Example of computer printout for peak flow frequency curve for the Knife River at Hazen.

STATION 06340500 KNIFE RIVER AT HAZEN, ND

DISCHARGE-(CFS)

STATISTICS ON NORMAL MONTHLY MEANS (ALL DAYS)

OCT	NOV	DEC	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT
BY ROWS (MEAN,VARIANCE,STANDARD DEVIATION,SKEWNESS,COEFF. OF VARIATION,PERCENTAGE OF AVERAGE VALUE)											
37.47	31.56	22.12	20.48	92.47	733.68	588.56	177.87	257.04	116.29	49.16	36.34
2403.17	851.04	195.08	634.83	25113.68	575559.12	753586.87	62666.24	63971.89	22842.28	1828.10	926.35
49.02	29.17	13.97	25.20	158.47	758.66	868.09	250.33	252.93	151.14	42.76	30.44
5.79	5.41	2.20	3.34	3.27	1.53	2.48	3.59	1.44	3.96	1.87	2.01
1.31	0.92	0.63	1.23	1.71	1.03	1.47	1.41	0.98	1.30	0.87	0.84
1.73	1.46	1.02	0.95	4.27	33.92	27.21	8.22	11.88	5.38	2.27	1.68

Figure 13.--Example of computer printout for statistics computed on monthly mean discharges for the period of record on the Knife River at Hazen.

STATION 06340500 KNIFE RIVER AT HAZEN, ND

DISCHARGE-(CFS)
NORMAL MONTHLY MEANS(ALL DAYS)

OCT	NOV	DEC	JAN	FEB	MARCH
		TWENTY FIFTH PERCENTILE			
17.8	19.2	12.6	7.54	9.35	169.7
		FIFTIETH PERCENTILE			
27.9	25.7	19.5	13.0	21.6	421.4
		SEVENTY FIFTH PERCENTILE			
40.6	35.7	28.5	19.5	120.6	1140

APRIL	MAY	JUNE	JULY	AUG	SEPT
		TWENTY FIFTH PERCENTILE			
97.4	55.7	70.0	30.8	17.5	19.0
		FIFTIETH PERCENTILE			
181.4	91.6	162.5	74.5	36.7	27.3
		SEVENTY FIFTH PERCENTILE			
784.9	181.5	353.0	150.4	71.2	46.0

NOTE -- PERCENTILES BASED ON AVAILABLE DATA

Figure 14.--Example of computer printout for quartile percentages of monthly mean discharges for the period of record on the Knife River at Hazen.

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY - WATER RESOURCES DIVISION STATE 38 DIST 380

PRIMARY COMPUTATIONS OF GAGE HEIGHT AND DISCHARGE
DATE PROCESSED: 03-22-1988 @ 18:16 BY REHARKNESS

06340500 RATINGS USED -- INPUT 13.0 09/01/79 (0015)

KNIFE RIVER AT HAZEN, ND STNRD 15.0 02/28/86 (0015)

OUTPUT PARAMETER 00060 STORE STATISTIC(S) 00003
PROVISIONAL DATA FOR WATER YEAR ENDING SEPT. 30, 1987 PUNCH INTERVAL: 15 MIN

DATE	MAX GH /DISCH <TIME>	MIN GH /DISCH <TIME>	MEAN GH	MEAN DISCH	SHIFT ADJ	DATUM CORR	STAGE, IN HUNDRETHS OF FEET, AT INDICATED HOURS 0100 0200 0300 0400 0500 0600 0700 0800 0900 1000 1100 1200 / 1300 1400 1500 1600 1700 1800 1900 2000 2100 2200 2300 2400
03/01/87	3.54 253 <1245>	3.48 244 <0645>	3.51	56	0.07W	-0.16	352 352 351 350 349 349 348 348 348 348 350 352 354 354 354 354 354 354 354 353 352 350 350 350
03/02/87	3.49 245 <0015>	3.43 236 <2245>	3.47	54	0.07W	-0.17	349 348 347 347 347 347 347 347 347 347 347 347 347 347 347 347 347 347 346 345 345 344 343 343
03/03/87	3.43 236 <0015>	3.42 235 <1730>	3.43	54	0.07W	-0.18	343 343 343 343 343 343 343 343 343 343 343 343 343 343 343 343 343 342 342 342 342 342 342 342
03/04/87	3.63 266 <2400>	3.42 235 <0015>	3.44	57	0.07W	-0.19	342 342 342 342 342 342 342 342 342 342 342 342 342 342 343 345 345 345 345 346 348 350 355 363
03/05/87	14.92 3400 <2400>	3.65 269 <0015>	6.63	700	0.07W	-0.21	372 384 395 403 409 414 421 430 443 454 463 472 487 528 600 697 772 851 969 1075 1200 1321 1389 1492
03/06/87	20.50 5740 <1015>	15.07 3460 <0015>	18.40	4500	0.07W	-0.22	1557 1613 1756 1786 1803 1832 1882 1887 1912 2025 1971 1939 1940 1985 1939 1915 1889 1841 1799 1780 1808 1828 1828 1823
03/07/87	18.17 4700 <0015>	12.70 2600 <2330>	14.83	2500	0.07W	-0.22	1784 1761 1720 1700 1650 1623 1590 1554 1523 1483 1463 1436 1425 1405 1391 1360 1346 1333 1321 1317 1302 1288 1278 1272
03/08/87	12.62 2580 <0015>	9.11 1480 <2400>	10.72	1700	0.07W	-0.21	1248 1224 1211 1188 1174 1159 1133 1114 1094 1071 1054 1046 1038 1031 1024 1016 1009 1008 994 975 961 945 928 911
03/09/87	9.08 1470 <0015>	6.41 797 <2400>	7.40	900	0.07W	-0.21	891 871 850 833 817 801 783 765 749 732 718 712 706 701 696 693 688 683 678 669 658 650 645 641
03/10/87	6.38 790 <0015>	4.89 482 <2400>	5.61	500	0.07W	-0.20	633 631 633 632 638 612 609 613 608 583 544 529 526 524 523 524 524 522 513 509 503 497 493 489
03/11/87	4.88 480 <0015>	4.37 388 <2000>	4.55	330	0.07W	-0.20	485 481 478 476 473 468 464 460 456 452 449 448 448 449 449 449 447 442 439 437 437 437 437 437
PERIOD	20.50 5740	3.42 235					TIME CORRECTION 0.0 MINUTES PER DAY

NOTE. SYMBOLS USED ABOVE HAVE THE FOLLOWING MEANINGS --

W - SHIFT IS A VALUE WEIGHTED BY DISCHARGE WHERE SHIFT VARIES WITH STAGE DURING THE DAY

Figure 15.--Example of "primary computation" computer printout for the Knife River at Hazen.

On-Site Measurements and Sample Collection

In obtaining water-quality data, a major concern needs to be 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 on-site 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 under "PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS" which appears at the end of the introductory text. Also, detailed information on collecting, treating, and shipping samples may be obtained from the U.S. Geological Survey North Dakota 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 (see definitions) 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 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. Geological Survey North Dakota 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, minimum, and mean temperatures for each day are published. Water temperatures measured at the time of water-discharge measurements are published with the water-quality records for each surface-water station in this report.

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. 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 biochemical-oxygen demand (BOD) and samples for indicator bacteria are analyzed locally. Sediment samples are analyzed in the U.S. Geological Survey laboratory in Iowa City, Iowa. All other samples are analyzed in either the U.S. Geological Survey laboratory in Arvada, Colo., or the North Dakota State Water Commission laboratory in Bismarck, N. Dak. Methods used in analyzing sediment samples and computing sediment records are given in TWRI, Book 5, Chap. C1. Methods used by the U.S. Geological Survey laboratory 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, and dissolved oxygen 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.

INSTRUMENTATION.--Information on instrumentation is given only if a water-quality monitor temperature recorder, sediment pumping sampler, or other sampling device is in operation at a station.

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 U.S. 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.

When the water-quality data for this report was prepared for publication, not all of the parameter values requested from the analyzing laboratories were available. As these data values are received the computer files will be updated, but no attempt to publish these data will be made.

As part of the quality assurance procedures for the samples analyzed at the North Dakota State Water Commission laboratory, about 5 percent of the samples include a "split" sample which is sent to the U.S. Geological Survey laboratory in Arvada. The "split" samples analyzed in Arvada are included in this report and identified with footnotes. The sampling times indicated on the "splits" are one minute later than the regular samples.

Remark Codes

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

PRINTED OUTPUT	REMARK
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)
ND	Not detected. No colonies were present on the least dilute sample prepared.

Records of Ground-Water Levels

Only water-level data from a network of selected observation wells are given in this report. These data are intended to provide a sampling and historical record of water-level changes in the most important aquifers. Locations of the observation wells in this selected network in North Dakota are shown in figure 3.

The complete statewide network included more than 800 wells during 1987. About one-half of these wells were measured annually and the others at a variety of frequencies. Forty wells were equipped with continuous water-level recorders.

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. 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 or a larger unit.

Data Presentation

Each well record consists of two parts, the station description and the data table of water levels measured 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 measurement 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 feet 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.

REMARKS.--This entry describes factors that may influence the water level in a well or the measurement of the water level. It should identify wells that also are water-quality observation wells, and may be used to acknowledge the assistance of local (non-Survey) observers.

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 U.S. Geological Survey, may be noted.

EXTREMES FOR PERIOD OF RECORD.--This entry contains the highest and lowest water levels of the period of published record, with respect to land-surface datum, and the dates of their occurrence.

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 levels are listed. For wells equipped with recorders, only abbreviated tables, every fifth day and at the end of the month (EOM) are published; taped measurements are not published for wells equipped with continuous recorders. The highest and lowest 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.

Availability of Data

All water-level measurements and recorder data are stored in computer as well as office files and are available in a tabular listing similar to those published in this report. However, ground-water data usually are more easily analyzed when displayed graphically. Examples of computer-generated hydrographs for water levels in four wells published in this report are presented in figures 16a-18.

The hydrograph for well 139-078-27CBB in the McKenzie aquifer in Burleigh County is shown in figures 16a and 16b, and the reported water use for irrigation from the McKenzie aquifer is shown in table 2. Very little fluctuation in water level occurred from 1963 until about 1972 (fig. 16a), and water-use data for the McKenzie aquifer (table 2) indicate that irrigation was insignificant until about 1972. Only annual water-level measurements at the end of the year were made during 1972-74 and the effect of irrigation withdrawals on the aquifer during the irrigation season cannot be detected on the hydrograph. Beginning in 1975, the frequency of water-level measurements was increased, and the annual declines in water level during the irrigation season and the recovery during the winter and spring can be seen in figure 16b. The largest annual decline in the water level, more than 7 feet, during the period of record for this well occurred during 1977. This decline corresponds to the largest reported water use for irrigation from the McKenzie aquifer (table 2).

Due to above normal precipitation during the 1986 irrigation season (fig. 4), reported water use for irrigation from the McKenzie aquifer (table 2) was the lowest since 1969. The 1986 hydrograph for the Burleigh County well in figure 16b does not show the decline in water level, during the irrigation season, that has become typical in recent years of larger withdrawals.

Table 2.--Reported water use, by year, for irrigation from the McKenzie aquifer, in acre-feet

Year	Water use	Year	Water use	Year	Water use	Year	Water Use
1969	0	1974	400	1979	314	1984	624
1970	75	1975	182	1980	475	1985	477
1971	150	1976	338	1981	230	1986	20
1972	436	1977	781	1982	348	1987	118
1973	416	1978	183	1983	486		

The 1987 hydrograph of water levels in well 134-052-06CCD2 completed in the Sheyenne Delta aquifer in Richland County and equipped with a continuous recorder is shown in figure 17. The maximum and minimum recorded daily water levels and the periodic water-level measurements are shown. The periodic measurements were made with a steel tape. A dotted line was drawn between the periodic measurements to illustrate the definition of changes indicated by periodic taped measurements as compared to definition of changes in water level that is provided when continuous recorder data are available. Although the general trend in water-level changes is provided by the periodic measurements (fig. 17), the water level in this well may fluctuate more than 2 feet between measurements. Straight-line interpolation between measurements would have been in error by more than half a foot at this site at several times during the water year.

Ground-water data are recorded and stored as water levels in feet below land surface. Because the elevation of land surface is determined for all well sites, it is possible to relate water level below land surface to elevation above National Geodetic Vertical Datum of 1929. Both vertical scales are used on the hydrographs, water level below land surface on the right margin and water-level elevation above National Geodetic Vertical Datum of 1929 on the left margin (figs. 16a-18). Gage datum at lake and reservoir sites also can be directly related to National Geodetic Vertical Datum; therefore, both ground-water and surface-water elevation data can be plotted on one hydrograph to show the relationship that exists between the ground-water level, and the level of water in nearby lakes and reservoirs. The hydrographs for well 153-063-30CBC in in Benson County and Devils Lake are shown in figure 18. Such comparison hydrographs are useful tools for analysis of ground-water/surface-water relationships.

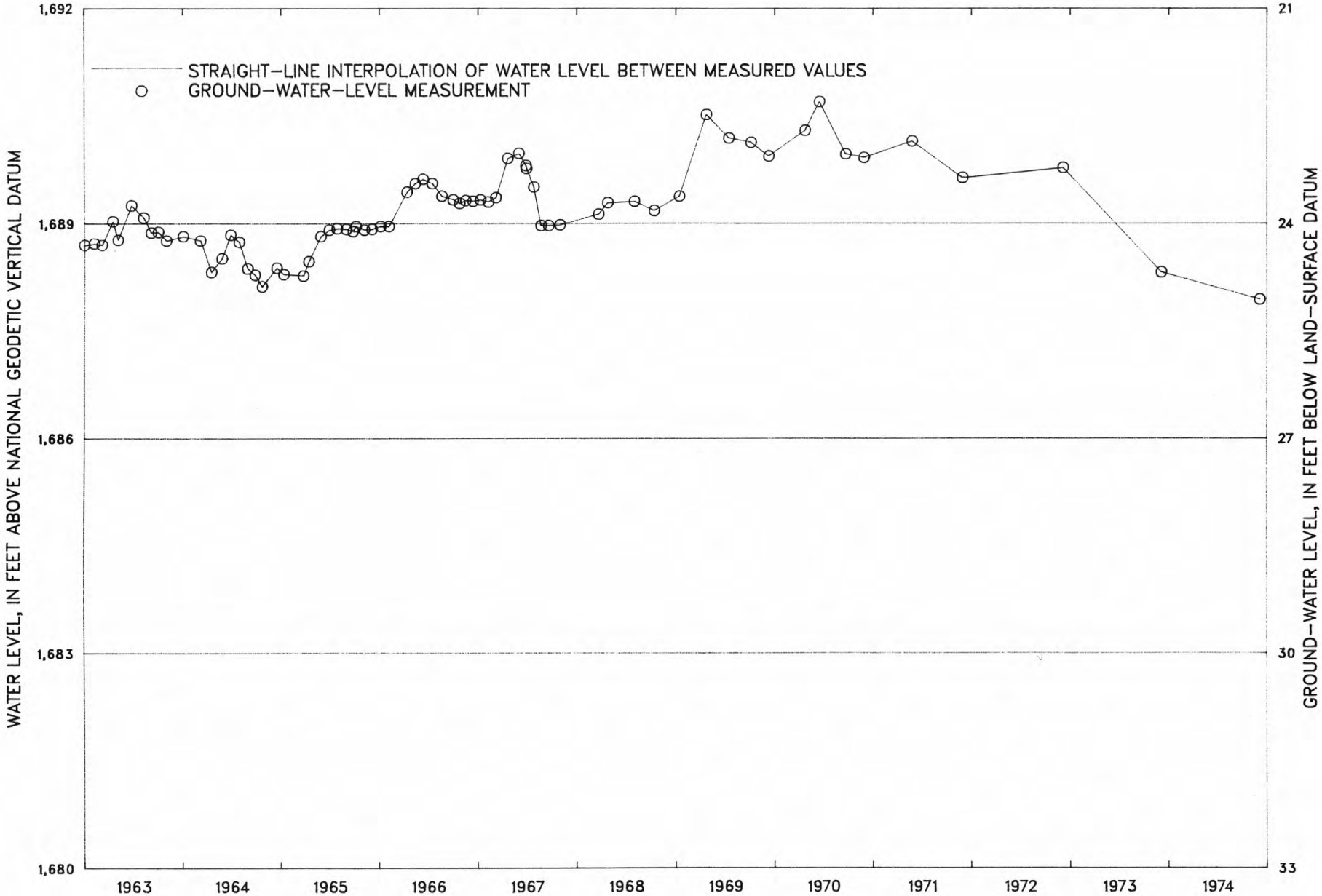

Figure 16a.--Water levels in well 139-078-27CBB completed in McKenzie aquifer, Burleigh County, 1963-74.

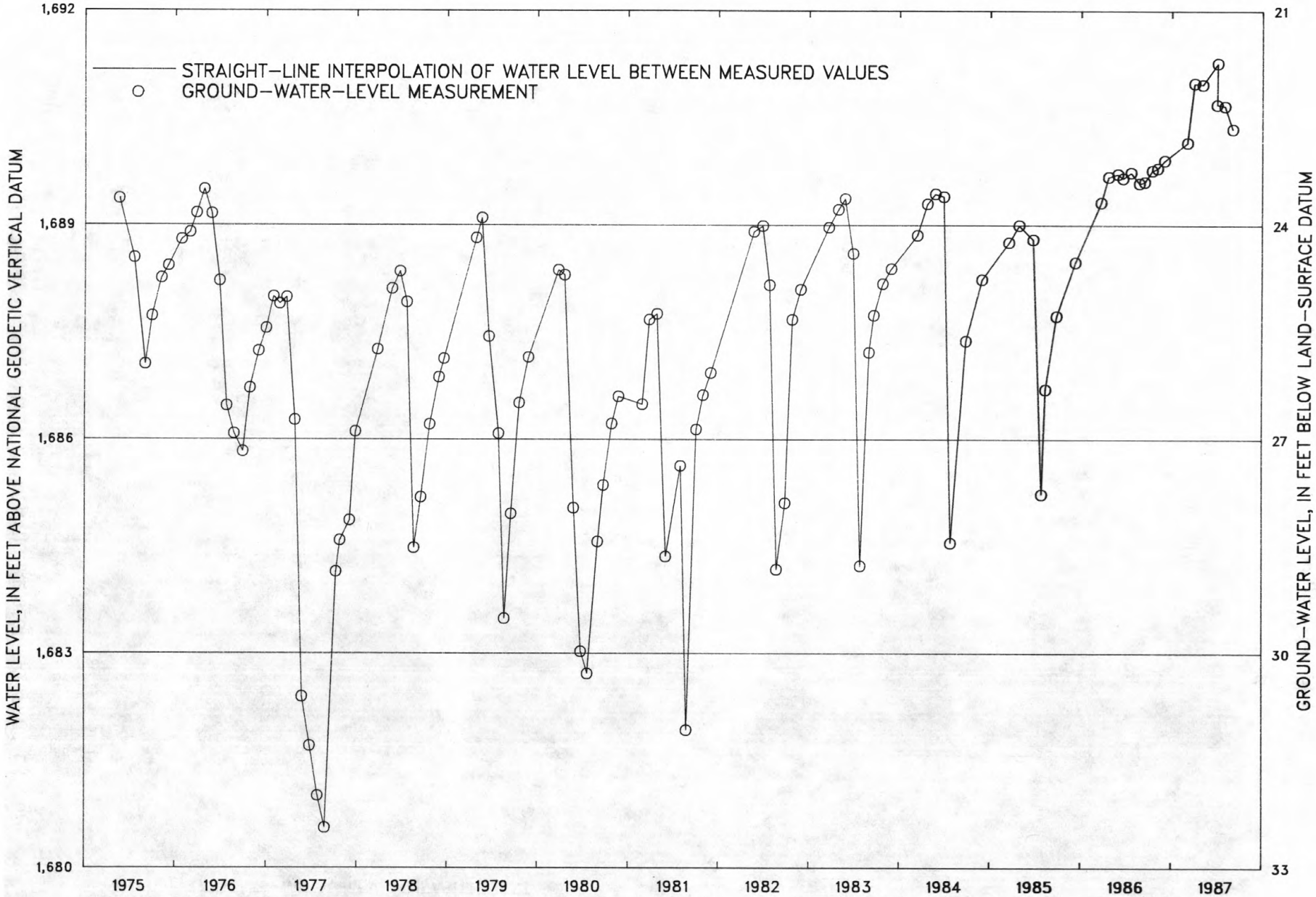

Figure 16b.--Water levels in well 139-078-27CBB completed in McKenzie aquifer, Burleigh County, 1975-87.

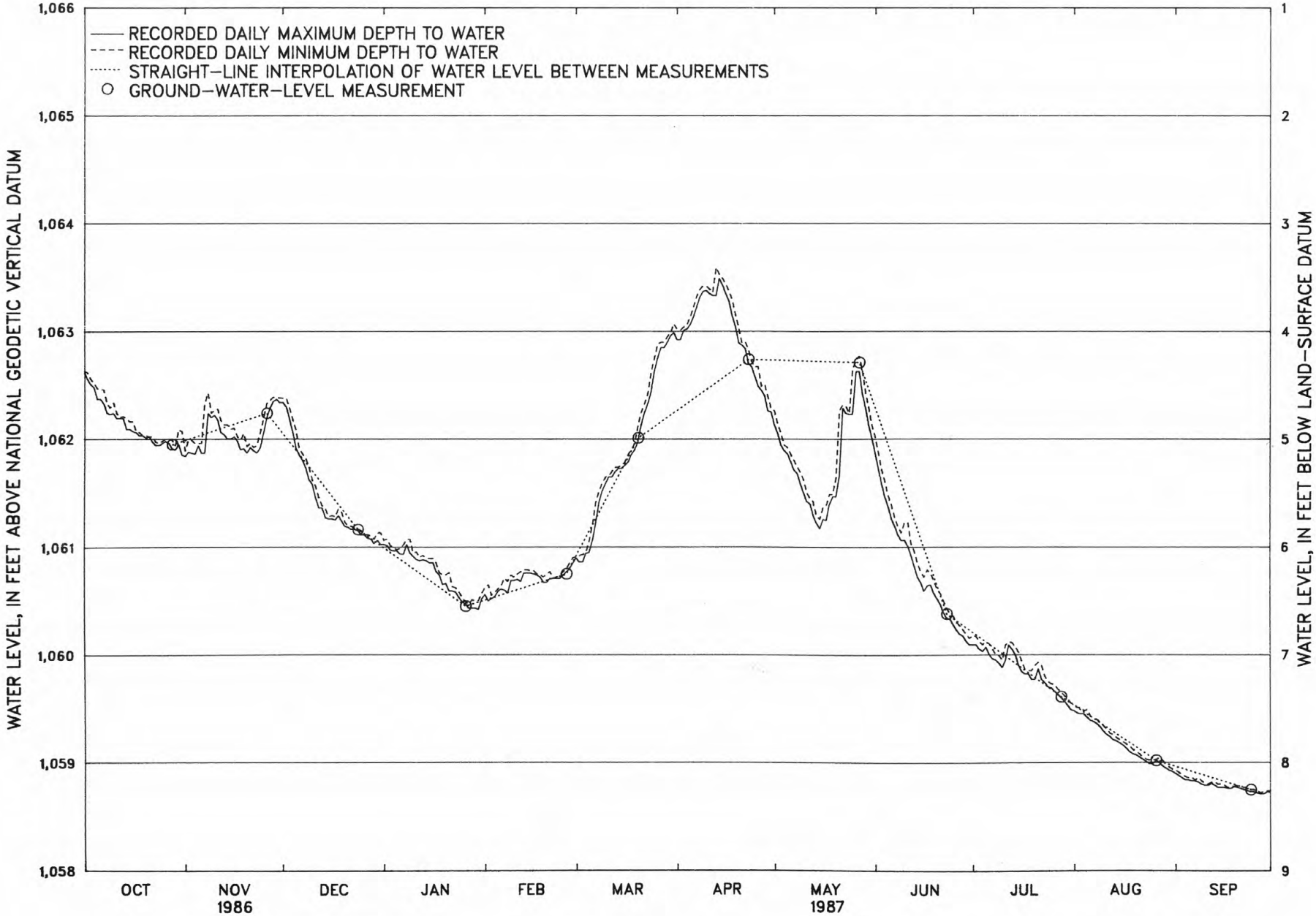

Figure 17.--Water levels in recorder well 134-052-06CCD2 completed in Sheyenne Delta aquifer, Richland County, water year 1987.

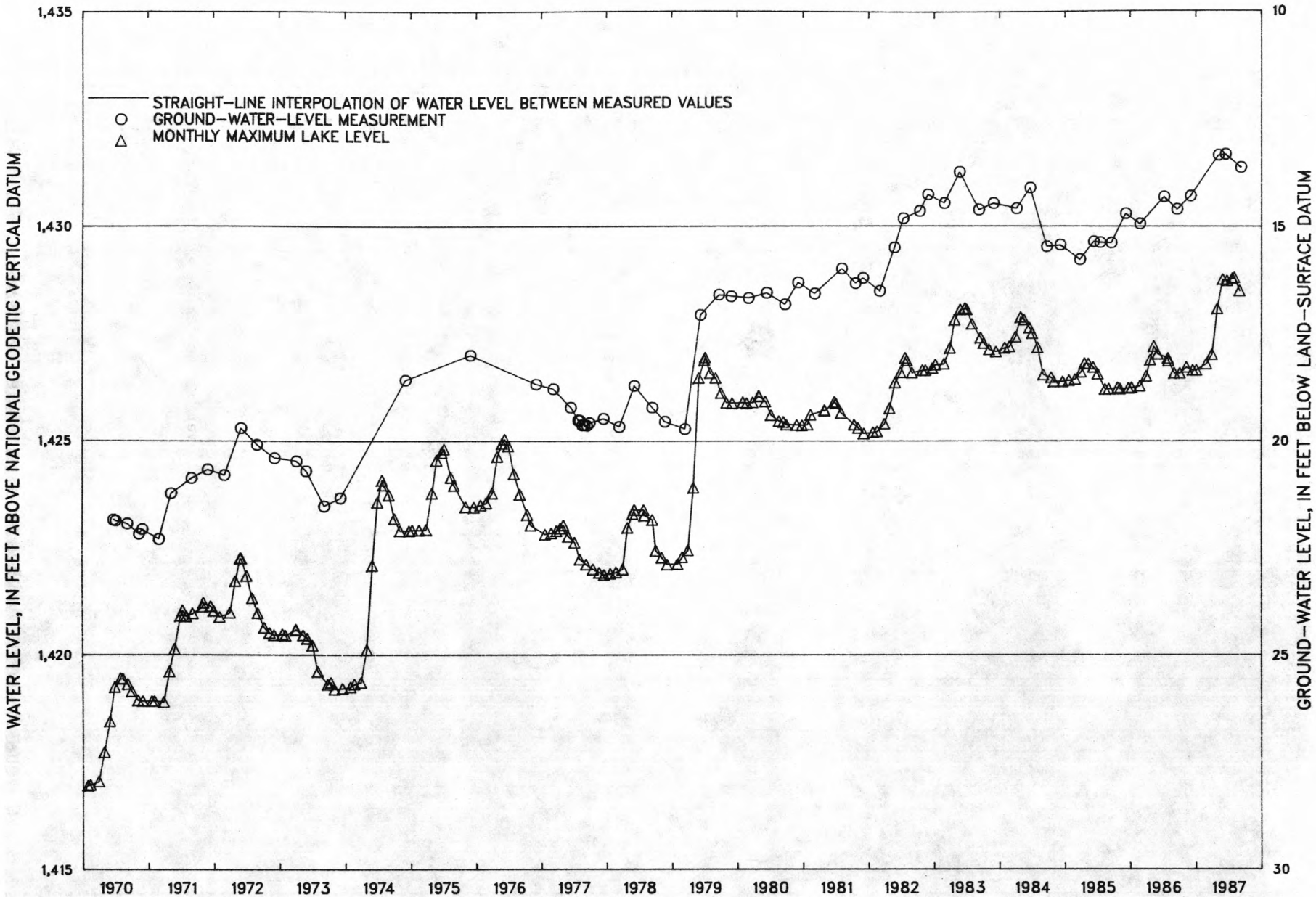

Figure 18.--Water levels in well 153-063-30CBC completed in Spiritwood aquifer, Benson County, and monthly maximum water levels in Devils Lake, 1970-87.

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 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 mostly as a part of special studies in specific areas. Consequently, a number of chemical analyses are presented for some counties but none are presented for others. 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 at the end of the introductory text. The values 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 casing.

Data Presentation

The records of ground-water quality are published in a section titled QUALITY OF GROUND WATER immediately following the ground-water-level records. Data for quality of ground water are listed alphabetically by County, and 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, depth of well, 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 the office whose address is 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 table for converting English units to International System (SI) Units 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 equivalent to 43,560 cubic feet or about 326,000 gallons or 1,233 cubic meters.

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.

Fecal coliform bacteria are bacteria that are present in the intestine or feces of warmblooded 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 plus or minus 0.2°C on M-FC medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

Fecal streptococcal bacteria are bacteria found also in the intestine 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 plus or minus 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 (or bottom material) is the sediment mixture of which a streambed, lake, pond, reservoir, or estuary bottom is composed.

Biochemical oxygen demand (BOD) is a measure of the quantity of dissolved oxygen, in milligrams per liter, necessary for the decomposition of organic matter by micro-organisms, such as bacteria.

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).

Chemical oxygen demand (COD) is a measure of the chemically oxidizable material in the water and furnishes an approximation of the amount of organic and reducing material present. The determined value may correlate with natural water color or with carbonaceous organic pollution from sewage or industrial wastes.

Color unit is produced by one milligram per liter of platinum in the form of the chloro-platinate 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.

Crest-stage gage is a device for obtaining the elevation of the flood crest of a stream.

Cubic foot per second or cfs (ft^3/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.

Cubic foot per second-day (ft^3/s) is the volume of water represented by a flow of 1 cubic foot per second for 24 hours. It is equivalent to 86,400 cubic feet, approximately 1.9835 acre-feet, about 646,000 gallons, or 2,445 cubic meters.

Cubic foot per second per square mile [$(ft^3/s)/mi^2$] is the average number of cubic feet of water flowing per second from each square mile of area drained, assuming that the runoff is distributed uniformly in time and area.

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 um 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 specified 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 specified.

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 ($CaCO_3$).

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.

Micrograms per gram (ug/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 (UG/L, ug/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 (MG/L, mg/L) is a unit for expressing the concentration of chemical constituents in solution. Milligrams per liter represents the mass of solute per unit volume (liter) of water. Concentration of suspended sediment also is expressed in mg/L and is based on the mass of dry sediment per liter of water-sediment mixture.

National Geodetic Vertical Datum of 1929 (NGVD of 1929) 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.

Normal as related to meteorological data published by the National Weather Service are computed as the average value of a meteorological element over a time period. Effective January 1, 1983, the averaging period is 1951 to 1980.

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 the recommendation made by the American Geophysical Union Subcommittee on Sediment Terminology. The classification is as follows:

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

The particle-size distributions given in this report are not necessarily representative of all particles in transport in the stream. Most of the organic 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.

pH indicates the degree of acidity or alkalinity of water and is expressed in terms of pH units. The pH value of a solution is the negative logarithm of the concentration of hydrogen ions, in moles per liter. A pH of 7.0 indicates that the water is neither acid nor alkaline. pH readings progressively less than 7.0 denote increasing acidity and those progressively greater than 7.0 denote increasing alkalinity. The pH of most natural surface waters ranges between 6 and 8.

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

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.

Runoff in inches (IN, in) shows the depth to which the drainage area would be covered if all the runoff for a given time period were uniformly distributed on it.

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.

Bed load is the sediment that is transported in a stream by rolling, sliding, or skipping along the bed and very close to it. In this report, bed load is considered to consist of particles in transit within 0.25 ft of the streambed.

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).

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 (ft^3/s) x 0.0027.

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

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 is the height of a water surface above an established datum plane; also gage height.

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.

Surface area of a lake is that area outlined on the latest U.S. Geological Survey 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.

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 the part of a representative water-suspended sediment sample that is retained on a 0.45 um 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 um membrane filter. This term is used 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.

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 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 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 a 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.

Water year in U.S. 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 abbreviaton for "Water-Supply Paper" in reference to previously published reports.

PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS

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, Books and Open- File Reports Section, Federal Center, Box 25425, Denver, Colorado 80225 (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 sedments*, 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. Schaffrannek, 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.

05051500 RED RIVER OF THE NORTH AT WAHPETON, ND

LOCATION.--Lat 46°15'55", long 96°35'40", in NE1/4 sec.8, T.132 N., R.47 W., Richland County, Hydrologic Unit 09020104, on left bank in Wahpeton, 800 ft downstream from confluence of Bois de Sioux and Otter Tail Rivers, and at mile 548.6.

DRAINAGE AREA.--4,010 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1942 to current year. Gage-height records collected in this vicinity since 1917 are contained in reports of the U.S. Weather Bureau.

GAGE.--Water-stage recorder and concrete and wooden dam. Datum of gage is 942.97 ft above National Geodetic Vertical Datum of 1929. Prior to Aug. 6, 1943, U.S. Weather Bureau nonrecording gage 800 ft upstream, converted to present datum. Aug. 6, 1943, to Oct. 27, 1950, nonrecording gage at present site and datum.

REMARKS.--Estimated daily discharges: Nov. 9 to Mar 18. Records good except those for period with ice effect, Nov. 9 to Mar. 18, which are fair. Flow regulated by Orwell Reservoir, capacity, 14,100 acre-ft at elevation 1,070 ft above National Geodetic Vertical Datum of 1929, adjustment of 1912; Lake Traverse, capacity, 137,000 acre-ft, available for flood control; numerous other controlled lakes and ponds, and several powerplants.

AVERAGE DISCHARGE.--44 years (1943-87), 556 ft^3/s, 402,800 acre-ft/yr; median of yearly mean discharges, 497 ft^3/s, 360,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,200 ft^3/s, Apr. 10, 1969, gage height, 16.34 ft; minimum daily, 1.7 ft^3/s, Aug. 28 to Sept. 5, 9, 10, 1976.

EXTREMES OUTSIDE PERIOD OF RECORD.--A stage of 17.0 ft, discharge, 10,500 ft^3/s, occurred in the spring of 1897 and has not been exceeded since.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,770 ft^3/s, Oct. 1, gage height, 7.46 ft; maximum observed gage height, 7.95 ft, Mar. 8; minimum daily, 54 ft^3/s, Aug. 10.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1740	988	898	719	646	711	831	743	630	637	78	133
2	1670	987	825	649	643	647	802	715	624	816	77	133
3	1620	977	776	687	659	576	780	669	619	890	76	132
4	1610	914	864	750	711	800	744	653	599	872	74	144
5	1570	816	771	741	702	853	733	656	535	838	79	193
6	1540	797	838	732	710	1120	727	655	517	792	83	189
7	1500	804	840	646	717	1330	724	640	514	734	75	180
8	1420	817	914	604	715	1610	681	620	517	680	61	180
9	1390	706	981	592	698	1380	653	580	522	639	55	188
10	1390	848	743	549	724	1150	655	563	519	582	54	207
11	1360	795	649	590	722	1600	665	553	514	525	117	217
12	1320	971	732	670	730	1010	666	526	511	422	236	225
13	1310	1030	678	689	731	772	669	486	481	387	250	226
14	1290	1030	641	675	703	690	673	489	429	394	259	218
15	1270	1150	688	584	698	580	672	486	429	296	258	214
16	1230	1170	703	467	688	590	674	481	437	145	258	214
17	1190	1130	723	603	691	616	679	490	479	118	258	211
18	1130	1050	786	632	659	641	677	509	478	122	257	214
19	1090	960	862	639	676	698	670	502	489	136	257	233
20	1070	930	906	607	666	725	665	511	488	174	248	222
21	1060	968	900	594	655	745	674	541	474	168	223	216
22	1050	973	899	518	653	749	672	543	468	156	223	199
23	1040	966	904	446	653	821	674	549	447	157	223	171
24	1010	912	900	507	650	982	704	578	435	115	220	166
25	975	968	886	630	655	1570	789	593	432	84	293	164
26	964	973	869	638	670	1700	883	609	431	76	446	164
27	958	957	876	604	697	1350	883	612	431	76	445	163
28	956	987	862	556	718	998	871	646	429	73	229	163
29	967	1040	853	555	---	822	808	640	430	72	150	166
30	976	951	854	557	---	946	756	644	471	70	137	169
31	985	---	807	593	---	930	---	639	---	67	134	---
TOTAL	38651	28565	25428	19023	19240	29712	21754	18121	14779	11313	5833	5614
MEAN	1247	952	820	614	687	958	725	585	493	365	188	187
MAX	1740	1170	981	750	731	1700	883	743	630	890	446	233
MIN	956	706	641	446	643	576	653	481	429	67	54	132
AC-FT	76660	56660	50440	37730	38160	58930	43150	35940	29310	22440	11570	11140

CAL YR 1986 TOTAL 560550 MEAN 1536 MAX 5820 MIN 597 AC-FT 1112000
WTR YR 1987 TOTAL 238033 MEAN 652 MAX 1740 MIN 54 AC-FT 472100

05051500 RED RIVER OF THE NORTH AT WAHPETON, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
OCT											
27...	1410	996	685	--	14.5	11.0	--	--	--	--	--
JAN											
13...	1455	699	560	--	9.0	0.0	--	--	--	--	--
MAR											
03...	1255	597	545	--	-2.5	0.0	--	--	--	--	--
19...	1455	699	400	7.20	1.0	0.5	270	45	50	34	13
MAY											
28...	1020	647	500	--	22.5	20.0	--	--	--	--	--
JUL											
10...	1045	581	450	--	25.0	24.0	--	--	--	--	--
28...	1315	72	542	8.10	29.0	27.0	270	99	50	35	15
SEP											
17...	0950	212	440	--	--	--	--	--	--	--	--

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
19...	9	0.4	5.6	220	60	13	0.10	16	316	320	0.43
JUL											
28...	11	0.4	5.1	170	75	7.0	0.30	13	313	310	0.43

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
MAR										
19...	2	50	50	<1	17	50	0.3	<1	<1	220
JUL										
28...	5	70	20	<1	25	10	0.7	2	<1	190

05051522 RED RIVER OF THE NORTH AT HICKSON, ND

LOCATION.--Lat 46°39'35", long 96°47'44", in SW1/4 sec.19, T.137 N., R.48 W., Clay County, MN, Hydrologic Unit 09020104, on right bank 60 ft downstream from bridge on township road, and 1 mi southeast of Hickson, ND.

DRAINAGE AREA.--4,300 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1975 to current year.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 877.06 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Nov. 8 to Mar. 30. Records fair. Flow regulated by Orwell Reservoir, capacity, 14,100 acre-ft at elevation, 1,070 ft above National Geodetic Vertical Datum of 1929, adjustment of 1912; Lake Traverse, capacity, 137,000 acre-ft, available for flood control, numerous other controlled lakes and ponds, and several powerplants.

AVERAGE DISCHARGE.--12 years, 649 ft^3/s, 470,200 acre-ft/yr; median of yearly mean discharges, 618 ft^3/s, 447,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,600 ft^3/s, Apr. 18, 1979, gage height, 33.03 ft; no flow Oct. 26, 1976, to Jan. 9, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,460 ft^3/s, Mar. 26, gage height, 15.34 ft, backwater from ice; minimum daily, 61 ft^3/s, Aug. 9,10.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2090	1030	958	850	630	762	1040	859	699	401	74	106
2	1860	1020	924	810	686	740	950	830	678	506	79	118
3	1740	1030	919	720	683	717	896	814	658	705	86	112
4	1640	1020	900	650	702	694	886	749	655	845	82	118
5	1600	1010	739	690	758	677	860	727	649	872	84	133
6	1570	947	562	750	753	853	836	722	594	870	72	152
7	1540	897	572	740	763	1220	824	723	559	852	73	182
8	1500	888	686	730	769	1760	816	718	534	777	71	162
9	1430	896	764	650	770	2030	800	699	521	718	61	154
10	1370	772	851	600	756	2020	773	665	526	672	61	151
11	1360	522	827	590	786	1740	739	624	539	649	75	158
12	1350	657	715	550	786	1670	743	605	536	591	96	181
13	1320	690	650	590	795	1710	761	588	529	478	138	206
14	1300	611	730	670	798	1520	765	546	499	405	226	216
15	1280	687	680	710	772	1340	763	526	445	378	261	212
16	1270	875	640	676	769	1120	795	538	417	377	261	206
17	1250	1040	690	552	763	985	816	521	437	255	246	202
18	1220	1090	700	554	754	946	820	521	465	141	257	202
19	1180	1040	720	640	744	937	813	514	463	109	241	208
20	1130	976	790	647	736	950	797	519	466	119	259	220
21	1110	923	860	658	739	999	764	538	482	141	243	237
22	1100	909	910	615	730	1080	773	586	475	131	231	218
23	1100	917	900	564	724	1130	800	610	465	122	199	218
24	1100	931	900	512	726	1340	775	617	450	120	202	196
25	1080	923	900	497	723	2090	772	657	425	117	201	166
26	1050	921	900	581	730	2430	833	686	424	106	192	157
27	1030	945	890	635	744	2370	927	698	430	91	320	155
28	1030	942	870	634	766	1950	960	687	415	82	443	150
29	1030	935	880	612	---	1430	949	696	423	77	407	146
30	1020	956	860	588	---	1130	925	706	423	75	215	144
31	1020	---	850	572	---	1120	---	706	---	77	127	---
TOTAL	40670	27000	24737	19837	20855	41460	24971	20195	15281	11859	5583	5186
MEAN	1312	900	798	640	745	1337	832	651	509	383	180	173
MAX	2090	1090	958	850	798	2430	1040	859	699	872	443	237
MIN	1020	522	562	497	630	677	739	514	415	75	61	106
AC-FT	80670	53550	49070	39350	41370	82240	49530	40060	30310	23520	11070	10290

CAL YR 1986 TOTAL 602549 MEAN 1651 MAX 6630 MIN 522 AC-FT 1195000
WTR YR 1987 TOTAL 257634 MEAN 706 MAX 2430 MIN 61 AC-FT 511000

05051522 RED RIVER OF THE NORTH AT HICKSON, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
OCT											
23...	1020	1090	715	--	5.5	9.5	--	--	--	--	--
JAN											
15...	1430	717	440	--	-18.0	0.0	--	--	--	--	--
MAR											
05...	1605	672	500	--	8.5	0.0	--	--	--	--	--
31...	1540	1140	625	8.40	13.0	1.5	310	110	65	37	17
MAY											
19...	1420	487	515	--	15.0	17.0	--	--	--	--	--
JUL											
09...	1655	721	460	--	27.0	24.0	--	--	--	--	--
29...	1235	74	550	8.10	30.0	32.0	260	48	49	33	15
SEP											
16...	1235	204	450	--	18.0	19.0	--	--	--	--	--

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
31...	10	0.4	7.0	200	110	15	0.10	17	416	390	0.57
JUL											
29...	11	0.4	5.7	210	77	3.5	0.10	16	345	340	0.47

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
MAR										
31...	2	20	30	<1	24	30	0.1	<1	<1	270
JUL										
29...	6	80	10	<1	24	20	0.7	2	1	190

05051600 WILD RICE RIVER NEAR RUTLAND, ND

LOCATION.--Lat 46°01'20", long 97°30'40", in SE¼SE¼ sec.36, T.130 N., R.55 W., Sargent County, Hydrologic Unit 09020105, on right bank 1,000 ft upstream from bridge on county highway, 2 mi south of Rutland, and 10 mi upstream from Lake Tewaukon.

DRAINAGE AREA.--546 mi^2, of which about 250 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1959 to current year (seasonal records only since 1982).

REVISED RECORDS.--WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,197.73 ft above National Geodetic Vertical Datum of 1929. Prior to Dec. 11, 1960, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Mar. 3-22. Records fair except those for periods of estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--23 years (water years 1960-82), 8.08 ft^3/s, 5,850 acre-ft/yr; median of yearly mean discharges, 4.7 ft^3/s; 3,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,270 ft^3/s, Apr. 8, 1969, gage height, 8.77 ft, backwater from ice; maximum gage height, 8.78 ft Apr. 8, 1969, backwater from ice; no flow for several months each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 138 ft^3/s, Mar. 30, gage height, 4.06 ft; no flow for several months.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						.00	64	20	10	.00	.00	.00
2						.00	55	20	9.5	.00	.00	.00
3						.00	47	20	8.4	.00	.00	.00
4						1.0	54	18	7.8	.00	.00	.00
5						5.0	62	16	7.4	.00	.00	.00
6						25	61	15	6.8	.00	.00	.00
7						30	53	14	6.3	.00	.00	.00
8						35	47	12	6.1	.00	.00	.00
9						40	41	12	5.9	.00	.00	.00
10						43	37	11	5.5	.00	.00	.00
11						45	34	10	5.2	.00	.00	.00
12						50	31	9.4	5.5	.00	.00	.00
13						40	31	8.0	4.6	.00	.00	.00
14						27	31	6.7	3.4	.00	.00	.00
15						23	31	5.8	2.4	.00	.00	.00
16						20	31	5.4	1.2	.00	.00	.00
17						18	32	4.9	.22	.00	.00	.00
18						17	32	4.6	.13	.00	.00	.00
19						17	29	4.4	.00	.00	.00	.00
20						18	26	5.2	.00	.00	.00	.00
21						20	24	8.8	.00	.00	.00	.00
22						25	22	12	.00	.00	.00	.00
23						49	21	12	.00	.00	.00	.00
24						72	19	12	.00	.00	.00	.00
25						82	27	11	.00	.00	.00	.00
26						79	28	13	.00	.00	.00	.00
27						85	25	14	.00	.00	.00	.00
28						94	24	13	.00	.00	.00	.00
29						89	23	12	.00	.00	.00	.00
30						94	22	12	.00	.00	.00	.00
31						72	---	11	---	.00	.00	---
TOTAL						1215.00	1064	353.2	96.35	.00	.00	.00
MEAN						39.2	35.5	11.4	3.21	.00	.00	.00
MAX						94	64	20	10	.00	.00	.00
MIN						.00	19	4.4	.00	.00	.00	.00
AC-FT						2410	2110	701	191	.0	.0	.0

05051600 WILD RICE RIVER NEAR RUTLAND, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1971 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
MAR											
06...	0915	26	1650	--	5.0	0.5	--	--	--	--	--
10...	1350	43	1300	--	-5.0	0.5	--	--	--	--	--
25...	1515	81	1480	--	0.0	2.0	--	--	--	--	--
APR											
01...	1300	137	1340	8.18	1.0	1.0	530	330	93	73	88
MAY											
20...	1000	4.6	1540	--	11.0	14.0	--	--	--	--	--

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
01...	26	2	20	200	480	39	0.10	12	968	930	1.3

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR										
01...	2	90	50	<1	110	30	0.3	1	<1	510

05053000 WILD RICE RIVER NEAR ABERCROMBIE, ND

LOCATION.--Lat 46°28'05", long 96°47'00", in NE¼NE¼ sec.36, T.135 N., R.49 W., Richland County, Hydrologic Unit 09020105, on right bank 420 ft upstream from bridge on county highway, 0.75 mi upstream from rubble masonry dam which serves as control, 3.2 mi northwest of Abercrombie, and 7 mi downstream from Antelope Creek.

DRAINAGE AREA.--2,080 mi^2, of which about 590 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1932 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1388: 1939, 1941(M). WSP 1728: Drainage area.

GAGE.--Water-stage recorder and masonry control. Datum of gage is 907.94 ft above National Geodetic Vertical Datum of 1929. Prior to Dec. 7, 1939, nonrecording gage at site 420 ft downstream at datum 5.0 ft lower. Dec. 7, 1939, to Nov. 24, 1952, nonrecording gage at site 0.75 mi downstream at present datum.

REMARKS.--Estimated daily discharges: Nov. 8 to Mar. 27. Records good, except those for period of ice effect, Nov. 8 to Mar. 27, which are fair. Some regulation by Fish and Wildlife Service reservoirs, of which Lake Tewaukon is the largest. Some small diversions for irrigation.

AVERAGE DISCHARGE.--55 years, 73.7 ft^3/s, 53,400 acre-ft/yr; median of yearly mean discharges, 36 ft^3/s, 26,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,540 ft^3/s, Apr. 11, 1969, gage height, 24.58 ft; no flow at times most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in spring of 1897 reached a stage of 27.5 ft, present site and datum, from floodmarks pointed out by local residents.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 701 ft^3/s, Mar. 27, gage height, 5.34 ft; only peak discharge greater than base discharge of 300 ft^3/s; no flow for several days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	205	45	34	10	4.6	14	180	72	35	.39	1.2	.03
2	180	44	35	9.4	4.6	15	140	68	32	.33	.87	.02
3	153	43	37	8.9	4.7	13	125	64	28	.22	.72	.02
4	130	42	35	8.9	4.7	14	118	59	24	.14	.54	.01
5	112	42	32	8.9	4.5	19	112	56	21	.28	.40	.02
6	97	42	31	8.9	4.5	113	106	54	19	.29	.31	.02
7	86	43	28	8.9	5.1	185	102	51	18	.39	.27	.02
8	77	47	26	8.9	5.5	157	102	48	17	.35	.23	.01
9	72	39	25	8.4	5.5	117	103	46	14	.34	.19	.01
10	70	45	22	7.7	5.9	138	108	45	12	.32	.18	.00
11	70	39	20	7.6	6.3	145	114	42	11	1.4	.15	.00
12	68	40	20	7.5	6.7	133	117	39	11	1.9	.13	.00
13	63	39	18	7.7	7.1	113	119	36	11	1.9	.11	.00
14	57	38	17	8.3	7.2	91	122	35	12	1.4	.10	.00
15	54	37	16	8.4	7.0	79	124	33	11	.78	.14	.00
16	53	36	15	7.4	7.0	73	130	32	9.3	.99	.18	.00
17	53	35	15	6.4	6.7	69	134	30	11	.37	.15	.00
18	50	35	15	5.8	7.0	66	137	30	9.1	.42	.13	.00
19	48	34	14	5.9	7.0	62	133	28	8.5	6.0	.11	.00
20	46	33	13	5.9	7.0	61	131	28	7.0	24	.11	.00
21	45	32	12	6.1	6.9	65	125	32	5.6	31	.09	.00
22	44	32	11	6.3	7.0	69	115	34	5.0	29	.09	.00
23	42	32	11	6.3	6.8	86	111	32	3.7	30	.08	.00
24	40	34	11	5.5	6.7	175	104	30	2.7	30	.07	.00
25	40	34	11	5.1	6.5	413	98	31	2.3	29	.07	.00
26	40	32	10	4.4	6.9	617	92	36	1.8	24	.06	.00
27	46	31	10	4.2	8.3	676	93	42	1.4	14	.06	.00
28	47	32	10	4.0	9.4	541	87	42	1.1	6.2	.05	.00
29	44	33	9.9	4.3	---	342	84	38	.90	2.5	.05	.00
30	43	35	9.9	4.5	---	236	78	35	.60	1.8	.04	.00
31	44	---	10	4.6	---	226	---	36	---	1.4	.04	---
TOTAL	2219	1125	583.8	215.1	177.1	5123	3444	1284	346.00	241.11	6.92	.16
MEAN	71.6	37.5	18.8	6.94	6.32	165	115	41.4	11.5	7.78	.22	.01
MAX	205	47	37	10	9.4	676	180	72	35	31	1.2	.03
MIN	40	31	9.9	4.0	4.5	13	78	28	.60	.14	.04	.00
AC-FT	4400	2230	1160	427	351	10160	6830	2550	686	478	14	.3

CAL YR 1986 TOTAL 73091.39 MEAN 200 MAX 2190 MIN .98 AC-FT 145000
WTR YR 1987 TOTAL 14765.11 MEAN 40.5 MAX 676 MIN .00 AC-FT 29290

05053000 WILD RICE RIVER NEAR ABERCROMBIE, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1967 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
OCT											
01...	1340	203	880	--	10.0	14.0	--	--	--	--	--
27...	1645	50	1490	--	15.0	9.5	--	--	--	--	--
DEC											
05...	1105	32	1750	--	-5.0	0.0	--	--	--	--	--
JAN											
14...	1000	8.0	2080	--	0.0	0.0	--	--	--	--	--
MAR											
03...	1620	13	1350	--	-2.0	0.0	--	--	--	--	--
30...	1345	220	885	8.00	4.5	0.5	380	200	83	43	42
MAY											
28...	1330	42	1620	--	25.0	21.5	--	--	--	--	--
JUL											
10...	1420	0.28	--	--	23.5	29.5	--	--	--	--	--
29...	1015	2.4	1520	8.10	27.0	27.0	560	220	110	69	130

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
30...	18	1	19	180	220	32	0.20	19	616	570	0.84
JUL											
29...	33	2	17	340	460	44	0.30	23	1080	1100	1.5

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
MAR										
30...	4	50	70	<1	49	130	0.3	1	<1	420
JUL										
29...	16	270	20	<1	110	70	0.8	2	1	700

05054000 RED RIVER OF THE NORTH AT FARGO, ND

LOCATION.--Lat 46°51'40", long 96°47'00", in NW1/4NE1/4 sec.18, T.139 N., R.48 W., Cass County, Hydrologic Unit 09020104, at city waterplant on 4th St. S. in Fargo, 25 mi upstream from mouth of Sheyenne River, and at mile 453.0.

DRAINAGE AREA.--6,800 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1901 to current year. Published as "at Moorhead, Minn." 1901. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1308: 1902-4, 1906-7, 1910-14, 1916, 1918, 1924. WSP 1388: 1905-6, 1917-20(M), 1935(M), 1938-39(M), 1943.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 861.8 ft above National Geodetic Vertical Datum of 1929. Oct. 1, 1960, to Sept. 30, 1962, water-stage recorder at present site at datum 5.6 ft higher. See WSP 1728 or 1913 for history of changes prior to Oct. 1, 1960.

REMARKS.--Estimated daily discharges: Nov. 10 to Mar. 26. Records good except those for period with ice effect, Nov. 10 to Mar. 26, which are fair. Flow regulated by Orwell Reservoir, capacity, 14,100 acre-ft at elevation 1,070 ft above National Geodetic Vertical Datum of 1929, adjustment of 1912; Lake Traverse, capacity 137,000 acre-ft, available for flood control, other controlled lakes and ponds, and several powerplants. Some small diversions for municipal supply. Figures of daily discharge do not include diversions to cities of Fargo and Moorhead and from Sheyenne River.

AVERAGE DISCHARGE (UNADJUSTED).--86 years, 580 ft^3/s, 420,200 acre-ft/yr; median of yearly mean discharges, 460 ft^3/s, 333,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 25,300 ft^3/s, Apr. 15, 1969, gage height, 37.34 ft; no flow for many days in each year for period 1932-41, Sept. 30, Oct. 1-2, 1970, Oct. 10-19, 1976.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Apr. 7, 1897, reached a stage of 39.1 ft present datum, discharge, 25,000 ft^3/s at site 1.5 mi downstream.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,300 ft^3/s, Mar. 27, gage height, 17.75 ft; minimum daily, 40 ft^3/s, Aug. 12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2450	1040	970	888	691	819	1420	970	690	390	72	111
2	2220	1040	946	856	713	829	1230	919	678	406	58	95
3	2070	1040	928	804	730	827	1120	883	655	550	76	86
4	1960	1030	909	758	739	835	1030	839	643	753	65	100
5	1880	1040	851	770	760	819	992	792	636	865	59	96
6	1780	1000	637	798	801	1030	945	761	611	859	50	98
7	1730	940	539	798	815	1370	914	750	556	833	41	114
8	1670	927	578	778	788	1640	897	750	519	771	46	130
9	1600	904	674	710	792	1840	887	730	507	720	47	151
10	1530	884	801	667	802	1930	867	703	543	654	44	126
11	1490	750	880	655	798	1780	821	643	521	624	50	125
12	1470	500	796	639	793	1550	810	618	512	585	40	141
13	1430	580	658	637	798	1530	824	606	510	511	43	160
14	1400	600	671	666	798	1470	831	575	496	402	88	175
15	1390	595	656	681	806	1330	839	545	474	339	251	185
16	1370	730	629	691	804	1200	844	551	423	321	222	191
17	1330	919	647	660	797	1050	849	575	440	283	225	190
18	1300	1040	662	589	786	955	850	480	441	179	229	194
19	1260	1050	687	633	783	929	852	460	462	113	219	199
20	1220	998	769	673	778	933	841	479	471	105	230	184
21	1170	932	843	710	776	959	837	506	493	148	220	191
22	1150	896	890	674	776	996	826	533	496	150	213	205
23	1130	900	910	659	767	1040	817	560	478	113	200	206
24	1120	911	918	625	760	1140	826	594	463	110	182	200
25	1100	921	919	590	761	1510	860	658	452	115	173	179
26	1070	903	915	606	793	2190	885	705	429	105	184	159
27	1050	927	910	716	781	2980	955	717	420	85	201	151
28	1040	938	900	786	802	2780	1050	711	420	64	338	156
29	1030	929	907	768	---	2220	1050	682	406	57	405	155
30	1030	934	906	730	---	1800	1030	705	375	55	305	147
31	1030	---	901	698	---	1590	---	711	---	51	170	---
TOTAL	44470	26798	24807	21913	21788	43871	27799	20711	15220	11316	4746	4580
MEAN	1435	893	800	707	778	1415	927	668	507	365	153	153
MAX	2450	1050	970	888	815	2980	1420	970	690	865	405	206
MIN	1030	500	539	589	691	819	810	460	375	51	40	86
AC-FT	88210	53150	49200	43460	43220	87020	55140	41080	30190	22450	9410	9080
(+)	1166	1122	1135	1243	1100	1115	1280	1566	1862	1789	1581	1339
MEAN*	1454	912	818	727	798	1433	948	694	538	394	179	176
AC-FT*	89380	54270	50340	44700	44320	88140	56420	42650	32050	24240	10990	10420

			OBSERVED							ADJUSTED		
CAL YR 1986	TOTAL	728298	MEAN	1995	MAX	8600	MIN	500	AC-FT	1445000	MEAN	2013	AC-FT	1459570
WTR YR 1987	TOTAL	268019	MEAN	734	MAX	2980	MIN	40	AC-FT	531600	MEAN	756	AC-FT	547920

\+ - Diversions in acre-feet to cities of Fargo and Moorhead.
* - Adjusted for diversions to cities of Fargo and Moorhead.

05054000 RED RIVER OF THE NORTH AT FARGO, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1956 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
OCT											
01...	1545	2800	642	--	14.0	15.0	--	--	--	--	--
JAN											
15...	1030	657	682	--	-18.5	0.0	--	--	--	--	--
MAR											
05...	1025	719	605	--	5.0	0.0	--	--	--	--	--
31...	1205	1610	782	8.00	9.0	1.0	370	180	79	42	26
MAY											
28...	1650	702	500	--	25.0	20.0	--	--	--	--	--
JUL											
02...	1405	413	510	--	23.0	22.5	--	--	--	--	--
29...	1605	57	550	8.10	31.0	32.0	240	22	44	32	13
SEP											
16...	1450	197	465	--	--	--	--	--	--	--	--

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
31...	13	0.6	11	190	200	22	0.20	19	544	510	0.74
JUL											
29...	10	0.4	5.2	220	57	4.3	0.10	15	300	310	0.41

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
MAR										
31...	3	30	40	<1	38	60	0.1	1	<1	360
JUL										
29...	5	70	10	<1	20	20	0.7	2	1	150

05054500 SHEYENNE RIVER ABOVE HARVEY, ND

LOCATION.--Lat 47°42'10", long 99°56'55", in SW¼SE¼ sec.24, T.149 N., R.73 W., Wells County, Hydrologic Unit 09020202, on right bank just downstream from county road, and 4.5 mi south of Harvey.

DRAINAGE AREA.--424 mi^2, of which about 270 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

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

REVISED RECORDS.--WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,547.30 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Nov. 7 to Apr. 2, May 25 to July 6. Records fair except those for periods of estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--32 years, 8.60 ft^3/s, 6,230 acre-ft/yr; median of yearly mean discharges, 8.0 ft^3/s, 5,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,000 ft^3/s, Apr. 20, 1979, gage height, 9.45 ft; maximum gage height, 10.30 ft, Apr. 1, 1971, backwater from ice; no flow at times most years.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 8	1700	100	*[a]9.31	June 23	----	[e]40	unknown
Mar. 24	0815	130	[a]9.12	July 24	2400	*434	9.08

Minimum daily discharge, .50 ft^3/s, Mar. 3.
a - Backwater from ice
e - Estimate

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.2	4.0	1.0	1.4	1.5	.55	85	19	9.0	6.0	13	5.1
2	2.0	4.1	1.0	1.4	2.8	.52	80	19	8.7	5.5	11	4.8
3	2.2	4.3	.98	1.4	5.0	.50	72	20	8.4	5.0	9.2	4.8
4	2.1	4.1	.96	1.4	4.5	.60	70	24	8.2	4.5	8.1	4.6
5	3.2	4.3	.94	1.4	5.0	1.0	65	23	8.0	3.8	7.5	4.5
6	4.4	4.8	.92	1.4	6.5	5.0	59	21	7.8	3.7	6.7	4.4
7	3.3	4.6	.92	1.4	8.0	20	56	19	7.6	3.9	6.0	3.1
8	2.2	4.4	.90	1.3	10	45	53	18	7.3	3.1	5.6	2.6
9	2.0	4.2	.90	1.3	8.0	85	50	17	7.0	3.1	5.1	2.2
10	2.7	4.1	.92	1.3	6.0	70	48	16	8.0	4.7	4.6	2.2
11	3.8	3.8	.92	1.4	5.0	55	46	14	7.5	3.8	4.5	2.4
12	3.8	3.5	.94	1.5	3.0	45	45	14	7.0	6.6	4.1	1.9
13	4.0	3.1	.96	1.5	2.5	35	43	12	6.8	6.9	3.9	1.8
14	4.6	2.8	.96	1.6	2.2	30	41	9.8	6.5	7.4	4.0	1.7
15	4.4	2.5	.98	1.5	1.9	25	38	9.5	6.2	7.7	5.4	1.5
16	4.3	2.3	1.0	1.5	1.7	20	35	8.1	6.0	7.0	4.7	1.4
17	4.4	2.0	1.0	1.5	1.4	15	34	7.5	5.8	5.8	4.5	2.1
18	4.6	1.8	1.0	1.4	1.2	10	31	7.6	5.5	5.6	4.4	3.4
19	4.6	1.5	1.1	1.4	1.1	5.0	29	7.4	5.2	7.9	4.5	1.7
20	4.5	1.0	1.1	1.3	1.0	20	25	8.0	7.0	7.1	4.6	1.7
21	4.3	.90	1.2	1.3	.92	40	25	13	6.6	12	4.7	1.0
22	4.2	.85	1.2	1.2	.86	60	24	11	6.2	36	4.3	.82
23	4.1	.80	1.3	1.2	.82	100	23	10	40	69	4.4	1.5
24	4.1	.82	1.3	1.1	.80	125	27	9.4	30	236	4.4	1.5
25	4.0	.86	1.3	1.0	.70	120	28	9.2	25	386	5.6	1.0
26	4.2	.92	1.3	.99	.66	110	28	10	20	190	6.2	.74
27	4.2	.96	1.3	.98	.64	100	26	12	15	105	5.6	.69
28	4.2	.98	1.3	.97	.58	95	25	11	10	58	5.2	.69
29	4.0	1.0	1.4	.96	---	90	22	10	8.0	33	5.2	.66
30	3.6	1.0	1.4	.96	---	85	21	9.5	7.0	22	5.0	.65
31	4.3	---	1.4	.95	---	90	---	9.2	---	16	5.0	---
TOTAL	114.5	76.29	33.80	39.91	84.28	1503.17	1254	408.2	311.3	1272.1	177.0	67.15
MEAN	3.69	2.54	1.09	1.29	3.01	48.5	41.8	13.2	10.4	41.0	5.71	2.24
MAX	4.6	4.8	1.4	1.6	10	125	85	24	40	386	13	5.1
MIN	2.0	.80	.90	.95	.58	.50	21	7.4	5.2	3.1	3.9	.65
AC-FT	227	151	67	79	167	2980	2490	810	617	2520	351	133

CAL YR 1986 TOTAL 5409.31 MEAN 14.8 MAX 150 MIN .10 AC-FT 10730
WTR YR 1987 TOTAL 5341.66 MEAN 14.6 MAX 386 MIN .50 AC-FT 10600

05054500 SHEYENNE RIVER ABOVE HARVEY, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	COLOR (PLAT-INUM-COBALT UNITS) (00080)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS (MG/L AS CACO3) (00900)
OCT										
08...	1130	1.8	1270	8.25	5.0	9.0	25	10.5	90	190
DEC										
01...	1200	1.0	2300	8.23	-5.0	2.0	90	--	--	300
JAN										
12...	1130	1.5	1550	8.05	3.0	0.0	35	6.6	45	200
MAR										
09...	1130	85	470	--	-15.0	0.5	--	--	--	--
24...	1000	124	450	--	0.0	0.5	--	--	--	--
APR										
06...	1300	59	930	8.20	15.0	5.0	55	11.7	90	230
MAY										
11...	1155	15	1400	8.65	15.0	15.5	55	9.0	89	330
JUL										
06...	1300	3.7	1200	8.73	26.0	24.0	90	7.8	93	180
AUG										
24...	1300	4.1	1160	8.57	12.0	16.5	47	8.8	89	220
SEP										
a30...	1400	0.66	860	8.18	15.0	13.0	--	--	--	--

DATE	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2) (00405)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)
OCT										
08...	0	43	19	230	72	8	5.4	490	5.3	180
DEC										
01...	0	45	45	480	77	12	13	834	9.4	460
JAN										
12...	0	42	23	290	75	9	6.8	611	10	250
APR										
06...	0	34	35	110	49	3	12	279	3.4	210
MAY										
11...	0	41	55	210	57	5	13	467	2.0	300
JUL										
06...	0	27	27	220	72	7	9.6	436	1.5	230
AUG										
24...	0	35	31	200	66	6	9.6	451	2.3	190

DATE	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P) (00666)	ALUM-INUM, DIS-SOLVED (UG/L AS AL) (01106)
OCT										
08...	15	0.30	36	1020	820	1.4	5.1	0.310	0.140	--
DEC										
01...	32	0.40	37	1590	1600	2.2	4.3	0.120	0.570	--
JAN										
12...	19	0.30	47	1060	1000	1.4	4.3	0.200	0.350	--
APR										
06...	12	0.20	18	612	600	0.83	98	<0.100	0.140	20
MAY										
11...	25	0.30	12	985	940	1.3	39	<0.100	0.230	--
JUL										
06...	12	0.30	26	862	810	1.2	8.6	<0.100	0.270	--
AUG										
24...	13	0.30	19	767	770	1.0	8.5	<0.100	0.170	10

a - Laboratory analysis not available at time of publication.

05054500 SHEYENNE RIVER ABOVE HARVEY, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)	BORON, DIS-SOLVED (UG/L AS B) (01020)	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)
OCT 08...	--	--	610	--	--	--	--	--	--	--
DEC 01...	--	--	1100	--	--	--	--	--	--	--
JAN 12...	--	--	800	--	--	--	--	--	--	--
APR 06...	3	45	330	<1	<10	1	<1	45	<5	71
MAY 11...	--	--	660	--	--	--	--	--	--	--
JUL 06...	--	--	770	--	--	--	--	--	--	--
AUG 24...	5	72	560	<1	<10	1	1	27	<5	90

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)	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)	CYANIDE TOTAL (MG/L AS CN) (00720)
APR 06...	69	0.2	2	1	<1	210	<14	5	<0.010
AUG 24...	49	0.7	<4	3	<1	200	5	3	<0.010

05056000 SHEYENNE RIVER NEAR WARWICK, ND

LOCATION.--Lat 47°48'20", long 98°42'57", on south quarter of line between secs.15 and 16, T.150 N., R.63 W., Eddy County, Hydrologic Unit 09020203, on left bank on downstream side of county highway bridge, and 3.3 mi south of Warwick.

DRAINAGE AREA.--2,070 mi^2, approximately, of which about 1,310 mi^2 is probably noncontributing - includes 227 mi^2 in closed basins.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1949 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1438: 1952(M). WSP 1728: Drainage area.

GAGE.--Water-stage recorder and rubble masonry control. Elevation of gage is 1,370 ft, by barometer.

REMARKS.--Estimated daily discharges: Nov. 14 to Apr. 4. Records good except those for period with ice effect, Nov. 14 to Apr. 4, which are fair.

AVERAGE DISCHARGE.--38 years, 57.9 ft^3/s, 41,950 acre-ft/yr; median of yearly mean discharges, 52 ft^3/s, 37,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,660 ft^3/s, Apr. 14, 1969, gage height, 7.51 ft; maximum gage height, 7.83 ft, Apr. 18, 1956; no flow Aug. 7 to Sept. 1, Sept. 3-9, 1961.

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

Date	Time	Discharge (ft3/s)	Gage height (ft)	Date	Time	Discharge (ft3/s)	Gage height (ft)
Mar. 30	----	----	a*6.67	July 24	2100	700	4.00
Apr. 05	0845	*1730	6.00				

Minimum daily discharge, 5.9 ft^3/s, July 17.
a - Backwater from ice

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24	14	22	15	12	22	1400	76	51	8.2	132	22
2	30	14	22	15	12	22	1500	72	42	7.2	129	21
3	33	17	22	15	12	22	1520	63	37	7.8	140	19
4	36	19	23	14	12	25	1630	68	37	8.4	152	18
5	30	19	23	15	12	29	1680	70	35	9.1	148	17
6	29	22	22	15	13	31	1400	64	30	9.3	134	16
7	26	22	22	15	13	33	1060	57	24	9.1	119	14
8	25	22	22	15	14	32	836	47	20	7.6	102	14
9	23	22	21	15	14	31	681	39	19	7.6	84	14
10	18	20	21	15	14	30	571	35	19	7.7	68	15
11	15	16	21	15	14	29	486	29	20	8.1	57	18
12	15	16	21	15	15	29	407	28	18	7.7	48	17
13	15	16	21	15	15	29	359	26	18	8.2	40	17
14	14	16	21	16	15	29	325	23	17	8.2	37	19
15	16	16	20	15	15	33	289	22	15	8.3	38	19
16	15	16	20	14	15	37	260	19	13	7.6	37	16
17	16	16	19	13	16	39	238	18	12	5.9	39	12
18	17	16	19	12	17	39	214	16	11	7.5	36	12
19	16	16	19	12	17	40	187	13	11	12	32	18
20	15	16	19	12	18	50	164	14	9.9	16	29	21
21	14	17	18	12	19	100	158	42	10	82	27	21
22	13	20	18	12	20	175	143	77	9.1	253	24	20
23	13	20	18	12	20	260	128	87	12	542	21	19
24	13	22	17	11	20	340	120	86	9.8	682	20	17
25	13	22	17	10	20	380	109	79	9.9	676	25	16
26	12	22	16	10	22	410	105	84	10	583	25	14
27	12	22	15	10	22	450	104	87	11	458	25	16
28	12	22	15	10	22	500	101	88	11	338	26	16
29	13	22	15	10	---	890	91	78	9.7	256	25	15
30	14	22	15	10	---	1250	86	69	8.7	200	23	14
31	15	---	15	10	---	1300	---	61	---	162	23	---
TOTAL	572	562	599	405	450	6686	16352	1637	560.1	4403.5	1865	507
MEAN	18.5	18.7	19.3	13.1	16.1	216	545	52.8	18.7	142	60.2	16.9
MAX	36	22	23	16	22	1300	1680	88	51	682	152	22
MIN	12	14	15	10	12	22	86	13	8.7	5.9	20	12
AC-FT	1130	1110	1190	803	893	13260	32430	3250	1110	8730	3700	1010

CAL YR 1986 TOTAL 29951.2 MEAN 82.1 MAX 950 MIN 1.8 AC-FT 59410
WTR YR 1987 TOTAL 34598.6 MEAN 94.8 MAX 1680 MIN 5.9 AC-FT 68630

05056000 SHEYENNE RIVER NEAR WARWICK, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1951, 1953, 1958 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
OCT											
07...	1220	28	620	--	13.5	11.0	--	--	--	--	--
15...	1745	15	590	--	15.0	8.5	--	--	--	--	--
16...	0905	15	620	8.00	7.0	6.5	--	--	--	--	--
16...	1335	16	645	8.10	14.5	6.5	--	--	--	--	--
DEC											
04...	1525	23	510	--	-6.5	0.5	--	--	--	--	--
JAN											
23...	1155	12	690	--	-28.5	0.5	--	--	--	--	--
FEB											
24...	1040	20	560	--	-5.0	1.5	--	--	--	--	--
APR											
05...	1005	1720	385	--	8.5	1.0	--	--	--	--	--
MAY											
07...	1320	58	1100	--	24.0	18.5	--	--	--	--	--
JUN											
11...	1500	18	950	--	28.0	21.0	--	--	--	--	--
JUL											
21...	1245	75	458	--	22.0	23.5	--	--	--	--	--
SEP											
08...	1415	14	960	8.50	23.0	21.5	300	0	56	38	110

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
SEP											
08...	44	3	11	300	140	18	0.0	17	617	610	0.84

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
SEP										
08...	4	190	30	1	67	50	0.2	2	<1	340

05056100 MAUVAIS COULEE NEAR CANDO, ND

LOCATION.--Lat 48°26'53", long 99°06'08", in SE1/4NE1/4SE1/4 sec.1, T.157 N., R.66 W., Towner County, Hydrologic Unit 09020201, on left bank 0.3 mi upstream from highway bridge, about 4 mi upstream from West Fork, 5.5 mi southeast of Cando, and 7 mi northeast of Maza.

DRAINAGE AREA.--387 mi^2, of which about 10 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1956 to current year (seasonal records only since 1982).

GAGE.--Water-stage recorder. Elevation of gage is 1,445 ft above National Geodetic Vertical Datum of 1929, from topographic map. Prior to July 2, 1957, nonrecording gage at present site and datum.

REMARKS.--Estimated daily discharges: Mar. 1 to Apr. 5. Records good except those for period with ice effect, Mar. 1 to Apr. 5, which are fair.

AVERAGE DISCHARGE.--26 years (water years 1957-82), 19.2 ft^3/s, 13,910 acre-ft/yr; median of yearly mean discharges, 13 ft^3/s, 9,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,660 ft^3/s, Apr. 25, 1979, gage height, 11.18 ft; no flow at times each year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 16, 1954, reached a stage of 9.83 ft, and flood of Apr. 20, 1956, reached a stage of 10.71 ft, from floodmarks set by local resident.

EXTREMES FOR CURRENT YEAR.--Maximum discharge during period March to September, 2,090 ft^3/s, Apr. 8, gage height, 10.29 ft; no flow Mar. 1-15.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						.00	50	34	2.5	.19	.87	.39
2						.00	100	29	1.9	.18	1.5	.34
3						.00	150	24	1.8	.16	1.1	.32
4						.00	175	23	1.6	.16	.87	.34
5						.00	600	20	1.2	.17	.74	.32
6						.00	1030	17	.97	.17	.58	.31
7						.00	1290	15	.82	.20	.46	.28
8						.00	1980	12	.69	.17	.39	.25
9						.00	1420	10	.66	.16	.33	.21
10						.00	998	8.4	.73	.20	.29	.18
11						.00	756	7.2	.89	.18	.27	.17
12						.00	640	6.4	.71	.16	.24	.17
13						.00	540	5.3	.61	.14	.22	.17
14						.00	441	5.0	.44	.12	.33	.18
15						.00	383	4.8	.34	.12	.62	.16
16						.00	328	4.5	.27	.13	.81	.16
17						.10	288	4.0	.30	.12	1.0	.17
18						.10	269	3.7	.25	.13	1.1	.17
19						.12	222	3.6	.22	.16	.93	.17
20						.20	185	3.6	.24	.16	.90	.19
21						.25	154	4.5	.36	.14	.78	.17
22						1.0	136	3.8	.34	.25	.63	.16
23						5.0	120	3.6	.42	.27	.52	.16
24						15	105	3.4	.38	.27	.46	.15
25						20	89	3.3	.32	.27	.45	.13
26						25	75	3.3	.27	.28	.48	.13
27						20	64	3.8	.23	.27	.53	.14
28						15	53	3.6	.23	.25	.56	.15
29						10	45	3.5	.24	.24	.56	.14
30						8.0	38	3.1	.20	.29	.47	.15
31						10	---	2.7	---	.32	.42	---
TOTAL						129.77	12724	279.1	20.13	6.03	19.41	6.13
MEAN						4.19	424	9.00	.67	.19	.63	.20
MAX						25	1980	34	2.5	.32	1.5	.39
MIN						.00	38	2.7	.20	.12	.22	.13
AC-FT						257	25240	554	40	12	38	12

05056100 MAUVAIS COULEE NEAR CANDO, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)
OCT										
15...	1025	1.3	490	--	4.0	5.0	--	--	--	--
MAR										
17...	1020	0.08	860	--	-0.5	0.5	--	--	--	--
APR										
07...	1920	1540	670	--	20.0	10.5	--	--	--	--
08...	1630	2090	540	7.60	20.0	12.0	8.3	77	210	57
13...	1835	515	450	--	10.0	10.5	--	--	--	--
16...	1045	328	490	7.90	13.0	10.5	9.9	90	210	52
21...	1245	152	560	--	11.0	11.5	--	--	--	--
30...	1004	38	680	--	12.0	13.5	--	--	--	--
MAY										
06...	1345	17	800	7.80	23.5	18.0	8.7	91	340	91
JUN										
10...	1120	0.70	1130	--	17.0	18.5	--	--	--	--
23...	1230	0.46	1200	8.05	23.0	25.0	8.6	106	490	190
JUL										
16...	1540	0.14	1190	--	28.5	27.0	--	--	--	--
29...	0905	0.24	1450	7.70	27.0	25.0	7.4	90	660	420
SEP										
09...	1250	0.22	1320	--	25.0	17.0	--	--	--	--

DATE	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)
APR										
08...	45	23	21	17	0.7	9.1	150	95	19	0.10
16...	47	23	19	16	0.6	9.6	160	95	11	0.10
MAY										
06...	72	39	39	19	0.9	12	250	150	18	0.20
JUN										
23...	99	60	68	22	1	13	300	300	34	0.10
JUL										
29...	130	82	87	22	2	11	240	550	48	0.30

DATE	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	SOLIDS RESIDUE AT 105 DEG. C, SUS-PENDED (MG/L) (00530)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N) (00618)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P) (00666)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)
APR											
08...	18	304	340	0.41	1720	--	0.170	--	5.27	0.630	2
16...	20	322	320	0.44	285	--	0.030	--	0.130	0.290	2
MAY											
06...	1.7	516	480	0.70	24	--	0.040	<0.01	<0.01	0.480	3
JUN											
23...	11	817	780	1.1	1.0	4	0.010	<0.01	<0.01	0.290	6
JUL											
29...	10	1120	1100	1.5	0.73	2	0.090	0.02	0.06	0.270	2

DATE	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR									
08...	120	50	<1	23	40	0.3	<1	<1	250
16...	60	60	<1	20	20	0.3	<1	1	240
MAY									
06...	50	70	<1	38	110	0.1	<1	<1	350
JUN									
23...	90	10	<1	73	10	0.1	1	1	460
JUL									
29...	80	20	<1	110	50	0.1	1	<1	630

05056200 EDMORE COULEE NEAR EDMORE, ND

LOCATION.--Lat 48°20'14", long 98°39'33", in NW1/4 sec.17, T.156 N., R.62 W., Ramsey County, Hydrologic Unit 09020201, on right bank 50 ft upstream from bridge on county highway, 11 mi southwest of Edmore, and about 13 mi upstream from Sweetwater Lake.

DRAINAGE AREA.--382 mi^2, of which about 100 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April to June 1956, June 1957 to current year (seasonal records only since 1982).

REVISED RECORDS.--WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,400.00 ft above National Geodetic Vertical Datum of 1929. June 26, 1957, to Sept. 30, 1985, water-stage recorder at same site at a datum of 1,479.79 ft above National Geodetic Vertical Datum of 1929. Prior to June 26, 1957, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Mar. 1 to Apr. 7, Apr. 30 to May 4. Records good except for period of ice effect, Mar. 1 to Apr. 7, and period of missing record, Apr. 30 to May 4, which are fair.

AVERAGE DISCHARGE.--25 years (1957-82), 13.3 ft^3/s, 9,640 acre-ft/yr; median of yearly mean discharges, 9.2 ft^3/s, 6,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,110 ft^3/s, Apr. 25, 1979, gage height, 87.10 ft; no flow for several months each year.

EXTREMES FOR CURRENT YEAR.--Maximum observed discharge, 1,060 ft^3/s, Apr. 8, gage height 86.30 ft. Maximum observed gage height, 86.48 ft, Apr. 4, backwater from ice. No flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						.00	1.0	17	1.7	.00	.26	.00
2						.00	10	14	1.4	.00	.87	.00
3						.00	65	11	1.2	.00	2.9	.00
4						.00	150	8.0	1.0	.00	2.3	.00
5						.00	250	6.5	.70	.00	1.0	.00
6						.00	450	6.2	.34	.00	.20	.00
7						.00	800	6.3	.18	.00	.07	.00
8						.00	1060	6.1	.10	.00	.03	.00
9						.00	991	5.5	.06	.00	.02	.00
10						.00	874	4.8	.05	.00	.02	.00
11						.00	743	4.2	.05	.00	.01	.00
12						.00	584	3.2	.04	.00	.00	.00
13						.00	453	2.6	.03	.00	.00	.00
14						.00	350	2.6	.02	.00	.00	.00
15						.00	270	2.0	.01	.00	.01	.00
16						.00	234	1.5	.00	.00	.01	.00
17						.00	203	1.3	.00	.00	.02	.00
18						.00	178	1.6	.00	.02	.03	.00
19						.00	159	1.7	.00	.05	.02	.00
20						.00	135	1.7	.00	.03	.02	.00
21						.00	121	3.1	.00	.02	.01	.00
22						.00	108	3.1	.00	1.7	.01	.00
23						.00	86	3.2	.00	9.6	.01	.00
24						.00	69	3.3	.00	10	.00	.00
25						.00	55	3.1	.00	5.1	.00	.00
26						.00	41	3.2	.00	2.6	.00	.00
27						.00	38	3.2	.00	1.5	.00	.00
28						.00	28	2.9	.00	.75	.00	.00
29						.00	23	2.7	.00	.18	.00	.00
30						.00	20	2.5	.00	.07	.00	.00
31						.00	---	2.1	---	.04	.00	---
TOTAL						.00	8549.0	140.2	6.88	31.66	7.82	.00
MEAN						.00	285	4.52	.23	1.02	.25	.00
MAX						.00	1060	17	1.7	10	2.9	.00
MIN						.00	1.0	1.3	.00	.00	.00	.00
AC-FT						.0	16960	278	14	63	16	.0

05056200 EDMORE COULEE NEAR EDMORE, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)
OCT										
14...	1330	0.34	530	--	8.5	5.5	--	--	--	--
APR										
03...	1830	61	620	--	5.0	0.5	--	--	--	--
08...	1030	1060	570	7.30	17.5	10.5	8.4	--	160	51
13...	1605	435	600	--	16.0	11.0	--	--	--	--
15...	1100	280	650	7.98	14.0	10.5	10.1	92	230	76
22...	0825	110	760	--	9.0	10.0	--	--	--	--
MAY										
07...	1025	5.6	970	8.20	23.0	15.5	11.8	118	370	110
JUN										
11...	0946	0.06	1310	--	20.0	17.0	--	--	--	--
JUL										
28...	1505	0.79	488	9.00	30.5	28.0	11.0	137	190	48

DATE	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)
APR										
08...	38	16	41	34	1	9.0	110	130	20	0.30
15...	54	22	48	30	1	12	150	170	19	0.10
MAY										
07...	86	38	72	28	2	18	260	240	26	0.20
JUL										
28...	47	17	26	22	0.9	9.8	140	110	7.0	0.10

DATE	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N) (00618)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P) (00666)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)
APR										
08...	3.9	329	370	0.45	942	0.180	--	9.56	0.870	3
15...	20	438	440	0.60	331	0.040	--	1.81	0.270	3
MAY										
07...	2.7	659	640	0.90	10	0.040	0.00	0.00	0.320	3
JUL										
28...	17	300	320	0.41	0.64	0.140	0.02	0.15	0.950	6

DATE	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR									
08...	90	60	<1	19	30	0.4	<1	<1	230
15...	60	40	<1	25	10	0.5	1	1	270
MAY									
07...	80	40	<1	45	60	0.1	<1	1	380
JUL									
28...	70	20	<1	18	10	0.2	<1	1	200

05056215 EDMORE COULEE TRIBUTARY NEAR WEBSTER, ND

LOCATION.--Lat 48°15'59", long 98°40'50", in NW1/4 NW1/4 sec.7, T.155 N., R.62 W., Ramsey County, Hydrologic Unit 09020201, on upstream side of bridge on county road, 9 mi east and 1.1 mi south of Webster.

DRAINAGE AREA.--148 mi^2, approximately, of which about 44 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1986 to current year (seasonal). Discharge record available for 1986 water year in Bismarck.

GAGE.--Water-stage recorder. Datum of gage is 1400.00 ft above National Geodetic Vertical Datum of 1929, from topographic map. Prior to October 1986 nonrecording gage at present site and datum.

REMARKS.--Estimated daily discharges: Mar. 1 to Apr. 5 and Sept. 16-30. Records fair except those for periods of estimated daily discharges, which are poor.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 739 ft^3/s, Apr. 9, 1987, gage height, 72.48 ft; no flow at times most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in spring of 1959 reached a stage of about 75.00 ft, from conversation with local residents.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 739 ft^3/s, Apr. 9, gage height, 72.48 ft; no flow for several months.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						.00	25	57	8.5	.00	2.2	.00
2						.00	50	49	6.7	.00	5.6	.00
3						.00	150	41	5.3	.00	4.8	.00
4						.00	210	35	2.4	.00	3.5	.00
5						.00	400	32	2.6	.00	1.6	.00
6						.00	659	31	2.4	.00	.69	.00
7						.00	662	30	1.5	.00	.29	.00
8						.00	692	29	1.3	.00	.05	.00
9						.00	724	27	.98	.00	.00	.00
10						.00	701	23	.87	.00	.00	.00
11						.00	672	21	.61	.00	.00	.00
12						.00	636	14	.48	.00	.00	.00
13						.00	581	11	.32	.00	.00	.00
14						.00	499	9.7	.11	.00	.00	.00
15						.00	418	6.5	.00	.00	.00	.00
16						.00	361	5.8	.00	.00	.02	.00
17						.00	314	6.4	.00	.00	.17	.00
18						.00	282	6.4	.00	.00	.13	.00
19						.00	259	6.4	.00	.00	.00	.00
20						.00	224	7.2	.00	.00	.00	.00
21						.00	190	11	.00	.00	.00	.00
22						.00	177	14	.00	.00	.00	.00
23						.00	156	12	.00	.16	.00	.00
24						.00	138	15	.00	1.5	.00	.00
25						.00	122	16	.00	5.4	.00	.00
26						.00	105	17	.00	5.3	.00	.00
27						.00	84	17	.00	2.7	.00	.00
28						.00	80	16	.00	2.0	.00	.00
29						.00	74	16	.00	1.6	.00	.00
30						.00	61	14	.00	1.1	.00	.00
31						5.0	---	8.5	---	.83	.00	---
TOTAL						5.00	9706	604.9	34.07	20.59	19.05	.00
MEAN						.16	324	19.5	1.14	.66	.61	.00
MAX						5.0	724	57	8.5	5.4	5.6	.00
MIN						.00	25	5.8	.00	.00	.00	.00
AC-FT						9.9	19250	1200	68	41	38	.0

05056215 EDMORE COULEE TRIBUTARY NEAR WEBSTER, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1985 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
OCT											
14...	1300	0.68	920	--	6.0	5.5	--	--	--	--	--
APR											
03...	1810	160	460	6.89	4.5	2.0	--	--	--	--	--
04...	0900	172	390	7.22	5.5	1.0	130	41	31	13	16
14...	1050	489	480	--	7.5	10.0	--	--	--	--	--
16...	1640	356	560	--	18.5	14.0	--	--	--	--	--
22...	0950	181	650	--	11.5	10.0	--	--	--	--	--
JUN											
11...	1055	0.65	1100	--	22.0	19.0	--	--	--	--	--

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
04...	20	0.6	8.0	90	76	9.6	0.10	15	219	220	0.30

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR										
04...	3	90	80	<1	16	80	0.1	<1	1	210

05056222 MORRISON LAKE NEAR WEBSTER, ND

LOCATION.--Lat 48°15'35", long 98°50'48", in NW1/4 sec.11, T.155 N., R.64 W., Ramsey County, Hydrologic Unit 09020201, on northwest shoreline of Morrison Lake.

DRAINAGE AREA.--501 mi^2, approximately.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--March 1985 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,400.00 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good. Stage frequently affected by wind.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height recorded, 62.02 ft, Apr. 13, 1987; minimum recorded, 57.31 ft, Aug. 13, 1985.

EXTREMES FOR CURRENT YEAR.--Maximum gage height recorded, 62.02 ft, Apr. 13; minimum recorded, 58.16 ft, Sept. 28.

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	58.86	58.72	58.68	58.68	58.69	58.84	58.95	60.73	---	58.64	---	58.44
2	58.87	58.76	58.68	58.68	58.70	58.84	58.97	60.64	---	58.56	---	58.48
3	58.84	58.74	58.68	58.68	58.70	58.84	59.00	60.57	---	58.58	---	58.48
4	58.85	58.65	58.68	58.68	58.70	58.85	59.07	60.52	59.21	58.60	---	58.41
5	58.82	58.62	58.68	58.68	58.71	58.86	59.19	60.46	59.22	58.58	---	58.42
6	58.83	58.61	58.68	58.68	58.72	58.86	59.42	60.38	59.19	58.57	---	58.42
7	58.83	58.60	58.68	58.68	58.72	58.86	59.91	60.32	59.09	58.55	---	58.37
8	58.82	58.56	58.68	58.68	58.72	58.86	60.58	60.28	59.04	58.55	---	58.37
9	58.80	58.68	58.68	58.68	58.72	58.86	61.12	60.21	59.06	58.57	---	58.37
10	58.79	58.71	58.68	58.68	58.72	58.86	61.46	60.12	59.06	58.55	---	58.34
11	58.73	58.71	58.68	58.68	58.72	58.86	61.75	60.03	58.98	58.57	---	58.33
12	58.76	58.71	58.68	58.68	58.72	58.86	61.93	60.07	58.96	58.54	58.49	58.35
13	58.72	58.72	58.68	58.68	58.72	58.86	62.00	59.92	58.94	58.57	58.52	58.36
14	58.73	58.72	58.68	58.68	58.72	58.86	62.02	59.84	58.89	58.59	58.55	58.37
15	58.81	58.73	58.68	58.68	58.72	58.86	61.97	59.85	58.90	58.61	58.59	58.33
16	58.87	58.74	58.68	58.68	58.72	58.86	61.89	59.76	58.89	58.61	58.56	58.33
17	58.85	58.73	58.68	58.68	58.72	58.86	61.83	59.67	58.80	58.54	58.57	58.27
18	58.84	58.72	58.68	58.68	58.72	58.86	61.77	59.67	58.75	58.53	58.58	58.26
19	58.82	58.72	58.68	58.68	58.72	58.88	61.66	59.66	58.76	58.62	58.58	58.29
20	58.82	58.71	58.68	58.68	58.72	58.91	61.42	59.58	58.75	58.66	58.59	58.30
21	58.81	58.72	58.68	58.68	58.72	58.92	61.44	59.48	58.74	58.65	58.55	58.31
22	58.81	58.73	58.68	58.68	58.72	58.92	61.39	59.58	58.73	58.74	58.50	58.31
23	58.76	58.72	58.68	58.68	58.73	58.92	61.31	59.60	58.72	58.75	58.51	58.31
24	58.77	58.72	58.68	58.68	58.73	58.92	61.24	59.71	58.71	58.75	58.53	58.30
25	58.79	58.71	58.68	58.68	58.76	58.92	61.17	59.83	58.63	58.76	58.54	58.30
26	58.80	58.71	58.68	58.68	58.79	58.92	61.06	60.02	58.61	58.76	58.55	58.29
27	58.77	58.70	58.68	58.68	58.79	58.92	60.99	60.05	58.62	58.74	58.54	58.26
28	58.70	58.70	58.68	58.68	58.82	58.92	60.96	60.04	58.61	58.74	58.54	58.20
29	58.71	58.69	58.68	58.68	---	58.92	60.87	---	58.61	58.73	58.52	58.21
30	58.71	58.69	58.68	58.69	---	58.92	60.81	---	58.62	58.72	58.43	58.23
31	58.69	---	58.68	58.69	---	58.94	---	---	---	---	58.45	---
MEAN	58.8	58.7	58.7	58.7	58.7	58.9	60.9	---	---	---	---	58.3
MAX	58.87	58.76	58.68	58.69	58.82	58.94	62.02	---	---	---	---	58.48
MIN	58.69	58.56	58.68	58.68	58.69	58.84	58.95	---	---	---	---	58.20

05056239 STARKWEATHER COULEE NEAR WEBSTER, ND

LOCATION.--Lat 48°19'13", long 98°56'23", in NW¼SW¼NW¼ sec.19, T.156 N., R.64 W., Ramsey County, Hydrologic Unit 09020201, on right bank 3.8 mi northwest of Webster.

DRAINAGE AREA.--About 310 mi^2, of which about 100 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1979 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,448.00 ft above National Geodetic Vertical Datum of 1929, from topographic map. Prior to July 23, 1986, nonrecording gage 100 ft downstream at same datum.

REMARKS.--Estimated daily discharges: Oct. 12-26, Mar. 21 to Apr. 5, June 6-9, and June 27 to July 28. Records good except those for periods of estimated daily discharges, which are fair.

AVERAGE DISCHARGE.--8 years, 11.1 ft3/s, 8,040 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge observed, 570 ft^3/s, Apr. 11, 1987, gage height, 8.50 ft; no flow for many months each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge observed, 570 ft^3/s, Apr. 11, gage height, 8.50 ft; no flow for several months.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.19	.00	.00	.00	.00	.00	10	14	8.2	.00	27	.07
2	.24	.00	.00	.00	.00	.00	20	12	2.9	.00	38	.04
3	.24	.00	.00	.00	.00	.00	48	9.7	.96	.00	32	.02
4	.24	.00	.00	.00	.00	.00	75	8.3	.46	.00	23	.01
5	.24	.00	.00	.00	.00	.00	200	6.8	.17	.00	19	.00
6	.21	.00	.00	.00	.00	.00	394	5.2	.15	.00	24	.00
7	.17	.00	.00	.00	.00	.00	506	4.5	.15	.00	17	.00
8	.15	.00	.00	.00	.00	.00	548	3.8	.15	.00	13	.00
9	.14	.00	.00	.00	.00	.00	556	3.4	.25	.00	10	.00
10	.10	.00	.00	.00	.00	.00	561	2.6	.41	.00	7.5	.00
11	.09	.00	.00	.00	.00	.00	569	1.3	.41	.00	5.8	.00
12	.08	.00	.00	.00	.00	.00	548	.68	.25	.00	4.3	.00
13	.07	.00	.00	.00	.00	.00	527	.71	.15	.00	3.0	.00
14	.06	.00	.00	.00	.00	.00	485	.37	.06	.00	2.0	.00
15	.05	.00	.00	.00	.00	.00	443	.18	.01	.00	6.3	.00
16	.04	.00	.00	.00	.00	.00	386	.18	.00	.00	9.4	.00
17	.03	.00	.00	.00	.00	.00	345	.18	.00	.00	8.8	.00
18	.02	.00	.00	.00	.00	.00	323	.14	.00	.00	7.5	.00
19	.01	.00	.00	.00	.00	.00	301	.12	.00	.50	6.0	.00
20	.00	.00	.00	.00	.00	.00	261	.17	.00	1.0	5.4	.00
21	.00	.00	.00	.00	.00	.00	203	.50	.00	2.0	4.7	.00
22	.00	.00	.00	.00	.00	.00	172	.28	.00	50	3.1	.00
23	.00	.00	.00	.00	.00	.00	136	.24	.00	74	1.9	.00
24	.00	.00	.00	.00	.00	.00	101	.24	.00	70	1.4	.00
25	.00	.00	.00	.00	.00	.00	68	.24	.00	65	1.2	.00
26	.00	.00	.00	.00	.00	.00	50	.31	.00	60	1.2	.00
27	.00	.00	.00	.00	.00	.00	39	.83	.00	50	1.1	.00
28	.00	.00	.00	.00	.00	.00	29	13	.00	40	1.1	.00
29	.00	.00	.00	.00	---	.00	21	65	.00	30	.76	.00
30	.00	.00	.00	.00	---	.00	17	43	.00	26	.32	.00
31	.00	---	.00	.00	---	2.0	---	17	---	23	.14	---
TOTAL	2.37	.00	.00	.00	.00	2.00	7942	214.97	14.68	491.50	285.92	.14
MEAN	.08	.00	.00	.00	.00	.06	265	6.93	.49	15.9	9.22	.00
MAX	.24	.00	.00	.00	.00	2.0	569	65	8.2	74	38	.07
MIN	.00	.00	.00	.00	.00	.00	10	.12	.00	.00	.14	.00
AC-FT	4.7	.0	.0	.0	.0	4.0	15750	426	29	975	567	.3

CAL YR 1986 TOTAL 6163.48 MEAN 16.9 MAX 279 MIN .00 AC-FT 12230
WTR YR 1987 TOTAL 8953.54 MEAN 24.5 MAX 569 MIN .00 AC-FT 17760

05056239 STARKWEATHER COULEE NEAR WEBSTER, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1980 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)
OCT										
31...	1015	0.04	1600	--	5.0	4.0	--	--	--	--
APR										
03...	1405	44	1020	--	9.0	0.5	--	--	--	--
08...	1345	556	450	7.10	23.0	12.5	9.4	88	160	57
14...	1640	488	620	--	15.0	13.0	--	--	--	--
16...	1315	369	465	--	18.0	12.0	--	--	--	--
22...	1150	173	530	8.00	18.0	9.0	9.7	84	230	63
30...	1316	17	690	--	16.0	12.0	--	--	--	--
MAY										
06...	1550	5.0	790	8.30	21.0	22.5	11.0	126	360	110
JUN										
10...	1305	0.34	530	--	15.0	16.5	--	--	--	--
10...	1500	0.34	530	8.60	15.0	16.5	11.1	115	250	37
JUL										
29...	1025	29	362	7.50	29.5	26.0	6.8	84	150	15

DATE	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)
APR										
08...	38	15	17	18	0.6	10	100	93	17	0.20
22...	57	22	17	15	0.5	13	170	110	11	0.10
MAY										
06...	85	35	31	15	0.7	18	250	160	20	0.20
JUN										
10...	61	23	17	12	0.5	12	210	71	9.6	0.20
JUL										
29...	42	12	8.0	9	0.3	11	140	42	3.9	0.10

DATE	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N) (00618)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P) (00666)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)
APR										
08...	16	268	320	0.36	402	0.110	--	11.2	1.00	5
22...	18	370	350	0.50	173	--	--	--	--	6
MAY										
06...	6.0	521	500	0.71	7.0	0.070	0.00	0.00	0.410	6
JUN										
10...	19	357	340	0.49	0.33	0.070	0.01	0.01	1.410	11
JUL										
29...	35	226	240	0.31	17	0.200	0.03	0.06	1.070	8

DATE	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR									
08...	100	30	<1	16	10	0.4	<1	<1	230
22...	30	40	<1	21	10	0.1	2	<1	290
MAY									
06...	80	30	<1	34	30	0.2	<1	1	350
JUN									
10...	40	30	<1	22	40	--	1	1	300
JUL									
29...	60	50	<1	13	30	<0.1	<1	1	190

05056241 DRY LAKE NEAR PENN, ND

LOCATION.--Lat 48°13'52", long 98°58'59", in NW¼NW¼SW¼ sec.23, T.155 N., R.65 W., Ramsey County, Hydrologic Unit 09020201, on west shoreline of Dry Lake, 6 mi east of Penn.

DRAINAGE AREA.--920 mi^2, approximately.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--October 1983 to present (gage heights only).

GAGE.--Water-stage recorder. Datum of gage is 1,400.00 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records fair. Stage affected by wind.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height recorded, 50.32 ft, Apr. 20, 1987, affected by wind; minimum recorded, 44.94 ft, July 3, 1986, affected by wind.

EXTREMES FOR CURRENT YEAR.--Maximum gage height recorded, 50.32 ft, Apr. 20, affected by wind; minimum recorded, 45.55 ft, Sept. 30.

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	46.52	46.40	---	---	---	---	---	49.02	46.88	45.89	46.11	45.94
2	46.58	46.39	---	---	---	---	---	48.88	46.82	45.95	46.09	45.82
3	46.56	46.40	---	---	---	---	46.76	48.74	46.81	45.87	46.10	45.85
4	46.51	46.34	---	---	---	---	46.67	48.64	46.74	45.84	46.06	45.88
5	46.57	46.33	---	---	---	---	46.75	48.53	46.72	45.84	45.98	45.88
6	46.54	46.33	---	---	---	---	46.97	48.43	46.74	45.86	46.05	45.80
7	46.59	46.48	---	---	---	---	47.16	48.33	46.75	45.88	46.02	45.86
8	46.60	46.77	---	---	---	---	47.38	48.17	46.69	45.86	46.01	45.82
9	46.45	46.51	---	---	---	---	47.59	48.13	46.58	45.85	46.03	45.82
10	46.53	46.51	---	---	---	---	47.84	48.05	46.54	45.90	45.87	45.85
11	46.62	46.47	---	---	---	---	48.10	47.92	46.57	46.01	45.92	45.83
12	46.60	46.43	---	---	---	---	48.37	47.60	46.53	45.96	45.97	45.81
13	46.57	46.37	---	---	---	---	48.66	47.74	46.50	45.91	45.91	45.79
14	46.64	46.33	---	---	---	---	48.94	47.66	46.49	45.88	45.89	45.74
15	46.56	46.32	---	---	---	---	49.22	47.55	46.34	45.86	46.04	45.79
16	46.61	46.31	---	---	---	---	49.50	47.59	46.30	45.87	46.04	45.78
17	46.59	46.29	---	---	---	---	49.71	47.52	46.34	45.96	46.04	45.81
18	46.59	46.27	---	---	---	---	49.88	47.34	46.34	46.01	46.05	45.83
19	46.62	46.24	---	---	---	---	50.02	47.28	46.30	45.96	46.02	45.87
20	46.63	46.21	---	---	---	---	50.22	47.35	46.25	45.95	46.00	45.84
21	46.62	46.17	---	---	---	---	50.08	47.54	46.22	46.01	46.04	45.80
22	46.63	46.15	---	---	---	---	50.06	47.21	46.16	46.06	46.03	45.77
23	46.59	46.12	---	---	---	---	50.01	47.13	46.15	46.09	45.98	45.80
24	46.56	46.10	---	---	---	---	49.91	47.09	46.11	46.08	45.96	45.79
25	46.53	46.09	---	---	---	---	49.80	47.08	46.10	46.10	45.97	45.76
26	46.52	46.05	---	---	---	---	49.73	47.08	46.03	46.13	45.98	45.76
27	46.49	46.04	---	---	---	---	49.53	47.07	45.97	46.12	45.97	45.75
28	46.52	46.03	---	---	---	---	49.39	46.96	45.97	46.12	45.94	45.79
29	46.48	45.98	---	---	---	---	49.28	47.01	45.96	46.13	45.95	45.74
30	46.40	45.96	---	---	---	---	49.08	46.99	45.90	46.11	45.98	45.68
31	46.46	---	---	---	---	---	---	46.90	---	46.09	45.92	---
MEAN	46.6	46.3	---	---	---	---	---	47.7	46.4	46.0	46.0	45.8
MAX	46.64	46.77	---	---	---	---	---	49.02	46.88	46.13	46.11	45.94
MIN	46.40	45.96	---	---	---	---	---	46.90	45.90	45.84	45.87	45.68

05056247 CALIO COULEE NEAR STARKWEATHER, ND

LOCATION.--Lat 48°23'58", long 99°02'46", in NW¼NE¼ sec.28, T.157 N., R.65 W., Towner County, Hydrologic Unit 09020201, on left bank on downstream side of bridge 6 mi southwest of Starkweather.

DRAINAGE AREA.--130 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1987 to September 1987 (seasonal records only).

GAGE.--Water-stage recorder. Datum of gage is 1,400.00 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Mar. 30 to Apr. 7 and Apr. 27 to June 10. Records fair.

EXTREMES FOR CURRENT PERIOD.--Maximum observed discharge, 292 ft^3/s, Apr. 7; no flow most of the time.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	.00	.60	.85	.00	.00	.00	.00
2	---	---	---	---	---	.00	2.0	.60	.00	.00	.00	.00
3	---	---	---	---	---	.00	8.0	.40	.00	.00	.00	.00
4	---	---	---	---	---	.00	15	.25	.00	.00	.00	.00
5	---	---	---	---	---	.00	50	.10	.00	.00	.00	.00
6	---	---	---	---	---	.00	120	.06	.00	.00	.00	.00
7	---	---	---	---	---	.00	279	.04	.00	.00	.00	.00
8	---	---	---	---	---	.00	267	.01	.00	.00	.00	.00
9	---	---	---	---	---	.00	255	.00	.00	.00	.00	.00
10	---	---	---	---	---	.00	233	.00	.00	.00	.00	.00
11	---	---	---	---	---	.00	164	.00	.00	.00	.00	.00
12	---	---	---	---	---	.00	130	.00	.00	.00	.00	.00
13	---	---	---	---	---	.00	81	.00	.00	.00	.00	.00
14	---	---	---	---	---	.00	67	.00	.00	.00	.00	.00
15	---	---	---	---	---	.00	63	.00	.00	.00	.00	.00
16	---	---	---	---	---	.00	54	.00	.00	.00	.00	.00
17	---	---	---	---	---	.00	42	.00	.00	.00	.00	.00
18	---	---	---	---	---	.00	30	.00	.00	.00	.00	.00
19	---	---	---	---	---	.00	18	.00	.00	.00	.00	.00
20	---	---	---	---	---	.00	14	.00	.00	.00	.00	.00
21	---	---	---	---	---	.00	9.9	.00	.00	.00	.00	.00
22	---	---	---	---	---	.00	7.5	.00	.00	.00	.00	.00
23	---	---	---	---	---	.00	5.2	.00	.00	.00	.00	.00
24	---	---	---	---	---	.00	3.4	.00	.00	.00	.00	.00
25	---	---	---	---	---	.00	2.4	.00	.00	.00	.00	.00
26	---	---	---	---	---	.00	1.9	.00	.00	.00	.00	.00
27	---	---	---	---	---	.00	1.6	.00	.00	.00	.00	.00
28	---	---	---	---	---	.00	1.4	.00	.00	.00	.00	.00
29	---	---	---	---	---	.00	1.3	.00	.00	.00	.00	.00
30	---	---	---	---	---	.00	1.0	.00	.00	.00	.00	.00
31	---	---	---	---	---	.30	---	.00	---	.00	.00	---
TOTAL	---	---	---	---	---	.30	1928.20	2.31	.00	.00	.00	.00
MEAN	---	---	---	---	---	.01	64.3	.07	.00	.00	.00	.00
MAX	---	---	---	---	---	.30	279	.85	.00	.00	.00	.00
MIN	---	---	---	---	---	.00	.60	.00	.00	.00	.00	.00
AC-FT	---	---	---	---	---	.6	3820	4.6	.0	.0	.0	.0

05056247 CALIO COULEE NEAR STARKWEATHER, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1986 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
APR											
07...	1715	279	420	--	--	--	--	--	--	--	--
10...	1130	234	430	7.81	3.5	5.0	170	48	39	17	13
15...	1645	64	560	--	--	14.5	--	--	--	--	--
30...	1210	1.0	640	--	15.5	12.5	--	--	--	--	--

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
10...	14	0.5	8.4	120	78	11	0.10	20	252	260	0.34

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR										
10...	5	100	30	<1	15	<10	0.1	<1	1	230

05056255 LAKE ALICE-IRVINE CHANNEL NEAR CHURCHS FERRY, ND

LOCATION.--Lat 48°19'26", long 99°56'07", in NW¼NE¼ sec.21, T.156 N., R.66 W., Ramsey County, Hydrologic Unit 09020201, on downstream side of control structure between Lake Alice and Lake Irvine, 5 mi northwest of the city of Churchs Ferry.

DRAINAGE AREA.--999 mi^2, approximately.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--March 1985 to September 1987 (seasonal records only, discontinued).

GAGE.--Water-stage recorder. Datum of gage is 1,400.00 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Elevation at gage frequently affected by wind. Records fair.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height recorded, 45.35 ft, Apr. 16, 1987; minimum recorded, 39.51 ft, Oct. 7, 1985.

EXTREMES FOR CURRENT YEAR.--Maximum gage height recorded, 45.35 ft, Apr. 16; minimum recorded, 40.45 ft, Sept. 30.

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	---	42.95	41.77	41.18	40.67
2	---	---	---	---	---	---	---	---	42.89	41.74	41.15	40.64
3	---	---	---	---	---	---	---	---	42.84	41.71	41.11	40.63
4	---	---	---	---	---	---	---	44.23	42.78	41.69	41.08	40.61
5	---	---	---	---	---	---	---	---	42.75	41.68	41.05	40.61
6	---	---	---	---	---	---	---	---	42.72	41.66	41.03	40.59
7	---	---	---	---	---	---	---	---	42.67	41.66	41.02	40.60
8	---	---	---	---	---	---	---	---	42.62	41.63	41.00	40.58
9	---	---	---	---	---	---	43.87	---	42.57	41.60	40.98	40.57
10	---	---	---	---	---	---	44.24	---	42.54	41.61	40.90	40.56
11	---	---	---	---	---	---	44.65	---	42.54	41.59	40.91	40.55
12	---	---	---	---	---	---	44.90	---	42.50	41.57	40.87	40.55
13	---	---	---	---	---	---	45.11	---	42.47	41.54	40.85	40.55
14	---	---	---	---	---	---	45.24	---	42.42	41.51	40.84	40.54
15	---	---	---	---	---	---	45.30	---	42.37	41.48	40.92	40.54
16	---	---	---	---	---	---	45.31	---	42.33	41.48	40.91	40.54
17	---	---	---	---	---	---	45.28	---	42.30	41.45	40.89	40.54
18	---	---	---	---	---	---	45.26	---	42.25	41.44	40.87	40.54
19	---	---	---	---	---	---	45.22	43.33	42.20	41.39	40.85	40.55
20	---	---	---	---	---	---	45.18	43.32	42.15	41.43	40.83	40.54
21	---	---	---	---	---	---	45.08	43.29	42.12	41.41	40.80	40.54
22	---	---	---	---	---	---	44.98	43.26	42.07	41.36	40.79	40.54
23	---	---	---	---	---	---	44.93	43.23	42.05	41.36	40.77	40.54
24	---	---	---	---	---	---	44.86	43.19	42.02	41.35	40.75	40.52
25	---	---	---	---	---	---	44.79	43.17	41.97	41.33	40.76	40.51
26	---	---	---	---	---	---	44.73	43.15	41.92	41.29	40.75	40.50
27	---	---	---	---	---	---	44.66	43.15	41.88	41.27	40.75	40.50
28	---	---	---	---	---	---	---	43.10	41.84	41.25	40.74	40.49
29	---	---	---	---	---	---	44.55	43.08	41.84	41.22	40.73	40.49
30	---	---	---	---	---	---	---	43.04	41.80	41.21	40.70	40.48
31	---	---	---	---	---	---	---	43.00	---	41.18	40.68	---
MEAN	---	---	---	---	---	---	---	---	42.3	41.5	40.9	40.6
MAX	---	---	---	---	---	---	---	---	42.95	41.77	41.18	40.67
MIN	---	---	---	---	---	---	---	---	41.80	41.18	40.68	40.48

05056390 LITTLE COULEE NEAR BRINSMADE, ND

LOCATION.--Lat 48°11'15", long 99°14'34", in SW1/4 sec.2, T.154 N., R.67 W., Benson County, Hydrologic Unit 09020201, on right bank 100 ft downstream from bridge on township road, 0.5 mi downstream from Silver Lake, and 4 mi east of Brinsmade.

DRAINAGE AREA.--350 mi^2, of which about 160 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1975 to current year (seasonal records only since 1983).

GAGE.--Water-stage recorder. Elevation of gage is 1,435 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Estimated daily discharges: Mar. 1 to Apr. 10, Apr. 21-29, May 13-19, May 24 to June 10, and June 17 to July 15. Records poor.

AVERAGE DISCHARGE.--7 years (water years 1976-82), 7.02 ft^3/s, 5,090 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 425 ft^3/s, May 1, 1979, gage height, 10.43 ft; no flow for several months each year.

EXTREMES FOR CURRENT YEAR.--Maximum recorded discharge during period March to September, 62.0 ft^3/s, Apr. 11, gage height, 8.64 ft; no flow for several months.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						.00	50	8.9	.30	.00	.00	.00
2						.00	57	8.0	.20	.00	.00	.00
3						.00	54	6.4	.10	.00	.00	.00
4						.00	50	5.5	.05	.00	.00	.00
5						.00	52	5.1	.02	.00	.00	.00
6						.00	55	4.2	.00	.00	.00	.00
7						.00	56	3.4	.00	.00	.00	.00
8						.00	57	2.7	.00	.00	.00	.00
9						.00	60	2.0	.00	.00	.00	.00
10						.00	61	1.6	.00	.00	.00	.00
11						.00	62	1.2	.00	.00	.00	.00
12						.00	62	.71	.00	.00	.00	.00
13						.00	58	.55	.00	.00	.00	.00
14						.00	44	.41	.00	.00	.00	.00
15						.00	47	.35	.00	.00	.00	.00
16						.00	52	.30	.00	.00	.00	.00
17						.00	54	.25	.00	.00	.00	.00
18						.00	42	.20	.00	.00	.00	.00
19						.00	38	.15	.00	.00	.00	.00
20						.00	39	.10	.00	.00	.00	.00
21						.20	36	.82	.00	.00	.00	.00
22						.50	33	1.0	.00	.00	.00	.00
23						1.0	30	.45	.00	.00	.00	.00
24						2.0	27	.45	.00	.00	.00	.00
25						5.0	24	.50	.00	.00	.00	.00
26						10	21	.55	.00	.00	.00	.00
27						15	18	.60	.00	.00	.00	.00
28						25	15	.65	.00	.00	.00	.00
29						30	12	.60	.00	.00	.00	.00
30						35	9.8	.50	.00	.00	.00	.00
31						45	---	.40	---	.00	.00	---
TOTAL						168.70	1275.8	58.54	.67	.00	.00	.00
MEAN						5.44	42.5	1.89	.02	.00	.00	.00
MAX						45	62	8.9	.30	.00	.00	.00
MIN						.00	9.8	.10	.00	.00	.00	.00
AC-FT						335	2530	116	1.3	.0	.0	.0

05056390 LITTLE COULEE NEAR BRINSMADE, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
APR											
02...	1510	61	900	7.50	11.0	2.0	280	72	50	38	75
14...	1350	42	650	--	--	11.5	--	--	--	--	--
MAY											
20...	1020	0.08	1400	7.40	13.0	12.0	390	52	66	55	140

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
02...	35	2	20	210	190	38	0.20	19	572	560	0.78
MAY											
20...	42	3	21	340	280	54	0.20	17	888	840	1.2

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR										
02...	4	110	50	<1	61	120	<0.2	1	<1	280
MAY										
20...	4	150	70	<1	91	270	0.1	<1	<1	390

05056400 BIG COULEE NEAR CHURCHS FERRY, ND

LOCATION.--Lat 48°10'40", long 99°13'15", in NW¼NW¼ sec.12, T.154 N., R.67 W., Benson County, Hydrologic Unit 09020201, on right bank on downstream side of bridge on U.S. Highway 281, 1 mi downstream from Little Coulee, and 6 mi south of Churchs Ferry.

DRAINAGE AREA.--1,620 mi^2, approximately, of which about 158 mi^2 is probably noncontributing (revised). Drainage area reduced from approximately 2,510 mi^2 with the completion of Channel A in March 1979.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1950 to current year. Prior to October 1960, published as Mauvais Coulee near Churchs Ferry.

GAGE.--Water-stage recorder. Datum of gage is 1,432.65 ft above National Geodetic Vertical Datum of 1929. Prior to June 21, 1950, reference marks, and June 21, 1950, to July 17, 1956, nonrecording gage at former bridge on U.S. Highway 281, 0.1 mi upstream at datum 0.70 ft higher.

REMARKS.--Estimated daily discharges: Nov. 8 to Apr. 4 and Sept. 14, 15. Records fair except those for estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--28 years prior to construction of Channel A (water years 1951-78), 37.3 ft^3/s, 27,000 acre-ft/yr; median of yearly mean discharges (1951-78), 7.8 ft^3/s, 5,700 acre-ft/yr. Nine years since construction of Channel A (water years 1979-87), 49.1 ft^3/s, 35,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,420 ft^3/s, May 6, 1979, gage height, 7.59 ft; no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 475 ft^3/s, Apr. 15, gage height, 6.03 ft; no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	8.0	1.3	.28	.00	.00	50	347	163	65	37	6.7
2	14	8.2	1.1	.28	.00	.00	90	346	151	64	35	5.3
3	16	8.2	1.0	.28	.00	.00	125	332	151	65	31	3.6
4	17	8.4	.98	.28	.00	.00	160	323	151	60	31	2.5
5	15	8.4	.96	.28	.00	.00	178	310	149	58	29	1.6
6	13	8.4	.90	.28	.00	.10	153	301	145	58	26	1.2
7	13	8.3	.88	.28	.00	.40	153	296	145	57	27	.69
8	13	8.0	.80	.27	.00	.60	172	285	143	56	25	.46
9	13	7.0	.76	.26	.00	1.0	248	276	137	54	23	.31
10	13	6.5	.73	.25	.00	.50	338	273	131	54	22	.21
11	13	6.0	.70	.25	.00	.40	439	267	129	56	21	.17
12	12	5.5	.60	.25	.00	.38	453	239	123	57	22	.13
13	12	5.2	.50	.24	.00	.36	453	216	120	53	20	.13
14	12	5.0	.43	.23	.00	.35	457	228	117	49	20	.12
15	12	5.0	.40	.22	.00	.35	472	226	110	46	26	.10
16	12	4.8	.38	.21	.00	.45	465	229	100	40	23	.08
17	11	4.5	.36	.18	.00	.57	457	243	98	43	22	.20
18	11	4.0	.34	.16	.00	.65	466	231	99	52	21	.13
19	11	3.5	.32	.14	.00	1.0	460	213	98	52	20	.12
20	10	3.0	.30	.14	.00	4.0	450	210	95	43	20	.11
21	9.9	2.5	.30	.14	.00	8.0	446	255	92	43	19	.10
22	9.8	2.5	.30	.14	.00	12	422	232	88	49	20	.10
23	9.8	2.5	.30	.10	.00	16	417	202	84	46	18	.10
24	9.8	2.5	.30	.05	.00	20	415	196	80	44	16	.10
25	9.8	2.5	.30	.00	.00	35	400	194	78	42	16	.10
26	9.3	2.5	.30	.00	.00	55	389	194	78	41	16	.11
27	8.4	2.2	.30	.00	.00	75	381	194	76	41	13	.12
28	7.8	2.0	.29	.00	.00	60	370	187	74	39	11	.15
29	7.8	1.8	.28	.00	---	45	365	176	74	38	8.5	.20
30	7.8	1.5	.28	.00	---	48	359	179	71	38	7.4	.21
31	7.8	---	.28	.00	---	50	---	176	---	38	8.1	---
TOTAL	354.0	148.4	16.97	5.19	.00	435.11	10203	7576	3350	1541	654.0	25.15
MEAN	11.4	4.95	.55	.17	.00	14.0	340	244	112	49.7	21.1	.84
MAX	17	8.4	1.3	.28	.00	75	472	347	163	65	37	6.7
MIN	7.8	1.5	.28	.00	.00	.00	50	176	71	38	7.4	.08
AC-FT	702	294	34	10	.0	863	20240	15030	6640	3060	1300	50

CAL YR 1986 TOTAL 6665.35 MEAN 18.3 MAX 114 MIN .00 AC-FT 13220
WTR YR 1987 TOTAL 24308.75 MEAN 66.6 MAX 472 MIN .00 AC-FT 48220

05056400 BIG COULEE NEAR CHURCHS FERRY, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1958, 1961 to current year.

PERIOD OF DAILY RECORDS.--
WATER TEMPERATURE: October 1983 to current year.
SPECIFIC CONDUCTANCE: October 1983 to current year.

INSTRUMENTATION.--Water-quality monitor since October 1983.

REMARKS.--Records poor. Interruptions in record due to malfunction of recording instruments. No flow Jan. 25 to Mar. 5.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Maximum, 30.5°C, June 20, minimum, 0.0°C on several days during most winters.
SPECIFIC CONDUCTANCE: Maximum, 2,840 microsiemens, Oct. 19, 1984; minimum, 380 microsiemens, Mar. 24, 1986.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: Maximum recorded, 30.1°C, July 29; minimum recorded, 0.6°C, Apr. 5.
SPECIFIC CONDUCTANCE: Maximum recorded, 1,590 microsiemens, Oct. 16; minimum recorded, 530 microsiemens, May 6.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)
OCT										
28...	1140	7.5	1500	8.00	10.5	8.5	9.3	84	--	--
DEC										
03...	1640	0.97	920	8.00	-7.5	0.0	7.3	53	--	--
JAN										
22...	1015	0.14	1020	--	-17.5	0.0	--	--	--	--
MAR										
17...	1445	0.57	640	7.00	0.0	0.0	11.6	82	--	--
APR										
02...	1505	92	--	--	3.5	--	--	--	--	--
14...	1330	460	550	7.50	14.5	8.5	9.9	94	210	70
30...	1500	359	560	8.60	18.0	14.5	9.2	91	230	75
MAY										
19...	1530	201	670	7.70	21.0	15.0	8.1	81	260	82
JUN										
24...	1315	81	820	8.05	26.0	23.5	7.4	89	310	78
AUG										
12...	0915	21	880	8.40	20.0	19.0	5.8	63	340	85
SEP										
10...	0900	0.17	1130	7.90	14.0	15.5	7.6	76	--	--

DATE	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)
APR										
14...	41	26	35	25	1	11	140	140	21	0.10
30...	44	28	34	24	1	12	150	140	19	0.10
MAY										
19...	52	32	37	22	1	15	180	150	19	0.10
JUN										
24...	64	36	43	22	1	19	230	160	23	0.10
AUG										
12...	67	43	57	25	1	20	260	200	27	0.20

05056400 BIG COULEE NEAR CHURCHS FERRY, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	SOLIDS, RESIDUE AT 105 DEG. C, SUS-PENDED (MG/L) (00530)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N) (00618)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P) (00666)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)
APR											
14...	13	375	380	0.51	466	--	0.270	--	3.20	0.310	2
30...	4.5	376	370	0.51	364	--	0.030	0.00	0.00	0.120	3
MAY											
19...	10	436	430	0.59	237	--	0.180	0.030	0.180	0.290	3
JUN											
24...	25	524	510	0.71	114	53	0.100	0.090	1.540	0.740	7
AUG											
12...	38	647	610	0.88	37	99	0.170	0.100	0.640	1.550	9

DATE	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR									
14...	60	50	<1	30	110	0.4	<1	1	240
30...	70	30	<1	33	10	0.1	<1	<1	250
MAY									
19...	90	40	<1	35	40	0.1	1	<1	270
JUN									
24...	70	20	<1	42	50	0.5	1	1	300
AUG									
12...	90	40	1	57	30	0	2	<1	310

05056400 BIG COULEE NEAR CHURCHS FERRY, ND--CONTINUED

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	11.5	8.0										
2	10.0	8.0										
3	10.5	7.5										
4	10.0	8.0										
5	13.0	8.0										
6	12.0	8.5										
7	9.0	5.5										
8	8.0	5.0										
9	8.0	5.0										
10	6.0	3.5										
11	7.0	4.0										
12	7.0	5.0										
13	6.0	4.5										
14	9.0	6.5										
15	1.0	7.0										
16	12.0	8.5										
17	12.0	8.5										
18	11.5	8.0										
19	12.5	7.5										
20	12.0	8.5										
21	8.5	5.5										
22	6.5	4.0										
23	6.5	3.5										
24	9.5	6.0										
25	9.5	8.0										
26	---	---										
27	---	---										
28	---	---										
29	---	---										
30	---	---										
31	---	---										
MONTH	---	---										

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	---	---	14.9	11.1	22.1	20.8	26.1	19.4	---	---	21.2	15.5
2	---	---	15.0	12.0	18.8	16.8	22.5	19.8	---	---	22.2	15.3
3	---	---	14.0	12.3	17.5	14.0	24.9	19.2	---	---	22.2	15.5
4	---	---	17.1	13.1	20.0	15.1	20.9	18.8	---	---	22.9	17.7
5	6.7	0.6	19.0	15.9	22.0	17.9	27.3	20.2	---	---	21.6	17.0
6	7.2	.8	18.2	15.5	24.1	20.1	26.6	24.0	---	---	21.4	16.6
7	7.8	1.4	18.6	15.7	24.7	19.8	26.7	23.6	---	---	20.6	15.9
8	7.2	2.1	19.7	16.2	21.2	18.7	27.3	22.1	---	---	20.4	14.1
9	6.2	2.7	19.3	17.1	21.8	17.9	26.1	22.4	---	---	19.5	15.0
10	4.8	3.1	19.6	16.4	19.9	17.5	25.6	21.8	---	---	17.0	15.1
11	5.5	2.0	18.4	15.6	22.3	17.0	21.7	19.4	---	---	17.1	14.2
12	5.1	3.4	18.8	15.3	26.8	19.9	21.7	17.2	21.9	9.4	17.1	13.8
13	6.8	3.5	18.9	16.9	26.4	22.0	26.7	18.2	20.8	7.7	---	---
14	8.0	4.6	18.4	15.2	26.6	22.6	24.5	17.4	22.8	8.2	---	---
15	9.1	5.4	20.9	16.4	28.3	22.6	26.1	22.6	22.7	9.1	---	---
16	9.6	6.7	20.3	17.9	27.0	22.0	27.2	21.7	20.6	8.4	---	---
17	12.0	8.0	17.5	13.5	27.7	23.9	26.1	21.2	22.2	7.9	19.2	15.3
18	14.5	10.0	13.4	12.3	28.2	23.7	21.2	18.7	21.6	7.1	15.8	13.5
19	15.2	13.0	15.4	11.9	28.3	24.6	25.9	17.8	23.3	7.0	16.6	14.0
20	13.9	10.6	14.9	11.6	26.5	23.6	27.9	19.1	24.7	7.9	17.0	12.3
21	12.3	18.9	11.2	7.5	26.9	23.1	25.7	20.4	23.1	8.6	18.9	12.2
22	13.6	19.6	11.3	6.6	29.5	23.0	23.6	18.3	21.6	6.8	19.6	13.1
23	12.9	11.0	14.6	11.0	---	---	24.6	18.8	22.6	5.7	19.5	15.0
24	13.9	11.2	16.0	13.9	24.8	24.0	27.8	20.6	20.8	7.5	17.1	12.5
25	13.6	11.8	15.2	13.7	22.0	21.6	29.1	23.4	19.3	5.1	17.2	13.5
26	15.7	12.7	15.4	13.3	22.2	17.8	28.6	23.5	20.2	4.0	19.3	14.1
27	14.7	11.5	18.9	15.1	22.4	18.4	29.0	24.0	21.0	7.2	17.2	14.6
28	16.1	12.3	20.0	17.9	22.7	19.1	29.5	25.6	23.0	7.2	15.6	11.8
29	15.1	12.9	21.8	17.8	22.9	17.3	30.1	25.0	22.8	8.1	17.0	11.4
30	14.1	12.0	23.8	20.0	23.5	19.1	26.2	24.5	20.2	4.9	16.3	13.3
31	---	---	24.3	20.5	---	---	29.6	23.8	19.9	3.8	---	---
MONTH	---	---	24.3	6.6	---	---	30.1	17.2	---	---	---	---

05056400 BIG COULEE NEAR CHURCHS FERRY, ND--CONTINUED

SPECIFIC CONDUCTANCE MICROSIEMENS/CM AT 25 DEG C, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	1330	1290										
2	1320	1290										
3	1300	1250										
4	1300	1250										
5	1310	1250										
6	1310	1260										
7	1300	1200										
8	1310	1290										
9	1310	1280										
10	1310	1250										
11	1300	1260										
12	1280	1260										
13	1300	1290										
14	1310	1210										
15	1480	1350										
16	1590	1560										
17	1580	1520										
18	1540	1500										
19	1540	1510										
20	1540	1510										
21	1530	1500										
22	1530	1500										
23	1510	1470										
24	1530	1490										
25	1510	1490										
26	---	---										
27	---	---										
28	---	---										
29	---	---										
30	---	---										
31	---	---										
MONTH	---	---										

SPECIFIC CONDUCTANCE MICROSIEMENS/CM AT 25 DEG C, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1							1360	1180	1280	590	566	579
2							1230	910	1100	664	560	580
3							930	750	838	588	545	575
4							850	800	831	669	562	599
5							940	830	873	667	565	596
6							990	770	889	683	530	591
7							1000	780	882	677	565	605
8							880	740	798	682	570	638
9							750	690	718	677	644	667
10							750	640	698	671	649	666
11							750	650	713	732	635	660
12							760	730	739	690	648	669
13							760	600	680	685	651	670
14							660	540	600	680	647	666
15							790	640	689	680	652	667
16							740	640	679	678	635	664
17							940	770	892	679	650	670
18							910	700	828	689	655	672
19							810	700	746	710	650	677
20							740	630	673	710	680	695
21							760	660	681	700	680	688
22							770	650	676	710	620	680
23							750	640	669	700	620	658
24							720	590	629	710	630	677
25							690	600	622	710	610	666
26							680	560	589	710	630	663
27							590	570	579	710	670	692
28							580	550	570	720	610	678
29							580	560	575	730	700	717
30							590	550	575	770	720	743
31				1350	1250	1310	---	---	---	---	---	---
MONTH				---	---	---	1360	540	744	---	---	---

05056400 BIG COULEE NEAR CHURCHS FERRY, ND--CONTINUED

SPECIFIC CONDUCTANCE MICROSIEMENS/CM AT 25 DEG C, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	---	---	---	860	830	845	---	---	---	890	860	871
2	---	---	---	870	840	858	---	---	---	900	880	888
3	---	---	---	890	850	870	---	---	---	930	890	905
4	---	---	---	880	830	854	---	---	---	940	900	919
5	---	---	---	880	840	866	---	---	---	960	920	940
6	---	---	---	880	850	863	---	---	---	990	950	969
7	---	---	---	890	810	859	---	---	---	1090	950	1010
8	---	---	---	900	850	876	---	---	---	---	---	---
9	---	---	---	870	810	850	---	---	---	---	---	---
10	---	---	---	850	800	833	---	---	---	1160	1140	1150
11	---	---	---	880	790	828	---	---	---	1180	1150	1170
12	---	---	---	820	750	789	880	850	864	1200	1130	1170
13	---	---	---	820	750	786	870	850	860	---	---	---
14	---	---	---	840	730	788	870	800	848	---	---	---
15	---	---	---	880	800	833	860	830	843	---	---	---
16	---	---	---	910	840	873	860	820	839	---	---	---
17	---	---	---	920	820	865	850	810	838	1260	1200	1220
18	---	---	---	880	850	866	850	820	835	1230	1200	1220
19	---	---	---	880	840	858	860	810	837	1250	1220	1240
20	---	---	---	890	870	878	860	830	848	1250	1220	1240
21	---	---	---	920	890	906	890	850	860	1280	1220	1250
22	---	---	---	910	880	899	890	850	872	1290	1220	1270
23	---	---	---	920	890	900	880	840	862	1330	1290	---
24	840	830	831	910	880	902	890	870	879	1330	1290	---
25	840	820	832	920	900	910	890	840	874	1310	1310	---
26	850	810	833	930	900	918	870	830	857	1320	1300	---
27	860	830	845	930	890	913	880	860	869	1310	1300	---
28	850	840	844	970	880	904	890	850	874	1310	1300	---
29	850	830	837	---	---	---	910	880	896	1300	1270	---
30	860	820	842	---	---	---	900	870	888	1300	1290	---
31	---	---	---	---	---	---	890	840	867	---	---	---
MONTH	---	---	---	---	---	---	---	---	---	---	---	---

05056403 COMSTOCK COULEE NEAR MINNEWAUKAN, ND

LOCATION.--Lat 48°06'33", long 99°13'35", in SE¼SE¼ sec.29, T.154 N., R.67 W., Benson County, Hydrologic Unit 09020201, at bridge on U.S. Highway 281, 2.8 mi north of Minnewauken.

DRAINAGE AREA.--58 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1987 to September 1987.

GAGE.--Wire-weight gage. Daily wire-weight readings are obtained by observer during periods of flow. Datum of gage is 1,410.00 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Mar. 24-27, Mar. 31 to Apr. 4, and May 7-10. Records fair.

EXTREMES FOR CURRENT PERIOD.--Maximum observed discharge, 114 ft^3/s, Apr. 4, gage height, 25.60; no flow most of the time.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						.00	100	1.4	.00	.00	.00	.00
2						.00	105	1.1	.00	.00	.00	.00
3						.00	111	.90	.00	.00	.00	.00
4						.00	114	.90	.00	.00	.00	.00
5						.00	99	.71	.00	.00	.00	.00
6						.00	72	.71	.00	.00	.00	.00
7						.00	48	.50	.00	.00	.00	.00
8						.00	32	.56	.00	.00	.00	.00
9						.00	25	.56	.00	.00	.00	.00
10						.00	25	.00	.00	.00	.00	.00
11						.00	25	.00	.00	.00	.00	.00
12						.00	19	.00	.00	.00	.00	.00
13						.00	18	.00	.00	.00	.00	.00
14						.00	17	.00	.00	.00	.00	.00
15						.00	16	.00	.00	.00	.00	.00
16						.00	15	.00	.00	.00	.00	.00
17						.00	13	.00	.00	.00	.00	.00
18						.00	12	.00	.00	.00	.00	.00
19						.00	8.4	.00	.00	.00	.00	.00
20						.00	8.4	.00	.00	.00	.00	.00
21						.00	3.6	.00	.00	.00	.00	.00
22						.00	3.6	.00	.00	.00	.00	.00
23						.00	3.6	.00	.00	.00	.00	.00
24						.00	3.0	.36	.00	.00	.00	.00
25						.20	2.1	.36	.00	.00	.00	.00
26						1.0	2.1	.36	.00	.00	.00	.00
27						1.0	1.8	.46	.00	.00	.00	.00
28						.00	1.7	.36	.00	.00	.00	.00
29						.00	1.7	.00	.00	.00	.00	.00
30						.00	1.7	.00	.00	.00	.00	.00
31						2.0	---	.00	---	.00	.00	---
TOTAL						4.20	907.7	9.24	.00	.00	.00	.00
MEAN						.14	30.3	.30	.00	.00	.00	.00
MAX						2.0	114	1.4	.00	.00	.00	.00
MIN						.00	1.7	.00	.00	.00	.00	.00
AC-FT						8.3	1800	18	.0	.0	.0	.0

05056403 COMSTOCK COULEE NEAR MINNEWAUKAN, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1986 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
APR											
04...	1300	114	560	7.18	13.0	4.5	200	88	43	22	28
09...	1800	25	648	--	8.0	11.5	--	--	--	--	--

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
04...	23	0.9	8.8	110	160	9.6	0.10	15	324	350	0.44

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR										
04...	2	120	40	<1	35	30	0.3	<1	<1	290

05056410 CHANNEL A NEAR PENN, ND

LOCATION.--Lat 48°10'00", long 98°58'47", in SE¼SW¼SW¼ sec.11, T.154 N., R.65 W., Ramsey County, Hydrologic Unit 09020201, on west bank of Channel A between Highway 2 and the Railroad bridge and 6.8 mi southeast of Penn on Highway 2, or 8.9 mi northwest of Devils Lake on Highway 2.

DRAINAGE AREA.--930 mi^2, approximately.

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder. Datum of gage is 1,400.00 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 1, 1985, water-stage recorder at same site at datum of 1,437.31 ft.

REMARKS.--Estimated daily discharges: Nov. 8 to Apr. 6. Records fair. Flow variable due to wind effect on Dry Lake (station 05056241). Flow regulated by gate control on Dry Lake 3.0 mi upstream.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,090 ft^3/s, Apr. 20, 1987, gage height, 42.87 ft; no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,090 ft^3/s, Apr. 20, gage height, 42.87 ft; no flow for several days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.41	51	42	.05	.00	.00	14	685	156	3.5	1.6	.19
2	.53	59	41	.05	.00	.00	24	650	157	3.1	1.6	.20
3	.29	60	41	.05	.00	.00	27	610	158	2.7	1.4	.39
4	.25	55	40	.05	.00	.00	50	586	160	2.7	1.2	.39
5	.28	56	38	.05	.00	.00	100	562	150	2.4	1.7	.39
6	.28	57	35	.05	.00	.00	150	538	139	2.1	1.0	.39
7	.29	48	30	.05	.00	.00	199	509	140	2.1	.20	.40
8	.28	46	25	.05	.00	.00	211	458	142	2.1	.21	.57
9	.25	44	20	.05	.00	.00	283	455	138	2.1	.25	.57
10	.25	42	10	.05	.00	.00	315	436	123	2.1	.30	.50
11	.19	40	5.0	.05	.00	.00	364	413	114	2.1	.32	.34
12	.31	40	2.0	.05	.00	.00	420	295	115	2.1	.16	.28
13	.39	39	1.0	.05	.00	.00	487	364	116	1.7	.04	.29
14	.34	38	.80	.05	.00	.00	557	342	117	1.7	.01	.39
15	.31	37	.60	.05	.00	.00	635	309	105	1.1	.01	.39
16	.39	36	.40	.04	.00	.00	730	328	86	.81	.01	.39
17	.44	36	.20	.04	.00	.00	804	322	70	.85	.01	.39
18	.57	35	.15	.04	.00	.00	868	267	70	.86	.02	.39
19	.57	35	.10	.04	.00	.00	919	250	70	.92	.12	.39
20	9.8	34	.10	.04	.00	.00	1050	249	70	.68	.01	.39
21	60	34	.10	.04	.00	.25	1000	250	70	.55	.01	.39
22	64	37	.09	.03	.00	.50	998	249	70	.57	.01	.39
23	66	37	.08	.02	.00	1.0	994	228	70	.74	.01	.39
24	62	37	.08	.01	.00	5.0	949	216	70	.73	.05	.39
25	60	40	.08	.01	.00	7.5	922	207	70	.79	.05	.39
26	60	42	.06	.00	.00	10	908	209	70	.85	.05	.39
27	60	44	.06	.00	.00	15	839	209	70	1.1	.05	.51
28	65	45	.06	.00	.00	10	785	185	69	.64	.05	.57
29	61	44	.06	.00	---	8.0	759	165	46	.81	.19	.57
30	55	43	.05	.00	---	6.0	683	167	8.6	1.1	.19	.57
31	66	---	.05	.00	---	4.0	---	164	---	1.3	.19	---
TOTAL	695.42	1291	333.12	1.06	.00	67.25	17044	10877	3009.6	46.90	11.02	12.19
MEAN	22.4	43.0	10.7	.03	.00	2.17	568	351	100	1.51	.36	.41
MAX	66	60	42	.05	.00	15	1050	685	160	3.5	1.7	.57
MIN	.19	34	.05	.00	.00	.00	14	164	8.6	.55	.01	.19
AC-FT	1380	2560	661	2.1	.0	133	33810	21570	5970	93	22	24

CAL YR 1986 TOTAL 9868.80 MEAN 27.0 MAX 152 MIN .00 AC-FT 19570
WTR YR 1987 TOTAL 33388.11 MEAN 91.5 MAX 1050 MIN .00 AC-FT 66230

05056410 CHANNEL A NEAR PENN, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1984 to current year.

PERIOD OF DAILY RECORDS.--
WATER TEMPERATURE: October 1983 to current year.
SPECIFIC CONDUCTANCE: October 1983 to current year.

INSTRUMENTATION.--Water-quality monitor since October 1983.

REMARKS.--Records fair. Interruptions in record due to malfunction of recording instruments. No flow Jan. 26 to Mar. 20.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Maximum, 32.6°C, Aug. 1, 1987; minimum, 0.0°C on many days most winters.
SPECIFIC CONDUCTANCE: Maximum, 2,880 microsiemens, June 9, 1984; minimum, 230 microsiemens, Apr. 16, 1984.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: Maximum, 32.6°C, Aug. 1; minimum, 0.0°C on several days during Dec. and Jan.
SPECIFIC CONDUCTANCE: Maximum, 1,880 microsiemens, Oct. 12; minimum, 498 microsiemens, Apr. 14.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)
OCT										
27...	1330	59	930	8.40	14.0	7.0	8.8	--	--	--
DEC										
03...	1150	41	1380	7.60	-5.0	0.5	8.3	61	--	--
JAN										
21...	1530	0.04	1150	--	-10.5	0.0	--	--	--	--
APR										
09...	1130	273	1120	7.73	8.5	3.0	9.6	73	370	48
14...	1720	570	500	--	15.5	6.5	--	--	--	--
16...	1340	713	580	--	--	7.5	--	--	--	--
21...	1625	980	590	--	16.0	12.0	--	--	--	--
30...	1115	696	560	8.72	13.5	12.5	9.4	89	210	62
MAY										
19...	1100	259	670	8.20	14.0	12.5	10.1	95	230	43
JUN										
24...	1545	74	670	7.90	26.0	26.5	7.5	96	190	30
JUL										
16...	1335	0.76	1000	--	29.0	25.0	--	--	--	--
29...	1440	0.81	1190	--	32.0	29.5	--	--	--	--
AUG										
11...	1015	0.44	1040	8.50	25.0	22.0	9.4	109	330	0
SEP										
10...	1050	0.57	1310	7.90	14.5	16.5	8.1	83	--	--

DATE	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)
APR										
09...	73	45	81	31	2	24	320	200	37	0.10
30...	47	23	42	28	1	14	150	120	18	0.20
MAY										
19...	47	28	50	30	1	16	190	140	18	0.20
JUN										
24...	30	28	61	38	2	20	160	150	23	0.10
AUG										
11...	68	38	110	40	3	22	330	230	28	0.20

05056410 CHANNEL A NEAR PENN, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	SOLIDS, RESIDUE AT 105 DEG.C, SUS-PENDED (MG/L) (00530)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N) (00618)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P) (00666)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)
APR											
09...	18	673	680	0.92	496	--	0.520	--	0.710	1.49	8
30...	3.1	348	360	0.47	654	--	0.030	<0.01	<0.01	0.270	6
MAY											
19...	5.1	447	420	0.61	313	--	0.110	<0.01	0.180	0.540	5
JUN											
24...	12	444	420	0.60	88	--	0.370	0.050	0.00	0.660	10
AUG											
11...	24	743	700	1.0	0.88	4	0.010	0.120	0.28	1.370	12

DATE	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR									
09...	170	30	<1	60	940	0.4	1	<1	400
30...	70	30	<1	28	<10	<0.1	<1	<1	250
MAY									
19...	60	30	<1	32	10	0.1	<1	<1	290
JUN									
24...	90	50	<1	39	60	0.4	3	2	220
AUG									
11...	140	20	<1	75	100	0.1	1	<1	420

05056410 CHANNEL A NEAR PENN, ND--CONTINUED

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	12.6	11.0	11.8	2.6	0.5	---	---	---	---	0.0	0.0	---
2	11.4	8.6	10.2	2.6	1.1	---	---	---	---	.0	.0	0.0
3	10.1	6.4	8.0	3.6	1.4	---	0.6	0.4	0.5	.0	.0	---
4	10.5	6.	8.1	1.0	.4	---	.6	.0	.5	.0	.0	---
5	10.4	6.5	8.2	.6	.4	---	.6	.6	.6	.0	.0	---
6	15.6	7.0	10.8	.6	.5	---	.6	.6	.6	.0	.0	---
7	12.1	9.0	10.8	.6	.5	---	.6	.6	.6	.0	.0	---
8	9.1	5.4	7.8	.6	.4	---	.6	.6	.6	.0	.0	.0
9	8.1	3.5	5.7	.6	.5	---	.6	.0	.4	.0	.0	.0
10	8.1	5.0	6.4	.6	.5	---	.6	.0	.6	.0	.0	.0
11	6.0	3.5	4.8	.6	.5	---	.5	.0	.4	.0	.0	.0
12	7.6	1.9	4.2	.6	.5	---	.5	.5	.5	.0	.0	.0
13	8.1	3.0	5.1	.6	.5	---	.5	.4	---	.5	.0	.3
14	---	---	---	.6	.5	---	.5	.4	---	.5	.0	.2
15	---	---	---	.6	.5	---	.5	.5	.5	.0	.0	.0
16	---	---	---	.6	.5	---	.5	.4	---	.0	.0	.0
17	---	---	---	.6	.4	---	.4	.4	---	.0	.0	.0
18	---	---	---	.6	.4	---	.4	.3	.4	.0	.0	.0
19	---	---	---	.5	.4	---	.4	.3	.3	.0	.0	.0
20	---	---	---	.6	.4	---	.5	.2	.3	.0	.0	---
21	---	---	---	.6	.4	---	.4	.2	.3	.0	.0	---
22	---	---	---	.6	.4	---	.5	.2	.4	---	---	---
23	---	---	---	.6	.5	---	.3	.3	.3	---	---	---
24	---	---	---	.6	.5	---	.5	.2	.3	---	---	---
25	---	---	---	.6	.6	---	.1	.1	.2	---	---	---
26	---	---	---	.6	.6	---	.2	.0	---	---	---	---
27	---	---	---	.6	.6	---	.1	.0	.1	---	---	---
28	4.7	4.6	---	.6	.6	---	.1	.0	.0	---	---	---
29	4.7	2.8	---	---	---	---	.0	.0	.0	---	---	---
30	2.4	.4	---	---	---	---	.0	.0	.0	---	---	---
31	2.2	.5	---	---	---	---	.0	.0	.0	---	---	---
MONTH	---	---	---	---	---	---	---	---	---	---	---	---

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1							---	---	---	14.2	11.2	12.7
2							---	---	---	15.0	12.0	13.6
3							1.8	0.0	0.5	14.7	12.4	13.7
4							6.7	.7	3.3	17.5	13.8	15.5
5							4.3	.8	2.4	18.3	15.0	16.6
6							1.7	.4	.9	18.9	16.2	17.5
7							3.7	.2	1.7	19.4	16.6	18.0
8							5.8	.5	3.0	20.2	16.5	18.5
9							3.2	1.4	2.3	20.4	17.6	19.0
10							2.2	1.0	1.7	20.5	16.8	18.6
11							4.2	.9	2.6	19.5	16.0	17.8
12							4.6	3.0	3.8	20.1	15.2	17.7
13							5.6	2.8	4.2	19.9	17.7	18.7
14							6.6	3.6	5.1	19.9	15.9	18.0
15							7.1	4.1	5.8	22.3	16.9	19.7
16							7.7	5.5	6.6	21.2	18.6	19.8
17							9.3	6.0	7.8	18.1	14.1	15.7
18							11.8	8.7	10.4	13.9	12.4	13.1
19							13.7	11.5	12.6	16.6	11.9	14.1
20							12.5	10.6	11.5	15.7	12.5	14.9
21							12.0	9.9	11.1	12.1	7.7	9.4
22							12.7	10.0	11.6	12.3	6.7	9.5
23							13.4	11.5	12.5	16.3	11.2	13.7
24							13.7	11.9	12.8	17.7	14.7	16.1
25							13.9	12.2	13.2	16.4	14.5	15.7
26							15.1	13.3	14.2	16.2	13.8	15.0
27							15.2	12.6	13.8	20.7	15.6	17.8
28							16.2	12.5	14.3	22.1	18.9	20.5
29							15.2	13.5	14.4	23.0	18.7	20.9
30							13.7	12.2	12.9	25.8	21.1	23.3
31							---	---	---	26.1	22.0	24.0
MONTH							---	---	---	26.1	6.7	16.7

05056410 CHANNEL A NEAR PENN, ND--CONTINUED

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	23.4	19.5	22.1	25.8	19.7	22.6	32.6	27.7	30.0	18.6	15.9	17.2
2	19.0	15.7	17.2	24.1	20.4	22.3	31.1	27.7	29.4	19.6	15.5	17.5
3	17.8	13.3	15.5	26.6	20.4	23.5	27.5	22.8	25.5	21.1	17.2	19.2
4	21.3	14.6	17.7	24.6	21.5	23.0	24.5	21.7	22.9	20.4	18.4	19.5
5	23.3	17.8	20.5	28.8	21.6	25.0	24.9	20.6	22.8	19.9	18.0	18.9
6	27.5	20.0	23.0	27.8	24.8	26.3	25.1	21.1	23.0	20.6	17.6	19.1
7	26.7	22.6	24.5	28.8	23.0	25.6	25.3	20.9	23.1	20.4	18.1	19.0
8	22.1	18.1	19.9	28.5	23.5	25.9	25.1	21.8	23.5	19.0	16.3	17.7
9	22.6	17.0	19.7	26.9	24.4	25.7	25.4	22.4	23.9	18.6	16.1	17.6
10	20.4	16.7	17.8	26.8	22.7	24.6	25.5	21.7	23.5	17.9	16.5	---
11	22.5	16.1	19.0	23.6	19.7	21.8	24.6	21.4	22.6	17.1	15.4	16.2
12	25.4	18.7	21.9	21.0	17.4	19.3	22.5	19.6	21.0	16.9	15.1	15.8
13	27.2	21.9	24.5	24.7	18.7	21.3	20.1	18.1	19.1	17.4	14.0	15.5
14	27.9	22.2	25.1	24.3	20.0	21.9	22.0	18.2	19.9	19.0	15.2	17.1
15	27.8	23.3	25.8	26.2	21.4	23.7	21.6	18.8	20.2	21.0	17.5	18.9
16	29.2	22.9	26.1	26.8	22.2	24.2	20.3	18.9	19.6	20.6	18.9	19.8
17	29.3	24.2	26.9	25.2	22.2	24.3	20.3	18.0	19.1	19.9	17.7	18.5
18	31.0	23.8	27.3	22.0	19.8	20.7	20.2	17.4	18.7	17.6	14.9	16.2
19	30.1	26.0	28.2	24.2	19.0	21.2	20.6	16.7	18.6	16.2	14.2	15.1
20	29.2	24.6	27.0	28.6	22.2	25.1	21.7	17.4	19.4	16.5	13.7	15.1
21	32.4	24.6	28.2	26.3	21.1	23.7	22.1	19.4	20.4	16.5	14.3	15.4
22	32.1	26.8	29.6	24.1	19.4	21.5	20.5	17.2	18.8	17.6	14.3	15.9
23	28.4	23.7	26.1	24.3	21.6	23.0	19.6	16.1	17.9	18.4	15.3	16.9
24	25.9	21.6	24.0	27.5	21.6	24.3	19.0	17.1	18.0	16.4	14.5	15.5
25	23.1	19.5	21.1	29.1	24.6	26.7	18.3	16.7	17.6	16.5	13.6	14.9
26	22.2	16.4	19.5	29.6	25.3	27.6	18.3	15.9	17.0	16.7	13.8	15.2
27	28.0	18.2	22.6	29.8	26.1	27.9	19.3	16.8	18.1	16.7	15.1	15.9
28	26.0	19.6	22.2	30.5	27.3	28.7	21.0	17.1	18.9	16.2	13.9	15.2
29	23.0	17.3	20.2	32.3	27.2	29.6	21.0	17.9	19.0	15.5	12.3	13.9
30	25.6	19.8	22.6	29.9	26.9	28.3	19.7	16.1	17.7	16.3	12.9	14.5
31	---	---	---	31.5	26.1	28.3	17.7	14.9	16.5	---	---	---
MONTH	32.4	13.3	22.9	32.3	17.4	24.4	32.6	14.9	20.8	21.1	12.3	---

SPECIFIC CONDUCTANCE MICROSIEMENS/CM AT 25 DEG C, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	1420	1200	1330	990	970	---	---	---	---			
2	1720	1000	1370	1060	994	---	---	---	---			
3	1500	1100	1220	978	958	---	---	---	---			
4	1500	1200	1410	1000	962	---	1240	1220	1230			
5	1600	1300	1420	1070	1010	---	1280	1240	1260			
6	1700	1220	1560	1150	1080	---	1300	1270	1290			
7	1680	1020	1380	1170	1150	---	1320	1310	1310			
8	1520	1220	1400	1180	1140	---	---	---	---			
9	1500	900	1230	1170	1140	---	---	---	---			
10	1820	1000	1350	1220	1180	---	---	---	---			
11	1800	1000	1280	1260	1230	---	---	---	---			
12	1880	1520	1780	1270	1260	---	---	---	---			
13	1820	1600	1760	1280	1270	---	---	---	---			
14	---	---	---	1290	1280	---	---	---	---			
15	---	---	---	1300	1280	---	---	---	---			
16	---	---	---	1300	1280	---	---	---	---			
17	---	---	---	1280	1270	---	---	---	---			
18	---	---	---	1280	1270	---	---	---	---			
19	---	---	---	1280	1270	---	---	---	---			
20	---	---	---	1290	1270	---	---	---	---			
21	---	---	---	1280	1270	---	---	---	---			
22	---	---	---	1280	1270	---	---	---	---			
23	---	---	---	1300	1290	---	---	---	---			
24	---	---	---	1290	1280	---	---	---	---			
25	---	---	---	1310	1290	---	---	---	---			
26	---	---	---	1340	1310	---	---	---	---			
27	---	---	---	1340	1330	---	---	---	---			
28	964	944	---	1350	1340	---	---	---	---			
29	978	948	---	---	---	---	---	---	---			
30	982	952	---	---	---	---	---	---	---			
31	996	976	---	---	---	---	---	---	---			
MONTH	---	---	---	--	--	---	---	---	---			

05056410 CHANNEL A NEAR PENN, ND--CONTINUED

SPECIFIC CONDUCTANCE MICROSIEMENS/CM AT 25 DEG C, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1							---	---	---	600	570	586
2							---	---	---	590	580	582
3							---	---	---	580	570	579
4							820	710	766	590	580	582
5							780	580	689	600	570	578
6							840	590	676	590	570	580
7							1150	860	1020	680	580	596
8							1190	130	1160	610	600	602
9							1150	060	1110	610	590	602
10							1050	938	1000	600	590	594
11							927	718	803	660	590	605
12							713	640	678	660	600	620
13							637	544	585	660	620	631
14							551	498	518	660	630	636
15							570	530	556	680	640	651
16							590	560	570	680	650	660
17							610	570	586	700	660	669
18							620	600	615	710	650	667
19							630	620	628	690	660	675
20							640	590	609	720	690	703
21							601	590	593	702	664	688
22							603	574	589	686	664	673
23							601	586	589	697	668	683
24							602	584	596	690	668	678
25							610	587	597	691	671	678
26							631	582	601	693	662	671
27							605	575	584	686	665	675
28							573	551	564	687	667	676
29							604	555	569	679	640	661
30							570	558	564	732	641	667
31							---	---	---	773	624	684
MONTH							---	---	---	773	570	640

SPECIFIC CONDUCTANCE MICROSIEMENS/CM AT 25 DEG C, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	705	644	668	899	846	871	1150	1080	1110	1370	1330	1340
2	727	647	661	933	899	921	1190	1100	1160	1390	1240	1340
3	740	649	687	936	914	927	1200	1150	1170	1440	1380	1410
4	772	642	676	949	917	932	1150	1110	1130	1480	1430	1450
5	694	652	670	993	920	944	1140	1110	1120	1490	1360	1460
6	716	656	683	1030	946	967	1180	1090	1140	1480	1450	1460
7	697	638	670	1030	948	977	1160	1080	1110	1450	1350	1420
8	670	639	654	963	941	955	1130	1090	1110	1370	1320	1350
9	671	642	655	997	934	949	1110	1080	1100	1360	1330	1340
10	664	642	650	1030	970	1000	1080	1050	1070	1330	1300	---
11	656	635	648	1100	991	1040	1070	1020	1050	1310	1260	1290
12	667	638	650	1020	995	1010	1050	1010	1040	1270	1210	1250
13	670	610	632	1010	979	990	1050	1020	1040	1250	1190	1220
14	692	641	650	994	972	980	1190	1030	1050	1210	1110	1180
15	684	633	653	1020	976	988	1480	1240	1290	1210	1190	1200
16	687	635	656	1030	988	1000	1240	1190	1220	1230	1200	1210
17	697	658	679	1110	1000	1030	1200	1150	1180	1320	1160	1210
18	679	660	668	1130	1030	1070	1190	1080	1150	1170	1000	1130
19	723	661	681	1150	1030	1080	1100	1060	1070	1170	1130	1140
20	723	683	703	1240	1120	1190	1100	1070	1080	1140	1110	1130
21	715	695	705	1270	1130	1210	1090	994	1060	1130	1110	1120
22	729	707	717	1220	1070	1130	1140	1080	1110	1120	1090	1110
23	719	650	687	1320	1090	1160	1150	1120	1140	1140	1060	1100
24	665	642	655	1180	1100	1140	1160	1140	1150	1170	1110	1140
25	665	636	648	1220	1080	1120	1160	1130	1150	1170	1140	1150
26	658	619	633	1140	1080	1100	1250	1140	1190	1170	1020	1120
27	685	632	647	1170	1070	1100	1280	1250	1270	1180	1080	1140
28	678	665	673	1190	1070	1120	1290	1210	1260	1180	1100	1140
29	742	669	692	1170	1110	1140	1310	1290	1300	1180	1100	1140
30	846	742	788	1150	1120	1130	1340	1300	1310	1170	1110	1140
31	---	---	---	1130	1110	1120	1370	1340	1350	---	---	---
MONTH	846	610	671	1320	846	1042	1480	994	1151	1490	1000	---

05056500 DEVILS LAKE NEAR DEVILS LAKE, ND

LOCATION.--Lat 48°04'00", long 98°56'07", in SW¼ sec.18, T.153 N., R.64 W., Ramsey County, Hydrologic Unit 09020201, at Lakewood, on east bank of Creel Bay, 4.5 mi southwest of city of Devils Lake. Creel Bay, which is 0.5 mi wide, is an arm of Devils Lake and extends 2 mi to the north of the lake.

DRAINAGE AREA.--3,130 mi^2, approximately, of which about 1,000 mi^2 is probably noncontributing.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--1867, 1879, 1883, 1887, 1890, 1896 (one gage height for each year), 1901-63 (fragmentary), 1964 to current year.

REVISED RECORDS.--WSP 1913: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,400.00 ft above National Geodetic Vertical Datum of 1929; gage readings have been reduced to elevations NGVD. June 23, 1950, to June 6, 1963, nonrecording gage at present site and datum. See WSP 1913 for history of changes prior to June 23, 1950. Prior to October 1979 only monthend elevations were published.

REMARKS.--Elevation at gage frequently affected by wind.

EXTREMES FOR PERIOD OF RECORD.--Maximum elevation observed, 1,438.40 ft in 1867, present datum; minimum observed, 1,400.87 ft, Oct. 24, 1940.

EXTREMES OUTSIDE PERIOD OF RECORD.--The lake level was at an elevation of about 1,441 ft around 1830 and lower thereafter. Reference is Geological Survey monograph, volume XXV, the Glacial History of Lake Agassiz by Warren Upham.

EXTREMES FOR CURRENT YEAR.--Maximum elevation, 1,428.89 ft, Aug. 2; minimum, 1,426.32 ft, Nov. 7.

MONTHEND ELEVATION, IN FEET, AT 2400, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

Oct. 31.....	1,426.47	Jan. 31.....	1,426.64	Apr. 30.....	1,428.06	July 31.....	1,428.77
Nov. 30.....	------	Feb. 28.....	1,426.82	May 31.....	1,428.74	Aug. 31.....	1,428.51
Dec. 31.....	1,426.64	Mar. 31.....	1,427.04	June 30.....	1,428.59	Sept.30.....	1,428.32

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	26.48	26.45	---	26.64	26.64	26.83	27.05	28.12	28.73	28.62	28.79	28.50
2	26.54	26.43	---	26.63	26.64	26.82	27.06	28.16	28.74	28.61	28.81	28.46
3	26.54	26.40	---	26.64	26.64	26.83	27.11	28.19	28.64	28.58	28.80	28.48
4	26.58	26.46	26.61	26.65	26.64	26.85	27.14	28.22	28.63	28.57	28.73	28.48
5	26.52	26.45	26.60	26.64	26.64	26.85	27.18	28.26	28.63	28.58	28.71	28.45
6	26.57	26.41	26.60	26.64	26.64	26.86	27.23	28.27	28.66	28.59	28.77	28.46
7	26.52	26.37	26.62	26.64	26.64	26.85	27.22	28.29	28.69	28.60	28.71	28.44
8	26.51	26.67	26.61	26.64	26.64	26.81	27.26	28.32	28.63	28.55	28.70	28.42
9	26.53	26.72	26.59	26.64	26.64	26.80	27.32	28.32	28.62	28.54	28.67	28.40
10	26.57	26.64	26.59	26.64	26.64	26.81	27.32	28.34	28.59	28.59	28.61	28.38
11	26.45	26.62	26.61	26.64	26.64	26.83	27.35	28.33	28.72	28.61	28.64	28.38
12	26.46	26.62	26.60	26.64	26.66	26.83	27.38	28.37	28.67	28.62	28.60	28.37
13	26.46	26.60	26.61	26.64	26.67	26.84	27.41	28.38	28.68	28.59	28.55	28.37
14	26.44	26.58	26.64	26.64	26.65	26.83	27.46	28.35	28.66	28.57	28.54	28.37
15	26.48	26.58	26.65	26.64	26.66	26.83	27.50	28.38	28.64	28.65	28.68	28.37
16	26.44	---	26.64	26.64	26.67	26.84	27.55	28.32	28.61	28.69	28.67	28.36
17	26.44	---	26.66	26.64	26.69	26.85	27.59	28.32	28.68	28.67	28.63	28.43
18	26.48	---	26.63	26.64	26.69	26.86	27.64	28.32	28.65	28.69	28.65	28.39
19	26.46	---	26.62	26.64	26.69	26.87	27.69	28.38	28.63	28.67	28.59	28.38
20	26.46	---	26.62	26.64	26.70	26.87	27.72	28.37	28.63	28.77	28.58	28.39
21	26.45	---	26.63	26.64	26.71	26.87	27.72	28.46	28.64	28.73	28.61	28.39
22	26.44	---	26.64	26.64	26.71	26.87	27.77	28.52	28.65	28.79	28.57	28.39
23	26.43	---	26.64	26.64	26.71	26.87	27.87	28.54	28.74	28.79	28.53	28.36
24	26.43	---	26.64	26.64	26.70	26.88	27.88	28.57	28.70	28.79	28.53	28.31
25	26.43	---	26.63	26.64	26.75	26.88	27.94	28.58	28.70	28.78	28.50	28.33
26	26.44	---	26.63	26.64	26.73	26.91	28.00	28.65	28.63	28.75	28.54	28.32
27	26.44	---	26.64	26.64	26.78	26.93	28.02	28.69	28.63	28.77	28.56	28.35
28	26.45	---	26.64	26.64	26.80	26.94	28.07	28.73	28.60	28.78	28.55	28.34
29	26.41	---	26.64	26.64	---	26.96	28.08	28.75	28.63	28.76	28.57	28.32
30	26.41	---	26.64	26.64	---	26.98	28.09	28.77	28.61	28.71	28.56	28.30
31	26.51	---	26.64	26.64	---	27.02	---	28.75	---	28.79	28.50	---
MEAN	26.5	---	---	26.6	26.7	26.9	27.6	28.4	28.7	28.7	28.6	28.4
MAX	26.58	---	---	26.65	26.80	27.02	28.09	28.77	28.74	28.79	28.81	28.50
MIN	26.41	---	---	26.63	26.64	26.80	27.05	28.12	28.59	28.54	28.50	28.30

05057000 SHEYENNE RIVER NEAR COOPERSTOWN, ND

LOCATION.--Lat 47°25'58", long 98°01'38", in NW¼NW¼SW¼ sec.26, T.146 N., R.58 W., Griggs County, Hydrologic Unit 09020203, on right bank 150 ft upstream from county bridge, and 5 mi east of Cooperstown.

DRAINAGE AREA.--6,470 mi^2, approximately, of which about 5,200 mi^2 is probably noncontributing, includes 3,800 mi^2 in closed basins.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1944 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1728: Drainage area. WRD ND-80-1: Gage datum.

GAGE.--Water-stage recorder. Datum of gage is 1,271.76 ft above National Geodetic Vertical Datum of 1929, Coast and Geodetic Survey benchmark. Prior to Oct. 22, 1985, gage located on right bank 300 ft downstream of present site. Datum of gage was 1,271.76 ft. Prior to Aug. 3, 1950, nonrecording gage at site 150 ft downstream of present site at same datum.

REMARKS.--Estimated daily discharges: Nov. 8 to Apr. 4. Records fair.

AVERAGE DISCHARGE.--43 years, 110 ft^3/s, 79,700 acre-ft/yr; median of yearly mean discharges, 87 ft^3/s, 63,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,830 ft^3/s, Apr. 17, 1950, gage height, 18.69 ft; no flow at times.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 24	----	1030	[a]12.84	May 28	1345	225	10.51
Apr. 5	2045	*4840	*18.21	July 27	1415	684	11.62

Minimum daily discharge, 18 ft^3/s, Nov. 13.
a - Backwater from ice

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	44	31	41	27	24	23	1050	210	208	59	677	81
2	45	30	40	27	28	23	1110	195	206	52	665	77
3	45	34	40	26	28	22	1640	181	196	45	611	77
4	44	33	39	26	28	24	3950	169	177	41	514	67
5	47	35	38	26	30	28	4660	159	154	38	411	61
6	55	39	37	26	32	31	4640	149	138	34	330	57
7	78	41	36	24	34	40	3860	142	123	36	280	55
8	74	24	35	22	32	55	3400	132	107	32	244	54
9	59	20	33	20	32	50	3070	127	98	28	225	53
10	53	20	31	20	32	45	2770	121	87	26	208	53
11	48	20	30	22	32	39	2510	115	84	30	193	51
12	43	20	28	24	32	38	2270	108	80	26	181	49
13	41	18	26	26	30	38	2020	103	75	27	164	48
14	40	19	26	25	29	33	1740	95	69	28	150	48
15	39	19	26	25	28	24	1500	89	63	30	145	47
16	36	19	26	25	28	22	1260	85	57	30	132	47
17	34	20	25	24	28	22	1060	78	51	31	123	48
18	31	20	25	24	27	24	883	78	48	30	122	44
19	30	20	25	23	26	40	716	77	42	46	117	42
20	30	20	24	22	26	105	615	77	41	52	114	42
21	30	24	24	22	26	280	521	91	41	68	106	43
22	30	28	26	21	25	489	454	111	39	370	97	45
23	29	32	26	21	25	928	405	148	44	622	90	50
24	28	40	28	20	25	970	359	176	41	634	84	50
25	28	42	28	20	25	793	325	190	80	652	84	49
26	28	42	30	20	25	661	298	189	114	665	87	49
27	29	42	30	20	24	648	277	185	111	676	89	50
28	28	42	29	20	24	521	260	188	96	676	95	52
29	28	42	28	20	---	467	244	201	80	675	100	53
30	28	41	28	20	---	532	228	208	68	675	98	53
31	29	---	28	23	---	669	---	206	---	678	87	---
TOTAL	1231	877	936	711	785	7684	48095	4383	2818	7112	6623	1595
MEAN	39.7	29.2	30.2	22.9	28.0	248	1603	141	93.9	229	214	53.2
MAX	78	42	41	27	34	970	4660	210	208	678	677	81
MIN	28	18	24	20	24	22	228	77	39	26	84	42
AC-FT	2440	1740	1860	1410	1560	15240	95400	8690	5590	14110	13140	3160

CAL YR 1986 TOTAL 47111 MEAN 129 MAX 1700 MIN 5.3 AC-FT 93440
WTR YR 1987 TOTAL 82850 MEAN 227 MAX 4660 MIN 18 AC-FT 164300

05057000 SHEYENNE RIVER NEAR COOPERSTOWN, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1960 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
OCT											
08...	1410	64	810	--	8.0	10.0	--	--	--	--	--
NOV											
05...	1040	32	540	--	4.0	3.0	--	--	--	--	--
DEC											
12...	1400	28	680	--	-16.0	0.0	--	--	--	--	--
JAN											
28...	1340	20	860	--	-4.5	0.0	--	--	--	--	--
MAR											
11...	1435	38	1180	--	-2.0	0.0	--	--	--	--	--
APR											
04...	1610	4220	396	--	13.0	2.0	--	--	--	--	--
07...	1323	3870	400	--	20.0	5.5	--	--	--	--	--
MAY											
01...	1200	212	960	--	18.0	14.0	--	--	--	--	--
JUN											
12...	0950	80	950	--	24.0	21.0	--	--	--	--	--
JUL											
22...	1720	525	560	--	33.0	26.0	--	--	--	--	--
SEP											
04...	1105	62	980	8.40	21.5	19.0	340	0	75	37	87
[a]04...	1106	62	980	8.40	21.5	19.0	350	0	79	37	87

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
SEP											
04...	35	2	9.9	340	170	15	0.30	30	645	630	0.88
[a]04...	34	2	9.3	350	160	17	0.30	29	644	630	0.88

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
SEP										
04...	3	230	40	1	68	130	0.1	<1	<1	400
[a]04...	5	190	24	<5	54	99	--	<1	<1	340

a - Split sample analysis for quality assurance.

05057200 BALDHILL CREEK NEAR DAZEY, ND

LOCATION.--Lat 47°13'45", long 98°07'28", in NW1/4SE1/4SW1/4 sec.2, T.143 N., R.59 W., Barnes County, Hydrologic Unit 09020203, on left bank 500 ft upstream from bridge on county highway, 4.5 mi northeast of Dazey, and 14 mi upstream from mouth.

DRAINAGE AREA.--691 mi^2, of which about 340 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1956 to current year.

REVISED RECORDS.--WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Prior to Nov. 9, 1956, nonrecording gage 500 ft downstream at same datum.

REMARKS.--Estimated daily discharges: Nov. 7 to Mar. 20, Mar. 28-31, and July 30 to Sept. 30. Records fair except those for periods of estimated discharge, which are poor.

AVERAGE DISCHARGE.--31 years, 16.4 ft^3/s, 11,880 acre-ft/yr; median of yearly mean discharges, 13 ft^3/s, 9,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 9,000 ft^3/s, Apr. 19, 1979, on basis of contracted opening measurement of peak flow at site 4.5 mi downstream, gage height, 17.78 ft, from floodmark; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 60 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 25	0415	920	8.80	Apr. 3	1000	*960	*8.99

Minimum daily discharge, 1.4 ft^3/s, Aug. 14, 23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	4.4	4.5	4.0	2.8	4.9	772	24	22	3.4	4.8	3.8
2	11	4.4	4.5	4.0	3.0	4.8	719	24	21	3.0	4.4	3.5
3	10	4.3	4.5	3.9	3.3	5.0	853	23	20	2.6	4.1	3.3
4	9.9	4.4	4.5	3.8	3.5	5.4	827	22	19	2.6	3.4	3.4
5	9.6	4.5	4.5	3.7	3.5	6.5	802	22	17	4.2	3.9	3.4
6	9.1	5.4	4.5	3.7	3.7	9.5	753	22	16	4.0	3.8	3.2
7	8.3	5.2	4.5	3.7	4.4	28	665	21	15	5.6	3.7	3.6
8	7.4	5.0	4.5	3.7	4.8	25	507	20	13	8.8	3.6	3.8
9	7.2	4.8	4.5	3.7	5.5	20	346	20	12	12	3.4	4.2
10	7.4	4.7	4.5	3.6	5.7	15	250	18	12	15	2.7	4.3
11	8.0	4.6	4.5	3.5	5.8	10	204	17	13	15	2.0	4.4
12	8.0	4.5	4.5	3.7	7.2	9.8	166	14	11	16	1.9	4.4
13	7.5	4.5	4.2	3.8	7.0	9.2	143	13	9.8	17	1.7	4.3
14	7.3	4.5	4.4	3.8	6.5	8.6	121	12	8.7	17	1.4	4.3
15	6.8	4.5	4.5	3.6	6.0	8.5	103	9.5	6.8	17	2.3	4.2
16	6.7	4.5	4.5	3.2	6.0	8.5	90	9.1	5.4	17	2.3	4.2
17	6.6	4.5	4.5	2.8	6.0	8.5	78	8.5	5.1	19	2.3	4.2
18	6.1	4.4	4.5	2.6	5.9	10	68	9.9	4.6	20	2.4	4.2
19	5.8	4.4	4.5	2.4	5.7	25	60	11	4.2	23	2.5	4.2
20	5.8	4.4	4.4	2.4	5.0	175	54	11	3.7	19	2.3	4.1
21	5.8	4.4	4.3	2.3	5.1	506	49	20	3.7	18	2.1	4.1
22	5.8	4.4	4.3	2.3	5.0	588	44	22	3.8	20	1.7	4.0
23	5.8	4.4	4.3	2.2	5.0	713	42	24	4.2	19	1.4	3.9
24	5.6	4.4	4.2	2.0	4.9	905	38	25	4.2	20	2.0	3.8
25	5.4	4.4	4.1	1.9	4.9	882	36	24	4.2	17	2.8	3.7
26	5.4	4.4	4.0	2.0	4.9	795	34	24	3.8	12	4.0	3.5
27	5.1	4.5	4.0	2.1	4.9	744	30	25	3.2	12	4.3	3.4
28	5.0	4.5	4.0	2.3	4.9	725	28	28	3.0	9.3	4.2	3.3
29	4.9	4.5	4.0	2.4	---	700	26	27	3.3	7.7	4.0	3.2
30	4.9	4.5	4.0	2.6	---	675	24	25	3.6	6.3	3.8	3.1
31	4.7	---	4.0	2.8	---	725	---	23	---	5.5	3.8	---
TOTAL	217.9	136.3	134.7	94.5	140.9	8355.2	7932	598.0	276.3	388.0	93.0	115.0
MEAN	7.03	4.54	4.35	3.05	5.03	270	264	19.3	9.21	12.5	3.00	3.83
MAX	11	5.4	4.5	4.0	7.2	905	853	28	22	23	4.8	4.4
MIN	4.7	4.3	4.0	1.9	2.8	4.8	24	8.5	3.0	2.6	1.4	3.1
AC-FT	432	270	267	187	279	16570	15730	1190	548	770	184	228

CAL YR 1986 TOTAL 4826.7 MEAN 13.2 MAX 171 MIN 1.0 AC-FT 9570
WTR YR 1987 TOTAL 18481.6 MEAN 50.6 MAX 905 MIN 1.4 AC-FT 36660

05057200 BALDHILL CREEK NEAR DAZEY, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
OCT											
08...	1145	7.2	560	--	7.5	10.0	--	--	--	--	--
NOV											
04...	1240	4.6	495	--	-1.5	2.5	--	--	--	--	--
DEC											
12...	1110	4.5	410	--	-16.5	0.0	--	--	--	--	--
JAN											
28...	1120	2.3	480	--	-6.5	0.0	--	--	--	--	--
MAR											
11...	1640	10	800	--	-3.0	0.0	--	--	--	--	--
24...	1405	910	223	7.40	2.0	0.5	83	3	20	8.0	7.5
MAY											
14...	1545	11	860	--	24.0	18.0	--	--	--	--	--
JUN											
12...	1130	11	--	--	28.0	22.0	--	--	--	--	--
AUG											
05...	1500	4.3	870	--	23.5	23.5	--	--	--	--	--
SEP											
10...	1505	4.6	895	7.90	13.5	16.0	370	66	69	47	63

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
24...	15	0.4	9.5	80	29	7.0	0.10	9.3	131	140	0.18
SEP											
10...	27	1	10	300	180	18	0.0	9.4	596	580	0.81

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
MAR										
24...	1	40	170	<1	8	170	0.1	<1	<1	160
SEP										
10...	2	90	20	<1	65	30	0.1	1	<1	490

05057500 LAKE ASHTABULA AT BALDHILL DAM, ND

LOCATION.--Lat 47°02'00", long 98°05'00", in NW¼ sec.18, T.141 N., R.58 W., Barnes County, Hydrologic Unit 09020203 at Baldhill Dam on Sheyenne River, and 8 mi northwest of Valley City.

DRAINAGE AREA.--7,470 mi^2, approximately, of which about 5,560 mi^2 is probably noncontributing, including 3,800 mi^2 in closed basins.

MONTHEND-ELEVATION AND CONTENTS RECORDS

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

REVISED RECORDS.--WSP 1238: 1950(M). WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929.

REMARKS.--Reservoir is formed by an earth-filled dam, 1,650 ft long; storage began on July 30, 1949; dam completed September 1949. Useable capacity, 69,100 acre-ft between invert of outlet conduit, elevation, 1,238.0 ft, and normal pool level, elevation, 1,266.0 ft. Dead storage below elevation 1,238.0 ft, 1,500 acre-ft. Maximum pool elevation, 1,273.2 ft, capacity, 116,500 acre-ft. Low flows are controlled by 2 sluice gates 3 ft in diameter. The spillway crest is 120 ft long at elevation 1,252.0 ft, surmounted by 3 taintor gates, each 15 ft high and 40 ft long. The reservoir is operated for flood control and to increase low-water flow.

COOPERATION.--Records furnished by U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 91,400 acre-ft, May 14, 1950, elevation, 1,269.46 ft; minimum since reservoir first reached spillway level, 6,660 acre-ft, Aug. 11-14, 1950, elevation, 1,245.13 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 74,248 acre-ft, April 14, elevation, 1,266.64 ft; minimum, 36,444 acre-ft, Apr. 3, elevation, 1,258.66 ft.

MONTHEND ELEVATION AND CONTENTS WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	1,265.93	70,210	--
Oct. 31	1,266.06	70,940	+730
Nov. 30	1,265.56	68,140	-2,800
Dec. 31	1,263.20	55,500	-12,640
CAL YR 1986	--	--	-2,950
Jan. 31	1,262.73	53,280	-2,220
Feb. 28	1,262.50	52,250	-1,030
Mar. 31	1,258.78	36,850	-15,400
Apr. 30	1,266.07	71,000	+34,150
May 31	1,266.38	72,770	+1,770
June 30	1,265.81	69,540	-3,230
July 31	1,266.35	72,600	+3,060
Aug. 31	1,266.23	71,910	-690
Sept. 30	1,265.94	70,260	-1,650
WTR YR 1987	--	--	+50

05058000 SHEYENNE RIVER BELOW BALDHILL DAM, ND

LOCATION.--Lat 47°01'50", long 98°05'50", in NW1/4 sec.18, T.141 N., R.58 W., Barnes County, Hydrologic Unit 09020204, on right bank 600 ft downstream from Baldhill Dam, 8 mi northwest of Valley City, and at mile 270.5.

DRAINAGE AREA.--7,470 mi^2, approximately, of which about 5,560 mi^2 is probably noncontributing, including 3,800 mi^2 in closed basins.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1949 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1728: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,200.00 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Oct. 1-24. Records good except those for period of missing record, Oct. 1-24, which are fair. Flow completely regulated by Lake Ashtabula (station 05057500). Records 1955 to 1972 include releases at Baldhill Dam to the fish-rearing ponds of the Fish and Wildlife Service. Small diversions are still made but not published.

AVERAGE DISCHARGE (UNADJUSTED).--38 years, 131 ft^3/s, 94,910 acre-ft/yr; median of yearly mean discharges, 96 ft^3/s, 69,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,740 ft^3/s, Apr. 24, 1979, gage height, 36.26 ft; no flow at times in 1950, 1952-53, 1970.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,200 ft^3/s, Apr. 14, gage height, 30.51 ft; minimum daily, 4.4 ft^3/s, July 5.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	57	13	197	147	56	222	1730	109	328	15	651	68
2	16	13	189	148	57	270	1810	109	329	9.1	652	67
3	14	13	197	144	57	354	1820	108	331	6.3	656	65
4	14	13	199	138	57	388	1840	108	335	5.3	648	67
5	14	30	200	136	56	498	1810	120	336	4.4	506	66
6	13	50	194	147	56	722	1930	140	337	9.1	407	65
7	13	51	198	153	56	792	2080	144	340	10	299	65
8	13	50	194	147	57	923	1840	143	223	9.7	237	67
9	13	52	200	157	57	1040	680	141	129	8.2	238	66
10	13	49	193	155	56	1060	503	140	106	7.9	242	64
11	14	57	196	145	56	972	2120	144	60	7.1	201	65
12	14	75	194	138	56	822	2140	147	54	6.5	184	66
13	14	93	196	138	56	567	2150	142	55	6.1	152	67
14	14	117	191	143	56	418	2170	143	55	5.9	125	68
15	13	133	188	162	56	432	2140	131	32	12	129	70
16	13	136	188	163	56	280	2000	122	12	16	129	70
17	14	137	193	160	56	223	1640	122	11	14	131	67
18	14	133	192	157	56	418	1270	122	11	12	130	66
19	14	132	202	157	56	698	1220	109	55	12	113	65
20	14	133	196	129	71	1020	1130	97	22	12	102	65
21	15	157	188	96	83	1420	748	102	12	40	103	66
22	14	201	179	97	84	1580	457	124	12	191	102	71
23	14	198	189	100	85	1480	426	146	12	374	102	73
24	14	184	187	98	84	1490	426	146	12	546	67	72
25	14	181	200	97	114	1720	427	146	12	607	40	68
26	14	187	189	94	182	1810	429	192	12	734	42	67
27	14	176	179	77	219	1790	402	223	11	831	40	66
28	14	176	186	56	199	1730	379	259	11	828	55	65
29	14	200	195	57	---	1680	229	297	11	819	67	62
30	14	202	175	56	---	1640	109	326	18	806	66	65
31	13	---	153	56	---	1600	---	327	---	712	67	---
TOTAL	472	3342	5917	3848	2190	30059	38055	4829	3284	6676.6	6683	2004
MEAN	15.2	111	191	124	78.2	970	1268	156	109	215	216	66.8
MAX	57	202	202	163	219	1810	2170	327	340	831	656	73
MIN	13	13	153	56	56	222	109	97	11	4.4	40	62
AC-FT	936	6630	11740	7630	4340	59620	75480	9580	6510	13240	13260	3970

CAL YR 1986 TOTAL 52371.3 MEAN 143 MAX 1690 MIN 7.4 AC-FT 103900
WTR YR 1987 TOTAL 107359.5 MEAN 294 MAX 2170 MIN 4.4 AC-FT 212900

05058000 SHEYENNE RIVER NEAR BALDHILL DAM, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1959 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
OCT											
24...	1200	13	760	--	3.0	8.5	--	--	--	--	--
DEC											
03...	1050	200	900	--	-5.0	2.0	--	--	--	--	--
JAN											
08...	1620	150	1020	--	0.0	2.0	--	--	--	--	--
MAR											
04...	1015	422	975	--	1.5	4.0	--	--	--	--	--
25...	1205	1830	638	7.70	3.5	3.0	230	20	49	26	54
MAY											
01...	1505	103	470	--	20.0	15.0	--	--	--	--	--
JUN											
30...	1305	10	560	--	26.0	23.5	--	--	--	--	--
AUG											
06...	1045	417	640	--	22.0	24.0	--	--	--	--	--

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
25...	33	2	9.5	210	120	15	0.10	15	380	420	0.52

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
MAR										
25...	2	90	160	<1	42	570	0.4	<1	<1	290

05058500 SHEYENNE RIVER AT VALLEY CITY, ND

LOCATION.--Lat 46°54'50", long 98°00'30", in SE¼NW¼ sec.28, T.140 N., R.58 W., Barnes County, Hydrologic Unit 09020204, on left bank 100 ft downstream from College Dam in Valley City, and at mile 253.0.

DRAINAGE AREA.--7,810 mi^2, approximately, of which about 5,700 mi^2 is probably noncontributing, includes 3,800 mi^2 in closed basins.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--March to August 1919, March to June 1938, August 1938 to September 1975; October 1979 to current year (gage heights and annual maximum discharge since 1979). Records for July 1938, published in WSP 855, have been found to be unreliable and should not be used.

REVISED RECORDS.---WSP 1388: 1939 (M). WSP 1728: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,199.27 ft above National Geodetic Vertical Datum of 1929. March to August 1919, nonrecording gage at site 0.5 mi upstream at different datum. March to Oct. 13, 1938, nonrecording gage at present site and datum.

REMARKS.--Flow regulated by Lake Ashtabula 13 mi upstream (see station 05057500). Small diversions above station for municipal supply.

AVERAGE DISCHARGE (UNADJUSTED).--37 years (1938-75), 124 ft^3/s, 89,840 acre-ft/yr; median of yearly mean discharges, 97 ft^3/s, 70,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,580 ft^3/s, Apr. 28, 1948, gage height, 17.51 ft; maximum gage height, 17.62 ft, Apr. 19, 1969; no flow during several periods in 1938-41.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2300 ft^3/s, Apr. 13, gage height, 11.43 ft; minimum not determined.

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.19	2.75	4.11	---	3.16	4.17	9.86	3.41	4.73	2.90	6.04	3.21
2	3.15	2.85	4.07	---	3.17	4.24	10.33	3.34	4.72	2.90	6.00	3.21
3	3.01	2.88	4.05	---	3.16	4.82	10.39	3.45	4.71	2.86	6.00	3.22
4	2.94	2.87	4.06	---	3.16	5.26	10.43	3.46	4.72	2.85	6.05	3.22
5	2.91	2.89	4.09	---	3.16	5.50	10.50	3.47	4.73	2.85	5.86	3.22
6	2.89	2.97	4.10	---	3.18	6.97	10.47	3.62	4.73	2.84	5.21	3.22
7	2.90	3.14	4.08	---	3.31	8.60	11.01	3.68	4.73	2.84	5.00	3.22
8	2.89	3.27	4.08	---	3.42	7.50	11.31	3.70	4.54	2.80	3.93	3.22
9	2.89	3.14	---	---	3.27	7.28	11.36	3.72	3.70	2.81	4.25	3.22
10	2.90	3.19	---	---	3.24	7.53	11.24	3.73	3.44	2.83	4.24	3.22
11	2.91	3.17	---	---	3.22	7.32	11.32	3.73	3.20	2.82	4.20	3.22
12	2.91	3.17	---	---	3.27	6.80	11.38	3.72	3.15	2.84	3.96	3.23
13	2.92	3.32	---	---	3.23	6.51	11.41	3.73	3.12	2.80	3.90	3.24
14	2.92	3.39	---	---	3.20	4.97	11.43	3.73	3.12	2.79	3.66	3.24
15	2.88	3.62	---	3.77	3.18	5.34	11.39	3.73	3.11	2.79	3.64	3.24
16	2.88	3.70	---	3.79	3.18	5.10	11.26	3.62	3.02	2.79	3.61	3.24
17	2.89	3.70	---	3.79	3.17	4.20	10.56	3.61	2.91	2.85	3.46	3.24
18	2.90	3.68	---	3.81	3.16	5.14	9.13	3.60	2.84	2.93	3.53	3.25
19	2.90	3.66	---	3.79	3.17	7.07	8.28	3.59	2.83	2.97	3.54	3.26
20	2.91	3.68	---	3.80	3.17	9.46	8.00	3.54	3.05	2.91	3.45	3.23
21	2.91	3.68	---	3.50	3.28	9.45	6.93	3.78	3.25	2.89	3.41	3.22
22	2.92	4.01	---	3.41	3.31	9.85	5.69	3.80	2.95	3.34	3.40	3.23
23	2.92	4.12	---	3.41	3.32	9.69	5.40	3.88	2.88	4.46	3.40	3.25
24	2.91	4.10	---	3.43	3.33	9.23	5.36	3.82	2.83	5.49	3.31	3.26
25	2.90	4.02	---	3.44	3.34	9.70	5.36	3.83	2.84	5.77	3.24	3.25
26	2.90	4.06	---	3.41	3.92	10.32	5.35	4.01	2.82	6.06	3.14	3.23
27	2.90	4.01	---	3.43	4.29	10.40	5.19	4.34	2.82	6.37	3.11	3.23
28	2.91	3.99	---	3.23	4.21	10.19	5.01	4.29	2.85	6.26	3.09	3.25
29	2.91	4.06	---	3.19	---	10.02	4.76	4.43	2.88	6.33	3.12	3.25
30	3.00	4.11	---	3.17	---	9.88	3.69	4.64	2.87	6.32	3.20	3.22
31	2.47	---	---	3.16	---	9.77	---	4.71	---	6.24	3.21	---
MEAN	2.91	3.51	---	---	3.33	7.49	8.79	3.80	3.47	3.76	4.04	3.23
MAX	3.19	4.12	---	---	4.29	10.40	11.43	4.71	4.73	6.37	6.05	3.26
MIN	2.47	2.75	---	---	3.16	4.17	3.69	3.34	2.82	2.79	3.09	3.21

05058500 SHEYENNE RIVER AT VALLEY CITY, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
MAR 25...	0845	1710	630	7.80	0.5	2.5	230	22	50	26	55

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR 25...	33	2	11	210	120	16	0.10	15	410	420	0.56

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
MAR 25...	1	100	300	<1	43	450	0.3	<1	<1	300

05058700 SHEYENNE RIVER AT LISBON, ND

LOCATION.--Lat 46°26'49", long 97°40'44", on line between secs.1 and 2, T.134 N., R.56 W., Ransom County, Hydrologic Unit 09020204, on left bank 150 ft downstream from dam at State Fish Hatchery at north edge of city of Lisbon, 3 mi upstream from Timber Coulee, and at mile 162.1.

DRAINAGE AREA.--8,190 mi^2, approximately, of which about 5,700 mi^2 is probably noncontributing, including 3,800 mi^2 in closed basins.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1956 to current year.

REVISED RECORDS.--WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,066.46 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Nov. 17 to Mar. 26. Records good except those for period with ice effect, Nov. 17 to Mar. 26, which are fair. Flow regulated by Lake Ashtabula (station 05057500) 108.5 mi upstream.

AVERAGE DISCHARGE.--31 years, 164 ft^3/s, 118,800 acre-ft/yr; median of yearly mean discharges, 166 ft^3/s, 120,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,270 ft^3/s, July 1, 1975, gage height, 19.04 ft; no flow Sept. 19-21, Oct. 23, 24, 1956, Aug. 16, 1961.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,000 ft^3/s, Mar. 23, gage height, 14.07 ft; minimum daily, .01 ft^3/s, Oct. 9-10.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	78	31	185	183	66	109	1830	368	285	29	675	45
2	93	39	193	168	61	175	1790	238	298	29	679	53
3	85	54	196	149	59	244	1800	178	298	28	623	58
4	78	34	197	141	58	247	1890	142	297	33	582	59
5	73	23	188	140	56	276	1940	137	297	35	579	62
6	66	17	189	138	57	658	1960	142	300	36	589	63
7	57	23	184	135	60	1170	1980	139	307	35	594	62
8	21	47	182	134	65	1410	1990	140	310	29	464	62
9	.01	23	186	135	77	1830	2090	156	314	26	442	61
10	.01	53	193	139	93	2080	2190	160	315	26	266	61
11	5.4	67	178	139	118	1900	2260	161	244	25	226	62
12	20	79	178	141	138	1440	2260	160	175	25	237	63
13	22	74	205	142	91	1350	2250	160	125	21	234	63
14	22	64	197	139	86	1140	2290	162	87	20	206	63
15	23	69	190	146	88	866	2300	164	73	21	181	63
16	22	82	195	134	76	603	2310	166	64	22	165	63
17	22	98	190	128	68	509	2310	170	63	21	139	62
18	23	118	188	137	64	644	2270	168	62	23	129	62
19	22	138	183	142	61	788	2120	162	60	22	122	65
20	22	142	188	145	59	1180	1730	167	54	46	103	67
21	25	140	192	145	59	1760	1430	304	47	30	108	66
22	26	138	197	157	59	2340	1280	225	38	27	107	66
23	27	142	193	150	60	2810	961	250	38	38	95	62
24	31	148	185	128	67	1980	625	253	84	37	89	59
25	32	166	178	103	76	1890	534	245	65	90	89	59
26	33	195	185	102	82	1830	512	238	46	311	94	60
27	34	196	191	97	88	1930	496	231	36	468	90	63
28	33	188	211	95	90	2020	484	238	30	521	77	67
29	33	190	194	95	---	2030	453	270	27	628	65	69
30	32	186	196	91	---	2040	394	267	24	618	53	65
31	33	---	190	77	---	1930	---	265	---	644	48	---
TOTAL	1093.42	2964	5897	4095	2082	41179	48729	6226	4463	3964	8150	1855
MEAN	35.3	98.8	190	132	74.4	1328	1624	201	149	128	263	61.8
MAX	93	196	211	183	138	2810	2310	368	315	644	679	69
MIN	.01	17	178	77	56	109	394	137	24	20	48	45
AC-FT	2170	5880	11700	8120	4130	81680	96650	12350	8850	7860	16170	3680

CAL YR 1986 TOTAL 69691.09 MEAN 191 MAX 1970 MIN .01 AC-FT 138200
WTR YR 1987 TOTAL 130697.41 MEAN 358 MAX 2810 MIN .01 AC-FT 259200

05058700 SHEYENNE RIVER AT LISBON, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1956 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
OCT											
21...	0930	25	1050	--	5.5	9.5	--	--	--	--	--
DEC											
04...	1045	217	905	--	-5.5	0.0	--	--	--	--	--
JAN											
09...	1215	138	1000	--	-8.0	0.0	--	--	--	--	--
MAR											
04...	1410	236	1000	--	5.0	0.0	--	--	--	--	--
20...	1100	1110	555	--	0.0	0.5	--	--	--	--	--
25...	1620	1900	780	8.10	4.5	4.0	270	15	55	31	72
MAY											
27...	1315	230	765	--	23.5	16.0	--	--	--	--	--
JUL											
08...	1440	24	960	--	22.0	25.0	--	--	--	--	--
AUG											
06...	1440	587	650	--	24.0	24.0	--	--	--	--	--
SEP											
18...	0920	63	780	8.20	15.0	17.5	270	0	60	30	64

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
25...	36	2	12	250	160	19	0.10	21	499	520	0.68
SEP											
18...	33	2	11	390	160	22	0.30	2.4	492	460	0.67

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
MAR										
25...	4	130	130	<1	57	230	0.4	1	<1	340
SEP										
18...	7	130	20	1	55	190	0.1	1	<1	360

05059000 SHEYENNE RIVER NEAR KINDRED, ND
(National stream-quality accounting network station)

LOCATION.--Lat 46°37'35", long 97°00'05", in NE¼NW¼ sec.5, T.136 N., R.50 W., Richland County, Hydrologic Unit 09020204, on right bank 25 ft downstream from Burlington Northern Railway bridge, 1.5 mi southeast of Kindred, and at mile 68.1.

DRAINAGE AREA.--8,800 mi^2, approximately, of which about 5,780 mi^2 is probably noncontributing, including 3,800 mi^2 in closed basins.

WATER-DISCHARGE RECORDS

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

REVISED RECORDS.--WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 925.55 ft above National Geodetic Vertical Datum of 1929. July 1949 to Sept. 30, 1962, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Nov. 7 to Mar. 28. Records good except those for period with ice effect, Nov. 7 to Mar. 28, which are fair. Flow regulated to a large degree by Lake Ashtabula (station 05057500) 202 mi upstream and several small reservoirs.

AVERAGE DISCHARGE.--38 years, 205 ft^3/s, 148,500 acre-ft/yr; median of yearly mean discharges, 172 ft^3/s, 124,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,690 ft^3/s, Apr. 15, 1969, gage height, 21.03 ft; maximum gage height, 21.66 ft, July 6, 1975; minimum daily discharge, 13 ft^3/s, Nov. 13, 1955, Aug. 22-24, 1959.

EXTREMES OUTSIDE PERIOD OF RECORD.--Spring flood in 1947 or 1948 reached a stage of 22.1 ft from floodmarks, discharge about 3,600 ft^3/s.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,000 ft^3/s, Mar. 26, gage height, 18.26 ft; minimum daily, 31 ft^3/s, July 19.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	104	70	210	188	146	98	2070	636	326	75	528	98
2	108	70	210	194	143	104	2010	586	324	72	549	88
3	109	71	210	209	131	113	1960	552	324	72	586	81
4	107	71	210	213	114	124	1910	481	341	68	615	77
5	116	71	210	202	112	157	1880	378	353	65	617	74
6	121	71	210	185	109	402	1900	302	357	66	578	79
7	119	64	210	169	104	516	1950	253	359	64	557	81
8	115	58	210	164	99	561	1980	236	356	60	556	83
9	111	50	210	165	95	654	1980	229	354	60	559	83
10	108	55	209	164	96	773	1990	222	356	57	519	81
11	102	62	203	166	95	961	2020	214	362	56	454	80
12	89	68	200	165	96	1180	2080	216	365	57	395	81
13	74	78	215	166	100	1380	2140	219	356	54	282	83
14	65	82	208	168	111	1540	2180	220	291	53	248	82
15	61	84	197	165	143	1530	2190	218	235	49	246	82
16	61	84	214	181	189	1410	2200	225	195	45	238	83
17	72	83	216	182	216	1300	2210	219	170	41	219	83
18	73	85	204	170	152	1140	2220	224	150	35	201	82
19	77	85	200	162	121	937	2220	225	134	31	183	85
20	78	100	204	161	110	826	2210	222	124	36	164	87
21	77	115	203	160	102	1030	2170	226	117	50	155	89
22	76	130	204	160	96	1350	2020	255	114	76	150	91
23	74	145	202	165	94	1770	1730	293	109	89	140	92
24	74	160	205	165	93	2170	1510	347	96	92	134	92
25	74	170	201	165	92	2580	1280	299	86	71	133	91
26	74	180	204	165	91	2930	987	344	78	70	130	92
27	73	190	198	165	96	2780	812	349	84	66	124	90
28	73	200	194	149	98	2290	733	328	100	81	121	89
29	73	210	197	146	---	2120	690	307	89	321	121	92
30	72	210	198	146	---	2110	657	290	79	408	118	99
31	71	---	203	147	---	2110	---	297	---	463	106	---
TOTAL	2681	3172	6369	5272	3244	38946	53889	9412	6784	2903	9726	2570
MEAN	86.5	106	205	170	116	1256	1796	304	226	93.6	314	85.7
MAX	121	210	216	213	216	2930	2220	636	365	463	617	99
MIN	61	50	194	146	91	98	657	214	78	31	106	74
AC-FT	5320	6290	12630	10460	6430	77250	106900	18670	13460	5760	19290	5100

CAL YR 1986 TOTAL 94538 MEAN 259 MAX 1700 MIN 50 AC-FT 187500
WTR YR 1987 TOTAL 144968 MEAN 397 MAX 2930 MIN 31 AC-FT 287500

05059000 SHEYENNE RIVER NEAR KINDRED, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
OCT											
21...	1245	77	900	--	18.0	9.5	--	--	--	--	--
28...	1115	73	900	8.00	11.0	8.0	5.2	12.0	99	72	92
DEC											
10...	1455	209	980	7.90	-15.0	0.0	7.4	11.8	85	6	170
JAN											
16...	1040	184	960	--	-17.0	0.0	--	--	--	--	--
MAR											
05...	1325	156	915	--	5.5	0.0	--	--	--	--	--
09...	1410	E650	810	7.90	-5.0	0.0	20	14.0	94	29	3400
20...	1610	811	550	--	2.0	0.0	--	--	--	--	--
27...	1640	2680	750	--	-4.0	0.0	240	13.5	90	260	610
MAY											
29...	1340	309	--	--	28.5	20.5	--	--	--	--	--
JUN											
23...	1410	112	765	8.30	24.0	26.0	20	8.2	102	63	23
AUG											
03...	1400	614	610	8.10	23.5	26.0	72	5.5	68	100	68
SEP											
24...	1500	91	785	8.20	20.0	16.5	--	8.4	86	--	--

DATE	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY, CARBON-ATE IT-FLD (MG/L CACO3) (00419)	BICAR-BONATE WATER WHOLE IT-FLD (MG/L) (00450)	CAR-BONATE WATER WHOLE IT-FLD (MG/L) (00447)
OCT											
28...	360	77	89	33	58	26	1	6.8	281	342	0
DEC											
10...	320	44	70	36	89	37	2	10	279	340	0
MAR											
09...	280	40	61	30	71	35	2	11	236	288	0
27...	240	--	52	26	60	34	2	12	a281	--	--
JUN											
23...	310	44	75	29	48	25	1	7.5	263	224	48
AUG											
03...	300	82	67	31	47	25	1	7.8	214	261	0

DATE	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2) (00405)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)
OCT											
28...	5.4	150	26	0.20	19	564	550	0.77	111	<0.010	<0.100
DEC											
10...	6.8	210	25	0.20	13	627	620	0.85	354	<0.010	0.280
MAR											
09...	5.7	170	21	0.20	19	541	530	0.74	E950	0.020	0.690
27...	--	140	12	0.20	16	467	450	0.64	3380	0.030	0.850
JUN											
23...	2.5	130	15	0.20	19	476	480	0.65	144	<0.010	<0.100
AUG											
03...	3.3	150	25	0.30	23	505	480	0.69	837	<0.010	0.230

a - Laboratory value

Note: Field-paramter cross sections were not made during current year.

05059000 SHEYENNE RIVER NEAR KINDRED, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, AMMONIA DISSOLVED (MG/L AS NH4) (71846)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	PHOSPHORUS, DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P) (00671)	ALUMINUM, DISSOLVED (UG/L AS AL) (01106)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BARIUM, DISSOLVED (UG/L AS BA) (01005)
OCT										
28...	0.060	0.040	0.05	0.80	0.090	0.020	0.030	20	4	120
DEC										
10...	0.140	0.130	0.17	1.4	0.120	0.100	0.080	--	--	--
MAR										
09...	0.200	0.190	0.24	1.9	0.380	0.240	0.190	<10	4	64
27...	0.320	0.410	0.53	11	1.80	0.130	0.090	10	2	61
JUN										
23...	0.070	0.060	0.08	1.4	0.140	0.030	<0.010	--	--	--
AUG										
03...	0.030	0.030	0.04	1.6	0.260	0.210	0.170	30	7	12

DATE	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COBALT, DISSOLVED (UG/L AS CO) (01035)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, DISSOLVED (UG/L AS PB) (01049)	LITHIUM DISSOLVED (UG/L AS LI) (01130)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY DISSOLVED (UG/L AS HG) (71890)
OCT										
28...	<0.5	<1	<1	<3	1	8	<5	55	120	0.1
MAR										
09...	<0.5	1	<1	<3	4	46	<5	59	100	<0.1
27...	<0.5	<1	<1	<3	5	28	<5	45	190	<0.1
AUG										
03...	<0.5	<1	<1	<3	6	21	<5	36	2	0.1

DATE	MOLYBDENUM, DISSOLVED (UG/L AS MO) (01060)	NICKEL, DISSOLVED (UG/L AS NI) (01065)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	SILVER, DISSOLVED (UG/L AS AG) (01075)	STRONTIUM, DISSOLVED (UG/L AS SR) (01080)	VANADIUM, DISSOLVED (UG/L AS V) (01085)	ZINC, DISSOLVED (UG/L AS ZN) (01090)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT										
28...	<10	5	<1	<1	370	<6	8	19	3.7	84
DEC										
10...	--	--	--	--	--	--	--	67	38	84
MAR										
09...	<10	4	<1	<1	270	<6	5	54	E95	98
27...	<10	8	<1	<1	240	<6	3	--		--
JUN										
23...	--	--	--	--	--	--	--	109	33	75
AUG										
03...	<10	6	<1	<1	270	6	10	141	234	100

05059400 SHEYENNE RIVER NEAR HORACE, ND

LOCATION.--Lat 46°48'13", long 96°54'13", in NW¼NW¼ sec.5, T.138 N., R.49 W., Cass County, Hydrologic Unit 09020204, at bridge on county road 3 mi north and 0.1 mi east of Horace.

DRAINAGE AREA.--8,850 mi^2, approximately, of which about 5,780 mi^2 is probably noncontributing, including 3,800 mi^2 in closed basins.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--October 1979 to current year (gage heights and annual maximum discharge).

GAGE.--Water-stage recorder. Datum of gage is 888.94 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records fair. Mean-daily gage heights for Apr. 2, May 11-19, 22, 26, 27, 29, June 2, 4, 5, 9, 10, 12, and 16 were obtained by using observer readings or telemark readings. Flow regulated to a large degree by Lake Ashtabula (station 05057500) 241 mi upstream. Above 3,000 ft^3/s overflow occurs upstream between Kindred and Horace. This overflow bypasses the station by flowing into the Maple River to the west and into the Wild Rice River to the east.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,960 ft^3/s, Mar. 28, 1987, determined from a hydrographic comparison with stations 05059000, Sheyenne River near Kindred, ND and 05059500, Sheyenne River at West Fargo, ND; maximum recorded gage height, 22.06 ft, Mar. 28, 1987, ice jam; minimum not determined.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,960 ft^3/s, Mar. 28, gage height, 22.06 ft; minimum not determined.

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.88	5.26	7.90	8.05	7.24	7.24	18.36	10.85	8.03	5.38	9.33	5.74
2	5.78	5.26	8.04	8.03	7.27	7.27	18.17	10.66	8.23	5.28	9.84	5.62
3	5.80	5.24	8.06	8.00	7.26	7.31	17.94	10.36	8.27	5.22	10.13	5.49
4	5.87	5.30	8.03	8.03	7.16	7.42	17.68	10.10	8.27	5.20	10.31	5.37
5	5.85	5.30	8.01	8.02	7.04	---	17.45	9.56	8.39	5.19	10.50	5.31
6	5.93	5.26	8.05	7.91	6.96	8.00	17.33	8.86	8.51	5.13	10.55	5.28
7	6.08	5.25	8.06	7.73	6.95	8.62	17.42	8.35	8.55	5.13	10.35	5.29
8	6.06	5.43	8.03	7.62	6.95	10.35	17.62	7.93	8.56	5.11	10.24	5.31
9	6.01	5.33	7.95	7.59	6.94	11.02	17.72	7.72	8.54	5.05	10.22	5.35
10	5.94	5.48	7.89	7.57	6.91	11.72	17.80	7.63	8.54	5.05	10.22	5.36
11	5.87	5.35	7.88	7.55	6.93	12.74	17.82	7.51	8.57	5.05	9.96	5.35
12	5.80	5.39	7.85	7.52	6.96	13.90	17.98	7.42	8.58	5.04	9.48	5.35
13	5.66	5.48	7.81	7.51	6.99	15.04	18.24	7.43	8.58	5.02	8.90	5.35
14	5.40	5.70	7.84	7.54	7.06	16.12	18.58	7.44	8.46	5.02	7.97	5.35
15	5.19	5.54	7.80	7.57	7.19	16.87	18.79	7.43	7.95	4.97	7.59	5.35
16	5.07	5.64	7.74	7.64	7.36	17.10	18.87	7.47	7.38	4.94	7.48	5.34
17	5.02	5.78	7.87	7.72	7.45	16.91	18.91	7.55	7.14	4.97	7.38	5.34
18	5.15	5.96	7.95	7.67	7.57	16.46	18.96	7.50	6.69	4.97	7.20	5.34
19	5.26	6.06	7.96	7.55	7.77	15.74	18.99	7.50	6.37	4.82	6.97	5.37
20	5.31	6.12	8.00	7.44	8.06	14.76	18.95	7.54	6.15	4.88	6.76	5.39
21	5.35	6.17	8.03	7.46	7.95	13.84	18.92	7.56	6.05	4.83	6.53	5.40
22	5.35	6.22	8.02	7.57	7.28	14.19	18.72	7.66	5.94	4.90	6.38	5.42
23	5.33	6.35	7.99	7.72	7.11	15.42	17.91	7.93	5.88	4.98	6.31	5.43
24	5.30	6.62	8.01	7.84	7.08	16.95	16.52	8.26	5.81	5.04	6.17	5.43
25	5.29	6.98	8.04	7.89	7.06	18.43	15.38	8.64	5.64	5.14	6.07	5.43
26	5.30	7.20	8.07	7.85	7.08	19.88	14.15	8.52	5.50	5.01	6.09	5.42
27	5.31	7.30	8.07	7.66	7.10	21.04	12.68	8.67	5.37	4.91	6.03	5.43
28	5.28	7.36	8.02	7.36	7.17	21.87	11.79	8.67	5.35	4.83	5.95	5.42
29	5.27	7.43	7.96	7.19	---	20.99	11.31	8.43	5.62	4.86	5.91	5.41
30	5.26	7.61	7.98	7.14	---	19.21	11.04	8.19	5.52	6.85	5.90	5.43
31	5.26	---	8.01	7.18	---	18.64	---	8.01	---	8.58	5.88	---
MEAN	5.52	5.98	7.97	7.65	7.21	---	17.1	8.30	7.21	5.20	8.02	5.40
MAX	6.08	7.61	8.07	8.05	8.06	---	18.99	10.85	8.58	8.58	10.55	5.74
MIN	5.02	5.24	7.74	7.14	6.91	---	11.04	7.42	5.35	4.82	5.88	5.28

05059400 SHEYENNE RIVER NEAR HORACE, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
MAR 28...	1545	2950	715	7.00	-5.0	0.0	220	7	49	23	56

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR 28...	35	2	11	210	140	18	0.10	21	430	450	0.58

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
MAR 28...	3420	2	110	70	<1	41	200	0.1	1	<1	280

05059500 SHEYENNE RIVER AT WEST FARGO, ND

LOCATION.--Lat 46°53'28", long 96°54'24", in SE¼SE¼ sec.31, T.140 N., R.49 W., Cass County, Hydrologic Unit 09020204, on right bank at downstream side of county highway bridge, 1 mi north of West Fargo, 3 mi upstream from Maple River, and at mile 24.5.

DRAINAGE AREA.--8,870 mi^2, approximately, of which about 5,780 mi^2 is probably noncontributing, including 3,800 mi^2 in closed basins.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March to November 1902 (gage heights only), April 1903 to October 1905, March to August 1919, September 1929 to current year. Published as "at or near Haggart" 1902-7, 1919. Records for March to November 1902 and November 1905 to June 1907, published in WSP 100, 171, 207, and 245, have been found to be unreliable and should not be used. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1388: 1904(M). WSP 1728: Drainage area. See also "PERIOD OF RECORD."

GAGE.--Water-stage recorder. Datum of gage is 877.19 ft above National Geodetic Vertical Datum of 1929. June 27, 1933, to September 1969 on left bank about 600 ft downstream on unimproved channel at same datum. See WSP 1728 or 1913 for history of changes prior to June 27, 1933.

REMARKS.--Estimated daily discharges: Nov. 8 to Mar. 30 and Sept. 29-30. Records good except those for period with ice effect, Nov. 8 to Mar. 30, and period of missing record, Sept. 29-30, which are fair. Flow regulated to a large degree by Lake Ashtabula (station 05057500) 246 mi upstream. Above 3,000 ft^3/s overflow that occurs upstream from the gaging station Sheyenne River near Horace (station 05059400) bypasses this station by flowing into the Maple River drainage to the west or into the Wild Rice River drainage to the east. This overflow is not included in the flow for this station. During some years, flow is diverted from just above the station into the Red River of the North in order to maintain adequate supply for municipal uses. Figures of daily discharge do not include this diversion.

AVERAGE DISCHARGE (ADJUSTED).--60 years (water years 1904-5, 1930-87), 182 ft^3/s, 131,900 acre-ft/yr; median of yearly mean discharges, 152 ft^3/s, 110,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,480 ft^3/s, Apr. 21, 1979, gage height, 22.12 ft, backwater from Red and/or Maple Rivers; maximum gage height, 22.25 ft, July 5, 1975, backwater from Red and/or Maple Rivers; minimum daily, 1.0 ft^3/s, Sept. 23, 1976, caused by diversion to Red River of the North.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,940 ft^3/s, Mar. 29, gage height, 20.35 ft; minimum daily, 55 ft^3/s, July 29.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	142	79	216	232	139	102	2100	670	316	100	467	124
2	129	79	234	233	140	103	2030	646	337	91	543	113
3	126	79	236	229	137	104	1980	608	346	85	588	104
4	131	78	236	229	129	113	1930	576	334	82	621	96
5	134	85	233	232	121	133	1860	521	346	83	650	92
6	133	80	234	225	113	167	1810	435	363	79	660	89
7	145	80	238	207	112	181	1810	371	370	76	635	87
8	148	88	237	192	107	296	1820	321	372	76	611	91
9	143	75	230	184	104	426	1850	290	370	73	605	93
10	139	80	223	179	100	504	1860	282	370	70	605	94
11	133	80	221	176	99	641	1860	271	373	70	583	93
12	128	79	214	170	100	807	1880	260	375	70	517	92
13	121	77	211	165	100	1010	1920	259	378	70	449	91
14	105	89	216	166	102	1200	1970	260	370	70	342	91
15	88	87	214	167	110	1360	2020	263	327	67	296	92
16	78	79	208	174	121	1430	2050	264	266	65	268	93
17	69	87	212	181	127	1430	2060	277	250	62	257	93
18	66	93	224	182	132	1390	2080	273	205	70	246	95
19	77	104	226	173	144	1290	2090	265	172	59	223	98
20	80	108	230	161	152	1150	2090	271	153	61	206	97
21	84	108	233	160	162	995	2080	283	143	67	185	97
22	84	108	234	156	134	1010	2060	285	136	74	170	98
23	84	111	231	115	102	1190	1940	303	130	67	162	100
24	82	124	231	155	97	1520	1670	333	126	69	153	100
25	81	150	232	154	96	1770	1440	395	116	75	146	101
26	81	175	236	152	100	2100	1220	394	105	74	147	101
27	81	180	237	149	97	2370	974	392	96	64	142	101
28	81	182	234	146	98	2540	816	406	90	59	136	102
29	79	184	227	142	---	2800	742	376	104	55	132	100
30	79	193	227	134	---	2470	701	346	108	130	130	100
31	79	---	228	133	---	2220	---	321	---	354	130	---
TOTAL	3210	3201	7043	5453	3275	34822	52713	11217	7547	2567	11005	2918
MEAN	104	107	227	176	117	1123	1757	362	252	82.8	355	97.3
MAX	148	193	238	233	162	2800	2100	670	378	354	660	124
MIN	66	75	208	115	96	102	701	259	90	55	130	87
AC-FT	6370	6350	13970	10820	6500	69070	104600	22250	14970	5090	21830	5790

CAL YR 1986 TOTAL 102114 MEAN 280 MAX 1680 MIN 66 AC-FT 202500
WTR YR 1987 TOTAL 144971 MEAN 397 MAX 2800 MIN 55 AC-FT 287500

05059500 SHEYENNE RIVER AT WEST FARGO, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1969 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
OCT											
23...	1305	84	900	--	6.0	10.0	--	--	--	--	--
JAN											
07...	1335	208	900	--	-2.0	0.0	--	--	--	--	--
MAR											
06...	1020	149	900	--	9.0	0.0	--	--	--	--	--
28...	1305	2510	630	--	-5.0	0.0	--	--	--	--	--
29...	1545	2890	765	6.70	-7.0	0.0	250	19	55	27	65
APR											
02...	1440	2030	620	--	2.0	2.0	--	--	--	--	--
MAY											
29...	1105	378	658	--	22.0	19.0	--	--	--	--	--
JUL											
01...	1720	99	825	--	27.0	24.0	--	--	--	--	--
AUG											
07...	1035	638	600	--	23.0	24.0	--	--	--	--	--
SEP											
17...	1625	93	812	8.10	21.0	18.0	310	110	73	30	55

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
29...	35	2	11	230	150	17	0.10	19	476	480	0.65
SEP											
17...	27	1	9.2	200	140	19	0.30	16	452	470	0.61

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
MAR										
29...	3	120	120	<1	51	210	0.3	1	<1	320
SEP										
17...	6	110	10	<1	50	10	0.2	2	<1	380

05059600 MAPLE RIVER NEAR HOPE, ND

LOCATION.--Lat 47°19'30", long 97°47'25", in NW¼NW¼ sec.4, T.144 N., R.56 W., Steele County, Hydrologic Unit 09020205, 100 ft downstream from box culvert on State Highway 38, 500 ft east of the intersection of State Highway 32 and 38, and 3 mi west of Hope.

DRAINAGE AREA.--20.2 mi^2, of which about 2.8 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1964 to current year (seasonal records only since 1983).

GAGE.--Water-stage recorder. Datum of gage is 1,296.62 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Mar. 1-30, May 25-28, and Sept. 6-10. Records good except those for estimated daily discharges, which are fair.

AVERAGE DISCHARGE.--18 years (water years 1965-82), 2.82 ft^3/s, 2,040 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 900 ft^3/s, Apr. 18, 1979, gage height, 5.86 ft, backwater from ice; maximum gage height, 6.49 ft, Mar. 21, 1987; no flow for many months each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 360 ft^3/s, Mar. 21, gage height, 6.47 ft, backwater from ice; no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						.00	87	.28	2.7	.00	1.3	.03
2						.00	120	.22	1.7	.00	.53	.02
3						.00	97	.15	.93	.00	.26	.02
4						2.0	98	.10	.55	.00	.14	.03
5						7.0	87	.06	.33	.00	.11	.16
6						15	56	.03	.20	.00	.15	.12
7						25	33	.02	.13	.00	.07	.08
8						20	22	.01	.07	.00	.04	.04
9						10	16	.01	.04	.00	.02	.02
10						7.5	13	.01	.03	.00	.02	.01
11						6.5	10	.00	.04	.00	.01	.00
12						5.0	8.3	.00	.02	.00	.01	.00
13						4.0	6.2	.00	.01	.00	.01	.00
14						3.0	4.8	.00	.00	.00	.01	.00
15						4.0	3.9	.00	.00	.00	.02	.00
16						4.0	3.0	.00	.00	.00	.02	.00
17						4.0	2.5	.00	.00	.00	.02	.00
18						5.5	1.9	.00	.00	.00	.02	.00
19						24	1.6	.00	.00	.00	.01	.00
20						45	1.3	.00	.00	.00	.02	.00
21						190	1.0	.46	.00	.01	.01	.00
22						150	.94	.95	.00	.04	.01	.01
23						133	.81	13	.00	74	.00	.01
24						123	.72	32	.00	167	.00	.01
25						110	.61	20	.00	100	.02	.02
26						75	.54	15	.00	55	.02	.01
27						70	.51	10	.00	26	.04	.01
28						68	.47	12	.00	13	.04	.01
29						65	.39	7.5	.00	7.2	.04	.00
30						56	.33	6.2	.00	3.7	.07	.00
31						63	---	4.3	---	2.1	.04	---
TOTAL						1294.50	678.82	122.30	6.75	448.05	3.08	.61
MEAN						41.8	22.6	3.95	.22	14.5	.10	.02
MAX						190	120	32	2.7	167	1.3	.16
MIN						.00	.33	.00	.00	.00	.00	.00
AC-FT						2570	1350	243	13	889	6.1	1.2

05059600 MAPLE RIVER NEAR HOPE, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
MAR											
11...	1235	6.5	720	--	-3.0	0.0	--	--	--	--	--
24...	0920	124	332	7.70	0.5	1.0	110	25	26	12	23
JUN											
03...	1225	0.76	2140	7.90	14.0	14.0	840	420	180	94	210

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
24...	29	1	8.1	90	76	10	0.10	12	210	220	0.29
JUN											
03...	35	3	8.8	420	780	61	0.20	27	1710	1600	2.3

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
MAR										
24...	1	30	180	2	15	40	0.2	<1	<1	170
JUN										
03...	4	190	70	<1	120	80	--	<1	<1	780

05059700 MAPLE RIVER NEAR ENDERLIN, ND

LOCATION.--Lat 46°37'18", long 97°34'25", on west line sec.2, T.136 N., R.55 W., Ransom County, Hydrologic Unit 09020205, on left bank 25 ft downstream from county highway bridge, 1 mi downstream from South Branch, and 1.2 mi east of Enderlin.

DRAINAGE AREA.--843 mi^2, of which about 47 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1956 to current year.

REVISED RECORDS.--WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,056.72 ft above National Geodetic Vertical Datum of 1929. Sept. 21, 1956 to June 9, 1969, recording gage on right bank at same datum. Prior to Sept. 20, 1956, nonrecording gage at site 25 ft upstream at same datum.

REMARKS.--Estimated daily discharges: Mar. 5-28. Records good .

AVERAGE DISCHARGE.--31 years, 41.9 ft^3/s, 30,360 acre-ft/yr; median of yearly mean discharges, 28 ft^3/s, 20,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,610 ft^3/s, June 30, 1975, gage height, 15.41 ft; minimum daily, 0.1 ft^3/s, Dec. 7-9, 1963.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 7	2315	188	5.50	Mar. 22	0130	*2220	*10.41
Mar. 13	2130	378	6.48	May 24	0400	292	6.09

Minimum daily discharge, 1.3 ft^3/s, Sept. 16.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.5	4.2	6.5	3.1	2.7	3.3	666	18	54	3.0	3.0	1.4
2	7.5	4.3	6.3	3.1	2.6	3.2	593	16	46	2.8	2.6	1.4
3	6.7	4.4	7.2	3.1	2.6	3.1	476	15	38	2.6	3.8	1.5
4	6.6	4.3	9.9	3.1	2.6	3.1	415	14	33	2.6	4.6	1.6
5	6.4	3.9	6.5	3.1	2.7	5.3	366	13	29	2.9	2.4	1.5
6	6.1	4.1	5.6	3.1	2.7	48	330	12	26	2.7	2.0	1.6
7	6.0	5.4	5.1	3.1	3.1	146	295	12	24	2.4	2.1	1.4
8	5.8	9.7	4.8	3.1	4.5	111	261	11	21	2.4	2.2	1.6
9	5.6	13	4.6	3.4	3.7	68	229	11	20	2.4	2.0	1.6
10	5.4	8.5	4.5	3.3	3.3	55	204	9.6	18	2.2	1.8	1.5
11	5.6	6.9	4.2	3.2	3.5	45	181	8.6	18	2.3	2.4	1.4
12	5.1	6.9	3.8	3.2	3.2	106	158	7.7	15	2.2	1.9	1.4
13	5.2	6.6	3.8	3.1	3.2	300	134	9.6	13	2.3	1.9	1.5
14	5.2	5.9	3.7	3.1	3.2	349	115	9.5	11	2.4	1.8	1.5
15	4.9	5.9	3.6	3.1	3.1	338	99	7.7	8.9	2.3	1.8	1.4
16	4.6	5.7	3.6	2.9	3.1	267	85	6.5	7.9	2.6	1.7	1.3
17	4.6	5.3	3.5	2.9	2.9	199	75	5.6	7.7	2.4	1.8	1.4
18	4.6	5.4	3.5	2.9	3.3	234	65	5.9	6.7	2.5	1.6	1.9
19	5.2	5.5	3.5	2.8	3.8	346	59	5.5	6.1	2.6	1.7	2.2
20	4.5	5.3	3.4	2.8	3.2	586	54	6.7	5.6	2.9	2.0	1.9
21	8.3	5.4	3.3	2.8	2.9	1180	48	26	5.1	2.5	1.6	1.8
22	8.6	5.5	3.3	2.8	2.7	1940	43	113	5.5	2.4	1.6	1.9
23	8.0	5.5	3.3	2.8	2.7	1660	40	194	4.7	2.5	1.5	2.1
24	7.3	5.6	3.2	2.8	2.7	1320	35	282	4.2	2.3	1.6	2.2
25	6.5	5.7	3.2	2.8	2.7	1060	32	230	3.9	2.3	1.7	2.4
26	5.4	6.3	3.2	2.8	2.7	975	29	185	3.7	2.4	1.7	2.3
27	4.9	6.5	3.2	2.8	3.1	1030	27	144	3.3	2.3	1.7	2.4
28	4.7	6.0	3.2	2.8	3.2	844	24	115	3.4	2.4	1.6	2.2
29	4.6	6.3	3.1	2.8	---	666	23	92	3.8	2.4	1.5	2.3
30	4.4	6.5	3.1	2.7	---	749	20	76	3.0	2.7	1.4	2.0
31	4.3	---	3.0	2.7	---	670	---	64	---	2.5	1.5	---
TOTAL	181.1	180.5	132.7	92.1	85.7	15310.0	5181	1725.9	449.5	77.2	62.5	52.6
MEAN	5.84	6.02	4.28	2.97	3.06	494	173	55.7	15.0	2.49	2.02	1.75
MAX	8.6	13	9.9	3.4	4.5	1940	666	282	54	3.0	4.6	2.4
MIN	4.3	3.9	3.0	2.7	2.6	3.1	20	5.5	3.0	2.2	1.4	1.3
AC-FT	359	358	263	183	170	30370	10280	3420	892	153	124	104

CAL YR 1986 TOTAL 19503.5 MEAN 53.4 MAX 963 MIN 1.7 AC-FT 38690
WTR YR 1987 TOTAL 23530.6 MEAN 64.5 MAX 1940 MIN 1.3 AC-FT 46670

05059700 MAPLE RIVER NEAR ENDERLIN, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
OCT											
20...	1625	4.4	1750	--	20.5	12.5	--	--	--	--	--
DEC											
04...	1335	8.8	2100	--	-7.0	0.5	--	--	--	--	--
JAN											
09...	1045	3.0	1930	--	-8.0	0.5	--	--	--	--	--
MAR											
04...	1545	2.9	1850	--	3.5	5.0	--	--	--	--	--
20...	1335	630	442	7.10	1.0	0.5	150	44	37	15	16
30...	1830	769	524	--	0.5	1.0	--	--	--	--	--
MAY											
20...	1015	7.6	1580	--	14.5	13.0	--	--	--	--	--
JUL											
09...	0930	2.4	1630	--	23.5	19.0	--	--	--	--	--
AUG											
06...	1625	2.1	1200	--	23.0	23.0	--	--	--	--	--
SEP											
18...	1155	1.9	1400	--	15.5	15.0	--	--	--	--	--

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
20...	16	0.6	19	110	74	17	0.10	15	286	260	0.39

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
MAR										
20...	2	60	170	<1	17	90	0.5	1	<1	230

05060500 RUSH RIVER AT AMENIA, ND

LOCATION.--Lat 47°01'00", long 97°12'50", in SE¼NW¼ sec.24, T.141 N., R.52 W., Cass County, Hydrologic Unit 09020204, on left bank on downstream side of bridge on State Highway 18, 0.6 mi north of Amenia.

DRAINAGE AREA.--116 mi^2.

WATER-DISCHARGE RECORDS

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

REVISED RECORDS.--WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 943 ft above National Geodetic Vertical Datum of 1929, from topographic map. See WSP 1913 for history of changes prior to June 10, 1961.

REMARKS.--Estimated daily discharges: Nov. 8 to Dec. 16, Feb. 7-10, and Feb. 28 to Mar. 24. Records fair except those for period with ice effect, Nov. 8 to Mar. 29, which are poor.

AVERAGE DISCHARGE.--41 years, 9.68 ft^3/s, 7,010 acre-ft/yr; median of yearly mean discharges, 6.6 ft^3/s, 4,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,490 ft^3/s, Apr. 19, 1979, gage height, 10.37 ft; maximum gage height, 12.15 ft, Mar. 23, 1966, backwater from ice; no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 27 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 9	----	300	ice jam	May 23	1530	132	6.41
Mar. 20	1745	*475	a*7.98	July 26	1100	74	5.99
Mar. 26	----	296	ice jam				

No flow for many days.
a - Backwater from ice

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.3	1.3	5.0	.34	.30	1.7	50	5.3	40	.49	5.1	.73
2	2.6	1.3	2.5	.34	.46	1.6	51	4.2	35	.27	3.3	.54
3	3.2	1.3	2.2	.33	.53	1.5	38	2.7	28	.13	2.2	.32
4	2.3	1.3	2.0	.32	.51	2.0	32	2.1	19	.07	1.6	.18
5	1.8	1.3	1.3	.68	.47	3.0	30	1.8	15	.05	1.0	.10
6	2.6	1.4	1.0	3.3	.54	4.0	27	1.6	11	.04	.65	.08
7	4.0	1.8	.80	.81	1.5	25	27	1.3	8.1	.03	.39	.05
8	2.0	1.5	.70	.60	6.0	60	25	1.2	5.5	.02	.20	.04
9	1.2	1.4	.64	.51	5.0	130	22	.96	3.6	.02	.07	.02
10	1.0	1.2	.58	.41	3.0	200	18	.66	2.6	.00	.06	.00
11	.98	1.1	.54	.38	2.1	150	17	.45	2.4	.00	.09	.00
12	.88	1.0	.50	.40	2.8	90	15	.33	1.8	.00	.07	.00
13	.83	.90	.48	.43	3.7	70	14	.22	1.3	.00	.02	.00
14	.96	.85	.46	.45	3.0	60	13	.16	.91	.00	.00	.00
15	.76	.80	.45	.49	2.3	50	11	.09	.64	.00	.12	.00
16	.70	.76	.45	.37	1.8	45	10	.07	.31	.00	.17	.00
17	.72	.72	.47	.33	1.5	40	11	.13	1.2	.00	.15	.00
18	.72	.68	.48	.31	1.4	40	12	.48	3.7	.00	.16	.00
19	.92	.66	.51	.29	1.1	150	12	.80	2.7	.00	.11	.00
20	1.6	.64	.45	.28	1.1	350	12	.96	1.8	.00	.08	.00
21	.98	.62	.43	.27	1.1	250	12	11	1.5	.00	.67	.00
22	.59	.62	.42	.28	1.1	150	12	39	2.2	.00	4.5	.00
23	.92	.60	.40	.26	1.3	110	12	102	2.0	.19	2.4	.00
24	.98	.60	.40	.21	1.4	100	9.9	114	4.5	.31	1.0	.00
25	.87	.70	.40	.19	1.5	200	8.8	95	6.9	1.7	.72	.00
26	5.6	1.0	.38	.19	1.5	269	7.6	84	3.8	63	.64	.00
27	4.0	2.0	.38	.19	1.6	211	6.3	85	1.7	46	.58	.00
28	2.1	4.0	.36	.20	1.5	130	5.8	83	1.1	28	.56	.00
29	1.8	8.0	.35	.23	---	103	5.8	69	1.1	19	.58	.00
30	1.7	10	.32	.23	---	85	5.0	58	.72	12	1.1	.00
31	1.3	---	.34	.27	---	62	---	49	---	7.8	1.2	---
TOTAL	52.91	50.05	25.69	13.89	50.11	3143.8	532.2	814.51	210.08	179.12	29.49	2.06
MEAN	1.71	1.67	.83	.45	1.79	101	17.7	26.3	7.00	5.78	.95	.07
MAX	5.6	10	5.0	3.3	6.0	350	51	114	40	63	5.1	.73
MIN	.59	.60	.32	.19	.30	1.5	5.0	.07	.31	.00	.00	.00
AC-FT	105	99	51	28	99	6240	1060	1620	417	355	58	4.1

CAL YR 1986 TOTAL 7448.86 MEAN 20.4 MAX 467 MIN .00 AC-FT 14770
WTR YR 1987 TOTAL 5103.87 MEAN 14.0 MAX 350 MIN .00 AC-FT 10120

05060500 RUSH RIVER AT AMENIA, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
OCT											
20...	1405	2.0	1770	--	19.0	11.5	--	--	--	--	--
DEC											
02...	1415	2.5	4000	--	-3.0	0.0	--	--	--	--	--
JAN											
07...	0945	0.70	2000	--	-2.0	0.0	--	--	--	--	--
MAR											
06...	1220	3.6	1600	--	7.5	0.0	--	--	--	--	--
26...	1455	262	495	7.80	3.5	1.0	210	86	51	19	18
MAY											
20...	1635	0.92	1440	--	12.5	14.5	--	--	--	--	--
JUN											
25...	1210	5.8	1080	--	24.0	23.0	--	--	--	--	--
AUG											
07...	1210	0.41	1600	--	25.0	23.0	--	--	--	--	--

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
26...	15	0.6	13	120	110	15	0.20	19	354	320	0.48

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
MAR										
26...	4	80	140	<1	30	130	0.4	<1	<1	300

05064500 RED RIVER OF THE NORTH AT HALSTAD, MN
(National stream quality accounting network station and radiochemical program station)

LOCATION.--Lat 47°21'10", long 96°50'50", on line between secs.24 and 25, T.145 N., R.49 W., Traill County, Hydrologic Unit 09020107, on left bank on upstream side of highway bridge, 0.5 mi west of Halstad, 2.5 mi downstream from Wild Rice River, and at mile 375.2.

DRAINAGE AREA.--21,800 mi^2, approximately, including 3,800 mi^2 in closed basins.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1936 to June 1937 (no winter records), April 1942 to September 1960 (spring and summer months only), May 1961 to current year.

REVISED RECORDS.--WSP 1388: 1936, 1950. WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 826.65 ft above National Geodetic Vertical Datum of 1929. Prior to July 17, 1961, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Oct. 1-6 and Nov. 10 to Apr. 4. Records good except those for period with ice effect, Nov. 10 to Apr. 4, and period of no gage height record, Oct. 1-6, which are fair.

AVERAGE DISCHARGE.--26 years (1962-87), 1,840 ft^3/s, 1,333,000 acre-ft/yr; median of yearly mean discharges, 1,820 ft^3/s, 1,319,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 42,000 ft^3/s, Apr. 22, 1979, gage height, 39.00 ft; minimum observed, 5.4 ft^3/s, Oct. 8, 9, 12-14, 1936.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in 1897 reached a stage of about 38.5 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 9,860 ft^3/s, Mar. 30, gage height, 21.43 ft, backwater from ice; minimum daily, 378 ft^3/s, Sept. 7.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3960	1540	1410	1260	879	1200	8680	2330	3000	699	1020	745
2	3720	1550	1440	1260	866	1210	7320	2220	2730	696	1110	616
3	3480	1550	1470	1260	869	1230	6320	2120	2480	692	1230	524
4	3240	1550	1490	1210	893	1280	5720	1990	2270	701	1240	456
5	3000	1540	1480	1150	923	1290	5270	1900	2090	808	1230	419
6	2760	1550	1460	1100	947	1560	4940	1790	1960	1000	1230	392
7	2520	1560	1390	1100	967	3170	4670	1660	1860	1110	1210	378
8	2460	1570	1230	1130	997	4270	4460	1520	1750	1110	1170	380
9	2390	1560	1120	1140	1030	4520	4330	1420	1640	1060	1110	390
10	2320	1310	1120	1120	1050	4820	4260	1350	1560	1000	1050	410
11	2230	1250	1190	1070	1050	5050	4210	1260	1510	961	1000	416
12	2160	1150	1270	1020	1060	4910	4150	1190	1480	915	957	422
13	2110	1120	1310	990	1060	4730	4080	1130	1440	876	921	415
14	2080	1280	1240	963	1080	4580	4060	1100	1400	836	856	414
15	2020	1420	1150	962	1090	4550	4060	1080	1350	766	824	426
16	1970	1490	1110	1000	1110	4580	4080	1040	1290	670	831	436
17	1950	1430	1090	1040	1120	4550	4080	1000	1210	580	902	444
18	1920	1430	1060	1030	1120	4430	4050	1060	1100	674	851	465
19	1870	1490	1050	978	1130	4290	4010	1440	1060	603	826	499
20	1820	1540	1070	917	1130	4390	3970	1500	1010	534	828	511
21	1780	1560	1100	921	1130	5130	3930	1560	973	710	772	536
22	1730	1490	1150	952	1130	5670	3930	1830	945	2970	731	505
23	1680	1400	1210	960	1140	5970	3900	2490	941	4180	683	492
24	1650	1330	1260	957	1140	6170	3810	2950	908	4300	637	503
25	1630	1290	1270	930	1120	6430	3600	3090	849	3950	608	507
26	1610	1280	1280	887	1120	7480	3310	3170	822	3410	594	491
27	1580	1300	1290	843	1130	8530	3030	3600	802	2740	594	474
28	1560	1310	1290	842	1180	9230	2760	3890	759	2120	635	449
29	1550	1350	1280	892	---	9520	2560	3820	723	1650	659	439
30	1550	1400	1280	921	---	9730	2430	3570	699	1330	747	423
31	1530	---	1270	905	---	9740	---	3280	---	1120	812	---
TOTAL	67830	42590	38830	31710	29461	154210	129980	63350	42611	44771	27868	13977
MEAN	2188	1420	1253	1023	1052	4975	4333	2044	1420	1444	899	466
MAX	3960	1570	1490	1260	1180	9740	8680	3890	3000	4300	1240	745
MIN	1530	1120	1050	842	866	1200	2430	1000	699	534	594	378
AC-FT	134500	84480	77020	62900	58440	305900	257800	125700	84520	88800	55280	27720

CAL YR 1986 TOTAL 1285540 MEAN 3522 MAX 17300 MIN 894 AC-FT 2550000
WTR YR 1987 TOTAL 687188 MEAN 1883 MAX 9740 MIN 378 AC-FT 1363000

05064500 RED RIVER OF THE NORTH AT HALSTAD, MN--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1961-67, 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
OCT											
28...	1540	1540	750	8.30	7.0	9.0	12	11.5	97	72	28
DEC											
11...	1035	1600	850	8.00	-15.0	0.0	3.8	10.8	78	31	49
JAN											
26...	1545	884	770	--	-2.0	0.0	--	--	--	--	--
APR											
01...	1345	8560	700	8.10	3.0	1.5	80	13.0	92	67	450
22...	1405	3940	585	8.20	21.5	10.0	90	10.1	89	11	33
JUN											
01...	1655	2870	525	7.90	20.0	22.5	--	--	--	--	--
24...	1305	869	705	8.10	21.5	24.5	80	7.5	90	63	E8
AUG											
04...	1330	1190	760	8.10	21.5	25.0	30	5.8	71	92	88
SEP											
23...	1505	490	475	8.20	21.5	17.0	--	9.0	93	--	--

DATE	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY, CARBON-ATE IT-FLD (MG/L CACO3) (00419)	BICAR-BONATE WATER WHOLE IT-FLD (MG/L) (00450)	CAR-BONATE WATER WHOLE IT-FLD (MG/L) (00447)
OCT											
28...	360	120	71	44	26	13	0.6	6.5	236	288	0
DEC											
11...	380	100	76	45	42	19	1	7.5	275	336	0
APR											
01...	280	94	61	31	35	21	0.9	10	--	--	--
22...	240	56	51	27	32	22	0.9	7.9	185	225	0
JUN											
24...	290	32	60	33	43	24	1	6.5	252	308	0
AUG											
04...	210	0	49	22	46	31	1	10	232	283	0

DATE	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2) (00405)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)
OCT											
28...	2.3	150	13	0.20	15	504	470	0.69	2100	0.020	0.170
DEC											
11...	5.3	150	18	0.20	17	550	520	0.75	2380	<0.010	0.360
APR											
01...	2.8	160	13	0.20	17	466	440	0.63	10800	0.090	2.80
22...	2.2	110	11	0.20	12	370	360	0.50	3940	0.030	0.530
JUN											
24...	3.9	100	29	0.30	14	436	440	0.59	1020	0.020	0.630
AUG											
04...	3.5	120	10	0.20	13	388	410	0.53	1250	--	--

Note: No radiochemical samples were collected during current year.

05064500 RED RIVER OF THE NORTH AT HALSTAD, MN--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, AMMONIA DISSOLVED (MG/L AS NH4) (71846)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	PHOSPHORUS, DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P) (00671)	ALUMINUM, DISSOLVED (UG/L AS AL) (01106)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BARIUM, DISSOLVED (UG/L AS BA) (01005)
OCT										
28...	0.090	0.080	0.10	1.4	0.210	0.080	0.070	20	3	84
DEC										
11...	0.850	0.940	1.2	2.0	0.270	0.250	0.230	--	--	--
APR										
01...	0.330	0.310	0.40	2.3	0.300	0.170	0.120	40	2	110
22...	0.140	0.090	0.12	1.2	0.430	0.090	0.060	60	2	140
JUN										
24...	0.070	0.060	0.08	1.6	0.390	0.240	0.160	--	--	--
AUG										
04...	--	--	--	--	--	--	--	10	6	86

DATE	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COBALT, DISSOLVED (UG/L AS CO) (01035)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, DISSOLVED (UG/L AS PB) (01049)	LITHIUM DISSOLVED (UG/L AS LI) (01130)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY DISSOLVED (UG/L AS HG) (71890)
OCT										
28...	<0.5	<1	<1	<3	3	6	<5	43	<1	0.6
APR										
01...	<0.5	<1	<1	<3	6	39	<5	36	77	<0.1
22...	<0.5	<1	<1	<3	5	44	<5	31	3	0.5
AUG										
04...	<0.5	<1	<1	<3	3	5	<5	27	1	0.1

DATE	MOLYBDENUM, DISSOLVED (UG/L AS MO) (01060)	NICKEL, DISSOLVED (UG/L AS NI) (01065)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	SILVER, DISSOLVED (UG/L AS AG) (01075)	STRONTIUM, DISSOLVED (UG/L AS SR) (01080)	VANADIUM, DISSOLVED (UG/L AS V) (01085)	ZINC, DISSOLVED (UG/L AS ZN) (01090)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT										
28...	<10	6	<1	<1	270	<6	8	--	--	--
APR										
01...	<10	4	<1	<1	240	<6	15	322	7450	100
22...	<10	3	<1	<1	210	<6	11	323	3430	100
JUN										
24...	--	--	--	--	--	--	--	302	709	99
AUG										
04...	<10	6	<1	<1	240	<6	7	181	582	99

05064900 BEAVER CREEK NEAR FINLEY, ND
(Hydrologic bench-mark station)

LOCATION.--Lat 47°35'40", long 97°42'18", in NE¼ sec.31, T.148 N., R.55 W., Steele County, Hydrologic Unit 09020109, on right bank 500 ft upstream from bridge on county highway, and 7 mi northeast of Finley.

DRAINAGE AREA.--160 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1964 to current year.

GAGE.--Water-stage recorder and concrete broad-crested weir. Datum of gage is 1,170.08 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Nov. 9 to Apr. 2. Records good except those for periods of estimated daily discharges, which are poor. Flow affected since June, 1987 by flood-control dam 2.0 mi upstream.

AVERAGE DISCHARGE.--23 years, 9.22 ft^3/s, 6,680 acre-ft/yr; median of yearly mean discharges, 9.3 ft^3/s, 6,740 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,900 ft^3/s, Apr. 19, 1979, gage height, 8.35 ft, backwater from ice; maximum gage height, 9.70 ft, Mar. 14, 1966, backwater from ice; no flow for several months each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 688 ft^3s, July 22, gage height, 6.04 ft from floodmark; no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.92	.00	.62	.00	.00	.00	150	24	17	17	33	7.0
2	.83	.00	.56	.00	.00	.00	191	22	13	11	32	6.4
3	.76	.00	.50	.00	.00	.00	219	20	11	6.9	30	4.6
4	.67	.00	.45	.00	.00	.00	316	18	9.0	5.2	27	5.4
5	.60	.00	.42	.00	.00	.00	427	16	7.4	4.7	17	5.0
6	.58	.00	.37	.00	.00	.10	450	14	6.3	4.9	19	4.2
7	.52	.31	.34	.00	.00	3.5	318	13	5.4	7.3	20	3.8
8	.51	20	.31	.00	.00	3.4	282	12	4.7	5.8	20	3.6
9	.41	10	.28	.00	.00	3.3	212	10	4.3	5.5	21	3.3
10	.37	5.0	.26	.00	.00	3.2	149	8.3	4.1	4.5	24	3.1
11	.39	3.0	.23	.00	.00	3.1	126	6.5	4.4	4.7	28	2.8
12	.38	2.0	.18	.00	.00	3.1	107	5.6	3.9	4.2	24	2.9
13	.36	.90	.10	.00	.00	3.0	100	4.3	3.6	4.3	23	2.7
14	.31	.86	.03	.00	.00	3.0	88	6.8	3.2	4.1	23	2.7
15	.31	.82	.01	.00	.00	2.8	86	4.0	2.6	3.5	23	2.6
16	.29	.80	.01	.00	.00	2.7	96	3.7	2.0	2.7	21	2.4
17	.31	.78	.01	.00	.00	2.5	103	3.9	64	2.1	20	1.7
18	.27	.76	.00	.00	.00	10	94	4.9	38	2.3	19	1.9
19	.21	.75	.00	.00	.00	45	83	4.4	24	6.6	17	2.2
20	.13	.74	.00	.00	.00	65	77	5.3	11	20	17	2.2
21	.08	.73	.00	.00	.00	75	76	24	18	8.7	15	1.9
22	.01	.72	.00	.00	.00	100	71	28	5.6	388	14	1.7
23	.00	.71	.00	.00	.00	206	59	24	11	402	11	1.5
24	.00	.70	.00	.00	.00	165	48	27	27	225	8.3	1.3
25	.00	.69	.00	.00	.00	90	41	27	80	153	8.2	1.1
26	.00	.68	.00	.00	.00	80	34	31	56	111	10	.90
27	.00	.68	.00	.00	.00	78	31	29	47	83	9.8	.82
28	.00	.67	.00	.00	.00	55	28	27	49	61	9.0	.83
29	.00	.67	.00	.00	---	40	27	24	36	49	7.9	.85
30	.00	.66	.00	.00	---	40	25	22	25	39	7.1	.72
31	.00	---	.00	.00	---	40	---	20	---	35	6.6	---
TOTAL	9.22	53.63	4.68	.00	.00	1122.70	4114	489.7	593.5	1682.0	564.9	82.12
MEAN	.30	1.79	.15	.00	.00	36.2	137	15.8	19.8	54.3	18.2	2.74
MAX	.92	20	.62	.00	.00	206	450	31	80	402	33	7.0
MIN	.00	.00	.00	.00	.00	.00	25	3.7	2.0	2.1	6.6	.72
AC-FT	18	106	9.3	.0	.0	2230	8160	971	1180	3340	1120	163

CAL YR 1986 TOTAL 3166.15 MEAN 8.67 MAX 170 MIN .00 AC-FT 6280
WTR YR 1987 TOTAL 8716.40 MEAN 23.9 MAX 450 MIN .00 AC-FT 17290

05064900 BEAVER CREEK NEAR FINLEY, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1965 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	HARD-NESS (MG/L AS CACO3) (00900)
OCT												
22...	1010	0.01	1420	7.90	13.0	10.5	0.90	11.2	104	K2	K3	570
DEC												
10...	1405	0.26	1430	7.70	-6.5	1.0	--	11.8	--	--	--	--
MAR												
12...	1330	3.1	1370	7.30	1.5	1.0	2.0	9.0	64	11	2500	620
23...	1625	201	940	--	6.0	1.5	--	--	--	--	--	--
APR												
21...	1300	75	930	--	15.0	6.5	--	--	--	--	--	--
JUN												
03...	1435	11	1730	8.20	17.0	18.0	4.5	10.2	--	150	36	620
JUL												
23...	1225	464	515	--	25.0	22.5	--	--	--	--	--	--
28...	0845	63	575	7.80	25.0	26.5	18	5.4	67	270	450	230
SEP												
11...	1015	2.6	1290	8.10	12.0	14.0	--	7.7	74	--	--	--

DATE	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY, CARBON-ATE IT-FLD (MG/L CACO3) (00419)	BICAR-BONATE WATER WHOLE IT-FLD (MG/L) (00450)	CAR-BONATE WATER WHOLE IT-FLD (MG/L) (00447)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2) (00405)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)
OCT												
22...	440	130	59	110	29	2	13	128	156	0	3.1	430
MAR												
12...	280	150	59	86	23	2	9.1	--	--	--	33	430
JUN												
03...	280	140	66	170	37	3	12	342	417	--	4.2	660
JUL												
28...	78	60	20	37	25	1	7.5	154	189	0	4.7	110
SEP												
11...	--	--	--	--	--	--	--	221	270	0	5.3	--

DATE	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS NH4) (71846)
OCT												
22...	34	0.20	9.1	1020	860	1.4	0.03	<0.010	4.60	0.060	0.600	0.77
MAR												
12...	34	0.20	22	1040	990	1.4	8.7	0.020	0.920	0.270	0.260	0.33
JUN												
03...	26	0.30	6.7	1250	1300	1.7	36	<0.010	<0.100	0.090	0.070	0.09
JUL												
28...	7.1	0.20	29	397	360	0.54	67	<0.010	<0.100	0.050	0.030	0.04

DATE	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHORUS, TOTAL (MG/L AS P) (00665)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P) (00666)	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)
OCT												
22...	1.1	0.060	0.050	0.020	<10	2	58	<0.5	<1	2	<3	3
MAR												
12...	1.9	0.170	0.120	0.100	<10	1	51	<0.5	<1	<1	<3	10
JUN												
03...	2.3	0.180	0.110	0.080	<10	6	85	<0.5	<1	<1	<3	4
JUL												
28...	1.4	0.270	0.250	0.160	<10	5	62	<0.5	<1	<1	<3	5

05064900 BEAVER CREEK NEAR FINLEY, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)
OCT 22...	14	<5	88	130	0.1	<10	3	<1	<1	560	<6	15
MAR 12...	59	<5	88	460	<0.1	<10	3	2	<1	590	<6	12
JUN 03...	10	<5	90	170	<0.1	<10	8	<1	<1	610	<6	12
28...	34	<5	31	50	0.1	<10	8	<1	<1	210	<6	13

DATE	GROSS ALPHA, DIS-SOLVED (UG/L AS U-NAT) (80030)	GROSS ALPHA, SUSP. TOTAL (UG/L AS U-NAT) (80040)	GROSS BETA, DIS-SOLVED (PCI/L AS CS-137) (03515)	GROSS BETA, SUSP. TOTAL (PCI/L AS CS-137) (03515)	GROSS BETA, DIS-SOLVED (PCI/L AS SR/YT-90) (80050)	GROSS BETA, SUSP. TOTAL (PCI/L AS SR/YT-90) (80060)	RADIUM 226, DIS-SOLVED, RADON METHOD (PCI/L) (09511)	URANIUM DIS-SOLVED, EXTRAC-TION (UG/L) (80020)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT 22...	3.2	<0.4	17	0.6	12	0.5	0.06	3.6	--	--	--
MAR 12...	--	--	--	--	--	--	--	--	50	0.42	94
JUN 03...	--	--	--	--	--	--	--	--	97	2.8	79
JUL 28...	--	--	--	--	--	--	--	--	21	3.5	99

05066500 GOOSE RIVER AT HILLSBORO, ND

LOCATION.--Lat 47°24'34", long 97°03'39", in NW¼ sec.5, T.145 N., R.50 W., Traill County, Hydrologic Unit 09020109, on right bank 600 ft upstream from Foogman Dam in Hillsboro, and 27.5 mi upstream from mouth.

DRAINAGE AREA.--1,203 mi^2, of which about 110 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1931 to current year (no winter records 1932-34). Monthly discharge only for some periods, published in WSP 1308.

GAGE.--Water-stage recorder and masonry dam. Datum of gage is 879.52 ft above National Geodetic Vertical Datum of 1929. Sept. 26, 1941, to Oct. 27, 1965, at site 600 ft downstream at same datum. See WSP 1728 or 1913 for history of changes prior to Sept. 26, 1941.

REMARKS.--Estimated daily discharges: Nov. 8 to Mar. 22 and July 26. Records good except those for periods of estimated daily discharges, which are fair.

AVERAGE DISCHARGE.--54 years (1931-32, 1934-87), 72.1 ft^3/s, 52,240 acre-ft/yr; median of yearly mean discharges, 43 ft^3/s, 31,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14,800 ft^3/s, Apr. 21, 1979, gage height, 16.76 ft; no flow at times.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 26	1730	*3570	*10.22	May 28	1645	287	2.57
Apr. 9	2245	2380	7.38	July 24	1800	2640	8.54

Minimum daily discharge, 5.8 ft^3/s, Feb. 9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	28	11	20	17	8.2	7.4	1110	182	199	134	390	91
2	24	11	20	16	8.2	7.4	1140	176	175	114	326	88
3	24	12	20	16	7.5	7.3	1340	164	166	98	275	86
4	24	11	19	15	6.6	7.2	1540	153	150	80	231	82
5	18	12	19	14	6.0	7.4	1770	148	136	68	202	77
6	17	13	19	16	5.9	51	1900	142	124	61	187	72
7	18	16	19	16	6.9	123	2080	137	111	56	182	69
8	15	13	18	16	6.0	97	2190	134	98	48	162	64
9	14	13	18	15	5.8	105	2330	129	87	39	142	59
10	13	13	18	14	6.0	155	2340	128	78	31	140	55
11	12	13	18	14	6.3	145	2150	121	71	28	220	52
12	11	13	18	13	7.0	120	1810	115	67	28	229	56
13	11	14	18	14	7.1	123	1410	109	64	25	189	56
14	12	14	18	14	7.2	117	1200	98	60	24	166	48
15	10	14	18	15	7.1	134	989	95	57	21	157	38
16	11	15	18	15	7.0	146	829	92	53	19	152	35
17	11	15	16	13	6.2	128	689	88	49	17	133	34
18	12	15	17	12	6.7	132	597	85	45	25	125	35
19	12	16	19	13	6.0	229	536	82	44	31	121	34
20	11	16	18	12	6.3	609	486	84	49	32	114	35
21	11	16	17	13	6.8	1310	435	100	91	37	107	36
22	13	17	16	13	6.6	1990	381	124	100	1520	102	33
23	12	17	16	14	6.1	2660	338	131	123	2240	98	35
24	12	18	17	9.9	7.0	3190	309	156	102	2570	96	36
25	11	18	18	8.3	7.0	3440	286	190	97	2440	96	35
26	11	19	18	7.7	8.0	3500	261	240	85	2010	106	33
27	11	19	18	7.4	7.9	3120	240	237	104	1580	106	32
28	11	20	18	7.0	7.3	2530	222	243	174	1180	107	32
29	12	20	17	7.8	---	1950	204	244	160	859	104	31
30	22	20	17	8.4	---	1310	188	240	155	621	100	30
31	13	---	18	8.2	---	1160	---	214	---	473	98	---
TOTAL	447	454	558	394.7	190.7	28610.7	31300	4581	3074	16509	4963	1499
MEAN	14.4	15.1	18.0	12.7	6.81	923	1043	148	102	533	160	50.0
MAX	28	20	20	17	8.2	3500	2340	244	199	2570	390	91
MIN	10	11	16	7.0	5.8	7.2	188	82	44	17	96	30
AC-FT	887	901	1110	783	378	56750	62080	9090	6100	32750	9840	2970

CAL YR 1986 TOTAL 31724.7 MEAN 86.9 MAX 1610 MIN 1.0 AC-FT 62930
WTR YR 1987 TOTAL 92581.1 MEAN 254 MAX 3500 MIN 5.8 AC-FT 183600

05066500 GOOSE RIVER AT HILLSBORO, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1969 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
OCT											
24...	1545	12	1280	--	8.5	8.5	--	--	--	--	--
JAN											
06...	1425	15	1200	--	-3.0	0.0	--	--	--	--	--
MAR											
06...	1505	40	1800	--	8.5	0.0	--	--	--	--	--
23...	1215	2650	362	[a]7.38	3.0	0.5	150	49	35	15	9.0
24...	1155	3380	360	--	0.0	0.5	--	--	--	--	--
APR											
01...	1655	1040	615	--	-1.0	1.5	--	--	--	--	--
JUN											
01...	1415	201	900	--	18.0	20.0	--	--	--	--	--
25...	1430	101	1490	--	22.0	21.0	--	--	--	--	--
JUL											
24...	1315	2600	380	--	31.0	26.0	--	--	--	--	--
SEP											
15...	1310	37	1240	8.10	22.5	17.5	560	340	130	58	77

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
23...	11	0.3	7.8	100	72	7.5	0.20	14	228	220	0.31
SEP											
15...	22	1	12	220	350	40	0.40	18	832	820	1.1

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
MAR										
23...	2	50	100	<1	17	210	0.1	<1	<1	220
SEP										
15...	4	110	20	1	84	<10	0.2	3	<1	700

a - Laboratory value

05082500 RED RIVER OF THE NORTH AT GRAND FORKS, ND

LOCATION.--Lat 47°55'38", long 97°01'34", in sec.2, T.151 N., R.50 W., Grand Forks County, Hydrologic Unit 09020301, on the right bank, 200 ft upstream from the DeMers Avenue bridge, .4 mi downstream from Red Lake River, and at mile 293.8.

DRAINAGE AREA.--30,100 mi^2, approximately, including 3,800 mi^2 in closed basins.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1882 to current year. Prior to May 1901 monthly discharge only, published in WSP 1308.

REVISED RECORDS.--WSP 855: 1936(M). WSP 1115: 1942. WSP 1175: 1897(M). WSP 1388: 1904, 1914-15, 1917-19, 1921-22, 1927, 1950. WSP 1728: Drainage area. WRD-ND-81-1: 1882, 1897 (M).

GAGE.--Water-stage recorder. Datum of gage is 779.00 ft above National Geodetic Vertical Datum of 1929. Oct. 1, 1983, to Sept. 30, 1986, datum of gage was 780.00 ft at same site. Apr. 14, 1965, to Sept. 30, 1983, water-stage recorder 1.9 mi downstream at a datum of 778.35 ft. Nov. 3, 1933, to Apr. 13, 1965, water-stage recorder 0.3 mi upstream at 778.35 ft datum. See WSP 1728 or 1913 for history of changes prior to Nov. 3, 1933.

REMARKS.--Estimated daily discharges: Oct. 13-31, Mar. 6 to Apr. 4, and Aug. 18, 19. Records good.

AVERAGE DISCHARGE.--105 years, 2,629 ft^3/s, 1,905,000 acre-ft/yr; median of yearly mean discharge, 2,370 ft^3/s, 1,720,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 85,000 ft^3/s, Apr. 10, 1897, gage height, 50.2 ft, site and datum then in use, from rating curve extended above 54,000 ft^3/s; minimum, 1.8 ft^3/s, Sept. 2, 1977, caused by unusual regulation during repair of dam at Grand Forks.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 17,500 ft^3/s, Mar. 29, gage height, 33.19 ft; minimum daily, 855 ft^3/s, Sept. 10.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6100	1910	2440	1970	1630	1850	15300	2960	6980	1130	4180	1390
2	5840	1870	2480	1970	1640	1840	15000	2840	6250	1100	3480	1420
3	5380	1890	2490	1970	1620	1830	14700	2730	5530	1120	3030	1330
4	4900	1890	2490	1940	1630	1850	13700	2620	4760	1110	2860	1170
5	4400	1890	2470	1860	1630	1910	12100	2530	4070	1090	2730	1040
6	4140	1910	2430	1860	1680	2020	10800	2410	3470	1270	2600	977
7	3930	1920	2300	1860	1720	2590	9800	2260	3090	1520	2480	918
8	3830	2060	2090	1850	1750	4870	9200	2120	2800	1610	2390	897
9	3750	1870	2040	1850	1760	6750	8500	1940	2620	1620	2250	875
10	3610	1490	1970	1850	1790	7300	8080	1800	2450	1500	2090	855
11	3570	1180	1940	1810	1820	7500	7820	1660	2310	1450	1920	867
12	3540	1010	1910	1740	1820	7400	7460	1570	2200	1320	1800	880
13	3410	1330	1930	1700	1820	7200	7040	1450	2170	1250	1770	904
14	3330	1450	1920	1710	1830	6940	6620	1380	2090	1220	1710	897
15	3310	1630	1970	1670	1860	6600	6330	1320	2070	1260	1620	888
16	3280	1870	1940	1700	1870	6400	6140	1270	1990	1170	1600	904
17	3280	2060	1880	1720	1870	6300	6000	1250	1870	1100	1750	889
18	3140	2170	1850	1660	1810	6200	5890	1260	1750	1160	1730	908
19	3120	2230	1830	1560	1750	6100	5660	1350	1620	1090	1580	994
20	3080	2300	1810	1610	1820	6620	5410	1570	1490	1110	1510	988
21	2940	2420	1810	1640	1890	7760	5260	1970	1390	1080	1470	1020
22	2740	2520	1810	1610	1930	9300	5090	2470	1360	1850	1430	1080
23	2550	2530	1850	1610	1910	11000	4940	3990	1370	6150	1310	1110
24	2190	2500	1900	1610	1880	12200	4820	6440	1380	9270	1220	1110
25	2110	2450	1940	1590	1860	13200	4640	6780	1360	10800	1210	1100
26	2040	2400	1970	1550	1860	14300	4440	6440	1280	11100	1230	1070
27	2040	2380	1990	1520	1840	15700	4090	6520	1220	10300	1250	1040
28	1980	2380	2010	1500	1840	16700	4100	8140	1160	8820	1260	999
29	1910	2380	2010	1510	---	17200	3950	9350	1160	7330	1250	983
30	2010	2390	2000	1550	---	16400	3800	8960	1180	6080	1280	953
31	1940	---	1980	1600	---	15700	---	7910	---	5040	1340	---
TOTAL	103390	60280	63450	53150	50130	249530	226680	107260	74440	103020	59330	30456
MEAN	3335	2009	2047	1715	1790	8049	7556	3460	2481	3323	1914	1015
MAX	6100	2530	2490	1970	1930	17200	15300	9350	6980	11100	4180	1420
MIN	1910	1010	1810	1500	1620	1830	3800	1250	1160	1080	1210	855
AC-FT	205100	119600	125900	105400	99430	494900	449600	212800	147700	204300	117700	60410

CAL YR 1986 TOTAL 2071720 MEAN 5676 MAX 31800 MIN 1010 AC-FT 4109000
WTR YR 1987 TOTAL 1181120 MEAN 3236 MAX 17200 MIN 855 AC-FT 2343000

05082500 RED RIVER OF THE NORTH AT GRAND FORKS, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1949, 1956 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
OCT											
24...	1250	2300	690	--	8.0	10.0	--	--	--	--	--
DEC											
17...	1445	1890	600	--	0.0	1.0	--	--	--	--	--
JAN											
28...	1620	1480	550	--	-2.0	0.5	--	--	--	--	--
MAR											
02...	1635	1940	--	--	2.0	0.5	--	--	--	--	--
30...	1515	16300	475	7.30	-2.0	0.0	210	69	49	21	11
a30...	1516	16300	475	7.30	-2.0	0.0	210	66	51	21	10
APR											
01...	1750	15300	700	--	-3.0	0.5	--	--	--	--	--
05...	1550	11900	545	--	15.5	4.0	--	--	--	--	--
27...	1215	4020	650	--	16.0	14.0	--	--	--	--	--
MAY											
22...	1045	2430	685	7.70	7.0	13.0	320	83	70	36	28
JUN											
25...	1035	1450	590	--	16.0	25.0	--	--	--	--	--
JUL											
27...	1135	10100	350	--	28.0	27.0	--	--	--	--	--
AUG											
27...	1210	1250	580	--	14.0	17.0	--	--	--	--	--
SEP											
25...	1435	1100	490	--	10.0	15.5	--	--	--	--	--

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
30...	10	0.3	6.3	140	83	13	0.30	12	305	280	0.41
a30...	9	0.3	6.5	148	86	9.8	0.20	12	294	290	0.40
MAY											
22...	16	0.7	6.7	240	120	16	0.20	9.1	448	430	0.61

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
MAR										
30...	2	40	80	<1	16	40	0.1	1	<1	210
a30...	3	20	60	<5	20	45	--	1	<1	130
MAY										
22...	3	60	40	<1	33	20	--	1	<1	350

a - Split sample analysis for quality assurance.

05083600 MIDDLE BRANCH FOREST RIVER NEAR WHITMAN, ND

LOCATION.--Lat 48°14'50", long 98°07'00", in SE¼NW¼ sec.16, T.155 N., R.58 W., Walsh County, Hydrologic Unit 09020308, 150 ft downstream from bridge on State Highway 35, and 6 mi north of Whitman.

DRAINAGE AREA.--47.7 mi^2, of which about 9 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1960 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,510 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Estimated daily discharges: Nov. 8 to Apr. 7. Records good except those for period with ice effect, Nov. 8 to Apr. 7, which are fair.

AVERAGE DISCHARGE.--27 years, 2.99 ft^3/s, 2,170 acre-ft/yr; median of yearly mean discharges, 2.2 ft^3/s, 1,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 984 ft^3/s, May 19, 1974, gage height, 7.11 ft; maximum gage height, 7.96 ft Apr. 4, 1987; no flow for many months each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 654 ft^3/s, Apr. 7, gage height, 6.85 ft; maximum gage height, 7.96 ft, Apr. 4, backwater from ice; only peak discharge greater than base discharge of 70 ft^3/s; no flow for several months.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.01	.00	.08	.00	.00	.00	.00	1.6	.52	.00	.20	.00
2	.22	.00	.07	.00	.00	.00	5.0	1.4	.44	.00	.17	.00
3	.18	.00	.06	.00	.00	.00	10	1.3	.38	.00	.13	.00
4	.13	.00	.06	.00	.00	.00	15	1.1	.33	.00	.10	.00
5	.16	.00	.05	.00	.00	.00	130	1.1	.26	.00	.07	.00
6	.16	.01	.05	.00	.00	.00	265	.92	.22	.00	.04	.00
7	.15	.04	.04	.00	.00	.00	458	.86	.18	.00	.00	.00
8	.13	.10	.03	.00	.00	.00	183	.81	.15	.00	.00	.00
9	.12	.05	.02	.00	.00	.00	112	.75	.13	.00	.00	.00
10	.11	.00	.02	.00	.00	.00	74	.68	.16	.00	.00	.00
11	.10	.00	.01	.00	.00	.00	46	.62	.22	.00	.00	.00
12	.08	.00	.01	.00	.00	.00	34	.57	.18	.00	.00	.00
13	.08	.00	.00	.00	.00	.00	26	.49	.15	.00	.00	.00
14	.08	.00	.00	.00	.00	.00	19	.45	.11	.00	.00	.00
15	.06	.00	.00	.00	.00	.00	15	.39	.05	.00	.06	.00
16	.06	.00	.00	.00	.00	.00	14	.36	.00	.00	.04	.00
17	.06	.00	.00	.00	.00	.00	13	.34	.00	.00	.01	.00
18	.07	.00	.00	.00	.00	.00	11	.34	.00	.00	.00	.00
19	.07	.00	.00	.00	.00	.00	9.8	.34	.00	.00	.00	.00
20	.07	.00	.00	.00	.00	.00	9.6	.39	.00	.00	.00	.00
21	.06	.00	.00	.00	.00	.00	8.4	1.0	.00	.00	.00	.00
22	.06	.00	.00	.00	.00	.00	6.1	.78	.00	.10	.00	.00
23	.04	.00	.00	.00	.00	.00	4.4	.68	.00	.24	.00	.00
24	.03	.00	.00	.00	.00	.00	3.7	.80	.00	.16	.00	.00
25	.03	.00	.00	.00	.00	.00	3.5	.73	.00	.16	.00	.00
26	.03	.00	.00	.00	.00	.00	3.2	.80	.00	.41	.00	.00
27	.03	.05	.00	.00	.00	.00	2.7	.96	.00	.40	.00	.00
28	.01	.10	.00	.00	.00	.00	2.4	.99	.00	.30	.00	.00
29	.01	.10	.00	.00	---	.00	2.1	.77	.00	.32	.00	.00
30	.02	.09	.00	.00	---	.00	1.8	.71	.00	.30	.00	.00
31	.01	---	.00	.00	---	.00	---	.61	---	.27	.00	---
TOTAL	2.43	.54	.50	.00	.00	.00	1487.70	23.64	3.48	2.66	.82	.00
MEAN	.08	.02	.02	.00	.00	.00	49.6	.76	.12	.09	.03	.00
MAX	.22	.10	.08	.00	.00	.00	458	1.6	.52	.41	.20	.00
MIN	.01	.00	.00	.00	.00	.00	.00	.34	.00	.00	.00	.00
AC-FT	4.8	1.1	.99	.0	.0	.0	2950	47	6.9	5.3	1.6	.0

CAL YR 1986 TOTAL 854.00 MEAN 2.34 MAX 59 MIN .00 AC-FT 1690
WTR YR 1987 TOTAL 1521.76 MEAN 4.17 MAX 458 MIN .00 AC-FT 3020

05083600 MIDDLE BRANCH FOREST RIVER NEAR WHITMAN, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
OCT											
06...	1240	0.16	2500	--	17.0	13.0	--	--	--	--	--
APR											
08...	1305	176	504	7.95	21.5	11.0	180	74	44	18	31
a08...	1306	176	504	7.95	21.5	11.0	190	83	45	18	31
JUN											
01...	1535	0.47	3000	--	20.0	21.5	--	--	--	--	--
JUL											
30...	1535	0.34	2900	7.50	27.0	24.5	1100	830	200	140	340

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
08...	26	1	7.1	110	130	13	0.20	19	333	330	0.45
a08...	26	1	7.2	104	130	10	0.30	18	335	320	0.46
JUL											
30...	40	5	16	250	1400	87	0.20	26	2460	2400	3.3

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR										
08...	3	50	40	<1	20	120	0.1	<1	1	200
a08...	3	30	24	<5	24	130	--	1	<1	180
JUL										
30...	4	170	40	1	150	280	0.2	3	5	1100

a - Split sample analysis for quality assurance.

05084000 FOREST RIVER NEAR FORDVILLE, ND

LOCATION.--Lat 48°11'50", long 97°43'49", on line between secs.32 and 33, T.155 N., R.55 W., Walsh County, Hydrologic Unit 09020308, on right bank 50 ft upstream from highway bridge, 0.5 mi downstream from South Branch, and 3 mi southeast of Fordville.

DRAINAGE AREA.--456 mi^2, of which about 120 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1940 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,035 ft above National Geodetic Vertical Datum of 1929, from topographic map. Prior to July 21, 1951, nonrecording gage at site 50 ft downstream at same datum.

REMARKS.--Estimated daily discharges: Nov. 8 to Mar. 24. Records good except those for period with ice effect, Nov. 8 to Mar. 24, which are fair. Some regulation of high flows by temporary retention in several retarding basins above station. Retarding basins have a combined capacity of about 14,000 acre-ft.

AVERAGE DISCHARGE.--47 years, 38.6 ft^3/s, 27,970 acre-ft/yr; median of yearly mean discharges, 36 ft^3/s, 26,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,400 ft^3/s, Apr. 18, 1950, gage height, 14.48 ft, from flood-mark, from rating curve extended above 5,600 ft^3/s on basis of contracted opening and slope-area measurements of peak flow; no flow Apr. 1-13, Sept. 3, 1940.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 24	2200	773	[a]4.86	Apr 5	0945	*1,410	*6.00

Minimum daily, 6.7 ft^3/s, Aug. 13.
a - Backwater from ice

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	12	11	8.5	11	12	595	95	37	16	15	9.4
2	17	12	11	8.5	11	12	640	88	35	15	14	8.7
3	17	13	11	8.5	11	12	592	83	32	14	13	8.9
4	17	13	10	8.5	11	12	823	81	29	13	12	9.2
5	16	13	10	8.8	11	13	1200	79	27	12	12	9.0
6	16	13	9.5	8.8	12	13	1150	84	26	12	11	9.9
7	16	12	9.5	8.8	12	13	888	97	24	12	9.9	9.8
8	16	12	9.5	8.8	13	13	778	90	24	11	10	10
9	16	12	9.0	8.8	13	12	707	73	24	11	8.2	11
10	15	11	8.2	8.8	13	12	641	43	26	16	7.5	12
11	15	11	8.2	9.0	13	12	583	39	33	14	7.6	12
12	14	11	8.2	9.5	13	12	539	36	29	14	6.9	12
13	15	11	8.0	10	13	12	512	34	26	14	6.7	13
14	15	11	8.0	11	13	12	495	33	24	13	6.9	13
15	14	11	8.0	11	12	13	479	30	22	13	9.1	12
16	26	11	8.0	11	12	13	462	26	21	12	9.2	12
17	46	11	8.2	10	12	14	444	22	24	12	8.8	11
18	37	10	8.2	10	12	14	418	22	28	14	8.6	12
19	16	10	8.2	10	12	15	382	21	23	22	8.0	12
20	10	10	8.2	10	12	15	350	23	21	20	7.9	11
21	8.9	10	8.2	10	12	30	320	35	23	19	7.6	11
22	8.5	10	8.2	10	12	127	291	38	21	50	7.2	11
23	8.7	10	8.2	10	12	224	264	37	23	109	7.2	11
24	12	10	8.5	9.5	12	686	230	39	21	111	7.0	11
25	13	11	8.5	9.5	12	436	206	42	19	103	9.5	9.9
26	13	11	8.5	9.5	12	290	182	46	17	95	11	9.7
27	13	11	8.5	10	12	452	157	51	16	81	11	10
28	12	11	8.5	10	12	327	135	51	15	73	11	10
29	12	11	8.5	10	---	276	115	51	16	24	10	10
30	13	11	8.5	10	---	238	104	46	15	17	9.6	10
31	13	---	8.5	11	---	206	---	41	---	16	9.3	---
TOTAL	495.1	336	272.5	297.8	338	3548	14682	1576	721	978	292.7	321.5
MEAN	16.0	11.2	8.79	9.61	12.1	114	489	50.8	24.0	31.5	9.44	10.7
MAX	46	13	11	11	13	686	1200	97	37	111	15	13
MIN	8.5	10	8.0	8.5	11	12	104	21	15	11	6.7	8.7
AC-FT	982	666	541	591	670	7040	29120	3130	1430	1940	581	638

CAL YR 1986 TOTAL 14821.9 MEAN 40.6 MAX 1150 MIN 4.2 AC-FT 29400
WTR YR 1987 TOTAL 23858.6 MEAN 65.4 MAX 1200 MIN 6.7 AC-FT 47320

05084000 FOREST RIVER NEAR FORDVILLE, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
OCT											
03...	1350	17	740	--	8.0	10.0	--	--	--	--	--
NOV											
25...	1205	12	990	--	3.0	0.5	--	--	--	--	--
JAN											
13...	1305	10	880	--	3.5	2.0	--	--	--	--	--
FEB											
12...	1605	12	--	--	2.0	0.5	--	--	--	--	--
APR											
09...	1110	715	563	8.14	13.0	6.0	200	67	46	20	41
JUN											
03...	1630	31	--	--	18.0	--	--	--	--	--	--
JUL											
24...	1410	113	790	--	22.0	23.0	--	--	--	--	--
AUG											
31...	1635	9.4	750	8.10	24.0	18.5	330	91	78	33	37

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
09...	30	1	6.0	130	150	13	0.20	17	372	370	0.51
AUG											
31...	19	0.9	5.9	240	170	13	0.20	15	523	510	0.71

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR										
09...	2	50	40	<1	22	260	0.1	<1	1	190
AUG										
31...	4	40	30	<1	31	60	0.2	2	1	280

05085000 FOREST RIVER AT MINTO, ND

LOCATION.--Lat 48°16'10", long 97°22'10", in SE¼ sec.31, T.156 N., R.52 W., Walsh County, Hydrologic Unit 09020308, on right bank 30 ft upstream from dam in Minto, 150 ft upstream from Burlington Northern Railway bridge, and 900 ft east of U.S. Highway 81.

DRAINAGE AREA.--740 mi^2, of which about 120 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1944 to current year.

REVISED RECORDS.--WSP 1438: 1948-50. WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 806.95 ft above National Geodetic Vertical Datum of 1929. Prior to July 15, 1954, nonrecording gage at site 400 ft upstream at same datum.

REMARKS.--Estimated daily discharges: Nov. 9 to Apr. 8. Records good except those for period with ice effect, Nov. 9 to Apr. 8, which are fair. Occasionally during high stages, particularly when the channel is filled with snow, overflow occurs 0.5 mi below the municipality of Forest River and bypasses the gage 3 mi south of Minto and flows into Lake Ardoch. Bypass flow is not included in computation of discharge record for station at Minto.

AVERAGE DISCHARGE.--43 years, 50.6 ft^3/s, 36,660 acre-ft/yr; median of yearly mean discharges, 47 ft^3/s, 34,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,600 ft^3/s, Apr. 18, 1950, gage height, 11.80 ft from flood-marks, from rating curve extended above 7,200 ft^3/s, on basis of contracted opening measurement of peak flow; no flow at times each year 1945-47, 1953-55, 1959-64.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Apr. 4	----	*2360	a*6.91	No other peak greater than base discharge.			

Minimum daily discharge, 2.6 ft^3/s, Nov. 13.
a - Backwater from ice

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	18	11	7.5	9.1	7.4	790	164	58	14	35	8.9
2	14	16	11	7.5	8.8	7.4	1340	149	53	13	29	8.0
3	14	18	11	7.5	8.5	7.4	1810	134	49	13	25	7.4
4	17	14	11	7.8	8.3	7.4	2270	124	46	11	23	7.5
5	18	21	11	8.0	8.1	7.5	2140	114	45	11	20	7.4
6	19	23	11	8.0	7.7	7.5	2020	109	41	10	20	7.6
7	19	19	11	8.0	7.5	8.0	1700	103	38	10	22	8.3
8	19	13	11	8.0	7.5	10	1300	121	34	9.4	19	8.3
9	19	2.7	11	8.5	7.3	20	1120	120	32	8.8	18	8.5
10	19	3.3	11	8.5	7.3	15	1000	111	32	9.7	17	7.9
11	18	4.0	10	9.0	7.2	9.0	890	88	32	11	16	7.5
12	18	3.6	9.1	9.5	7.1	8.5	802	74	33	12	14	7.5
13	18	2.6	8.8	10	7.0	8.0	737	68	34	12	13	8.4
14	18	3.0	8.5	11	7.0	8.0	693	64	31	11	11	8.6
15	17	5.2	7.8	13	7.0	8.0	665	59	27	10	12	8.8
16	17	12	7.5	13	6.8	8.5	642	60	24	10	12	8.9
17	16	11	7.5	12	6.8	8.5	617	58	23	9.4	14	9.1
18	27	12	7.2	12	6.8	8.5	592	54	23	10	13	8.6
19	52	13	6.8	11	6.8	9.0	563	47	21	29	13	5.9
20	48	10	6.8	11	6.8	9.5	518	47	21	27	11	6.2
21	30	9.9	6.8	11	6.8	10	478	53	18	22	11	6.7
22	23	10	6.8	11	6.7	20	446	55	17	33	9.6	6.7
23	18	9.8	6.8	10	6.8	33	409	56	18	36	9.1	7.2
24	15	9.9	7.1	10	6.8	70	376	59	18	31	8.9	6.6
25	15	10	7.5	9.5	6.8	295	339	61	18	54	9.5	6.8
26	15	9.9	7.5	9.5	6.8	380	307	62	16	62	10	6.6
27	17	10	7.5	9.5	7.1	600	271	66	15	76	11	6.7
28	16	11	7.5	9.5	7.4	450	237	66	15	81	10	7.5
29	17	11	7.5	9.5	---	540	206	66	14	80	10	7.9
30	18	11	7.5	9.5	---	650	181	65	13	73	9.6	8.3
31	19	---	7.5	9.4	---	560	---	62	---	47	9.5	---
TOTAL	623	326.9	270.0	299.2	204.6	3791.1	25459	2539	859	846.3	465.2	230.3
MEAN	20.1	10.9	8.71	9.65	7.31	122	849	81.9	28.6	27.3	15.0	7.68
MAX	52	23	11	13	9.1	650	2270	164	58	81	35	9.1
MIN	13	2.6	6.8	7.5	6.7	7.4	181	47	13	8.8	8.9	5.9
AC-FT	1240	648	536	593	406	7520	50500	5040	1700	1680	923	457

CAL YR 1986 TOTAL 16887.6 MEAN 46.3 MAX 540 MIN 2.6 AC-FT 33500
WTR YR 1987 TOTAL 35913.5 MEAN 98.4 MAX 2270 MIN 2.6 AC-FT 71230

05085000 FOREST RIVER AT MINTO, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
NOV											
21...	1215	10	1290	--	0.0	0.0	--	--	--	--	--
JAN											
13...	1045	10	1090	--	0.0	1.0	--	--	--	--	--
FEB											
13...	0955	7.0	1030	--	-3.0	0.5	--	--	--	--	--
APR											
05...	1540	2090	405	7.50	15.0	3.0	150	38	36	14	18
09...	1500	1080	593	--	14.5	9.0	--	--	--	--	--
JUN											
04...	1305	45	960	--	17.0	18.0	--	--	--	--	--
JUL											
28...	1100	81	835	--	29.0	27.0	--	--	--	--	--
SEP											
09...	1335	8.9	810	7.70	22.0	18.0	350	120	77	37	46
a09...	1336	8.9	810	7.70	22.0	18.0	350	120	81	37	47

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
05...	20	0.7	7.1	110	86	11	0.10	16	220	250	0.30
SEP											
09...	22	1	6.8	230	170	29	0.20	10	550	520	0.75
a09...	22	1	7.1	234	180	--	0.30	12	--	--	--

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR										
05...	3	30	90	<1	17	170	0.4	<1	<1	190
SEP										
09...	2	60	10	<1	36	<10	0.2	2	<1	340
a09...	3	80	220	<5	31	260	--	3	<1	290

a - Split sample analysis for quality assurance.

05088500 HOMME RESERVOIR NEAR PARK RIVER, ND

LOCATION.--Lat 48°24'20", long 97°47'10", in SE¼NW¼ sec.19, T.157 N., R.55 W., Walsh County, Hydrologic Unit 09020310, at Homme Dam on South Branch Park River, and 2 mi west of town of Park River.

DRAINAGE AREA.--226 mi^2.

MONTHEND-ELEVATION AND CONTENTS RECORDS

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

REVISED RECORDS.--WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929.

REMARKS.--Reservoir is formed by an earth-filled dam, 865 ft long; storage began in September 1949, dam completed in October 1950. Useable capacity between invert of outlet, elevation, 1,048.0 ft, and crest of spillway, elevation, 1,080.0 ft, is 3,550 acre-ft. Dead storage is 100 acre-ft. Low flows are controlled by two sluice gates 3 x 5 ft. The spillway, which is 150 ft long, is uncontrolled. The records herein represent total contents. The reservoir is operated for flood control, water supply, and pollution abatement during low-flow periods.

COOPERATION.--Records furnished by U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 4,710 acre-ft, Apr. 20, 1979, elevation, 1,084.58 ft; minimum since first reaching spillway level, 184 acre-ft, Feb. 8, 1952, elevation, 1,051.22 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 3,403 acre-ft, Apr. 06, elevation, 1,082.78 ft; minimum, 1,216 acre-ft, Mar. 23, elevation, 1,068.86 ft.

MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	1,078.00	2,490	
Oct. 31	1,078.25	2,532	+42
Nov. 30	1,078.53	2,580	+48
Dec. 31	1,078.15	2,515	-65
CAL YR 1986	--	--	-172
Jan. 31	1,076.40	2,218	-297
Feb. 28	1,075.00	1,990	-228
Mar. 31	1,079.30	2,714	+724
Apr. 30	1,080.42	2,924	+210
May 31	1,080.12	2,864	-60
June 30	1,079.11	2,679	-185
July 31	1,078.09	2,505	-174
Aug. 31	1,077.26	2,364	-141
Sept. 30	1,076.40	2,218	-146
WTR YR 1987	--	--	-270

05089000 SOUTH BRANCH PARK RIVER BELOW HOMME DAM, ND

LOCATION.--Lat 48°24'07", long 97°46'55", in SE¼ sec.19, T.157 N., R.55 W., Walsh County, Hydrologic Unit 09020310, on right bank 0.5 mi downstream from Homme Dam, and 2 mi west of town of Park River.

DRAINAGE AREA.--226 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1949 to current year. Monthly discharge only for October and November 1949, published in WSP 1308.

REVISED RECORDS.--WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,000.00 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Nov. 11 to Mar. 31, Sept. 11-14, and Sept. 27-30. Records good except those for periods of estimated daily discharges, which are fair. Flow regulated by Homme Reservoir (station 05088500).

AVERAGE DISCHARGE.--38 years, 26.3 ft^3/s, 19,050 acre-ft/yr; median of yearly mean discharges, 23 ft^3/s, 16,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 13,000 ft^3/s, Apr. 24, 1950, gage height, 37.52 ft, from rating curve extended above 5,500 ft^3/s, result of failure of emergency embankment at site of Homme Dam; no flow Oct. 1 to Dec. 3, 1949, Oct. 1-4, 1969, Sept. 21, 1970, July 1, 1974.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,000 ft^3/s, Apr. 6, gage height, 28.36 ft; minimum daily, 0.17 ft^3/s, Nov. 13.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.66	.80	.92	6.8	6.0	6.8	110	19	11	6.6	7.0	.60
2	1.3	.77	.97	6.8	6.0	6.8	235	18	12	6.2	7.0	.57
3	1.0	.78	.95	6.8	6.0	6.7	319	18	6.5	6.1	7.0	.61
4	.85	.70	.95	6.8	6.0	6.8	596	16	6.1	5.9	6.8	.69
5	.73	.70	.93	6.8	6.2	7.4	1570	16	6.6	6.0	6.8	.73
6	.73	.73	1.0	6.8	6.4	19	1900	16	6.9	6.1	6.8	.77
7	.69	.90	1.0	6.8	6.6	24	1190	14	7.4	5.9	4.4	.82
8	.67	1.0	1.0	6.8	6.8	23	820	14	7.6	5.9	1.7	.80
9	.70	.68	.99	6.8	7.0	23	605	14	7.3	6.0	1.6	.81
10	.74	.45	4.5	6.8	7.0	23	440	16	7.5	6.1	1.4	.83
11	.78	.29	13	6.8	7.0	23	365	14	8.2	6.4	1.5	.85
12	.71	.22	12	6.8	7.0	23	262	13	8.0	6.3	1.5	.87
13	.66	.17	15	6.8	6.9	23	174	15	7.7	6.3	1.5	.89
14	.68	.39	13	6.8	6.8	23	148	13	7.6	6.6	1.5	.90
15	.74	.98	8.2	6.6	6.8	22	129	11	7.7	6.4	1.4	.91
16	.76	.98	7.3	6.6	6.8	22	62	10	8.0	6.3	1.3	.90
17	.76	.92	7.0	6.6	6.8	22	82	9.9	8.7	6.4	1.3	.95
18	.73	.85	7.0	6.6	6.8	22	81	9.9	8.4	6.8	1.2	.91
19	.79	.80	7.0	6.6	6.8	21	74	9.8	8.4	6.8	1.2	.94
20	.85	.75	7.0	6.6	6.8	21	48	8.4	8.0	6.3	1.0	1.1
21	.92	.74	7.0	6.6	6.8	21	37	9.1	7.3	6.3	.90	1.1
22	.93	.78	7.0	6.6	6.8	21	33	6.6	7.0	6.8	.91	1.1
23	.97	.78	6.8	6.4	6.8	21	29	7.6	7.1	6.6	.97	1.2
24	.99	.80	6.6	6.2	6.8	21	25	11	6.7	6.6	.94	1.4
25	1.0	.87	6.6	6.0	6.8	22	24	11	6.7	6.6	.88	1.3
26	1.0	.87	6.6	5.8	6.8	28	25	13	6.8	6.6	.66	1.3
27	.84	.88	6.7	5.8	6.8	28	23	16	6.8	6.6	.55	1.2
28	.76	.88	6.8	5.8	6.8	27	22	14	6.8	6.6	.56	1.2
29	.78	.86	6.8	6.0	---	26	21	13	6.8	6.6	.64	1.1
30	.80	.89	6.8	6.0	---	25	20	10	6.8	6.8	.73	1.1
31	.82	---	6.8	6.0	---	40	---	9.3	---	7.0	.63	---
TOTAL	25.34	22.21	184.21	202.0	186.9	648.5	9469	395.6	228.4	198.5	72.27	28.45
MEAN	.82	.74	5.94	6.52	6.67	20.9	316	12.8	7.61	6.40	2.33	.95
MAX	1.3	1.0	15	6.8	7.0	40	1900	19	12	7.0	7.0	1.4
MIN	.66	.17	.92	5.8	6.0	6.7	20	6.6	6.1	5.9	.55	.57
AC-FT	50	44	365	401	371	1290	18780	785	453	394	143	56

CAL YR 1986 TOTAL 7224.10 MEAN 19.8 MAX 499 MIN .17 AC-FT 14330
WTR YR 1987 TOTAL 11661.26 MEAN 31.9 MAX 1900 MIN .17 AC-FT 23130

05089000 SOUTH BRANCH PARK RIVER BELOW HOMME DAM, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
OCT											
09...	1205	0.67	890	--	7.0	8.0	--	--	--	--	--
NOV											
20...	1510	0.73	1390	--	-6.0	0.0	--	--	--	--	--
JAN											
13...	1620	6.8	990	--	4.0	3.0	--	--	--	--	--
FEB											
12...	1255	7.0	--	--	-3.0	0.5	--	--	--	--	--
APR											
02...	1435	261	518	[a]7.74	2.0	1.0	170	47	42	15	35
10...	1500	536	474	--	10.0	8.0	--	--	--	--	--
MAY											
29...	1700	11	730	--	21.0	21.0	--	--	--	--	--
JUL											
24...	0955	6.4	750	7.20	23.0	22.0	280	100	71	26	49
SEP											
01...	1005	0.57	810	7.40	16.0	16.5	330	120	80	31	51

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
02...	30	1	7.8	120	120	13	0.20	14	330	320	0.45
JUL											
24...	26	1	9.2	180	190	14	0.20	17	498	490	0.68
SEP											
01...	25	1	9.4	210	210	16	0.30	15	566	540	0.77

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR										
02...	2	50	210	<1	26	440	0.2	<1	1	250
JUL										
24...	7	90	20	1	41	2100	0.6	1	1	360
SEP										
01...	4	60	20	<1	45	90	0.2	5	<1	410

a - Laboratory value

05090000 PARK RIVER AT GRAFTON, ND

LOCATION.--Lat 48°25'29", long 97°24'42", in NE¼ sec.13, T.157 N., R.53 W., Walsh County, Hydrologic Unit 09020310, on right bank at the upstream corner of Highway 81 bridge in Grafton, and 3.5 mi downstream from South Branch.

DRAINAGE AREA.--695 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1931 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 955: 1941. WSP 1438: 1932, 1933(M), 1936-37(M), 1939(M), 1944. WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 811.00 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 1, 1984, gage located on right bank 30 ft upstream of Wakeman Avenue bridge. Datum of gage was 807.39 ft. Prior to Sept. 30, 1940, nonrecording gage at site 30 ft downstream at same datum. Oct. 1, 1940, to Sept. 17, 1946, nonrecording gage at site 2 mi downstream above masonry dam at same datum. Sept. 18, 1946, to July 25, 1952, nonrecording gage at site 30 ft downstream at same datum.

REMARKS.--Records good except those for period with ice effect, Nov. 11 to Mar. 24, which are fair. Flow regulated by Homme Reservoir (station 05088500) and several small reservoirs.

AVERAGE DISCHARGE.--56 years, 58.0 ft^3/s, 42,020 acre-ft/yr; median of yearly mean discharges, 43 ft^3/s, 31,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,600 ft^3/s, Apr. 19, 1950, gage height, 20.13 ft, from rating curve extended above 9,000 ft^3/s; no flow at times in most years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,220 ft^3/s, Apr. 7, gage height, 13.44 ft; minimum daily discharge, 0.06 ft^3/s, Sept. 22-27, 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.3	.08	.45	.40	.35	3.0	931	95	36	7.0	11	.10
2	3.0	.08	.45	.40	.35	3.0	1110	89	30	6.2	10	.09
3	.50	.09	.40	.40	.35	3.0	1380	84	28	5.8	8.4	.09
4	.62	.08	.40	.41	.35	3.0	1720	78	26	5.6	7.2	.10
5	.70	.09	.40	.40	.35	3.0	2250	70	18	6.6	6.0	.09
6	.76	.50	.35	.45	.50	3.1	2590	62	16	7.7	7.0	.09
7	.71	.49	.35	.45	1.0	3.2	3160	57	16	7.3	8.0	.09
8	.28	1.5	.35	.45	1.5	3.6	3000	52	14	5.9	7.7	.08
9	.24	1.7	.35	.45	2.0	3.8	2780	48	13	5.4	8.4	.07
10	.33	1.5	.30	.45	2.0	3.1	2200	43	14	7.0	6.0	.08
11	.19	1.3	.30	.45	2.0	3.0	1680	38	17	6.2	4.8	.08
12	.09	1.0	.30	.50	2.0	3.0	1320	39	15	6.9	3.4	.09
13	.12	.75	.30	.50	2.0	3.0	917	34	12	6.5	3.0	.10
14	.14	.50	.30	.50	1.7	3.0	642	33	11	5.8	3.3	.09
15	.16	.35	.30	.45	1.7	3.5	534	35	9.6	5.9	7.1	.09
16	.36	.25	.30	.40	1.7	4.0	471	34	9.2	8.0	7.3	.09
17	.46	.20	.30	.35	1.7	6.0	358	30	16	6.8	7.4	.08
18	.56	.20	.30	.35	2.4	10	350	26	23	6.6	5.1	.08
19	.86	.20	.30	.30	3.0	12	339	25	13	12	3.5	.08
20	1.3	.20	.30	.30	3.0	15	296	25	9.9	11	3.7	.07
21	1.7	.20	.30	.25	3.5	22	251	34	11	5.9	3.7	.07
22	1.9	.20	.35	.25	4.0	33	226	40	12	14	2.8	.06
23	.90	.20	.35	.20	3.1	34	202	39	10	17	1.6	.06
24	1.1	.25	.35	.15	3.0	44	180	41	9.5	17	.65	.06
25	1.1	.30	.40	.15	3.0	186	160	40	8.7	14	.71	.06
26	1.4	.40	.40	.15	3.0	165	143	42	7.3	16	1.6	.06
27	1.7	.45	.40	.15	3.0	202	129	47	6.1	17	.96	.06
28	.90	.50	.40	.15	3.0	293	121	50	5.6	15	1.1	.07
29	.16	.50	.40	.20	---	525	110	50	6.2	13	.59	.07
30	.14	.45	.40	.25	---	625	100	48	6.8	11	.35	.06
31	.15	---	.40	.30	---	793	---	43	---	11	.14	---
TOTAL	23.83	14.51	10.95	10.56	55.55	3016.3	29650	1471	429.9	291.1	142.50	2.36
MEAN	.77	.48	.35	.34	1.98	97.3	988	47.5	14.3	9.39	4.60	.08
MAX	3.0	1.7	.45	.50	4.0	793	3160	95	36	17	11	.10
MIN	.09	.08	.30	.15	.35	3.0	100	25	5.6	5.4	.14	.06
AC-FT	47	29	22	21	110	5980	58810	2920	853	577	283	4.7

CAL YR 1986 TOTAL 20091.49 MEAN 55.0 MAX 812 MIN .08 AC-FT 39850
WTR YR 1987 TOTAL 35118.22 MEAN 96.2 MAX 3160 MIN .06 AC-FT 69660

05090000 PARK RIVER AT GRAFTON, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1969 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
OCT											
01...	1635	1.0	810	--	14.0	16.0	--	--	--	--	--
NOV											
13...	1615	0.75	1360	--	-17.0	0.0	--	--	--	--	--
DEC											
15...	1400	0.30	2130	--	-2.0	1.0	--	--	--	--	--
FEB											
09...	1145	2.0	--	--	1.0	0.0	--	--	--	--	--
APR											
05...	1155	2150	455	[a]7.52	13.0	2.5	170	0	43	15	23
07...	1625	3170	441	--	20.5	5.5	--	--	--	--	--
JUN											
15...	1215	8.8	1820	--	27.0	23.0	--	--	--	--	--
JUL											
23...	1540	22	910	--	25.0	22.0	--	--	--	--	--
SEP											
04...	1325	0.10	1180	7.60	22.0	19.5	390	130	84	43	110

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
05...	22	0.8	7.7	1110	96	15	0.20	17	273	280	0.37
SEP											
04...	37	3	11	260	240	94	0.40	19	793	760	1.1

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR										
05...	5	50	110	<1	22	250	0.1	<1	<1	250
SEP										
04...	6	180	50	<1	62	60	0.9	6	<1	480

a - Laboratory value

05092000 RED RIVER OF THE NORTH AT DRAYTON, ND

LOCATION.--Lat 48°34'20", long 97°08'50", in SE¼SE¼SE¼ sec.24, T.159 N., R.51 W., Pembina County, Hydrologic Unit 09020311, on downstream end of east pier of interstate highway bridge, 1.5 mi northeast of Drayton, and at mile 206.7.

DRAINAGE AREA.--34,800 mi^2, approximately, includes 3,800 mi^2 in closed basins.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1936 to June 1937, April 1941 to current year (fragmentary prior to April 1949).

REVISED RECORDS.--WSP 1388: 1949-50. WSP 1728: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 755.00 ft above National Geodetic Vertical Datum of 1929 (Minnesota highway benchmark). Prior to Nov. 30, 1954, nonrecording gage at site 1.5 mi upstream at datum 1.59 ft higher.

REMARKS.--Estimated daily discharges: Dec. 14-19 and Jan. 11 to Apr. 5. Records good except those for period of estimated daily discharges, Nov. 8 to Apr. 5, which are fair. Some regulation by reservoirs on tributaries.

AVERAGE DISCHARGE.--38 years (water years 1950-87), 3,907 ft^3/s, 2,831,000 acre-ft/yr; median of yearly mean discharges, 3,870 ft^3/s, 2,800,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 92,900 ft^3/s, Apr. 28, 1979, gage height, 43.66 ft; minimum observed, 7.7 ft^3/s, Oct. 16, 1936, gage height, 1.75 ft, former site and datum.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of April 1897 reached a stage of about 41 ft, at site and datum in use prior to Nov. 30, 1954.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 27,600 ft^3/s, Apr. 7, gage height, 36.61 ft; minimum daily, 960 ft^3/s, Sept. 15-18.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5860	2040	2620	2250	1560	1710	22200	4000	9800	1080	6050	1310
2	6060	1990	2670	2210	1560	1710	22800	3800	8700	1060	5300	1370
3	6000	1930	2710	2210	1560	1710	23500	3540	7700	1050	4750	1410
4	5670	1920	2740	2220	1560	1710	24300	3240	6800	1020	4250	1400
5	5170	1910	2750	2230	1560	1740	25700	2970	5900	1010	3740	1360
6	4630	1910	2770	2180	1570	1800	27000	2720	4880	997	3420	1270
7	4170	1920	2760	2070	1580	1910	27500	2570	4030	995	3300	1170
8	3880	2040	2710	1980	1590	2060	27400	2400	3420	1100	3120	1100
9	3660	1360	2550	1970	1650	2800	26500	2220	3020	1250	2970	1050
10	3550	1320	2390	1970	1730	4600	24900	2050	2750	1360	2840	999
11	3460	1620	2300	1960	1730	6300	23000	1890	2570	1370	2640	999
12	3410	1750	2180	1960	1720	7000	21000	1750	2360	1370	2440	979
13	3390	1630	2190	1950	1720	7380	18800	1560	2170	1300	2270	969
14	3310	1510	2180	1940	1720	7500	16700	1480	2040	1230	2130	969
15	3270	1540	2170	1850	1720	7550	14800	1390	1960	1150	2080	960
16	3230	1630	2160	1820	1720	7430	13300	1310	1880	1080	1980	960
17	3220	1750	2150	1800	1720	7300	11800	1270	1840	1040	1910	960
18	3220	1890	2140	1780	1720	6600	10500	1250	1760	1050	1870	960
19	3170	2050	2130	1720	1720	6450	9400	1220	1680	1170	1940	989
20	3100	2150	2110	1660	1720	6300	8450	1230	1590	1180	1940	1020
21	3080	2230	2060	1650	1720	6300	7600	1330	1520	1140	1850	1060
22	3020	2320	2080	1640	1720	7000	6900	1570	1410	1180	1760	1080
23	2880	2400	2100	1610	1720	8500	6300	1850	1330	1310	1680	1080
24	2680	2510	2130	1600	1720	10200	5800	2660	1290	3460	1610	1070
25	2490	2620	2150	1590	1710	12000	5600	4910	1250	6450	1570	1070
26	2320	2660	2180	1570	1710	13900	5100	6800	1230	8200	1450	1080
27	2190	2650	2260	1560	1710	15600	4950	7300	1220	9400	1390	1070
28	2110	2630	2290	1560	1710	17000	4700	7500	1180	10000	1370	1070
29	2100	2620	2320	1560	---	18500	4530	8300	1130	9600	1320	1060
30	2070	2620	2300	1560	---	19500	4150	9750	1100	8200	1310	1040
31	2020	---	2270	1560	---	21000	---	10400	---	7000	1320	---
TOTAL	108390	61120	72520	57190	46850	241060	455180	106230	89510	88802	77570	32884
MEAN	3496	2037	2339	1845	1673	7776	15170	3427	2984	2865	2502	1096
MAX	6060	2660	2770	2250	1730	21000	27500	10400	9800	10000	6050	1410
MIN	2020	1320	2060	1560	1560	1710	4150	1220	1100	995	1310	960
AC-FT	215000	121200	143800	113400	92930	478100	902800	210700	177500	176100	153900	65230

CAL YR 1986 TOTAL 2201320 MEAN 6031 MAX 29500 MIN 1320 AC-FT 4366000
WTR YR 1987 TOTAL 1437310 MEAN 3938 MAX 27500 MIN 960 AC-FT 2851000

05092000 RED RIVER OF THE NORTH AT DRAYTON, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
OCT											
02...	1655	6070	550	--	10.0	12.0	--	--	--	--	--
16...	1350	4960	565	--	3.0	5.0	--	--	--	--	--
JAN											
05...	1645	2160	--	--	0.0	0.5	--	--	--	--	--
FEB											
09...	1610	1690	--	--	1.0	--	--	--	--	--	--
APR											
07...	1200	27500	603	8.00	15.5	3.5	230	90	54	23	31
14...	1430	16300	645	--	14.0	9.0	--	--	--	--	--
MAY											
26...	1700	6460	--	--	18.0	18.0	--	--	--	--	--
JUL											
20...	1545	1200	675	--	30.0	26.0	--	--	--	--	--
28...	1640	10200	--	--	30.0	--	--	--	--	--	--
SEP											
03...	1255	1400	725	7.80	20.0	18.0	290	65	63	31	44

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
07...	22	0.9	8.5	140	120	33	0.20	15	385	370	0.52
SEP											
03...	25	1	6.5	220	100	43	0.20	12	455	430	0.62

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR										
07...	5	50	40	1	27	40	0.3	<1	1	250
SEP										
03...	4	80	20	<1	33	10	0.3	2	<1	300

05098700 HIDDEN ISLAND COULEE NEAR HANSBORO, ND
(International gaging station)

LOCATION.--Lat 48°57'10", long 99°25'35", in SE¼SW¼ sec.11, T.163 N., R.68 W., Towner County, Hydrologic Unit 09020313, on right bank 400 ft downstream from bridge on county highway, and 2.5 mi west of Hansboro.

DRAINAGE AREA.--38 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1961 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,615 ft above National Geodetic Vertical Datum of 1929 from topographic map. Prior to May 20, 1962, nonrecording gage 400 ft upstream at same datum.

REMARKS.--Estimated daily discharges: Mar. 21 to Apr. 5. Records good except those for period with ice effect, Mar. 21 to Apr. 5, which are poor.

COOPERATION.--This station is one of the international gaging stations maintained by the United States under agreement with Canada.

AVERAGE DISCHARGE.--26 years, 3.43 ft^3/s, 2,490 acre-ft/yr; median of yearly mean discharges, 2.3 ft^3/s, 1,670 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 1,200 ft^3/s Apr. 23, 1979, gage height, 10.50 ft, from floodmark, backwater from ice; no flow for several months each year.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 29	----	----	a*8.70	Aug. 16	1500	105	7.15
Apr. 5	2015	a*281	8.14				

No flow for several months.
a - Backwater from ice and/or snow

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	30	.49	.00	.00	.00	.08
2	.00	.00	.00	.00	.00	.00	32	.38	.00	.00	.00	.05
3	.00	.00	.00	.00	.00	.00	40	.29	.00	.00	.00	.04
4	.00	.00	.00	.00	.00	.00	65	.34	.00	.00	.00	.03
5	.00	.00	.00	.00	.00	.00	165	.33	.00	.00	.00	.02
6	.00	.00	.00	.00	.00	.00	139	.24	.00	.00	.00	.02
7	.00	.00	.00	.00	.00	.00	57	.17	.00	.00	.00	.01
8	.00	.00	.00	.00	.00	.00	37	.13	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	28	.09	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	21	.07	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	18	.04	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	16	.03	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	14	.03	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	11	.02	.00	.00	1.5	.00
15	.00	.00	.00	.00	.00	.00	8.6	.01	.00	.00	16	.00
16	.00	.00	.00	.00	.00	.00	6.4	.00	.00	.00	59	.00
17	.00	.00	.00	.00	.00	.00	4.9	.00	.00	.00	59	.00
18	.00	.00	.00	.00	.00	.00	3.5	.00	.00	.00	33	.00
19	.00	.00	.00	.00	.00	.00	2.5	.00	.00	.00	20	.00
20	.00	.00	.00	.00	.00	.00	.83	.00	.00	.00	16	.00
21	.00	.00	.00	.00	.00	2.0	.45	.00	.00	.00	8.3	.00
22	.00	.00	.00	.00	.00	5.0	.48	.01	.00	.00	4.7	.00
23	.00	.00	.00	.00	.00	10	.88	.01	.00	.00	3.0	.00
24	.00	.00	.00	.00	.00	20	.90	.00	.00	.00	2.1	.00
25	.00	.00	.00	.00	.00	15	.91	.00	.00	.00	1.4	.00
26	.00	.00	.00	.00	.00	20	.96	.00	.00	.00	.94	.00
27	.00	.00	.00	.00	.00	25	.83	.00	.00	.00	.68	.00
28	.00	.00	.00	.00	.00	20	.80	.01	.00	.00	.44	.00
29	.00	.00	.00	.00	---	18	.68	.00	.00	.00	.29	.00
30	.00	.00	.00	.00	---	16	.57	.00	.00	.00	.19	.00
31	.00	---	.00	.00	---	25	---	.00	---	.00	.12	---
TOTAL	.00	.00	.00	.00	.00	176.00	707.19	2.69	.00	.00	226.66	.25
MEAN	.00	.00	.00	.00	.00	5.68	23.6	.09	.00	.00	7.31	.01
MAX	.00	.00	.00	.00	.00	25	165	.49	.00	.00	59	.08
MIN	.00	.00	.00	.00	.00	.00	.45	.00	.00	.00	.00	.00
AC-FT	.0	.0	.0	.0	.0	349	1400	5.3	.0	.0	450	.5

CAL YR 1986 TOTAL 780.29 MEAN 2.14 MAX 89 MIN .00 AC-FT 1550
WTR YR 1987 TOTAL 1112.79 MEAN 3.05 MAX 165 MIN .00 AC-FT 2210

05098700 HIDDEN ISLAND COULEE NEAR HANSBORO, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
APR											
07...	1135	53	518	7.60	15.0	5.0	200	82	43	23	22
14...	1340	11	--	--	16.0	11.0	--	--	--	--	--
MAY											
28...	1430	0.01	1240	7.40	19.0	19.0	630	290	140	67	60
SEP											
02...	1535	0.05	680	--	22.0	18.0	--	--	--	--	--

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
07...	19	0.7	6.2	120	140	7.3	0.10	15	308	330	0.42
MAY											
28...	17	1	9.1	340	390	14	0.10	13	914	900	1.2

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR										
07...	2	40	70	<1	23	50	0.3	<1	1	220
MAY										
28...	4	70	40	<1	80	390	0.9	<1	<1	540

05098800 CYPRESS CREEK NEAR SARLES, ND
(International gaging station)

LOCATION.--Lat 48°56'35", long 98°57'05", in SW¼SE¼ sec.9, T.163 N., R.64 W., Cavalier County, Hydrologic Unit 09020313, on right bank 150 ft downstream from twin multiplate culverts on county highway, and 2.5 mi east of Sarles.

DRAINAGE AREA.--71 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1961 to current year. Prior to October 1973, published as Long River near Sarles.

GAGE.--Water-stage recorder. Elevation of gage is 1,545 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Estimated daily discharges: Apr. 1-6 and July 22-29. Records good except those for periods of estimated daily discharges, Apr. 1-6 and July 22-29, which are fair.

COOPERATION.--This station is one of the international gaging stations maintained by the United States under agreement with Canada.

AVERAGE DISCHARGE.--26 years, 5.90 ft^3/s, 4,270 acre-ft/yr; median of yearly mean discharges, 4.9 ft^3/s, 3,550 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge observed, 2,000 ft^3/s, Apr. 21, 1979, gage height, 10.35 ft, backwater from ice and snow; no flow for several months each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 605 ft^3/s, Apr. 5, gage height, 7.20 ft, backwater from ice; only peak above base of 50 ft^3/s; no flow for several months.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	.21	.00	.00	.00	.43
2	.00	.00	.00	.00	.00	.00	.00	.15	.00	.00	.00	.32
3	.00	.00	.00	.00	.00	.00	2.0	.12	.00	.00	.00	.26
4	.00	.00	.00	.00	.00	.00	25	.12	.00	.00	.00	.25
5	.00	.00	.00	.00	.00	.00	490	.11	.00	.00	.00	.23
6	.00	.00	.00	.00	.00	.00	470	.08	.00	.00	.00	.21
7	.00	.00	.00	.00	.00	.00	385	.05	.00	.00	.00	.21
8	.00	.00	.00	.00	.00	.00	234	.02	.00	.00	.00	.19
9	.00	.00	.00	.00	.00	.00	148	.00	.00	.00	.00	.19
10	.00	.00	.00	.00	.00	.00	108	.00	.00	.00	.00	.18
11	.00	.00	.00	.00	.00	.00	80	.00	.00	.00	.00	.17
12	.00	.00	.00	.00	.00	.00	56	.00	.00	.00	.00	.17
13	.00	.00	.00	.00	.00	.00	34	.00	.00	.00	.00	.17
14	.00	.00	.00	.00	.00	.00	21	.00	.00	.00	.04	.17
15	.00	.00	.00	.00	.00	.00	15	.00	.00	.00	.23	.16
16	.00	.00	.00	.00	.00	.00	8.2	.00	.00	.00	.13	.15
17	.00	.00	.00	.00	.00	.00	4.5	.00	.00	.00	.20	.15
18	.00	.00	.00	.00	.00	.00	3.4	.00	.00	.00	.31	.14
19	.00	.00	.00	.00	.00	.00	3.2	.00	.00	.00	1.1	.14
20	.00	.00	.00	.00	.00	.00	2.9	.00	.00	.00	.64	.13
21	.00	.00	.00	.00	.00	.00	2.1	.00	.00	.00	.49	.12
22	.00	.00	.00	.00	.00	.00	1.4	.00	.00	.00	1.3	.11
23	.00	.00	.00	.00	.00	.00	1.1	.00	.00	.00	2.2	.11
24	.00	.00	.00	.00	.00	.00	1.1	.00	.00	.00	2.3	.10
25	.00	.00	.00	.00	.00	.00	.97	.00	.00	.00	2.1	.08
26	.00	.00	.00	.00	.00	.00	.72	.00	.00	.00	3.3	.07
27	.00	.00	.00	.00	.00	.00	.58	.00	.00	.00	3.1	.06
28	.00	.00	.00	.00	.00	.00	.46	.00	.00	.00	1.9	.07
29	.00	.00	.00	.00	---	.00	.38	.00	.00	.00	1.0	.08
30	.00	.00	.00	.00	---	.00	.31	.00	.00	.00	.68	.07
31	.00	.00	.00	.00	---	.00	---	.00	---	.00	.51	---
TOTAL	.00	.00	.00	.00	.00	.00	2099.32	.86	.00	.00	21.53	4.89
MEAN	.00	.00	.00	.00	.00	.00	70.0	.03	.00	.00	.69	.16
MAX	.00	.00	.00	.00	.00	.00	490	.21	.00	.00	3.3	.43
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.06
AC-FT	.0	.0	.0	.0	.0	.0	4160	1.7	.0	.0	43	9.7

CAL YR 1986 TOTAL 1861.91 MEAN 5.10 MAX 127 MIN .00 AC-FT 3690
WTR YR 1987 TOTAL 2126.58 MEAN 5.83 MAX 490 MIN .00 AC-FT 4220

05098800 CYPRESS CREEK NEAR SARLES, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
APR											
07...	1515	335	402	7.90	14.0	3.0	150	60	37	14	22
14...	1515	21	--	--	18.0	11.0	--	--	--	--	--
SEP											
02...	1415	0.27	610	7.10	20.0	17.0	260	30	66	23	30

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
07...	23	0.8	5.3	90	100	6.8	0.10	16	237	260	0.32
SEP											
02...	19	0.8	8.3	230	89	9.2	0.30	42	436	400	0.59

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR										
07...	4	20	60	<1	14	10	0.3	<1	<1	210
SEP										
02...	6	50	30	<1	27	40	0.3	3	<1	190

05099100 SNOWFLAKE CREEK NEAR SNOWFLAKE, MAN
(International gaging station)

LOCATION.--Lat 49°01'17", long 98°36'13", in SW¼ sec.10, T.1, R.9 W., 1st meridian, at traffic bridge, 2.5 mi east, and 1.5 mi south of Snowflake.

DRAINAGE AREA.--348 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1961 to current year.

GAGE.--Water-stage recorder since March 1968 and nonrecording gage prior thereto. Datum of gage is Geodetic Survey of Canada Datum of 1929. Prior to Jan. 1, 1987, recording gage at same site at datum of 1221.66 ft above Geodetic Survey of Canada Datum of 1929. Prior to Apr. 2, 1964, nonrecording gage at present site and datum. Apr. 2, 1964, to May 10, 1965, nonrecording gage at site 0.5 mi downstream at present datum.

COOPERATION.--This station is one of the international gaging stations maintained by Canada under agreement with the United States. Records provided by the Water Survey of Canada.

AVERAGE DISCHARGE.--26 years, 15.6 ft^3/s, 11,300 acre-ft/yr; median of yearly mean discharges, 9.8 ft^3/s, 7,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 1,130 ft^3/s, Apr. 21, 1979, gage height, 1229.94 ft; no flow for several months each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 438 ft^3/s, Apr. 5, gage height, 1228.77 ft; maximum gage height, 1229.47 ft, Apr. 4; no flow for several months.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.04	116	19	.35	.03	.23
2	.00	.00	.00	.00	.00	.00	.04	106	18	.24	.00	.17
3	.00	.00	.00	.00	.00	.00	.11	102	17	.15	.00	.13
4	.00	.00	.00	.00	.00	.00	200	97	16	.11	.00	.10
5	.00	.00	.00	.00	.00	.00	373	91	15	.07	.00	.08
6	.00	.00	.00	.00	.00	.00	382	82	14	.05	.00	.06
7	.00	.00	.00	.00	.00	.00	234	75	13	.03	.00	.04
8	.00	.00	.00	.00	.00	.00	217	68	12	.04	.00	.02
9	.00	.00	.00	.00	.00	.00	356	65	11	.04	.00	.04
10	.00	.00	.00	.00	.00	.00	388	62	10	.30	.00	.06
11	.00	.00	.00	.00	.00	.00	394	54	10	.15	.00	.06
12	.00	.00	.00	.00	.00	.00	390	52	11	.12	.00	.06
13	.00	.00	.00	.00	.00	.00	384	49	9.9	.10	.00	.05
14	.00	.00	.00	.00	.00	.00	381	41	8.9	.07	.68	.03
15	.00	.00	.00	.00	.00	.00	379	37	8.0	.09	4.0	.01
16	.00	.00	.00	.00	.00	.00	360	35	7.6	.04	12	.00
17	.00	.00	.00	.00	.00	.00	339	31	8.0	.04	8.8	.06
18	.00	.00	.00	.00	.00	.00	327	30	6.3	.02	5.1	.05
19	.00	.00	.00	.00	.00	.00	317	31	4.7	.07	3.2	.06
20	.00	.00	.00	.00	.00	.00	276	30	4.2	.05	2.3	.06
21	.00	.00	.00	.00	.00	.00	237	28	3.9	.04	2.1	.04
22	.00	.00	.00	.00	.00	.04	251	25	2.6	.05	1.8	.03
23	.00	.00	.00	.00	.00	.07	228	26	2.4	.05	2.0	.00
24	.00	.00	.00	.00	.00	.07	212	25	1.9	.04	1.8	.00
25	.00	.00	.00	.00	.00	.07	198	24	1.5	.01	1.6	.00
26	.00	.00	.00	.00	.00	.04	177	24	1.2	.00	1.3	.00
27	.00	.00	.00	.00	.00	.04	153	24	.97	.00	1.2	.00
28	.00	.00	.00	.00	.00	.04	146	23	.75	.00	.94	.39
29	.00	.00	.00	.00	---	.04	129	22	.58	.00	.76	.22
30	.00	.00	.00	.00	---	.04	121	21	.38	.00	.60	.12
31	.00	---	.00	.00	---	.04	---	19	---	.07	.36	---
TOTAL	.00	.00	.00	.00	.00	.49	7549.19	1515	239.78	2.39	50.57	2.17
MEAN	.00	.00	.00	.00	.00	.02	252	48.9	7.99	.08	1.63	.07
MAX	.00	.00	.00	.00	.00	.07	394	116	19	.35	12	.39
MIN	.00	.00	.00	.00	.00	.00	.04	19	.38	.00	.00	.00
AC-FT	.0	.0	.0	.0	.0	.97	14970	3010	476	4.7	100	4.3

CAL YR 1986 TOTAL 4972.80 MEAN 13.6 MAX 288 MIN .00 AC-FT 9860
WTR YR 1987 TOTAL 9359.51 MEAN 25.6 MAX 394 MIN .00 AC-FT 18560

05099150 MOWBRAY CREEK NEAR MOWBRAY, MAN
(International gaging station)

LOCATION.--Lat 49°00'00", long 98°27'15", in SE¼ sec.3, T.1, R.8 W., 1st meridian, on downstream side of bridge on Municipal Road on international boundary, and 1.5 mi east of Mowbray.

DRAINAGE AREA.--93.9 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1962 to current year (seasonal records only most years).

GAGE.--Water-stage recorder operated March 1 to October 31 each year. Datum of gage is Geodetic Survey of Canada datum of 1929. Nonrecording gage prior to 1971.

COOPERATION.--Records furnished by the Water Survey of Canada.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 777 ft^3/s, Apr. 24, 1979, gage height, 1,533.67 ft; maximum gage height, 1,534.53 ft, Mar. 29, 1966, backwater from ice; no flow for several months each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 943 ft^3/s, Apr. 6, gage height, 1,534.57 ft; no flow for several months.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.21	.00	.00	.00	.00	.00	.00	2.0	.82	.00	.00	.52
2	.21	.00	.00	.00	.00	.00	.00	1.6	.75	.00	.00	.31
3	.21	.00	.00	.00	.00	.00	11	1.3	2.0	.00	.00	.14
4	.21	.00	.00	.00	.00	.00	47	1.1	3.6	.00	.00	.07
5	.18	.00	.00	.00	.00	.00	189	.71	4.2	.00	.00	.00
6	.10	.00	.00	.00	.00	.00	787	.33	4.3	.00	.00	.00
7	.03	.00	.00	.00	.00	.00	706	.21	4.0	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	614	.15	3.3	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	561	.00	2.5	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	462	.00	1.7	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	351	.00	1.3	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	246	.00	.93	.05	.00	.00
13	.00	.00	.00	.00	.00	.00	170	.00	.63	.21	.00	.00
14	.00	.00	.00	.00	.00	.00	129	.00	.23	.14	.97	.00
15	.00	.00	.00	.00	.00	.00	98	.00	.01	.05	8.7	.00
16	.00	.00	.00	.00	.00	.00	72	.00	.00	.00	2.0	.00
17	.00	.00	.00	.00	.00	.00	56	.00	.00	.00	2.6	.00
18	.00	.00	.00	.00	.00	.00	40	.00	.00	.00	3.9	.00
19	.00	.00	.00	.00	.00	.00	28	.00	.00	.00	3.8	.00
20	.00	.00	.00	.00	.00	.00	21	.00	.00	.00	2.9	.00
21	.00	.00	.00	.00	.00	.00	16	.03	.00	.00	2.2	.00
22	.00	.00	.00	.00	.00	.00	13	.01	.00	.00	1.6	.00
23	.00	.00	.00	.00	.00	.00	9.7	.00	.00	.00	2.1	.00
24	.00	.00	.00	.00	.00	.00	7.1	.00	.00	.00	5.0	.00
25	.00	.00	.00	.00	.00	.00	5.9	.00	.00	.00	5.7	.00
26	.00	.00	.00	.00	.00	.00	4.7	.20	.00	.00	4.3	.00
27	.00	.00	.00	.00	.00	.00	4.0	.41	.00	.00	2.9	.00
28	.00	.00	.00	.00	.00	.00	3.5	.60	.00	.00	2.0	.11
29	.00	.00	.00	.00	---	.00	2.7	1.1	.00	.00	1.5	.09
30	.00	.00	.00	.00	---	.00	2.3	1.2	.00	.00	1.1	1.0
31	.00	---	.00	.00	---	.00	---	.95	---	.00	.82	---
TOTAL	1.15	.00	.00	.00	.00	.00	4656.90	11.90	30.27	.45	54.09	2.24
MEAN	.04	.00	.00	.00	.00	.00	155	.38	1.01	.01	1.74	.07
MAX	.21	.00	.00	.00	.00	.00	787	2.0	4.3	.21	8.7	1.0
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	2.3	.0	.0	.0	.0	.0	9240	24	60	.9	107	4.4

CAL YR 1986 TOTAL 4299.72 MEAN 11.8 MAX 388 MIN .00 AC-FT 8530
WTR YR 1987 TOTAL 4756.97 MEAN 13.0 MAX 787 MIN .00 AC-FT 9440

05099300 PEMBINA RIVER NEAR WINDYGATES, MAN
(International gaging station)

LOCATION.--Lat 49°01'53", long 98°16'40", in SE¼ sec.13, T.1, R.7 W., 1st meridian, on left bank 0.2 mi downstream from bridge, and 3 mi northeast of Windygates.

DRAINAGE AREA.--3,020 mi^2.

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder. Datum of gage is Geodetic Survey of Canada datum of 1929. Prior to Jan. 1, 1985, datum of gage at 1102.02 ft above Geodetic Survey of Canada datum of 1929.

REMARKS.--Records fair.

COOPERATION.--This station is one of the international gaging stations maintained by Canada under agreement with the United States. Records provided by Water Survey of Canada.

AVERAGE DISCHARGE.--25 years, 205 ft^3/s, 148,500 acre-ft/yr; median of yearly mean discharges, 149 ft^3/s, 108,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,500 ft^3/s, Apr. 26, 1974, gage height, 1,121.52 ft; no flow in some years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,540 ft^3/s, Apr. 8, gage height, 1,111.90 ft; minimum daily, 1.2 ft^3/s, Mar. 2.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	34	15	5.7	4.2	4.1	1.3	4.1	1200	322	76	27	45
2	35	15	5.6	4.2	4.1	1.2	16	1130	302	72	24	49
3	35	14	5.5	4.2	4.1	1.5	105	1070	283	68	23	51
4	34	14	5.4	4.2	3.4	1.7	424	1020	278	64	21	50
5	32	14	5.4	4.2	4.3	1.7	862	979	277	61	21	50
6	32	15	5.3	4.2	4.7	2.5	2140	942	264	59	20	49
7	30	15	5.2	4.2	4.0	3.3	2110	916	245	56	19	51
8	29	14	5.2	4.2	3.5	3.5	2440	889	228	52	18	53
9	29	12	5.1	4.2	3.3	2.6	2250	856	217	52	16	53
10	29	11	5.0	4.2	3.4	4.2	1890	825	210	72	15	56
11	27	10	4.9	4.2	3.8	6.1	1630	795	200	75	15	56
12	27	9.7	4.9	4.2	3.2	6.5	1570	765	190	63	12	57
13	27	9.4	4.9	4.2	3.1	8.5	1570	738	183	57	8.2	56
14	26	9.0	4.8	4.2	3.0	9.4	1630	701	177	59	17	56
15	26	8.8	4.8	4.2	2.9	8.0	1780	672	165	59	34	55
16	25	8.5	4.8	4.2	2.8	6.0	1880	652	155	55	28	54
17	24	8.1	4.7	4.2	2.7	5.5	1930	620	148	48	35	55
18	24	7.9	4.7	4.2	3.2	6.9	2000	597	139	47	78	55
19	23	7.8	4.7	4.2	2.4	6.3	2060	573	129	49	83	55
20	22	7.6	4.6	4.2	1.8	11	2040	549	125	44	72	54
21	22	7.4	4.6	4.1	2.0	10	1950	541	130	41	65	55
22	21	7.2	4.6	4.1	1.9	8.2	1900	524	125	42	56	56
23	20	7.1	4.5	4.1	1.8	9.9	1850	498	117	42	53	55
24	20	7.0	4.5	4.1	1.9	6.9	1740	465	107	40	51	54
25	18	6.8	4.4	4.1	2.2	7.5	1670	437	100	39	51	53
26	18	6.5	4.4	4.1	2.2	7.2	1590	425	95	37	41	53
27	16	6.2	4.4	4.1	1.5	4.0	1490	403	92	35	50	53
28	14	6.1	4.3	4.1	1.4	3.8	1420	392	89	33	51	57
29	13	5.9	4.3	4.1	---	3.2	1360	377	84	30	48	59
30	16	5.8	4.3	4.1	---	1.4	1270	357	79	29	46	58
31	15	---	4.2	4.1	---	1.9	---	336	---	29	45	---
TOTAL	763	291.8	149.7	129.1	82.7	161.7	46571.1	21244	5255	1585	1143.2	1613
MEAN	24.6	9.73	4.83	4.16	2.95	5.22	1552	685	175	51.1	36.9	53.8
MAX	35	15	5.7	4.2	4.7	11	2440	1200	322	76	83	59
MIN	13	5.8	4.2	4.1	1.4	1.2	4.1	336	79	29	8.2	45
AC-FT	1510	579	297	256	164	321	92370	42140	10420	3140	2270	3200

CAL YR 1986 TOTAL 65598.2 MEAN 180 MAX 1140 MIN .67 AC-FT 130100
WTR YR 1987 TOTAL 78989.3 MEAN 216 MAX 2440 MIN 1.2 AC-FT 156700

05099600 PEMBINA RIVER AT WALHALLA, ND

LOCATION.--Lat 48°54'50", long 97°55'00", in NE¼NE¼ sec.29, T.163 N., R.56 W., Pembina County, Hydrologic Unit 09020313, on left bank at downstream side of bridge on State Highway 32, at south edge of Walhalla, and 7 mi downstream from Little South Pembina River.

DRAINAGE AREA.--3,350 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1939 to current year. Prior to October 1963, published as "near Walhalla."

REVISED RECORDS.--WSP 1388: 1943, 1950(P). WSP 1558: 1957. WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 934 ft above National Geodetic Vertical Datum of 1929 from topographic map. Prior to Nov. 10, 1943, nonrecording gage and Nov. 10, 1943, to Sept. 30, 1963, water-stage recorder at site 5.5 mi upstream at different datum.

REMARKS.--Estimated daily discharges: Nov. 7 to Mar. 31 and July 14-22. Records good except those for period with ice effect, Nov. 7 to Mar. 31, which are fair and period of no gage-height record, July 14-22, which are poor.

AVERAGE DISCHARGE.--48 years, 231 ft^3/s, 167,400 acre-ft/yr; median of yearly mean discharges, 170 ft^3/s, 123,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 20,400 ft^3/s, Apr. 18, 1950, gage height, 19.2 ft former site and datum, 16.2 ft present site and datum, from rating curve extended above 7,000 ft^3/s on basis of contracted-opening measurement of peak flow; no flow at times in some years.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Apr. 5	0415	*5300	*10.39	No other peak greater than base discharge			

Minimum daily discharge, 4.0 ft^3/s, Jan. 25-27.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	43	24	8.4	6.6	4.2	8.0	360	1370	382	92	45	49
2	52	22	8.4	6.6	4.2	8.0	467	1290	360	88	42	48
3	48	21	9.0	6.6	4.3	8.0	641	1260	341	83	38	51
4	46	27	8.5	8.4	4.3	8.0	1800	1200	328	78	35	54
5	45	24	8.5	8.6	4.3	8.0	4190	1150	323	76	35	53
6	44	25	8.0	8.5	4.4	8.5	4420	1080	314	72	34	54
7	43	20	8.0	8.7	5.5	9.0	3700	1020	300	73	34	53
8	43	16	8.0	8.5	8.0	12	3300	982	277	66	32	54
9	41	12	8.0	8.3	12	24	3120	940	260	63	30	56
10	40	10	7.2	8.3	9.0	12	2660	902	251	90	29	60
11	41	8.0	7.0	8.0	8.8	12	2270	855	247	140	29	63
12	40	7.0	6.8	8.0	8.6	11	2050	836	229	104	29	63
13	39	7.5	6.6	8.0	8.5	10	1930	817	214	84	27	62
14	38	7.0	6.6	7.6	8.3	9.0	1860	772	206	76	30	62
15	38	7.0	6.6	11	8.1	9.0	1890	742	195	70	52	61
16	36	6.5	6.6	10	8.0	8.5	1980	716	184	66	57	61
17	36	6.0	6.6	8.0	7.5	8.5	2040	679	178	65	46	60
18	35	5.4	6.6	7.5	7.5	9.0	2100	645	165	65	44	64
19	35	4.6	6.6	7.0	7.0	9.5	2180	642	153	64	80	72
20	35	4.4	6.6	6.5	7.0	10	2210	622	143	63	87	64
21	35	4.4	6.6	6.0	7.0	11	2140	630	152	63	86	60
22	34	4.4	6.6	5.5	7.0	28	2060	603	150	62	75	62
23	33	4.5	6.6	5.0	7.0	57	2020	575	143	63	64	62
24	33	4.5	6.6	4.5	7.2	92	1940	549	128	59	61	60
25	33	6.0	6.6	4.0	7.4	85	1860	510	116	58	58	58
26	33	8.0	6.6	4.0	7.6	134	1790	493	109	54	57	59
27	32	10	6.6	4.0	7.8	216	1690	487	104	51	51	58
28	32	10	6.6	4.1	7.9	173	1590	460	102	48	55	61
29	29	9.5	6.6	4.1	---	187	1510	441	99	46	55	63
30	28	9.0	6.6	4.1	---	176	1440	420	93	48	52	64
31	28	---	6.6	4.2	---	162	---	396	---	49	50	---
TOTAL	1168	334.7	221.2	210.2	198.4	1523.0	63208	24084	6246	2179	1499	1771
MEAN	37.7	11.2	7.14	6.78	7.09	49.1	2107	777	208	70.3	48.4	59.0
MAX	52	27	9.0	11	12	216	4420	1370	382	140	87	72
MIN	28	4.4	6.6	4.0	4.2	8.0	360	396	93	46	27	48
AC-FT	2320	664	439	417	394	3020	125400	47770	12390	4320	2970	3510

CAL YR 1986 TOTAL 87303.4 MEAN 239 MAX 1800 MIN 3.7 AC-FT 173200
WTR YR 1987 TOTAL 102642.5 MEAN 281 MAX 4420 MIN 4.0 AC-FT 203600

05099600 PEMBINA RIVER AT WALHALLA, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1962 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
OCT											
08...	1135	43	820	--	5.0	8.0	--	--	--	--	--
NOV											
19...	1210	4.6	1100	--	-6.0	0.0	--	--	--	--	--
JAN											
08...	1210	8.5	--	--	-6.0	0.5	--	--	--	--	--
FEB											
10...	1415	8.9	--	--	-2.0	0.5	--	--	--	--	--
MAR											
25...	1030	69	750	--	1.0	0.0	--	--	--	--	--
APR											
03...	1150	626	--	--	5.5	2.5	--	--	--	--	--
06...	1535	4170	405	7.50	10.0	2.0	140	5	36	11	28
MAY											
27...	1250	486	770	--	16.0	18.0	--	--	--	--	--
JUL											
22...	1540	62	790	--	22.0	21.0	--	--	--	--	--
SEP											
02...	0900	47	750	7.70	9.0	14.0	320	82	71	35	54

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
06...	30	1	5.4	130	98	8.2	0.20	29	246	290	0.33
SEP											
02...	26	1	11	240	190	15	0.30	21	561	540	0.76

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR										
06...	3	40	60	<1	21	130	0.1	3	1	220
SEP										
02...	3	110	30	<1	66	70	0.3	5	<1	350

05100000 PEMBINA RIVER AT NECHE, ND
(International gaging station)

LOCATION.--Lat 48°59'20", long 97°33'05", in SE¼NW¼ sec.31, T.164 N., R.53 W., Pembina County, Hydrologic Unit 09020313, on right bank 0.3 mi east of State Highway 18, and at north edge of Neche.

DRAINAGE AREA.--3,410 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1903 to September 1908, June 1909 to September 1915, April 1919 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1308: 1904-8, 1910-15, 1920, 1921, 1923, 1924. WSP 1388: 1904(M), 1914, 1915(M), 1931(M), 1933, 1938(M). WSP 1728: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 809.69 ft above National Geodetic Vertical Datum of 1929. Prior to May 24, 1932, nonrecording gage at Burlington Northern Railway bridge 1 mi upstream, at same datum. May 25, 1932, to Apr. 17, 1939, nonrecording gage on bridge on State Highway 18, 500 ft downstream from railway bridge, at same datum.

REMARKS.--Estimated daily discharges: Nov. 7 to Apr. 9, Apr. 12-15, May 4-28, Aug. 15-17, and Sept. 16-30. Records fair except those for periods of estimated daily discharges, which are poor.

COOPERATION.--This station is one of the international gaging stations maintained by the United States under agreement with Canada.

AVERAGE DISCHARGE.--79 years (1903-8, 1909-15, 1919-87), 192 ft^3/s, 139,100 acre-ft/yr; median of yearly mean discharges, 148 ft^3/s, 107,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,700 ft^3/s, Apr. 20, 1950, gage height, 21.58 ft, backwater from ice; from rating curve extended above 5,300 ft^3/s; maximum gage height, 23.64 ft, Apr. 20, 1979, backwater from ice; no flow at times each year 1932-41, 1953, 1960-62.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,510 ft^3/s, Apr. 7, gage height, 21.41 ft, backwater from ice; only peak above base of 400 ft^3/s, minimum daily discharge, 5.6 ft^3/s, Feb. 5.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	55	36	14	11	7.2	10	113	1510	440	145	69	63
2	59	19	15	11	7.2	10	117	1420	419	143	70	59
3	57	25	15	11	6.9	10	182	1340	399	139	65	58
4	58	25	15	12	6.0	10	292	1300	380	133	60	59
5	58	33	15	13	5.6	12	1120	1260	365	126	56	59
6	54	45	14	14	120	14	2360	1220	359	119	53	62
7	56	30	14	15	60	20	4580	1180	353	114	52	63
8	53	25	13	15	50	34	4010	1140	335	109	51	61
9	52	22	13	15	46	57	3350	1100	321	106	49	60
10	53	18	13	15	24	45	3230	1060	301	110	46	61
11	53	16	12	15	7.6	26	2740	1020	294	111	44	63
12	52	16	11	16	7.4	25	2320	980	289	127	46	64
13	52	14	11	16	7.8	26	2170	940	276	156	42	65
14	52	14	11	18	8.0	24	2020	900	262	140	40	67
15	52	13	11	25	8.0	22	1900	870	247	126	45	66
16	52	12	12	22	8.0	21	1960	840	240	120	50	66
17	51	11	12	20	8.0	21	2030	810	233	124	55	66
18	48	10	12	17	8.0	37	2070	780	221	116	61	68
19	47	9.6	12	14	8.0	56	2100	750	217	120	54	76
20	47	9.0	11	14	8.0	57	2140	720	208	120	54	74
21	47	9.0	11	13	8.5	58	2160	690	203	129	82	72
22	47	9.0	11	13	8.6	58	2130	650	196	123	94	70
23	47	8.8	11	12	8.7	53	2070	610	196	106	95	64
24	44	8.8	11	11	8.8	40	2030	580	193	100	89	65
25	42	10	11	10	8.9	36	1980	560	185	95	80	65
26	42	12	11	10	9.0	114	1910	540	172	90	76	64
27	42	16	11	9.5	9.5	134	1830	530	166	85	73	64
28	43	16	11	9.2	10	113	1750	520	158	81	72	64
29	42	15	11	8.7	---	127	1660	500	152	75	65	66
30	40	15	11	8.1	---	116	1580	463	149	71	62	70
31	38	---	11	7.3	---	118	---	448	---	69	64	---
TOTAL	1535	522.2	377	420.8	483.7	1504	59904	27231	7929	3528	1914	1944
MEAN	49.5	17.4	12.2	13.6	17.3	48.5	1997	878	264	114	61.7	64.8
MAX	59	45	15	25	120	134	4580	1510	440	156	95	76
MIN	38	8.8	11	7.3	5.6	10	113	448	149	69	40	58
AC-FT	3040	1040	748	835	959	2980	118800	54010	15730	7000	3800	3860

CAL YR 1986 TOTAL 95720.7 MEAN 262 MAX 2200 MIN 5.5 AC-FT 189900
WTR YR 1987 TOTAL 107292.7 MEAN 294 MAX 4580 MIN 5.6 AC-FT 212800

05100000 PEMBINA RIVER AT NECHE, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
OCT											
08...	1445	49	865	--	7.0	9.0	--	--	--	--	--
NOV											
19...	1640	9.6	1270	--	-4.0	0.0	--	--	--	--	--
JAN											
09...	1650	15	--	--	-5.0	0.5	--	--	--	--	--
FEB											
12...	0955	6.9	--	--	-4.0	0.5	--	--	--	--	--
APR											
08...	1010	4100	450	--	9.0	8.0	--	--	--	--	--
10...	1105	3250	450	[a]7.63	7.0	4.0	150	14	40	13	28
MAY											
29...	1330	495	750	--	21.0	20.0	--	--	--	--	--
JUN											
17...	1130	214	--	--	28.0	24.0	--	--	--	--	--
JUL											
23...	1135	99	800	--	20.0	21.0	--	--	--	--	--
SEP											
04...	1055	56	850	7.70	18.0	18.0	360	98	84	36	52
22...	1040	71	--	--	18.0	15.0	--	--	--	--	--

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
10...	27	1	6.2	140	110	11	0.30	18	298	310	0.41
SEP											
04...	23	1	11	260	190	18	0.20	24	587	570	0.80

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR										
10...	2	80	100	1	26	240	0.1	5	2	260
SEP										
04...	4	120	20	<1	66	40	0.2	7	<1	420

a - Laboratory value

05101000 TONGUE RIVER AT AKRA, ND

LOCATION.--Lat 48°46'42", long 97°44'43", in SW1/4 sec.10, T.161 N., R.55 W., Pembina County, Hydrologic Unit 09020313, on left bank 300 ft downstream from Renwick Dam, 0.9 mi northwest of Akra, and 6 mi west of Cavalier.

DRAINAGE AREA.--160 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April to June 1950 (WSP 1137-B), October 1951 to current year (seasonal record since 1983).

REVISED RECORDS.--WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 930.00 ft above National Geodetic Vertical Datum of 1929. Prior to July 10, 1954, nonrecording gage 1.2 mi downstream at datum 30.00 ft lower. July 23, 1954, to Dec. 19, 1973, water stage recorder 2.7 mi downstream at datum 9.10 ft lower.

REMARKS.--Records fair. Flow regulated by temporary retention in ten retarding basins beginning 300 ft above station, four of which have slow release outlet structures to regulate the flow. Retarding basins were completed during the period 1955 to 1961 and have a combined capacity of 19,245 acre-ft.

AVERAGE DISCHARGE.--31 years (water years 1952-82), 21.4 ft^3/s, 15,500 acre-ft/yr; median of yearly mean discharges, 19 ft^3/s, 13,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,800 ft^3/s, Apr. 18, 1950, gage height, 48.7 ft, from flood-marks, site and datum then in use, from rating curve extended above 1,500 ft^3/s on basis of contracted-opening measurement of peak flow; no flow at times. This flood is the highest known since settlement of the region in about 1860.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 480 ft^3/s, Apr. 8, gage height, 13.79 ft; minimum daily recorded discharge, 0.09 ft^3/s, Aug. 9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						16	130	15	16	2.0	1.4	.21
2						16	163	21	14	1.9	.62	.18
3						20	191	26	11	1.6	.37	.14
4						23	251	28	10	1.6	.26	.14
5						22	340	28	10	1.5	.24	.12
6						21	414	27	11	1.5	.22	.16
7						20	449	26	11	1.1	.21	.14
8						20	460	24	9.5	.16	.10	.13
9						20	461	21	8.8	.14	.09	.13
10						21	456	20	9.7	.14	.10	.14
11						21	435	18	12	.16	.10	.14
12						22	410	17	11	.26	.12	.13
13						21	390	17	10	.31	.12	.14
14						21	374	16	8.8	.43	.15	.17
15						20	362	16	7.9	.97	.40	.15
16						19	349	15	7.0	.99	1.2	.18
17						21	333	14	7.8	.86	2.3	.22
18						20	308	9.8	5.3	2.5	2.7	.34
19						20	267	11	3.8	11	1.8	.81
20						38	234	13	3.1	12	1.5	.84
21						51	209	20	4.7	12	2.6	.78
22						51	195	28	5.2	11	1.6	.88
23						50	180	31	6.5	8.8	1.1	.77
24						56	160	27	5.7	7.1	1.0	1.2
25						63	129	22	4.4	5.2	1.0	2.9
26						65	111	21	3.3	4.1	.94	4.8
27						75	98	22	3.1	3.1	.83	6.8
28						92	89	22	3.1	2.7	.81	8.7
29						100	76	22	2.6	2.3	.77	8.8
30						102	68	21	2.0	2.0	.55	9.0
31						100	---	18	---	2.2	.25	---
TOTAL						1227	8092	636.8	228.3	101.62	25.45	49.24
MEAN						39.6	270	20.5	7.61	3.28	.82	1.64
MAX						102	461	31	16	12	2.7	9.0
MIN						16	68	9.8	2.0	.14	.09	.12
AC-FT						2430	16050	1260	453	202	50	98

05101000 TONGUE RIVER AT AKRA, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
FEB 10...	0815	4.0	--	--	-2.0	--	--	--	--	--	--
MAR 25...	1305	63	675	--	1.0	0.5	--	--	--	--	--
APR 08...	1500	481	410	7.50	20.5	5.0	150	25	40	11	19
JUN 02...	1430	14	635	--	20.0	18.0	--	--	--	--	--
JUL 21...	0905	12	570	--	15.0	21.0	--	--	--	--	--
AUG 24...	1220	0.99	465	8.50	19.0	20.5	230	48	58	20	29

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR 08...	21	0.7	4.9	120	68	9.5	0.30	18	233	240	0.32
AUG 24...	21	0.9	7.0	180	97	9.6	0.40	12	362	340	0.49

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR 08...	2	70	100	1	19	290	0.1	<1	1	240
AUG 24...	8	60	10	1	34	340	2.4	3	1	270

05102500 RED RIVER OF THE NORTH AT EMERSON, MAN
(National stream-quality accounting network station)
(International gaging station)

LOCATION.--Lat 49°00'30", long 97°12'40", in sec.2, T.1, R.2 E., on right bank 1,500 ft downstream from Canadian National Railway bridge in Emerson, 0.8 mi downstream from international boundary, 3.6 mi downstream from Pembina River, and at mile 154.3.

DRAINAGE AREA.--40,200 mi^2, approximately, includes 3,800 mi^2 in closed basins.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March to November 1902 (gage heights only), May 1912 to September 1929 (monthly discharge only, published in WSP 1308), October 1929 to current year.

GAGE.--Water-stage recorder. Datum of gage is 700.00 ft above National Geodetic Vertical Datum of 1929, by Survey of Canada. See WSP 1728 or 1913 for history of changes prior to Apr. 10, 1953.

REMARKS.--Records good. Discharge partially regulated by reservoirs on tributaries.

COOPERATION.--This station is one of the international gaging stations maintained by Canada under agreement with the United States. Records provided by Water Survey of Canada.

AVERAGE DISCHARGE.--75 years (water years 1913-87), 3,420 ft^3/s, 2,478,000 acre-ft/yr; median of yearly mean discharges, 2,890 ft^3/s, 2,094,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 95,500 ft^3/s, May 13, 1950, gage height, 90.89 ft; maximum gage height, 91.19 ft, May 1, 1979; minimum observed discharge, 0.9 ft^3/s, Feb. 6-8, 1937.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 37,400 ft^3/s, Apr. 9; minimum daily, 953 ft^3/s, Sept. 17.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5400	2170	2130	1990	1570	1690	21900	6000	9890	1510	7420	1310
2	5650	2170	2130	1990	1570	1690	24000	5620	9390	1470	6180	1310
3	5690	2120	2140	1990	1580	1680	26100	5190	8510	1450	5260	1340
4	5580	2070	2170	1990	1590	1670	28300	4840	7590	1440	4410	1360
5	5300	2060	2190	1990	1600	1670	30400	4590	6670	1410	3810	1370
6	4940	2060	2220	1990	1590	1690	32500	4340	5860	1380	3390	1340
7	4560	2070	2220	1970	1570	1720	36000	4130	5160	1360	3140	1270
8	4240	1880	2220	1950	1560	1760	37100	3960	4520	1330	3010	1180
9	3990	1890	2200	1920	1560	1850	37400	3710	4030	1420	2860	1090
10	3810	1880	2150	1890	1560	2220	37100	3510	3670	1590	2750	1040
11	3670	1910	2060	1870	1570	3470	36400	3310	3430	1710	2630	982
12	3600	2000	1990	1870	1590	5030	35100	3160	3230	1730	2470	971
13	3510	2060	1930	1860	1610	6070	33600	2930	3010	1740	2330	961
14	3450	2060	1890	1850	1620	6690	31400	2750	2820	1730	2210	961
15	3380	2010	1870	1820	1630	7000	28700	2600	2660	1620	2150	957
16	3320	1960	1870	1780	1640	7100	25200	2480	2550	1510	2060	953
17	3260	2000	1870	1750	1650	7020	23400	2370	2490	1430	1980	953
18	3220	2020	1880	1730	1660	6870	21400	2300	2420	1410	1890	957
19	3210	2040	1900	1740	1660	6710	19100	2230	2330	1500	1880	985
20	3160	2110	1880	1760	1650	6580	16800	2190	2240	1560	1910	989
21	3090	2160	1860	1740	1640	6490	14800	2250	2180	1570	1920	1020
22	3030	2180	1840	1710	1600	6590	13000	2350	2060	1570	1840	1080
23	2960	2200	1810	1690	1600	7120	11200	2550	1940	1600	1780	1110
24	2840	2220	1800	1670	1620	8230	9820	2830	1830	1840	1700	1100
25	2690	2240	1810	1660	1660	9730	8790	3810	1780	4130	1620	1100
26	2540	2240	1830	1640	1690	11300	8090	5720	1710	7240	1520	1110
27	2410	2210	1860	1640	1700	13200	7520	6890	1680	9040	1450	1120
28	2300	2200	1890	1640	1700	14900	7060	7200	1660	10100	1390	1120
29	2260	2170	1920	1630	---	17000	6600	7450	1600	10300	1360	1110
30	2240	2150	1950	1610	---	18700	6180	8550	1550	9890	1330	1110
31	2180	---	1980	1590	---	20300	---	9680	---	8790	1310	---
TOTAL	111480	62510	61460	55920	45240	213740	674960	131490	110460	96370	80960	33259
MEAN	3596	2084	1983	1804	1616	6895	22500	4242	3682	3109	2612	1109
MAX	5690	2240	2220	1990	1700	20300	37400	9680	9890	10300	7420	1370
MIN	2180	1880	1800	1590	1560	1670	6180	2190	1550	1330	1310	953
AC-FT	221100	124000	121900	110900	89730	424000	1339000	260800	219100	191100	160600	65970

CAL YR 1986 TOTAL 2585570 MEAN 7084 MAX 34200 MIN 1680 AC-FT 5128000
WTR YR 1987 TOTAL 1677850 MEAN 4597 MAX 37400 MIN 953 AC-FT 3328000

05102500 RED RIVER AT EMERSON, MANITOBA--CONTINUED
(National stream-quality accounting network station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1978 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1977 to current year.
WATER TEMPERATURE: October 1977 to current year.

REMARKS.--Records of daily mean values of water temperature and specific conductance are furnished by Water Survey of Canada.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily mean, 1,200 microsiemens, Sept. 24, 1978, Aug. 30, 1980, and on many days during October 1980 through March 1981; minimum daily mean, 330 microsiemens, Apr. 10, 16, 17, 1978.

WATER TEMPERATURES: Maximum daily mean, 26.0°C July 13, 14, 1981, Aug. 2, 1987; minimum daily mean, 0.0°C on many days during winter months.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily mean, 893 microsiemens, Dec. 1; minimum daily mean, 372 microsiemens, Mar. 15.
WATER TEMPERATURES: Maximum daily mean, 26.0°C Aug. 2; minimum daily mean, 0.1°C on many days during winter months.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
OCT 21...	1100	[b]3090	725	8.10	8.0	9.0	40	10.8	96	K8	K10
JAN 27...	1120	b1640	742	7.30	-3.5	0.0	4.2	10.2	70	30	22
APR 16...	1535	25100	585	7.90	15.0	9.0	46	9.5	--	0	800
[a]JUN 15...	1340	[b]2660	865	8.50	32.0	24.5	32	7.6	92	7	100
SEP 01...	1100	1240	735	8.50	21.5	17.5	38	9.0	92	12	24

DATE	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY, CARBON-ATE IT-FLD (MG/L CACO3) (00419)	BICAR-BONATE WATER WHOLE IT-FLD (MG/L) (00450)	CAR-BONATE WATER WHOLE IT-FLD (MG/L) (00447)
OCT 21...	320	120	68	37	30	16	0.7	6.7	204	249	0
JAN 27...	310	110	68	34	37	20	0.9	5.3	197	240	0
APR 16...	240	100	57	23	30	21	0.9	7.8	136	166	0
JUN 15...	340	86	77	37	48	23	1	8.2	259	219	48

DATE	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2) (00405)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)
OCT 21...	3.0	130	27	0.10	15	468	430	0.64	3900	--	--
JAN 27...	19	83	46	0.20	15	447	410	0.61	1980	<0.010	0.350
APR 16...	3.3	110	21	0.20	17	373	350	0.51	25300	0.060	1.60
JUN 15...	1.1	150	50	0.30	13	557	490	0.76	4000	0.010	0.220

a - Analysis incomplete prior to report publication.
b - Daily mean discharge.
Note: Field-parameter cross sections were not made during current year.

05102500 RED RIVER AT EMERSON, MANITOBA--CONTINUED
(National stream-quality accounting network station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, AMMONIA DISSOLVED (MG/L AS NH4) (71846)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	PHOSPHORUS, DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P) (00671)	ALUMINUM, DISSOLVED (UG/L AS AL) (01106)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BARIUM, DISSOLVED (UG/L AS BA) (01005)
OCT 21...	0.040	--	--	1.5	0.130	--	--	20	4	60
JAN 27...	0.180	0.170	0.22	1.4	0.070	0.020	0.040	<10	2	64
APR 16...	0.150	0.140	0.18	1.1	0.190	0.130	0.110	30	4	97
JUN 15...	0.090	0.070	0.09	0.80	0.330	0.120	0.090	--	--	--
SEP 01...	0.030	<0.010	--	3.7	0.150	0.090	0.070	20	5	81

DATE	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COBALT, DISSOLVED (UG/L AS CO) (01035)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, DISSOLVED (UG/L AS PB) (01049)	LITHIUM DISSOLVED (UG/L AS LI) (01130)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY DISSOLVED (UG/L AS HG) (71890)
OCT 21...	<0.5	<1	<1	<3	4	8	<5	39	3	--
JAN 27...	<0.5	2	<1	<3	2	10	<5	37	20	<0.1
APR 16...	<0.5	<1	<1	<3	5	33	<5	31	9	0.5
SEP 01...	<0.5	<1	2	<3	4	21	<5	34	15	0.5

DATE	MOLYBDENUM, DISSOLVED (UG/L AS MO) (01060)	NICKEL, DISSOLVED (UG/L AS NI) (01065)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	SILVER, DISSOLVED (UG/L AS AG) (01075)	STRONTIUM, DISSOLVED (UG/L AS SR) (01080)	VANADIUM, DISSOLVED (UG/L AS V) (01085)	ZINC, DISSOLVED (UG/L AS ZN) (01090)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT 21...	<10	2	<1	<1	260	<6	13	66	550	100
JAN 27...	260	<1	<1	<1	<6	<6	44	37	16	99
APR 16...	<10	6	<1	<1	220	<6	20	130	8810	100
JUN 15...	--	--	--	--	--	--	--	136	98	99
SEP 01...	<10	4	<1	<1	270	<6	6	101	33	99

05102500 RED RIVER AT EMERSON, MANITOBA--CONTINUED
(National stream-quality accounting network station)

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12.0	3.1	.5	.1	.1	.1	.3	15.6	20.0	20.8	25.5	17.5
2	11.7	3.1	.4	.2	.1	.2	.2	15.6	20.0	21.7	26.0	17.5
3	10.9	3.0	.4	.1	.1	.2	.3	15.5	20.1	22.0	25.7	17.8
4	10.2	2.7	.2	.1	.1	.2	.6	15.4	20.3	22.1	24.6	17.8
5	9.7	2.7	.2	.2	.1	.2	.7	15.5	20.8	22.6	23.9	18.0
6	9.3	2.4	.1	.2	.1	.2	1.2	15.6	21.6	23.4	23.0	17.5
7	9.1	2.3	.1	.1	.1	.2	2.3	15.6	21.8	24.1	22.6	17.3
8	9.0	2.0	.1	.1	.1	.2	3.4	15.8	22.1	24.0	23.0	16.8
9	8.2	2.0	.1	.1	.1	.2	4.4	16.0	21.6	24.0	22.9	17.0
10	7.5	1.7	.1	.1	.1	.2	5.5	16.2	20.8	24.1	23.1	16.8
11	6.6	1.6	.1	.1	.1	.2	6.5	16.4	20.7	23.4	22.5	16.0
12	5.4	1.5	.1	.1	.1	.2	7.6	16.1	21.0	22.6	22.0	15.4
13	5.3	1.3	.1	.1	.1	.2	8.3	15.6	21.7	21.5	21.0	15.1
14	4.9	1.0	.1	.2	.1	.2	10.0	15.2	22.1	20.4	20.6	15.4
15	4.8	.8	.1	.1	.1	.2	11.5	14.9	22.6	20.8	20.6	16.5
16	5.0	.8	.1	.1	.1	.2	12.5	14.7	23.0	21.3	20.7	17.2
17	5.9	.6	.1	.1	.1	.3	12.7	14.0	23.6	21.9	20.3	17.1
18	6.7	.6	.1	.1	.1	.3	13.0	14.0	24.4	21.4	20.3	16.2
19	8.5	.6	.1	.1	.1	.3	14.8	13.5	24.4	20.4	20.2	15.2
20	9.2	.5	.1	.1	.1	.3	14.8	13.5	24.5	21.3	20.4	14.8
21	8.8	.5	.1	.1	.1	.3	14.6	13.5	24.8	22.0	20.8	15.1
22	7.4	.5	.1	.1	.1	.3	14.0	13.7	25.6	21.8	19.8	15.6
23	7.0	.5	.1	.2	.1	.3	14.0	14.0	25.2	21.9	18.9	15.8
24	6.5	.5	.1	.2	.1	.3	14.4	14.6	24.8	22.1	18.9	15.2
25	6.2	.5	.1	.2	.1	.3	14.4	15.4	23.6	23.2	19.0	14.4
26	5.3	.5	.1	.2	.1	.3	14.6	15.6	22.4	23.7	18.9	14.0
27	5.4	.5	.1	.1	.1	.3	14.4	16.2	21.6	24.1	19.2	13.4
28	5.4	.5	.1	.1	.1	.3	14.8	17.2	21.6	24.4	19.2	12.9
29	4.7	.5	.1	.1	---	.3	15.0	18.2	20.9	25.0	19.0	12.8
30	3.5	.5	.1	.1	---	.3	15.5	18.6	20.8	25.0	18.7	12.4
31	3.4	---	.1	.1	---	.3	---	18.9	---	24.8	17.9	---
MEAN	7.21	1.31	.14	.13	.10	.25	9.21	15.5	22.3	22.6	21.3	15.8

SPECIFIC CONDUCTANCE MICROSIEMENS/CM AT 25 DEG C, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	576	755	893	739	651	583	441	715	699	791	491	712
2	586	762	853	700	642	586	456	719	712	780	552	680
3	612	794	806	706	610	584	480	717	727	750	597	705
4	508	805	775	704	625	586	474	727	744	757	629	710
5	493	792	760	686	621	617	469	735	746	838	635	698
6	519	773	753	680	620	597	460	744	749	849	642	720
7	555	743	761	671	645	630	489	761	767	849	653	744
8	575	713	792	676	635	637	527	753	754	832	655	725
9	598	707	816	675	633	625	539	763	763	824	665	707
10	607	721	787	678	622	600	524	775	806	818	660	712
11	611	725	768	681	624	565	507	760	808	787	665	720
12	639	724	754	686	626	510	502	768	809	802	704	715
13	659	717	770	680	626	455	505	790	807	786	755	698
14	656	695	756	671	613	425	511	804	816	756	771	712
15	677	686	768	672	617	372	527	796	833	777	816	712
16	677	736	757	676	603	376	549	801	829	753	861	704
17	668	810	733	682	595	398	576	808	793	722	864	717
18	671	825	712	690	587	463	608	803	771	722	836	718
19	673	823	720	687	592	500	633	815	773	739	807	724
20	673	785	760	677	594	499	646	820	768	704	800	726
21	669	750	761	675	574	529	672	817	764	695	795	715
22	678	762	764	682	573	549	710	815	780	678	767	726
23	681	726	759	682	587	550	691	831	783	672	765	734
24	695	704	750	675	584	565	705	840	784	681	761	748
25	692	738	736	671	582	520	690	837	784	704	754	755
26	687	735	750	695	588	495	691	815	790	654	745	759
27	709	740	723	669	590	470	680	740	790	489	733	763
28	725	730	721	661	589	457	692	690	789	465	712	751
29	763	791	713	664	---	430	699	721	789	420	687	747
30	760	861	702	652	---	425	701	731	788	422	686	739
31	756	---	726	647	---	427	---	723	---	451	712	---
MEAN	647	754	761	680	609	517	578	772	777	709	715	723

05113360 LONG CREEK AT WESTERN CROSSING OF INTERNATIONAL BOUNDARY, SASK.
(International gaging station)

LOCATION.--Lat 49°00'01", long 103°21'08", in SE1/4 sec.1, T.1, R.11 W., 2d meridian, Hydrologic Unit 09010001, and on right bank 10 mi south of Outram.

DRAINAGE AREA.--1,320 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1959 to current year.

GAGE.--Water-stage recorder and artificial control. Datum of gage is 1,894.00 ft above National Geodetic Vertical Datum of 1929, international boundary survey.

REMARKS.--Records good.

COOPERATION.--This station is one of the international gaging stations maintained by Canada under agreement with the United States. Records provided by the Water Survey of Canada.

AVERAGE DISCHARGE.--28 years, 36.7 ft^3/s, 26,590 acre-ft/yr; median of yearly mean discharges, 25 ft^3/s, 18,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,690 ft^3/s, Apr. 1, 1976, gage height, 12.05 ft; maximum gage height, 12.70 ft, Mar. 31, 1976 backwater from ice; no flow for several months each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 300 ft^3/s, Apr. 3, gage height, 4.34 ft; no flow June 9 to Aug. 2, and Aug. 13 to Sept. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.07	.04	.14	.21	.07	.21	87	9.2	.14	.00	.00	.00
2	.07	.04	.21	.21	.04	.21	131	9.5	.18	.00	.00	.00
3	.04	.04	.21	.18	.04	.25	260	9.0	.14	.00	.14	.00
4	.04	.04	.21	.18	.04	.78	155	8.0	.11	.00	1.5	.00
5	.04	.04	.21	.18	.00	1.2	100	6.3	.07	.00	.64	.00
6	.04	.04	.18	.25	.18	1.4	97	5.1	.07	.00	.28	.00
7	.04	.04	.18	.25	.32	2.2	135	4.0	.04	.00	.14	.00
8	.04	.04	.18	.21	.35	1.9	168	2.8	.04	.00	.11	.00
9	.04	.07	.14	.18	.28	1.9	170	2.0	.00	.00	.07	.00
10	.04	.07	.18	.14	.28	1.9	155	2.4	.00	.00	.04	.00
11	.04	.07	.18	.14	.32	1.5	136	1.8	.00	.00	.04	.00
12	.04	.07	.18	.18	.25	1.2	121	1.4	.00	.00	.04	.00
13	.04	.07	.18	.25	.28	1.1	100	.99	.00	.00	.00	.00
14	.04	.07	.21	.35	.39	.95	83	.71	.00	.00	.00	.00
15	.04	.07	.21	.28	.35	.95	75	.53	.00	.00	.00	.00
16	.04	.04	.21	.25	.32	1.1	69	.53	.00	.00	.00	.00
17	.04	.07	.21	.14	.32	1.4	61	.53	.00	.00	.00	.00
18	.04	.07	.21	.11	.32	2.0	55	.53	.00	.00	.00	.00
19	.04	.07	.21	.11	.32	2.5	49	.42	.00	.00	.00	.00
20	.04	.07	.21	.11	.35	3.0	42	.39	.00	.00	.00	.00
21	.04	.07	.21	.11	.35	5.9	35	.39	.00	.00	.00	.00
22	.04	.07	.21	.11	.35	23	31	.32	.00	.00	.00	.00
23	.04	.07	.21	.11	.35	76	28	.28	.00	.00	.00	.00
24	.04	.11	.21	.11	.39	85	24	.28	.00	.00	.00	.00
25	.04	.14	.21	.11	.35	93	21	.18	.00	.00	.00	.00
26	.04	.11	.21	.11	.32	105	20	.14	.00	.00	.00	.00
27	.04	.11	.21	.11	.28	117	17	.18	.00	.00	.00	.00
28	.04	.11	.21	.11	.25	102	15	.18	.00	.00	.00	.00
29	.04	.07	.21	.11	---	90	12	.14	.00	.00	.00	.00
30	.04	.11	.21	.11	---	79	10	.14	.00	.00	.00	.00
31	.04	---	.21	.11	---	71	---	.14	---	.00	.00	---
TOTAL	1.30	2.10	6.16	5.12	7.46	874.55	2462	68.50	.79	.00	3.00	.00
MEAN	.04	.07	.20	.17	.27	28.2	82.1	2.21	.03	.00	.10	.00
MAX	.07	.14	.21	.35	.39	117	260	9.5	.18	.00	1.5	.00
MIN	.04	.04	.14	.11	.00	.21	10	.14	.00	.00	.00	.00
AC-FT	2.6	4.2	12	10	15	1730	4880	136	1.6	.0	6.0	.0

CAL YR 1986 TOTAL 2858.05 MEAN 7.83 MAX 139 MIN .00 AC-FT 5670
WTR YR 1987 TOTAL 3430.97 MEAN 9.40 MAX 260 MIN .00 AC-FT 6810

05113600 LONG CREEK NEAR NOONAN, ND
(International gaging station)

LOCATION.--Lat 48°58'52", long 103°04'34", near north line of NE1/4 sec.1, T.163 N., R.96 W., Divide County, Hydrologic Unit 09010001, on right bank 150 ft upstream from county highway bridge, 1.5 mi upstream from international boundary, and 7 mi northwest of Noonan.

DRAINAGE AREA.--1,790 mi^2, approximately, of which about 1,160 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1959 to current year.

REVISED RECORDS.--WSP 2113: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 1,840 ft, from topographic map. Prior to Aug. 18, 1960, non-recording gage at same site and datum.

REMARKS.--Estimated daily discharges: Oct. 19 to Apr. 3 and Aug. 1-19. Records fair except those for Jan. 7 to Mar. 2, which are poor.

COOPERATION.--This station is one of the international gaging stations maintained by the United States under agreement with Canada.

AVERAGE DISCHARGE.--28 years, 47.7 ft^3/s, 34,560 acre-ft/yr; median of yearly mean discharges, 25 ft^3/s, 18,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,310 ft^3/s, Mar. 31, 1976, gage height, 17.61 ft; no flow at times most years.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 26	----	333	[a]6.76	Apr. 4	0030	*356	*6.79

a - Backwater from ice

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.77	.60	.69	.59	.00	.15	127	12	.33	.00	.09	.00
2	1.1	.59	.75	.60	.00	.60	159	12	.43	.00	.05	.00
3	.95	.63	.70	.68	.01	1.2	262	13	.26	.00	.04	.00
4	.75	.57	.65	.63	.02	2.1	316	14	.17	.00	.02	.00
5	.64	.62	.72	.63	.05	2.4	191	12	.15	.00	.01	.00
6	.57	.53	.69	.54	.15	4.2	136	10	.15	.00	.00	.00
7	.64	.45	.63	.50	.50	5.6	131	8.5	.09	.00	.00	.00
8	.62	.73	.68	.45	1.0	8.9	171	6.1	.06	.00	.00	.00
9	.55	.65	.60	.40	1.2	16	196	4.8	.04	.00	.00	.00
10	.62	.62	.55	.35	1.3	12	192	4.1	.04	.00	.00	.00
11	.62	.68	.62	.30	1.4	11	178	2.6	.06	.00	.00	.00
12	.64	.64	.58	.25	1.5	8.1	165	.96	.06	.00	.00	.00
13	.57	.58	.54	.20	1.4	6.2	143	.97	.05	.00	.00	.00
14	.57	.54	.47	.18	1.2	6.0	116	.68	.04	.00	.00	.00
15	.57	.51	.52	.15	1.1	6.1	96	.60	.04	.00	.00	.00
16	.53	.50	.53	.10	1.0	6.5	86	.85	.03	.00	.00	.00
17	.52	.51	.56	.07	.90	7.0	75	.80	.03	.00	.00	.00
18	.51	.53	.57	.05	.80	8.7	62	1.2	.02	.00	.00	.00
19	.50	.58	.57	.03	.70	10	53	1.1	.02	.00	.00	.00
20	.50	.93	.59	.02	.60	13	43	.76	.02	.00	.00	.00
21	.50	.96	.65	.01	.50	37	34	.53	.01	.00	.00	.00
22	.50	.90	.71	.00	.45	94	31	.25	.01	.00	.00	.00
23	.50	.93	.73	.00	.40	117	28	.13	.02	.00	.00	.00
24	.50	1.1	.79	.00	.30	215	25	.10	.02	.01	.00	.00
25	.50	1.3	.77	.00	.25	242	23	.10	.01	.01	.00	.00
26	.50	1.0	.74	.00	.20	255	21	.10	.01	.00	.00	.00
27	.50	.97	.71	.00	.18	239	19	.12	.00	.00	.00	.00
28	.50	.89	.74	.00	.15	212	17	.14	.00	.00	.00	.00
29	.52	.75	.69	.00	---	202	16	.10	.00	.03	.00	.00
30	.54	.70	.65	.00	---	171	13	.14	.00	.10	.00	.00
31	.55	---	.63	.00	---	133	---	.21	---	.13	.00	---
TOTAL	18.35	21.49	20.02	6.73	17.26	2052.75	3125	108.94	2.17	.28	.21	.00
MEAN	.59	.72	.65	.22	.62	66.2	104	3.51	.07	.01	.01	.00
MAX	1.1	1.3	.79	.68	1.5	255	316	14	.43	.13	.09	.00
MIN	.50	.45	.47	.00	.00	.15	13	.10	.00	.00	.00	.00
AC-FT	36	43	40	13	34	4070	6200	216	4.3	.6	.4	.0

CAL YR 1986 TOTAL 4035.98 MEAN 11.1 MAX 175 MIN .00 AC-FT 8010
WTR YR 1987 TOTAL 5373.17 MEAN 14.7 MAX 316 MIN .00 AC-FT 10660

05113600 LONG CREEK NEAR NOONAN, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
OCT											
07...	1055	0.75	1470	--	6.5	10.5	--	--	--	--	--
NOV											
19...	1205	0.58	840	--	-4.5	0.0	--	--	--	--	--
JAN											
06...	1135	0.51	2100	--	-6.5	0.0	--	--	--	--	--
FEB											
11...	1130	1.3	1650	--	2.5	0.5	--	--	--	--	--
MAR											
04...	1430	2.3	1520	7.89	14.5	2.5	560	85	110	68	130
11...	1200	11	2280	--	-4.0	0.5	--	--	--	--	--
APR											
16...	1100	90	815	--	15.0	11.0	--	--	--	--	--
MAY											
05...	1010	12	930	--	19.0	13.5	--	--	--	--	--

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
04...	33	2	15	470	360	19	0.20	20	1030	1000	1.4

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
MAR										
04...	4	80	40	<1	69	470	0.2	<1	<1	480

05113750 EAST BRANCH SHORT CREEK RESERVOIR NEAR COLUMBUS, ND

LOCATION.--Lat 48°59'26", long 102°47'07", in SW1/4NW1/4 sec.32, T.164 N., R.93 W., Burke County, Hydrologic Unit 09010001, on left bank of reservoir on East Branch Short Creek, 0.5 mi south of international boundary, and 6.0 mi north of Columbus.

DRAINAGE AREA.--280 mi^2, of which 175 mi^2 is probably noncontributing.

RESERVOIR-GAGE HEIGHT AND CONTENTS RECORDS

PERIOD OF RECORD.--April 1963 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,860.00 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good. Reservoir is formed by earth-fill dam; storage began April 1963. Outlet of lake is a fixed-crest concrete dam; average crest elevation, 1,886.90 ft National Geodetic Vertical Datum of 1929. Reservoir capacity at crest elevation, 1,200 acre-ft. The reservoir is operated for water supply and recreation. Records of daily reservoir stage and contents are available from files at the Bismarck District office.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 1,850 acre-ft, Mar. 28, 1976, gage height, 32.13 ft; minimum, 890 acre-ft, Dec. 10, 1977, gage height, 23.92 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 1,430 acre-ft, Mar. 27, Apr. 1, gage height, 28.92 ft; minimum contents, 1,060 acre-ft, Sept. 30, gage height, 25.68 ft.

MONTHEND GAGE HEIGHT AND CONTENTS AT 2400, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

Date	Gage height (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	27.07	1,210	--
Oct. 31	26.93	1,190	-20
Nov. 30	26.92	1,190	0
Dec. 31	26.91	1,190	0
CAL YR 1986	--	--	+80
Jan. 31	26.91	1,190	0
Feb. 28	27.01	1,200	+10
Mar. 31	28.81	1,420	+220
Apr. 30	27.66	1,280	-140
May 31	27.21	1,220	-60
June 30	26.63	1,160	-60
July 31	26.46	1,140	-20
Aug. 31	26.00	1,090	-50
Sept. 30	25.71	1,060	-30
WTR YR 1987	--	--	-150

05113800 SHORT CREEK BELOW INTERNATIONAL BOUNDARY NEAR ROCHE PERCEE, SASK.
(International gaging station)

LOCATION.--Lat 49°01'42", long 102°51'00", in SW1/4 sec.14, T.1, R.7 W., 2d meridian, Hydrologic Unit 09010001, 4 mi southwest of Roche Percee, Saskatchewan, and 5 mi upstream from mouth.

DRAINAGE AREA.--480 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1960 to current year.

GAGE.--Water-stage recorder.

REMARKS.--Estimated daily discharges: Jan. 31 to Mar. 2. Records good except those for winter period which are fair.

COOPERATION.--This station is one of the international gaging stations maintained by Canada under agreement with the United States.

AVERAGE DISCHARGE.--27 years, 12.4 ft^3/s, 8,980 acre-ft/yr; median of yearly mean discharges, 5.8 ft^3/s, 4,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,700 ft^3/s, Apr. 7, 1969, gage height, 14.33 ft; maximum gage height, 14.39 ft, Mar. 28, 1960; no flow on many days each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 243 ft^3/s, Mar. 26; maximum gage height, 6.68 ft, Mar. 24, backwater from ice; no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.21	.25	.07	.07	.04	.07	122	2.5	.95	.00	.11	.00
2	.21	.25	.07	.07	.00	.07	180	2.5	.95	.00	.11	.00
3	.21	.25	.07	.07	.00	.42	164	2.2	.53	.00	.07	.00
4	.21	.28	.07	.07	.00	.11	127	2.2	.32	.00	.07	.00
5	.25	.21	.07	.07	.00	1.9	93	2.0	.25	.00	.04	.00
6	.35	.25	.07	.07	.00	4.4	72	1.9	.18	.04	.04	.00
7	2.0	.25	.07	.07	.00	18	56	1.8	.14	.00	.04	.00
8	.33	.25	.07	.07	.00	22	42	1.8	.07	.00	.04	.00
9	.33	.25	.07	.07	.04	23	32	1.7	.07	.28	.04	.00
10	.70	.21	.07	.07	.04	22	26	1.5	.07	.14	.04	.00
11	.70	.18	.07	.07	.04	20	22	1.3	.11	.14	.04	.00
12	.50	.14	.07	.07	.04	12	20	1.2	.07	.11	.00	.00
13	.49	.14	.07	.07	.04	6.6	19	1.2	.07	.07	.00	.00
14	.49	.14	.07	.07	.04	3.7	20	1.1	.07	.07	.00	.00
15	.46	.14	.07	.07	.04	2.9	17	1.1	.04	.04	.00	.00
16	.42	.11	.07	.07	.04	2.4	14	2.1	.00	.04	.00	.00
17	.39	.11	.07	.07	.07	1.9	13	4.7	.00	.04	.00	.00
18	.35	.11	.07	.07	.07	1.4	12	2.6	.00	.07	.00	.00
19	.35	.11	.07	.04	.07	1.4	9.8	2.0	.00	.07	.00	.00
20	.32	.07	.07	.04	.07	2.0	8.1	1.6	.00	.07	.00	.00
21	.32	.07	.07	.04	.07	9.9	7.2	1.4	.00	.11	.00	.00
22	.32	.07	.07	.04	.07	11	6.7	1.2	.00	.07	.00	.00
23	.25	.07	.07	.04	.07	21	6.1	1.2	.00	.07	.00	.00
24	.21	.11	.07	.04	.07	153	5.8	1.2	.00	.07	.00	.00
25	.25	.11	.07	.04	.07	180	5.1	1.1	.00	.04	.00	.00
26	.25	.07	.07	.04	.07	199	4.4	1.2	.00	.04	.00	.00
27	.25	.07	.07	.04	.07	173	3.8	1.1	.00	.00	.00	.00
28	.25	.07	.07	.04	.07	135	3.7	1.1	.07	.00	.00	.00
29	.25	.07	.07	.04	---	157	3.2	1.1	.04	.00	.00	.00
30	.25	.07	.07	.04	---	125	3.1	1.0	.00	.07	.00	.00
31	.25	---	.07	.04	---	108	---	.85	---	.07	.00	---
TOTAL	13.93	4.48	2.17	1.78	1.20	1418.17	1118.0	51.45	4.00	1.72	.64	.00
MEAN	.45	.15	.07	.06	.04	45.7	37.3	1.66	.13	.06	.02	.00
MAX	2.0	.28	.07	.07	.07	199	180	4.7	.95	.28	.11	.00
MIN	.21	.07	.07	.04	.00	.07	3.1	.85	.00	.00	.00	.00
AC-FT	28	8.9	4.3	3.5	2.4	2810	2220	102	7.9	3.4	1.3	.0

CAL YR 1986 TOTAL 2862.67 MEAN 7.84 MAX 214 MIN .00 AC-FT 5680
WTR YR 1987 TOTAL 2617.52 MEAN 7.17 MAX 199 MIN .00 AC-FT 5190

05114000 SOURIS (MOUSE) RIVER NEAR SHERWOOD, ND
(International gaging station)

LOCATION.--Lat 48°59'24", long 101°57'28", in NW¼SE¼NE¼ sec.33, T.164 N., R.87 W., Renville County, Hydrologic Unit 09010001, on right bank 0.8 mi downstream from international boundary, 16 mi northwest of Sherwood, and at mile 511.4.

DRAINAGE AREA.--8,940 mi^2, approximately, of which about 5,900 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1930 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1308: 1934, 1945. WSP 2113: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,603.73 ft above National Geodetic Vertical Datum of 1929. Prior to Apr. 8, 1935, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Dec. 7 to Jan. 5, 17-29, Feb. 16, 17, Mar. 4-6, 15-Apr. 3, ice backwater; and July 7-28, missing stage record. Records good except those for periods Mar. 4-6, 15-Apr. 3 and July 7-28, which are poor. Some regulation by reservoirs in Canada. Some small diversions for irrigation and municipal supply.

COOPERATION.--This station is one of the international gaging stations maintained by the United States under agreement with Canada.

AVERAGE DISCHARGE.--57 years, 136 ft^3/s, 98,530 acre-ft/yr; median of yearly mean discharges, 76 ft^3/s, 55,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14,800 ft^3/s, Apr. 10, 1976, gage height, 25.15 ft; no flow at times in some years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in 1927 reached a stage of about 22 ft and flood in 1904 reached a stage of about 25.8 ft from information by local residents.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,300 ft^3/s, Apr. 4, gage height, 12.07 ft, backwater from ice; maximum gage height, 12.13, Mar. 29, backwater from ice; minimum daily discharge, 0.07 ft^3/s, Sept. 4, 21.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.6	5.4	7.0	3.0	2.3	3.5	490	79	22	3.0	2.0	.20
2	6.7	5.3	7.1	3.0	2.4	3.4	420	88	20	2.7	1.6	.19
3	6.6	5.9	6.4	3.0	2.5	3.4	730	89	18	2.6	1.5	.10
4	6.8	11	5.2	3.0	2.3	7.3	1250	84	17	2.5	1.4	.07
5	6.8	16	4.8	3.0	2.3	25	1170	77	17	2.4	1.0	.08
6	6.6	17	4.1	3.1	2.5	47	880	69	19	2.9	.85	.10
7	6.8	18	3.5	3.0	3.3	60	615	61	18	3.0	.91	.11
8	6.7	18	3.2	3.0	3.9	80	483	56	16	2.8	.85	.14
9	6.3	16	2.9	3.0	5.4	90	367	51	14	2.6	.84	.14
10	6.0	18	2.8	2.9	12	95	290	46	13	3.0	.78	.13
11	5.8	17	2.7	2.8	8.6	100	246	40	12	3.5	.72	.14
12	6.0	17	2.6	2.9	7.0	105	214	37	11	4.0	.63	.13
13	6.0	14	2.5	3.0	6.7	100	185	34	10	3.0	.56	.12
14	6.0	12	2.6	3.2	4.0	85	174	31	10	2.6	.63	.11
15	5.9	11	2.8	2.8	3.1	70	173	29	8.9	2.2	.65	.10
16	6.0	11	2.9	2.3	2.8	65	167	29	8.1	2.0	.71	.10
17	6.0	9.5	3.0	2.2	2.7	60	161	31	7.8	1.8	.63	.13
18	5.8	9.4	3.1	2.0	3.3	55	148	29	7.3	2.5	.81	.13
19	5.7	9.9	3.1	2.2	3.0	50	134	27	6.6	3.5	.59	.10
20	5.6	9.1	3.1	2.3	3.1	65	130	27	5.8	4.0	.51	.08
21	5.5	9.9	3.0	2.4	3.1	190	121	28	5.3	5.0	.49	.07
22	5.6	9.7	3.0	2.5	3.3	370	120	27	5.1	4.0	.41	.09
23	5.8	9.3	3.0	2.5	3.3	390	112	27	4.5	3.6	.38	.11
24	5.7	9.8	3.0	2.4	3.3	560	104	29	3.7	3.2	.36	.12
25	5.9	9.8	3.0	2.4	3.4	700	102	29	3.2	2.8	.37	.10
26	5.9	9.4	3.0	2.4	3.5	710	99	27	2.9	2.6	.38	.11
27	5.7	9.2	3.0	2.3	3.3	780	94	26	2.6	2.4	.39	.22
28	5.7	8.7	3.0	2.3	3.5	780	87	25	3.4	2.2	.37	.39
29	5.6	8.3	3.0	2.4	---	800	84	23	3.5	1.7	.35	.37
30	5.4	7.7	3.1	2.5	---	720	76	23	3.3	2.3	.33	.35
31	5.5	---	3.1	2.7	---	620	---	24	---	2.2	.27	---
TOTAL	187.0	342.3	108.6	82.5	109.9	7789.6	9426	1302	299.0	88.6	22.27	4.33
MEAN	6.03	11.4	3.50	2.66	3.92	251	314	42.0	9.97	2.86	.72	.14
MAX	6.8	18	7.1	3.2	12	800	1250	89	22	5.0	2.0	.39
MIN	5.4	5.3	2.5	2.0	2.3	3.4	76	23	2.6	1.7	.27	.07
AC-FT	371	679	215	164	218	15450	18700	2580	593	176	44	8.6

CAL YR 1986 TOTAL 18171.70 MEAN 49.8 MAX 500 MIN .96 AC-FT 36040
WTR YR 1987 TOTAL 19761.92 MEAN 54.1 MAX 1250 MIN .07 AC-FT 39200

05114000 SOURIS RIVER NEAR SHERWOOD, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1970, 1972 to current year.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: August 1983 to current year.
SPECIFIC CONDUCTANCE: August 1983 to current year.

INSTRUMENTATION.--Water quality monitor since August 1983.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Maximum, 27.5°C, June 26, 1986; minimum, 0.0°C several days during winter months each year.
SPECIFIC CONDUCTANCE: Maximum daily, 2,190 micromhos, Dec. 15, 1983; minimum, 320 micromhos, Apr. 5, 1987.
EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: Maximum recorded, 26.9°C, June 22; minimum 0.0°C on many days during winter months.
SPECIFIC CONDUCTANCE: Maximum recorded, 2,090 micromhos, Jan. 30; minimum, 321 micromhos, Apr. 5.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	COLOR (PLAT-INUM-COBALT UNITS) (00080)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)
OCT											
08...	1545	6.6	--	--	6.5	10.5	--	--	--	--	--
NOV											
18...	1350	9.8	1750	8.24	-9.5	0.5	37	11.1	77	380	0
JAN											
06...	1250	3.0	1900	--	-6.0	0.5	--	--	--	--	--
FEB											
18...	1145	3.3	1660	7.74	-0.5	0.5	58	6.6	46	450	0
APR											
01...	1435	494	420	7.97	2.0	0.5	110	11.4	78	96	0
22...	1100	122	770	8.26	21.5	12.0	70	9.1	85	190	0
MAY											
28...	1205	25	1140	8.22	21.0	17.5	28	6.2	66	280	0
JUN											
23...	1105	4.5	1210	8.18	21.5	22.0	55	4.9	56	310	0
AUG											
05...	1110	1.0	1120	8.25	25.5	20.0	27	5.8	64	300	0
SEP											
16...	1545	0.09	1160	7.95	22.0	16.0	28	6.4	65	310	0
30...	1120	0.26	--	--	14.0	14.0	--	--	--	--	--

DATE	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RARIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2) (00405)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)
NOV											
18...	80	43	250	58	6	13	465	5.1	370	80	0.30
FEB											
18...	98	50	210	49	4	16	520	18	390	78	0.30
APR											
01...	22	10	47	47	2	15	100	2.1	93	14	0.10
22...	42	21	92	50	3	9.5	203	2.1	170	19	0.20
MAY											
28...	60	31	130	49	3	15	301	3.5	220	54	0.30
JUN											
23...	66	36	160	51	4	14	359	4.6	230	69	0.30
AUG											
05...	59	36	150	51	4	14	351	3.8	180	67	0.30
SEP											
16...	60	39	150	50	4	12	381	8.2	160	71	0.30

05114000 SOURIS RIVER NEAR SHERWOOD, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	PHOS-PHORUS, TOTAL (MG/L AS P) (00665)	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)
NOV											
18...	5.8	1160	1100	1.6	31	<0.100	0.080	0.090	0.050	--	--
FEB											
18...	13	1070	1200	1.5	9.6	0.260	0.360	0.140	0.080	<10	1
APR											
01...	8.7	282	270	0.38	376	0.280	0.080	0.240	0.090	60	1
22...	10	508	490	0.69	166	<0.100	0.040	0.140	0.050	--	--
MAY											
28...	6.5	759	700	1.0	50	<0.100	0.080	0.200	0.080	--	--
JUN											
23...	14	810	810	1.1	9.9	<0.100	0.090	0.450	0.320	<10	11
AUG											
05...	16	732	730	1.0	2.1	<0.100	0.040	0.650	0.440	--	--
SEP											
16...	8.3	752	730	1.0	0.18	<0.100	0.030	0.270	0.470	--	--

DATE	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)	BORON, DIS-SOLVED (UG/L AS B) (01020)	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)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)
NOV											
18...	--	230	--	--	--	--	--	--	--	--	--
FEB											
18...	98	190	<1	<10	1	7	110	<5	63	430	<0.1
APR											
01...	38	140	<1	<10	<1	1	190	<5	12	36	<0.1
22...	--	140	--	--	--	--	--	--	--	--	--
MAY											
28...	--	410	--	--	--	--	--	--	--	--	--
JUN											
23...	91	470	<1	<10	3	<1	10	<5	57	330	0.2
AUG											
05...	--	420	--	--	--	--	--	--	--	--	--
SEP											
16...	--	370	--	--	--	--	--	--	--	--	--

DATE	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG) (01077)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)	VANA-DIUM, DIS-SOLVED (UG/L AS V) (01085)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)	CYANIDE TOTAL (MG/L AS CN) (00720)
FEB										
18...	1	5	8	<1	<1	540	<30	<10	12	<0.010
APR										
01...	1	3	2	<1	<1	150	5	10	6	<0.010
JUN										
23...	<1	5	3	<1	<1	470	5	<10	10	<0.010

05114000 SOURIS RIVER NEAR SHERWOOD, ND--CONTINUED

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	12.5	11.5	12.0	1.6	0.8	1.2	0.0	0.0	0.0	0.0	0.0	0.0
2	12.1	10.5	11.3	1.3	.4	.9	.0	.0	.0	.0	.0	.0
3	10.4	9.3	9.8	1.3	1.2	1.3	.0	.0	.0	.0	.0	.0
4	10.3	8.8	9.5	2.8	.9	1.7	.0	.0	.0	.0	.0	.0
5	10.1	8.6	9.4	2.9	2.2	2.6	.0	.0	.0	.0	.0	.0
6	12.3	9.3	10.5	2.1	1.6	1.9	.0	.0	.0	.0	.0	.0
7	11.7	10.6	11.0	1.5	.0	1.0	.0	.0	.0	.0	.0	.0
8	10.8	9.4	10.2	.0	.0	.0	.0	.0	.0	.0	.0	.0
9	9.2	7.0	8.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
10	8.6	7.0	7.9	.0	.0	.0	.0	.0	.0	.0	.0	.0
11	6.8	5.3	5.9	.0	.0	.0	.0	.0	.0	.0	.0	.0
12	5.2	3.2	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
13	4.7	2.7	3.6	.0	.0	.0	.0	.0	.0	.0	.0	.0
14	4.6	3.2	3.6	.0	.0	.0	.0	.0	.0	.0	.0	.0
15	6.1	3.0	4.2	.0	.0	.0	.0	.0	.0	.0	.0	.0
16	7.5	5.2	6.1	.0	.0	.0	.0	.0	.0	.0	.0	.0
17	8.0	5.7	6.8	.0	.0	.0	.0	.0	.0	.0	.0	.0
18	8.2	6.0	7.1	.0	.0	.0	.0	.0	.0	.0	.0	.0
19	8.1	6.5	7.4	.0	.0	.0	.0	.0	.0	.0	.0	.0
20	7.6	5.8	6.8	.0	.0	.0	.0	.0	.0	.0	.0	.0
21	8.4	5.8	7.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
22	8.3	6.8	7.6	.0	.0	.0	.0	.0	.0	.0	.0	.0
23	7.6	6.3	6.9	.0	.0	.0	.0	.0	.0	.0	.0	.0
24	6.7	5.0	5.8	.0	.0	.0	.0	.0	.0	.0	.0	.0
25	6.0	4.4	5.3	.0	.0	.0	.0	.0	.0	.0	.0	.0
26	6.3	4.5	5.4	.0	.0	.0	.0	.0	.0	.0	.0	.0
27	7.3	5.1	6.1	.0	.0	.0	.0	.0	.0	.0	.0	.0
28	7.1	5.9	6.5	.0	.0	.0	.0	.0	.0	.0	.0	.0
29	6.4	4.8	5.5	.0	.0	.0	.0	.0	.0	.0	.0	.0
30	4.8	3.7	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
31	4.0	1.8	3.0	---	---	---	.0	.0	.0	.0	.0	.0
MONTH	12.5	1.8	7.04	2.9	.0	.35	.0	.0	.0	.0	.0	.0

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.2	13.8	14.6
2	.0	.0	.0	.0	.0	.0	.0	.0	.0	15.0	13.5	14.2
3	.0	.0	.0	.0	.0	.0	.0	.0	.0	13.9	13.0	13.5
4	.0	.0	.0	.0	.0	.0	.1	.0	.0	15.7	11.8	13.6
5	.0	.0	.0	.0	.0	.0	.3	.0	.1	17.0	13.5	15.1
6	.0	.0	.0	.0	.0	.0	3.2	.0	1.2	17.5	13.9	15.6
7	.0	.0	.0	.0	.0	.0	4.9	2.5	3.6	18.3	14.2	16.1
8	.0	.0	.0	.0	.0	.0	7.4	4.9	6.1	20.0	15.4	17.6
9	.0	.0	.0	.0	.0	.0	7.4	6.3	7.2	19.3	16.4	17.9
10	.0	.0	.0	.0	.0	.0	6.2	5.3	5.7	19.9	15.7	17.8
11	.0	.0	.0	.0	.0	.0	5.4	4.4	5.0	19.5	15.1	17.5
12	.0	.0	.0	.0	.0	.0	6.6	5.1	5.8	20.8	16.2	18.6
13	.0	.0	.0	.0	.0	.0	8.0	6.0	7.0	20.1	17.8	19.0
14	.0	.0	.0	.0	.0	.0	9.2	7.2	8.2	19.2	15.4	17.6
15	.0	.0	.0	.0	.0	.0	10.2	8.5	9.4	20.9	16.9	19.0
16	.0	.0	.0	.0	.0	.0	11.2	9.6	10.4	20.8	18.7	19.9
17	.0	.0	.0	.0	.0	.0	12.7	10.5	11.5	19.6	16.9	17.7
18	.0	.0	.0	.0	.0	.0	13.9	11.8	12.8	16.7	14.9	15.8
19	.0	.0	.0	.0	.0	.0	14.5	12.7	13.4	16.6	14.3	15.4
20	.0	.0	.0	.0	.0	.0	13.2	11.7	12.5	16.2	12.7	14.3
21	.0	.0	.0	.0	.0	.0	12.9	10.6	11.7	13.4	11.4	12.4
22	.0	.0	.0	.0	.0	.0	14.1	11.0	12.4	12.9	11.2	12.3
23	.0	.0	.0	.0	.0	.0	13.6	11.8	12.6	16.1	12.0	13.9
24	.0	.0	.0	.0	.0	.0	14.0	12.0	12.8	18.5	14.1	16.2
25	.0	.0	.0	.0	.0	.0	14.5	12.3	13.3	18.3	16.0	16.7
26	.0	.0	.0	.0	.0	.0	15.0	12.7	13.6	16.5	15.3	16.0
27	.0	.0	.0	.0	.0	.0	14.7	11.9	13.2	18.5	15.4	16.9
28	.0	.0	.0	.0	.0	.0	16.6	12.6	14.4	18.9	16.8	17.9
29	---	---	---	.0	.0	.0	16.6	14.0	15.2	20.4	16.6	18.5
30	---	---	---	.0	.0	.0	16.7	13.4	14.9	21.6	18.3	20.0
31	---	---	---	.0	.0	.0	---	---	---	22.1	20.1	21.2
MONTH	.0	.0	.0	.0	.0	.0	16.7	.0	8.47	22.1	11.2	16.5

05114000 SOURIS RIVER NEAR SHERWOOD, ND--CONTINUED

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1988 TO SEPTEMBER 1987

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	21.5	18.9	20.1	20.9	18.6	20.0	26.2	23.2	24.8	18.1	14.6	16.2
2	18.8	15.9	17.0	22.2	18.5	20.1	24.5	21.6	23.0	19.1	14.9	16.8
3	17.0	14.2	15.7	21.9	18.4	20.3	21.8	19.9	20.8	18.8	17.1	17.9
4	19.2	15.7	17.4	22.9	20.3	21.3	19.9	17.8	19.1	17.4	15.9	16.6
5	21.5	17.1	19.2	24.0	20.3	22.1	21.9	18.0	19.8	16.4	14.3	15.3
6	24.0	20.3	22.0	23.4	21.6	22.5	23.0	17.9	20.2	18.4	14.3	15.9
7	23.6	21.7	22.7	23.1	19.6	21.4	23.9	18.2	20.6	16.8	14.3	15.3
8	21.9	19.5	20.9	21.8	20.0	20.9	23.9	18.6	20.9	15.7	12.8	14.1
9	21.9	18.2	20.1	20.5	19.6	20.0	22.9	19.4	21.1	13.4	11.7	12.4
10	20.4	19.0	19.7	19.5	18.4	19.0	21.9	19.3	20.6	13.4	11.6	12.6
11	22.1	17.7	19.7	18.5	17.4	17.9	22.9	19.6	20.9	13.4	11.3	12.4
12	23.6	19.0	21.2	20.7	15.8	18.1	21.6	17.4	19.4	14.5	11.6	12.7
13	25.0	20.6	22.7	21.3	16.9	19.0	18.6	16.8	17.8	15.2	10.7	12.8
14	25.1	21.3	23.1	22.9	18.1	20.4	17.5	16.5	17.0	16.9	12.2	14.3
15	26.2	21.6	23.8	23.6	19.2	21.4	18.7	16.9	17.6	17.9	13.8	15.7
16	26.5	22.1	24.3	25.6	21.1	23.2	18.2	16.3	17.2	16.9	15.0	15.9
17	26.2	22.9	24.5	23.3	19.3	21.0	17.6	15.7	16.7	15.3	14.2	14.7
18	25.6	21.2	23.3	19.2	17.9	18.4	18.3	14.7	16.4	14.8	13.4	13.8
19	25.5	21.8	23.4	21.8	17.4	19.0	18.6	14.5	16.5	14.8	12.8	13.7
20	24.6	22.0	23.3	23.2	19.0	21.2	18.6	14.9	16.7	15.0	11.8	13.3
21	26.1	21.3	23.6	21.5	17.9	19.3	18.8	16.0	17.3	15.1	11.1	13.0
22	26.9	22.3	23.8	21.5	17.3	18.9	19.0	14.5	16.4	15.8	11.6	13.6
23	23.3	21.1	22.5	20.9	19.0	19.9	17.6	13.7	15.6	15.3	12.6	14.0
24	22.3	19.9	21.3	21.8	18.1	19.9	15.6	13.9	15.0	13.8	11.8	12.8
25	20.5	18.1	19.4	24.3	19.6	21.4	16.1	14.6	15.2	13.5	10.5	12.0
26	21.8	16.7	19.1	24.2	21.4	22.8	16.6	14.2	15.3	13.6	10.6	12.1
27	22.6	17.6	19.9	25.1	22.1	23.3	17.5	14.2	15.9	13.1	11.9	12.3
28	20.8	18.6	19.5	26.2	23.6	24.9	19.2	14.7	16.7	14.6	11.6	12.6
29	21.7	17.1	19.0	25.5	23.1	24.3	18.1	16.3	16.9	14.2	10.9	12.4
30	20.3	17.6	18.9	23.5	22.0	22.7	18.6	14.4	16.0	12.9	10.3	11.8
31	---	---	---	26.1	22.4	24.0	18.2	13.4	15.3	---	---	---
MONTH	26.9	14.2	21.0	26.2	15.8	20.9	26.2	13.4	18.2	19.1	10.3	14.0
YEAR	26.9	.0	8.92									

SPECIFIC CONDUCTANCE MICROSIEMENS/CM AT 25 DEG C, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	1160	1140	1150	1370	1360	1360	1770	1750	1770	1910	1880	1890
2	1160	1150	1160	1390	1370	1380	1780	1760	1770	1900	1880	1890
3	1170	1160	1160	1410	1380	1390	1780	1770	1770	1900	1890	1900
4	1180	1140	1170	1420	1390	1400	1780	1770	1770	1910	1890	1900
5	1160	1150	1150	1440	1410	1420	1790	1770	1780	1900	1890	1900
6	1160	1150	1150	1460	1440	1450	1800	1780	1790	1910	1890	1900
7	1160	1140	1150	1480	1450	1470	1800	1790	1800	1920	1890	1900
8	1160	1140	1150	1490	1470	1480	1810	1800	1810	1920	1910	1910
9	1170	1160	1160	1520	1490	1500	1820	1810	1810	1920	1900	1910
10	1180	1160	1170	1520	1510	1520	1830	1810	1820	1930	1910	1920
11	1190	1170	1180	1540	1510	1530	1840	1820	1830	1930	1920	1930
12	1200	1170	1190	1560	1530	1550	1850	1830	1840	1940	1920	1930
13	1200	1180	1190	1600	1560	1580	1860	1840	1850	1950	1930	1940
14	1200	1180	1190	1630	1600	1610	1870	1860	1860	1960	1940	1940
15	1210	1190	1200	1660	1620	1640	1880	1870	1870	1950	1930	1940
16	1210	1200	1210	1700	1660	1680	1890	1860	1880	1950	1940	1950
17	1220	1200	1210	1740	1700	1710	1900	1880	1890	1970	1950	1960
18	1230	1200	1220	1760	1730	1750	1900	1890	1890	2000	1960	1980
19	1230	1210	1220	1780	1750	1770	1900	1880	1890	2010	1990	2000
20	1240	1220	1230	1780	1770	1780	1900	1880	1890	2050	2010	2030
21	1240	1220	1230	1790	1780	1780	1910	1880	1890	2060	2050	2060
22	1250	1230	1240	1790	1780	1790	1920	1900	1910	2080	2060	2070
23	1260	1230	1240	1780	1770	1780	1920	1910	1920	2090	2080	2080
24	1260	1240	1250	1780	1770	1770	1930	1910	1920	2090	2060	2080
25	1290	1250	1270	1790	1760	1770	1930	1910	1920	2070	2050	2050
26	1300	1280	1290	1780	1760	1770	1930	1910	1920	2070	2050	2060
27	1320	1290	1300	1770	1770	1770	1930	1920	1930	2080	2070	2070
28	1310	1300	1310	1780	1760	1770	1930	1920	1920	2070	2060	2070
29	1330	1300	1320	1770	1760	1770	1930	1920	1920	2080	2070	2080
30	1350	1330	1340	1770	1760	1760	1920	1910	1910	2090	2070	2080
31	1360	1330	1340	---	---	---	1920	1910	1910	2090	2070	2080
MONTH	1360	1140	1217	1790	1360	1623	1930	1750	1860	2090	1880	1981

05114000 SOURIS RIVER NEAR SHERWOOD, ND--CONTINUED

SPECIFIC CONDUCTANCE MICROSIEMENS/CM AT 25 DEG C, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	2080	2060	2070	1660	1640	1650	480	403	427	988	957	975
2	2070	2040	2060	1660	1640	1660	553	484	520	1010	978	991
3	2050	2040	2050	1680	1650	1660	548	487	517	1000	989	994
4	2050	2030	2040	1690	1670	1670	515	459	477	1020	990	1000
5	2060	2050	2050	1680	1660	1670	390	321	357	1020	1010	1020
6	2050	2040	2050	1650	1560	1610	403	352	373	1030	1010	1020
7	2050	2030	2040	1550	1410	1490	455	413	433	1040	1020	1030
8	2040	2000	2020	1410	1290	1340	507	465	481	1050	1030	1040
9	2000	1980	2000	1300	1240	1260	519	497	510	1060	1040	1050
10	1980	1940	1970	1250	1230	1240	540	519	529	1070	1050	1070
11	1940	1870	1900	1380	1260	1310	552	530	544	1090	1070	1070
12	1860	1790	1830	1480	1370	1430	584	552	567	1100	1080	1090
13	1790	1740	1770	1490	1470	1480	596	574	588	1110	1090	1100
14	1730	1720	1720	1470	1400	1450	627	596	611	1120	1090	1100
15	1710	1700	1710	1400	1320	1360	649	627	635	1130	1110	1120
16	1700	1670	1690	1310	1190	1260	671	649	658	1130	1110	1110
17	1670	1650	1660	1200	1080	1140	702	671	684	1120	1100	1110
18	1670	1650	1660	1080	1020	1040	704	692	698	1100	1090	1090
19	1660	1640	1650	1040	1010	1020	726	694	715	1140	1080	1100
20	1650	1630	1640	1060	1040	1050	758	726	745	1140	1100	1120
21	1640	1620	1630	1050	915	1000	769	748	760	1120	1100	1110
22	1640	1620	1630	905	728	814	781	759	771	1110	1080	1110
23	1650	1630	1640	718	611	663	811	781	790	1140	1110	1120
24	1640	1630	1640	625	598	610	842	801	817	1140	1120	1130
25	1660	1630	1640	623	587	601	873	832	852	1150	1140	1140
26	1660	1640	1650	576	479	531	884	863	874	1160	1140	1140
27	1660	1640	1650	469	392	437	905	874	887	1150	1140	1140
28	1670	1640	1650	417	390	401	915	895	905	1150	1140	1150
29	---	---	---	431	413	421	946	906	924	1170	1140	1150
30	---	---	---	435	416	427	967	936	947	1170	1160	1160
31	---	---	---	421	387	401	---	---	---	1170	1150	1160
MONTH	2080	1620	1811	1690	387	1100	967	321	653	1170	957	1087

SPECIFIC CONDUCTANCE MICROSIEMENS/CM AT 25 DEG C, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	1150	1140	1150	1180	1150	1170	1110	1080	1100	1160	1140	1150
2	1150	1130	1140	1190	1170	1180	1120	1100	1110	1160	1150	1150
3	1140	1120	1130	1200	1180	1190	1120	1100	1110	1170	1140	1150
4	1140	1130	1130	1200	1180	1190	1120	1110	1120	1160	1150	1160
5	1140	1120	1130	1210	1190	1200	1130	1110	1120	1170	1140	1160
6	1140	1120	1130	1210	1140	1180	1150	1120	1130	1170	1160	1160
7	1140	1120	1130	1210	1130	1170	1150	1130	1140	1180	1160	1170
8	1150	1130	1140	1200	1180	1190	1170	1140	1150	1180	1150	1170
9	1140	1120	1140	1190	1140	1170	1170	1150	1170	1180	1150	1160
10	1150	1130	1140	1150	1130	1140	1180	1150	1170	1170	1150	1160
11	1160	1130	1140	1130	1100	1120	1180	1170	1170	1160	1150	1160
12	1180	1150	1160	1110	1070	1090	1190	1170	1180	1170	1150	1160
13	1180	1160	1170	1100	1070	1080	1190	1170	1180	1180	1150	1160
14	1190	1170	1180	1120	1090	1100	1180	1170	1170	1180	1140	1170
15	1210	1180	1200	1160	1110	1120	1180	1170	1170	1190	1140	1160
16	1220	1190	1200	1130	1100	1120	1170	1160	1170	1180	1120	1150
17	1220	1200	1210	1120	1080	1100	1170	1150	1160	1150	1120	1130
18	1210	1200	1200	1090	1000	1040	1160	1140	1150	1150	1110	1130
19	1220	1190	1200	1020	1000	1010	1160	1120	1150	1160	1110	1130
20	1200	1180	1200	1030	1010	1020	1160	1130	1140	1160	1110	1130
21	1210	1180	1200	1060	1030	1040	1150	1140	1140	1160	1110	1140
22	1220	1190	1200	1080	1050	1060	1160	1140	1150	1160	1120	1140
23	1230	1200	1210	1110	1070	1080	1160	1130	1150	1160	1130	1140
24	1220	1210	1210	1120	1090	1100	1160	1140	1150	1160	1130	1150
25	1210	1200	1200	1130	1100	1110	1160	1150	1150	1190	1120	1150
26	1220	1190	1200	1130	1110	1120	1160	1140	1150	1160	1130	1140
27	1240	1190	1220	1130	1100	1120	1160	1140	1150	1160	1120	1140
28	1230	1150	1200	1150	1110	1130	1160	1150	1150	1120	1080	1100
29	1190	1140	1160	1160	1120	1140	1150	1130	1140	1150	1110	1120
30	1180	1150	1160	1140	1060	1100	1150	1140	1140	1150	1110	1130
31	---	---	---	1110	1060	1090	1160	1140	1150	---	---	---
MONTH	1240	1120	1173	1210	1000	1118	1190	1080	1148	1190	1080	1147
YEAR	2090	321	1325									

05114700 LAKE DARLING NEAR GRANO, ND

LOCATION.--Lat 48°36'49", long 101°37'01", in NW1/4 sec.11, T.159 N., R.85 W., Renville County, Hydrologic Unit Unit 09010001, at highway bridge 1.3 mi west of Grano.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1985 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH (STANDARD UNITS) (00400)	TEMPERATURE AIR (DEG C) (00020)	TEMPERATURE WATER (DEG C) (00010)	COLOR (PLATINUM-COBALT UNITS) (00080)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)	HARDNESS (MG/L AS CACO3) (00900)	HARDNESS NONCARBONATE (MG/L AS CACO3) (95902)	CALCIUM DISSOLVED (MG/L AS CA) (00915)
NOV											
19...	1550	880	8.49	-3.5	1.5	6	9.8	70	260	0	53
FEB											
18...	1450	1180	8.00	0.0	4.0	8	11.7	89	320	0	66
APR											
01...	0930	997	8.14	-1.0	5.0	17	9.8	76	290	0	58
22...	1415	1030	8.35	21.0	12.0	55	9.4	88	160	0	34
MAY											
28...	1510	750	[a]8.10	21.0	17.0	26	8.7	91	190	0	41
JUN											
23...	1415	740	8.55	25.0	23.0	24	7.5	88	210	0	45
AUG											
05...	1445	770	9.11	29.5	22.5	13	8.3	96	220	0	47
SEP											
16...	1730	800	9.02	22.0	16.0	27	6.8	69	220	0	46

DATE	MAGNESIUM, DISSOLVED (MG/L AS MG) (00925)	SODIUM, DISSOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM ADSORPTION RATIO (00931)	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	ALKALINITY LAB (MG/L AS CACO3) (90410)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2) (00405)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)
NOV											
19...	31	100	44	3	13	263	1.6	200	30	0.30	7.9
FEB											
18...	38	130	45	3	14	331	6.4	240	39	0.30	11
APR											
01...	34	110	44	3	14	294	4.1	220	36	0.20	9.3
22...	18	75	49	3	11	175	1.5	140	19	0.20	7.8
MAY											
28...	22	81	46	3	14	212	--	150	22	0.20	12
JUN											
23...	23	82	45	3	12	217	1.2	160	20	0.20	13
AUG											
05...	26	88	44	3	14	233	0.3	170	23	0.20	7.1
SEP											
16...	25	84	44	3	11	242	0.4	150	23	0.20	7.2

DATE	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301)	SOLIDS, DISSOLVED (TONS PER AC-FT) (70303)	SOLID, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITRO-NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	PHORUS, ORTHO, DISSOLVED (MG/L AS P) (00671)	PHOSALUMINUM, DISSOLVED (UG/L AS AL) (01106)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BARIUM, DISSOLVED (UG/L AS BA) (01005)
NOV										
19...	617	590	0.84	0.190	0.090	0.120	0.090	--	--	--
FEB										
18...	762	740	1.0	<0.100	0.260	0.190	0.100	<10	4	100
APR										
01...	663	660	0.90	0.110	0.140	0.110	0.070	<10	3	86
22...	393	410	0.53	<0.100	0.050	0.120	0.050	--	--	--
MAY										
28...	503	470	0.68	<0.100	0.080	0.170	0.120	--	--	--
JUN										
23...	494	490	0.67	<0.100	0.020	0.230	0.170	<10	6	61
AUG										
05...	518	520	0.70	<0.100	0.060	0.380	0.270	--	--	--
SEP										
16...	523	490	0.71	<0.100	0.110	0.530	0.130	--	--	--

a - Laboratory value

05114700 LAKE DARLING NEAR GRANO, ND

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	BORON, DIS-SOLVED (UG/L AS B) (01020)	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)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)
NOV										
19...	290	--	--	--	--	--	--	--	--	--
FEB										
18...	320	<1	<10	<1	1	11	<5	55	630	<0.1
APR										
01...	290	<1	<10	<1	1	14	<5	45	230	<0.1
22...	170	--	--	--	--	--	--	--	--	--
MAY										
28...	210	--	--	--	--	--	--	--	--	--
JUN										
23...	210	<1	<10	1	1	<3	<5	34	8	0.2
AUG										
05...	250	--	--	--	--	--	--	--	--	--
SEP										
16...	240	--	--	--	--	--	--	--	--	--

DATE	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG) (01077)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)	VANA-DIUM, DIS-SOLVED (UG/L AS V) (01085)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)	CYANIDE TOTAL (MG/L AS CN) (00720)
FEB										
18...	3	6	2	<1	1	410	<20	20	22	<0.010
APR										
01...	4	11	4	<1	<1	350	<17	10	<3	<0.010
JUN										
23...	<1	5	2	<1	<1	260	<25	10	10	<0.010

05115500 LAKE DARLING NEAR FOXHOLM, ND

LOCATION.--Lat 48°27'27", long 101°35'14", in NE¼NE¼ sec.1, T.157 N., R.85 W., Ward County, Hydrologic Unit 09010001, on control structure of Lake Darling Dam, reservoir of Fish and Wildlife Service, on Souris River about 6 mi north of Foxholm, and at mile 430.0.

DRAINAGE AREA.--9,450 mi^2, approximately, of which about 6,200 mi^2 is probably noncontributing.

PERIOD OF RECORD.--April 1936 to current year (no winter records 1936-39).

REVISED RECORDS.--WSP 1338: 1942. WSP 2113: Drainage area.

GAGE.--Non-recording gage. Datum of gage is 1,577.00 ft National Geodetic Vertical Datum of 1929. April 1936 to Aug. 8, 1963, nonrecording gages at same site and datum.

REMARKS.--Gage heights frequently affected by wind. Reservoir is formed by earth dam; storage began in April 1936; dam completed in July 1936. Usable capacity, 108,500 acre-ft between gage heights of 0.0 ft, sill of control gages, and 21.0 ft, crest of spillway. Dead storage, 3,500 acre-ft. Figures given herein represent total contents based on capacity table dated June 7, 1943. Water is used during periods of low flow at wildlife refuge downstream.

COOPERATION.--Gage readings furnished by Fish and Wildlife Service.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 145,400 acre-ft Apr. 17, 1976, gage height, 24.24 ft; minimum observed since April 1943 when reservoir was first filled to spillway level, 31,200 acre-ft Feb. 18, 25, 1963, gage height, 10.04 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents observed, 107,600 acre-ft, Apr. 10, gage height, 20.54 ft; minimum observed, 81,400 acre-ft, Jan. 31, gage height, 19.69.

MONTHEND GAGE HEIGHT AND CONTENTS AT 2400, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

Date	Gage height (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	18.25	86,200	--
Oct. 31	18.12	85,100	-1,100
Nov. 30	17.91	83,200	-1,900
Dec. 31	17.85	82,800	-400
CAL YR 1986	--	--	+2,300
Jan. 31	17.69	81,400	-1,400
Feb. 28	17.73	81,700	+300
Mar. 31	19.63	98,700	+17,000
Apr. 30	19.91	101,000	+2,300
May 31	19.81	100,000	-1,000
June 30	19.32	95,900	-4,100
July 31	19.15	94,400	-1,500
Aug. 31	18.60	89,400	-5,000
Sept. 30	18.05	84,400	-5,000
WTR YR 1987	--	--	-1,800

05116000 SOURIS (MOUSE) RIVER NEAR FOXHOLM, ND

LOCATION.--Lat 48°22'20", long 101°30'18", in SW¼SE¼ sec.34, T.157 N., R.84 W., Ward County, Hydrologic Unit 09010001, on left bank 30 ft upstream from county highway bridge, 3 mi east of Foxholm, 19 mi upstream from Des Lacs River, and at mile 414.5.

DRAINAGE AREA.--9,470 mi^2, approximately, of which about 6,200 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1904 to November 1905, March to July 1906 (gage heights only), October 1936 to current year. Monthly discharge only for some periods, published in WSP 1308. Published as Mouse River near Foxholm, 1904-6.

REVISED RECORDS.--WSP 1308: 1905. WSP 2113: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,560.73 ft above National Geodetic Vertical Datum of 1929. June 23, 1904, to July 31, 1906, nonrecording gage at site 3.2 mi upstream at different datum. Apr. 1, 1937, to Mar. 25, 1938, nonrecording gage at site 600 ft downstream at datum about 0.5 ft higher.

REMARKS.--Estimated daily discharges: Oct. 1-8. Records good. Flow almost completely regulated since 1936 by Lake Darling (station 05115500) 15 mi upstream and several small reservoirs, combined capacity, about 184,000 acre-ft. Some small diversions for irrigation and municipal supply.

AVERAGE DISCHARGE.--52 years, 142 ft^3/s, 102,900 acre-ft/yr; median of yearly mean discharges, 60 ft^3/s, 43,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,600 ft^3/s, Apr. 17, 1976, gage height, 17.17 ft; maximum reverse flow, 25 ft^3/s, Apr. 4, 1949 caused by backwater from the Des Lacs River; no flow at times in many years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 866 ft^3/s, Apr. 12, gage height, 9.60 ft; minimum daily discharge, 1.6 cfs, July 12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	25	29	22	21	20	2.5	89	42	11	17	9.4	11
2	25	28	22	21	21	2.4	133	43	14	16	9.2	11
3	30	22	22	21	21	2.3	207	20	17	16	9.4	11
4	31	13	22	21	21	2.5	250	17	18	16	9.6	16
5	31	16	22	21	21	3.4	320	17	18	17	9.4	67
6	31	17	22	22	21	3.6	413	15	18	15	9.5	67
7	31	16	22	21	21	3.4	549	14	18	6.1	9.6	67
8	31	21	22	21	21	3.2	676	13	18	4.4	9.6	67
9	32	19	22	21	20	3.0	778	13	15	3.6	9.6	68
10	32	17	21	21	20	3.0	829	12	6.2	2.7	9.9	69
11	33	17	21	21	20	3.0	854	11	5.2	2.1	9.9	70
12	33	17	21	21	20	3.0	864	11	4.4	1.6	9.7	71
13	33	17	21	21	20	3.1	860	11	3.8	3.2	10	71
14	33	17	21	20	20	3.2	756	11	3.2	11	11	71
15	33	17	21	20	20	3.2	522	11	2.9	14	11	72
16	33	17	21	20	20	3.4	280	11	2.4	13	10	72
17	33	17	21	20	20	3.4	138	10	2.2	12	10	72
18	33	17	21	19	20	3.7	63	11	2.0	13	10	65
19	33	17	21	19	20	3.7	21	11	2.1	11	10	46
20	33	17	21	19	17	4.5	21	11	4.6	11	10	46
21	33	17	21	19	2.5	7.9	31	11	6.2	11	11	46
22	33	17	21	19	2.2	12	45	11	6.6	11	11	47
23	33	18	21	19	2.2	29	25	11	9.7	10	11	48
24	33	21	21	19	2.2	83	28	11	13	10	11	39
25	33	22	21	19	2.2	89	31	11	15	10	11	30
26	33	22	21	19	2.2	89	30	11	16	9.9	11	30
27	33	23	21	20	2.1	88	29	11	16	9.6	11	30
28	33	23	21	20	2.4	86	31	11	16	10	11	29
29	33	23	21	20	---	84	37	11	17	9.6	11	28
30	32	23	21	20	---	82	40	10	17	9.6	11	27
31	32	---	21	20	---	81	---	9.8	---	9.6	11	---
TOTAL	990	577	660	625	422.0	794.4	8950	433.8	318.5	316.0	317.8	1464
MEAN	31.9	19.2	21.3	20.2	15.1	25.6	298	14.0	10.6	10.2	10.3	48.8
MAX	33	29	22	22	21	89	864	43	18	17	11	72
MIN	25	13	21	19	2.1	2.3	21	9.8	2.0	1.6	9.2	11
AC-FT	1960	1140	1310	1240	837	1580	17750	860	632	627	630	2900

CAL YR 1986 TOTAL 11933.6 MEAN 32.7 MAX 239 MIN .00 AC-FT 23670
WTR YR 1987 TOTAL 15868.5 MEAN 43.5 MAX 864 MIN 1.6 AC-FT 31480

05116000 SOURIS RIVER NEAR FOXHOLM, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	COLOR (PLAT-INUM-COBALT UNITS) (00080)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)
OCT 09...	1255	31	880	--	10.0	9.5	--	--	--	--	--
NOV 19...	1305	19	910	8.18	-0.5	1.0	7	10.5	75	270	0
JAN 07...	1205	21	1000	--	-2.0	1.5	--	--	--	--	--
FEB 19...	1040	21	1060	8.55	0.5	3.0	7	14.1	103	280	9
MAR 24...	1630	87	950	--	2.0	4.0	--	--	--	--	--
APR 23...	1025	23	990	8.61	15.0	13.5	14	9.5	90	270	8
MAY 29...	1300	11	940	--	23.0	19.0	19	10.0	108	260	0
JUN 22...	1400	6.3	930	9.01	32.0	26.0	23	5.2	65	260	0
AUG 06...	1015	9.4	950	8.36	21.0	21.5	27	6.2	70	240	0
SEP 09...	1455	66	930	8.56	19.0	16.0	12	9.4	95	270	4

DATE	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2) (00405)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)
NOV 19...	54	32	100	43	3	14	272	3.5	180	28	0.20
FEB 19...	57	33	100	42	3	15	270	1.4	210	31	0.30
APR 23...	54	32	95	42	3	12	259	1.2	180	27	0.20
MAY 29...	50	33	100	44	3	13	273	--	170	30	0.30
JUN 22...	47	34	110	47	3	13	279	0.5	180	32	0.30
AUG 06...	38	35	120	50	3	15	282	2.4	200	33	0.30
SEP 09...	54	32	110	46	3	13	263	1.4	180	31	0.30

DATE	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	PHOS-PHORUS, TOTAL (MG/L AS P) (00665)	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)
NOV 19...	1.1	606	570	0.82	30	<0.100	0.280	0.100	0.060	--	--
FEB 19...	2.2	593	610	0.81	33	<0.100	0.030	0.060	0.030	<10	2
APR 23...	6.2	572	560	0.78	35	<0.100	0.020	0.080	0.040	<10	3
MAY 29...	4.3	618	570	0.84	18	<0.100	0.050	0.390	0.180	--	--
JUN 22...	6.9	624	590	0.85	10	<0.100	0.030	0.510	0.470	<10	10
AUG 06...	2.0	623	610	0.85	16	<0.100	0.010	0.450	0.300	--	--
SEP 09...	3.2	596	580	0.81	107	<0.100	0.020	0.140	0.060	--	--

05116000 SOURIS RIVER NEAR FOXHOLM, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)	BORON, DIS-SOLVED (UG/L AS B) (01020)	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)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)
NOV 19...	--	290	--	--	--	--	--	--	--	--	--
FEB 19...	91	300	<1	<10	<1	8	7	5	44	170	<0.1
APR 23...	80	260	1	<10	<1	<1	6	<5	41	130	<0.1
MAY 29...	--	300	--	--	--	--	--	--	--	--	--
JUN 22...	6	310	<1	<10	2	<1	7	<5	50	40	0.2
AUG 06...	--	350	--	--	--	--	--	--	--	--	--
SEP 09...	--	290	--	--	--	--	--	--	--	--	--

DATE	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG) (01077)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)	VANA-DIUM, DIS-SOLVED (UG/L AS V) (01085)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)	CYANIDE TOTAL (MG/L AS CN) (00720)
FEB 19...	4	5	6	<1	1	340	<20	<10	19	<0.010
APR 23...	6	4	2	<1	<1	320	<1	<10	4	<0.010
JUN 22...	<1	3	<1	<1	<1	300	9	<10	9	<0.010

05116500 DES LACS RIVER AT FOXHOLM, ND

LOCATION.--Lat 48°22'14", long 101°34'11", in NW¼NE¼NW¼ sec 2, T.156 N., R.85 W., Ward County, Hydrologic Unit 09010002, on left bank 200 ft upstream from county highway bridge in Foxholm, and at mile 23.0.

DRAINAGE AREA.--939 mi^2, of which about 400 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1904 to July 1906, October 1945 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,632.98 ft above National Geodetic Vertical Datum of 1929. June 14 to Oct. 23, 1955, nonrecording gage at site 200 ft downstream from present gage at same datum. See WSP 1728 or 1913 for history of changes prior to June 14, 1955.

REMARKS.--Estimated daily discharges: Oct. 1-8, 14 to Nov. 19, Mar. 6-7, 23 to Apr. 1, July 9 to Aug. 4, and Aug. 8 to Sept. 9. Records good except for period of estimated record, Mar. 23 to Apr. 1, July 9 to Aug. 4, and Aug. 8 to Sept. 9, which are poor.

AVERAGE DISCHARGE.--44 years (water years 1905-06, 1946-87), 30.0 ft^3/s, 21,740 acre-ft/yr; median of yearly mean discharges, 16 ft^3/s, 11,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,260 ft^3/s, Apr. 19, 1979, gage height, 21.23 ft, from highwater mark; no flow at times in some year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, about 750 ft^3/s, Apr. 1, gage height unknown; maximum observed gage height, 11.35 ft, Apr. 2, backwater from ice; minimum daily discharge, .29 ft^3/s, Sept. 16.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.7	2.2	1.9	1.0	.59	1.6	700	23	8.1	1.7	1.5	1.0
2	2.6	2.2	2.0	.91	.64	1.6	580	21	7.7	1.6	2.0	1.0
3	2.5	2.2	2.0	.90	.63	1.6	253	22	6.7	1.5	2.5	1.0
4	2.4	2.2	1.8	.91	.65	3.8	168	21	6.2	1.4	2.6	1.0
5	2.3	2.2	1.6	1.0	.67	21	125	20	5.8	1.3	2.2	1.0
6	2.3	2.2	1.4	1.0	.78	85	93	18	5.7	1.2	1.9	1.0
7	2.2	2.2	1.4	.91	1.1	111	83	17	5.1	1.2	1.8	1.2
8	2.2	2.2	1.4	.81	1.4	56	80	16	4.7	1.1	1.6	1.4
9	2.2	1.7	1.1	.72	2.2	29	80	15	4.4	1.5	1.5	1.6
10	2.0	1.2	.64	.65	2.2	24	79	14	4.1	2.0	1.3	.92
11	2.1	1.0	.74	.63	2.4	16	77	13	4.2	2.2	1.0	.53
12	2.0	1.1	.75	.69	3.6	10	74	12	4.8	2.2	1.0	.41
13	2.0	1.2	.56	.73	2.9	8.0	71	11	4.2	2.1	1.0	.36
14	2.0	1.3	.63	.82	2.2	6.6	69	11	3.6	2.0	2.0	.33
15	2.0	1.4	.69	.83	1.8	5.7	67	10	3.1	1.9	6.0	.31
16	2.0	1.5	.74	.73	1.6	5.2	65	10	2.7	1.7	4.0	.29
17	1.9	1.5	.83	.68	1.7	4.6	69	9.8	2.8	1.6	2.0	.34
18	1.8	1.5	.94	.64	1.7	4.1	66	9.7	2.5	2.3	1.8	.41
19	1.8	2.5	.95	.66	1.6	4.1	62	9.9	2.3	2.9	1.5	.59
20	1.9	2.0	.85	.64	1.6	11	56	9.9	2.1	3.8	1.5	.91
21	2.0	1.4	.72	.68	1.6	50	51	10	2.1	7.5	1.4	1.1
22	2.0	1.5	.76	.68	1.6	139	45	9.4	2.1	7.4	1.2	1.5
23	2.1	1.4	.80	.65	1.7	200	43	9.0	2.0	6.5	1.0	1.8
24	2.1	1.6	.85	.59	1.8	240	40	8.6	1.9	3.6	1.0	2.2
25	2.2	1.9	.90	.52	1.8	160	37	8.3	1.7	2.5	1.0	2.2
26	2.2	1.8	.83	.48	1.7	140	34	8.6	1.6	2.0	1.0	2.3
27	2.2	1.9	.85	.47	1.6	100	31	9.6	1.6	1.7	1.0	2.3
28	2.2	1.9	.89	.46	1.6	80	29	9.1	1.8	1.5	1.0	2.4
29	2.2	1.9	.96	.49	---	70	27	8.5	2.0	1.5	1.0	2.5
30	2.2	2.0	.99	.54	---	60	25	8.0	1.8	1.5	1.0	2.0
31	2.2	---	1.0	.56	---	100	---	7.7	---	1.5	1.0	---
TOTAL	66.5	52.8	32.47	21.98	45.36	1748.9	3279	390.1	109.4	74.4	52.3	35.90
MEAN	2.15	1.76	1.05	.71	1.62	56.4	109	12.6	3.65	2.40	1.69	1.20
MAX	2.7	2.5	2.0	1.0	3.6	240	700	23	8.1	7.5	6.0	2.5
MIN	1.8	1.0	.56	.46	.59	1.6	25	7.7	1.6	1.1	1.0	.29
AC-FT	132	105	64	44	90	3470	6500	774	217	148	104	71

CAL YR 1986 TOTAL 5294.89 MEAN 14.5 MAX 370 MIN .21 AC-FT 10500
WTR YR 1987 TOTAL 5909.06 MEAN 16.2 MAX 700 MIN .29 AC-FT 11720

05116500 DES LACS RIVER AT FOXHOLM, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1950-51, 1969-70, 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	COLOR (PLAT-INUM-COBALT UNITS) (00080)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)
OCT											
08...	1845	--	1860	--	11.0	6.5	--	--	--	--	--
NOV											
19...	0940	1.4	2500	7.85	-1.5	0.5	25	1.9	14	700	140
JAN											
06...	1550	1.0	2750	--	-5.0	0.5	--	--	--	--	--
FEB											
17...	1430	1.8	1720	7.62	0.5	0.5	45	1.2	8	520	100
MAR											
25...	1025	141	354	--	1.5	0.5	--	--	--	--	--
26...	1430	137	378	7.98	7.0	0.5	110	11.5	81	120	46
APR											
21...	1445	54	1000	8.92	17.0	12.0	65	11.9	109	230	0
MAY											
29...	1025	8.5	1500	[a]8.00	23.0	19.5	55	7.1	77	410	13
JUN											
24...	1050	2.0	1580	8.47	23.5	21.5	55	5.6	63	480	0
AUG											
04...	1450	2.6	1600	8.76	24.5	23.0	38	10.2	119	410	28
SEP											
10...	1150	0.91	1770	8.63	17.5	15.0	17	8.3	82	500	110

DATE	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2) (00405)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)
NOV											
19...	130	91	350	52	6	11	562	15	780	47	0.30
FEB											
17...	110	59	200	45	4	8.9	414	19	560	29	0.30
MAR											
26...	30	12	20	24	0.8	10	78	1.6	81	4.4	<0.10
APR											
21...	47	28	120	51	4	13	244	0.5	230	18	0.20
MAY											
29...	88	47	180	48	4	12	400	--	400	22	0.30
JUN											
24...	96	58	230	50	5	12	481	3.1	500	34	0.30
AUG											
04...	67	60	220	53	5	9.3	386	1.3	470	27	0.30
SEP											
10...	93	65	230	49	5	11	389	1.7	500	26	0.40

DATE	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	PHOS-PHORUS, TOTAL (MG/L AS P) (00665)	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)
NOV											
19...	20	1830	1800	2.5	7.0	<0.100	0.620	0.160	0.090	--	--
FEB											
17...	21	1180	1200	1.6	5.6	0.140	1.20	0.230	0.090	<10	1
MAR											
26...	11	226	220	0.31	84	0.690	0.140	0.340	0.170	160	1
APR											
21...	12	641	620	0.87	93	<0.100	0.070	0.410	0.170	--	--
MAY											
29...	16	1060	1000	1.4	23	<0.100	0.040	0.240	0.090	--	--
JUN											
24...	24	1250	1200	1.7	6.6	<0.100	0.060	0.790	0.580	<10	16
AUG											
04...	9.9	1150	1100	1.6	8.0	<0.100	0.010	0.610	0.260	--	--
SEP											
10...	19	1230	1200	1.7	3.0	<0.100	0.020	0.290	0.120	--	--

a - Laboratory value.

05116500 DES LACS RIVER AT FOXHOLM, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)	BORON, DIS-SOLVED (UG/L AS B) (01020)	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)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)
NOV 19...	--	150	--	--	--	--	--	--	--	--	--
FEB 17...	62	100	<1	<10	1	3	63	<5	77	410	<0.1
MAR 26...	32	30	<1	<10	<1	2	190	<5	11	42	<0.1
APR 21...	--	70	--	--	--	--	--	--	--	--	--
MAY 29...	--	120	--	--	--	--	--	--	--	--	--
JUN 24...	76	160	<1	<10	1	<1	7	23	87	270	0.2
AUG 04...	--	170	--	--	--	--	--	--	--	--	--
SEP 10...	--	150	--	--	--	--	--	--	--	--	--

DATE	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG) (01077)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)	VANA-DIUM, DIS-SOLVED (UG/L AS V) (01085)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)	CYANIDE TOTAL (MG/L AS CN) (00720)
FEB 17...	1	4	4	1	1	510	<10	20	12	<0.010
MAR 26...	1	8	3	<1	<1	100	<5	20	10	<0.010
JUN 24...	<1	3	<1	<1	<1	530	<25	<10	5	<0.010

05117500 SOURIS (MOUSE) RIVER ABOVE MINOT, ND

LOCATION.--Lat 48°14'45", long 101°22'15", in NW¼NW¼SE¼ sec.17, T.155 N., R.83 W., Ward County, Hydrologic Unit 09010001, on right bank 180 ft downstream from county highway bridge, 3.5 mi west of Minot, 7 mi downstream from Des Lacs River, and at mile 388.5.

DRAINAGE AREA.--10,600 mi^2, approximately, of which about 6,700 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1903 to current year. Monthly discharge only for some periods, published in WSP 1308. Published as Mouse River at Minot, 1903-24, Souris River at Minot, 1927-28, 1929-34, and Souris River near Minot, 1928-29.

REVISED RECORDS.--WSP 1308: 1905, 1909-14, 1918, 1924-25, 1927. WSP 1338: 1903-4, 1906, 1917, 1928, 1929(M). WSP 2113: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,545.75 ft above National Geodetic Vertical Datum of 1929. May 5, 1903, to Sept. 30, 1928; Oct. 1, 1929, to Sept. 30, 1934; nonrecording gages at mile 377.6 in Minot, at datum 12.5 ft lower, Oct. 1, 1928, to Sept. 30, 1929, nonrecording gages at Saugstad bridge at mile 366.8, 5 mi southeast of Minot and at datum 19.2 ft lower than present datum. Records equivalent except those for periods of extreme low flow, as some industrial and sanitary waste enters river between the sites.

REMARKS.--Estimated daily discharges: Nov. 8-14, Dec. 3-16, Jan. 15-30, Mar. 6-9 and Mar. 22 to Apr. 2. Records good except those for period of estimated daily discharges, Mar. 22 to Apr. 2, which are poor. Flow almost completely regulated by Lake Darling (station 05115500), 41 mi upstream and several smaller reservoirs; combined capacity, about 248,000 acre-ft. Some small diversions for irrigation and municipal supply.

AVERAGE DISCHARGE.--84 years, 165 ft^3/s, 119,500 acre-ft/yr; median of yearly mean discharges, 86 ft^3/s, 62,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,000 ft^3/s, Apr. 20, 1904, gage height, 21.9 ft at site in Minot, from rating curve extended above 8,100 ft^3/s; no flow at times in some years. Maximum stage at present site, about 23 ft in April 1904.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage in Minot at least 3 ft higher than 1904 peak, in 1881, according to Apr. 20, 1904 issue of Minot Daily Optic. This peak probably occurred in 1882.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 862 ft^3/s, Apr. 12, gage height, 8.09 ft, minimum daily discharge, .55 ft^3/s, June 24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	32	39	23	21	24	6.3	420	69	16	16	16	15
2	23	36	23	23	24	5.6	600	69	16	16	14	14
3	21	35	22	23	23	5.3	660	68	19	16	10	14
4	21	33	21	22	23	6.4	450	64	21	15	9.3	14
5	28	28	20	21	23	53	380	49	20	15	9.5	15
6	35	25	19	21	24	150	360	38	19	19	8.4	31
7	29	23	19	22	24	180	500	32	18	24	8.4	51
8	29	22	19	22	26	170	674	27	17	26	7.9	54
9	28	20	18	24	25	76	758	28	16	23	8.6	56
10	28	19	18	26	24	65	817	26	17	18	10	59
11	30	18	18	25	23	51	848	26	17	14	9.6	60
12	30	17	18	23	23	36	858	23	7.5	11	9.4	61
13	31	18	18	23	23	25	860	25	4.0	8.3	11	60
14	34	19	19	23	22	19	841	24	3.6	6.2	87	60
15	31	20	20	22	21	16	707	24	3.0	5.4	58	61
16	30	20	22	20	22	14	515	30	2.5	4.2	29	62
17	31	20	23	20	22	13	310	26	2.3	3.4	23	64
18	33	20	23	20	21	14	200	23	2.1	14	19	65
19	33	20	23	20	21	13	133	21	1.7	27	17	65
20	34	20	22	21	22	17	92	23	1.3	22	17	54
21	35	20	23	22	20	84	77	29	1.0	19	17	45
22	35	20	24	23	14	300	81	26	.63	21	16	45
23	35	20	23	23	9.8	670	92	24	.79	20	11	44
24	35	20	23	23	7.8	700	73	21	.55	20	10	47
25	35	24	23	23	6.3	570	70	19	1.7	16	12	45
26	35	25	21	24	5.6	430	73	20	13	15	14	38
27	35	25	21	24	5.2	450	65	28	15	15	14	30
28	35	26	21	24	5.2	380	62	26	16	15	14	30
29	38	25	21	24	---	200	61	22	17	15	13	30
30	38	24	20	24	---	115	67	19	15	16	14	28
31	39	---	21	25	---	115	---	16	---	16	14	---
TOTAL	986	701	649	701	533.9	4949.6	11704	965	304.67	491.5	531.1	1317
MEAN	31.8	23.4	20.9	22.6	19.1	160	390	31.1	10.2	15.9	17.1	43.9
MAX	39	39	24	26	26	700	860	69	21	27	87	65
MIN	21	17	18	20	5.2	5.3	61	16	.55	3.4	7.9	14
AC-FT	1960	1390	1290	1390	1060	9820	23210	1910	604	975	1050	2610

CAL YR 1986 TOTAL 19342.68 MEAN 53.0 MAX 410 MIN 3.7 AC-FT 38370
WTR YR 1987 TOTAL 23833.73 MEAN 65.3 MAX 860 MIN .55 AC-FT 47270

05117500 SOURIS RIVER ABOVE MINOT, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1969 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
OCT											
09...	1045	28	940	--	6.5	9.5	--	--	--	--	--
JAN											
07...	1000	22	1180	--	-7.0	0.5	--	--	--	--	--
FEB											
17...	1340	22	1120	--	0.0	0.5	--	--	--	--	--
MAR											
26...	0940	428	380	7.85	2.0	0.5	110	19	24	12	21
APR											
22...	1710	87	960	--	24.0	14.5	--	--	--	--	--
MAY											
27...	1535	31	1090	--	23.5	18.5	--	--	--	--	--
JUN											
22...	1635	0.33	1110	--	32.5	28.0	--	--	--	--	--
SEP											
10...	0925	55	1020	8.29	12.0	15.5	260	0	46	36	130
a10...	0926	55	1020	8.29	12.0	15.5	270	0	47	36	130

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
26...	27	0.9	11	90	73	8.1	0.10	8.9	219	210	0.30
SEP											
10...	50	4	16	300	190	35	0.30	0	673	640	0.92
a10...	50	4	16	306	180	--	0.30	4.0	660	--	--

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
MAR										
26...	1	40	170	<1	13	60	0.1	<1	<1	130
SEP										
10...	7	240	30	<1	50	30	0.1	1	<1	370
a10...	6	300	15	<5	45	25	--	3	<1	310

a - Split sample analysis for quality assurance.

05120000 SOURIS (MOUSE) RIVER NEAR VERENDRYE, ND

LOCATION.--Lat 48°09'35", long 100°43'45", in NW¼SW¼ sec.17, T.154 N., R.78 W., McHenry County, Hydrologic Unit 09010003, on left bank 2.7 mi north of Verendrye, 19 mi upstream from mouth of Wintering River and at mile 302.0.

DRAINAGE AREA.--11,300 mi^2, approximately, of which about 6,900 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--February to June 1933 (gage heights only), April 1937 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 2113: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,464.87 ft above National Geodetic Vertical Datum of 1929. February to June 1933, at site 4 mi upstream at datum 1.65 ft higher. April 1, 1937, to Mar. 3, 1938, non-recording gage at present site, at datum 1.97 ft higher.

REMARKS.--Estimated daily discharges: Nov. 10 to Apr. 3. Records good except those for period of estimated daily discharges, which are poor. Flow regulated by reservoirs on Souris and Des Lacs Rivers, the largest of which is Lake Darling (station 05115500), 128 mi upstream, combined capacity about 248,000 acre-ft. Some small diversions for irrigation and municipal supply.

AVERAGE DISCHARGE.--50 years, 210 ft^3/s, 152,100 acre-ft/yr; median of yearly mean discharges, 117 ft^3/s, 84,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,900 ft^3/s, Apr. 19, 1976, gage height, 17.84 ft; minimum daily flows of 0.3 ft^3/s or less occurred in Aug., Sept. 1937, Oct. 1939 and Feb. 1963.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,240 ft^3/s, Mar. 26, gage height, 12.98 ft, backwater from ice; minimum daily discharge 8.5 ft^3/s, July 4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	47	51	24	22	26	20	700	92	70	12	230	31
2	60	51	24	22	25	20	680	85	64	11	149	31
3	78	52	23	22	25	20	730	84	63	9.5	94	33
4	76	49	22	23	25	20	980	92	57	8.5	63	38
5	67	51	21	23	25	23	1200	93	54	8.8	49	35
6	58	53	20	23	25	60	1150	95	52	8.6	41	31
7	52	44	19	22	25	200	940	83	48	9.0	35	30
8	48	38	19	22	26	300	765	72	45	9.8	32	29
9	45	21	19	23	26	320	703	64	42	12	29	27
10	48	20	19	22	27	150	718	56	41	16	27	25
11	52	25	19	22	28	100	762	49	40	23	26	24
12	51	27	19	23	30	80	805	43	38	33	25	26
13	50	27	19	24	30	70	829	42	32	52	23	62
14	47	27	19	24	30	60	840	41	27	49	27	73
15	47	27	20	27	29	40	841	34	22	39	41	69
16	48	27	20	28	28	35	830	34	20	33	179	69
17	48	26	20	30	27	30	772	33	19	27	565	70
18	48	25	20	31	26	28	657	33	18	23	376	81
19	50	25	21	30	27	25	509	33	17	34	178	89
20	50	25	21	29	28	50	366	34	16	51	113	92
21	50	25	21	28	27	180	263	41	16	106	83	92
22	48	24	21	27	26	420	197	44	15	216	59	92
23	48	23	21	27	25	840	164	45	14	635	41	88
24	49	23	22	27	24	1110	148	43	14	712	41	80
25	55	23	21	27	23	1200	145	44	13	390	40	82
26	53	23	21	26	23	1230	146	45	12	181	39	79
27	56	24	21	25	22	1200	135	59	10	111	38	72
28	54	24	22	25	21	1100	127	60	11	78	36	70
29	54	24	21	25	---	950	120	60	12	61	35	69
30	52	24	22	25	---	850	104	69	12	119	33	67
31	53	---	23	26	---	750	---	75	---	217	33	---
TOTAL	1642	928	644	780	729	11481	17326	1777	914	3295.2	2780	1756
MEAN	53.0	30.9	20.8	25.2	26.0	370	578	57.3	30.5	106	89.7	58.5
MAX	78	53	24	31	30	1230	1200	95	70	712	565	92
MIN	45	20	19	22	21	20	104	33	10	8.5	23	24
AC-FT	3260	1840	1280	1550	1450	22770	34370	3520	1810	6540	5510	3480

CAL YR 1986 TOTAL 33748.0 MEAN 92.5 MAX 890 MIN 14 AC-FT 66940
WTR YR 1987 TOTAL 44052.2 MEAN 121 MAX 1230 MIN 8.5 AC-FT 87380

05120000 SOURIS RIVER NEAR VERENDRYE, ND--CONTINUED

WATER-QUALITY RECORD

PERIOD OF RECORD.--Water years 1950-51, 1957 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	COLOR (PLAT-INUM-COBALT UNITS) (00080)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)
OCT												
06...	1355	56	1240	--	21.5	11.0	--	--	--	--	--	--
NOV												
17...	1730	27	1630	7.86	-12.5	0.0	13	7.5	51	430	63	82
JAN												
06...	1400	23	1360	7.34	-4.5	0.5	--	2.7	18	--	--	--
MAR												
05...	1700	26	1320	7.57	8.0	0.5	40	3.5	24	410	74	90
31...	1200	736	410	7.50	11.0	0.5	100	10.6	--	140	0	30
APR												
07...	1845	885	555	7.73	21.0	5.0	100	10.0	77	170	28	35
13...	1845	830	850	8.10	15.0	8.5	--	9.8	82	--	--	--
20...	1300	360	920	8.00	12.0	14.0	--	8.3	79	--	--	--
MAY												
01...	1220	93	1110	8.33	19.0	15.0	37	11.4	113	320	20	67
JUN												
08...	1730	45	1330	8.00	17.0	23.0	55	7.3	84	360	17	73
JUL												
17...	0855	27	1180	8.01	18.0	23.0	17	6.8	79	380	65	80
AUG												
24...	1820	40	765	7.71	16.5	19.0	27	5.4	57	230	4	51

DATE	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2) (00405)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)
NOV												
17...	55	210	50	5	15	368	9.8	420	82	0.60	6.9	1120
MAR												
05...	46	150	43	3	10	341	18	330	30	0.20	12	911
31...	15	30	30	1	11	100	46	91	6.9	<0.10	11	278
APR												
07...	19	50	38	2	11	138	5.0	130	12	0.20	9.7	370
MAY												
01...	37	130	46	3	12	300	2.7	270	35	0.30	9.6	755
JUN												
08...	44	160	48	4	14	347	6.7	330	49	0.30	14	922
JUL												
17...	44	130	42	3	10	316	6.0	300	29	0.30	15	806
AUG												
24...	25	78	41	2	8.4	226	8.5	170	13	0.20	13	508

DATE	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	PHOS-PHORUS, TOTAL (MG/L AS P) (00665)	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)	BORON, DIS-SOLVED (UG/L AS B) (01020)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)
NOV												
17...	1100	1.5	80	0.350	0.740	1.10	0.990	--	--	--	350	--
MAR												
05...	870	1.2	63	0.450	0.350	0.360	0.100	10	1	70	230	<1
31...	650	0.38	552	1.00	0.210	0.330	0.110	200	2	41	60	<1
APR												
07...	350	0.50	884	0.450	0.360	0.340	0.120	--	--	--	100	--
MAY												
01...	740	1.0	189	0.330	0.070	0.730	0.510	--	--	--	220	--
JUN												
08...	890	1.3	111	<0.100	0.080	0.530	0.280	<10	12	63	280	<1
JUL												
17...	800	1.1	59	<0.100	0.020	0.470	0.310	--	--	--	230	--
AUG												
24...	490	0.69	55	0.360	0.160	0.200	0.170	--	--	--	180	--

05120000 SOURIS RIVER NEAR VERENDRYE, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COBALT, DISSOLVED (UG/L AS CO) (01035)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, DISSOLVED (UG/L AS PB) (01049)	LITHIUM DISSOLVED (UG/L AS LI) (01130)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY DISSOLVED (UG/L AS HG) (71890)	MOLYBDENUM, DISSOLVED (UG/L AS MO) (01060)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI) (01067)	NICKEL, DISSOLVED (UG/L AS NI) (01065)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)
MAR												
05...	<10	2	1	49	<5	68	180	<0.1	1	6	6	<1
31...	<10	<1	2	260	<5	20	74	0.3	2	5	5	<1
JUN												
08...	<10	1	4	6	<5	69	5	0.1	9	4	<1	<1

DATE	SILVER, TOTAL RECOVERABLE (UG/L AS AG) (01077)	STRONTIUM, DISSOLVED (UG/L AS SR) (01080)	VANADIUM, DISSOLVED (UG/L AS V) (01085)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN) (01092)	ZINC, DISSOLVED (UG/L AS ZN) (01090)	CYANIDE TOTAL (MG/L AS CN) (00720)	ALDRIN, TOTAL (UG/L) (39330)	CHLORDANE, TOTAL (UG/L) (39350)	DDD, TOTAL (UG/L) (39360)	DDE, TOTAL (UG/L) (39365)	DDT, TOTAL (UG/L) (39370)	DIAZINON, TOTAL (UG/L) (39570)
MAR												
05...	<1	480	<17	<10	13	<0.010	--	--	--	--	--	--
31...	--	130	<1	20	13	<0.010	--	--	--	--	--	--
APR												
13...	--	--	--	--	--	--	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01
JUN												
08...	<1	450	2	20	11	<0.010	--	--	--	--	--	--

DATE	DICAMBA (MEDIBEN) (BANVEL D) TOTAL (UG/L) (82052)	DIELDRIN TOTAL (UG/L) (39380)	ENDOSULFAN, TOTAL (UG/L) (39388)	ENDRIN, TOTAL (UG/L) (39390)	ETHION, TOTAL (UG/L) (39398)	HEPTACHLOR, TOTAL (UG/L) (39410)	HEPTACHLOR EPOXIDE TOTAL (UG/L) (39420)	LINDANE TOTAL (UG/L) (39340)	MALATHION, TOTAL (UG/L) (39530)	METHOXYCHLOR, TOTAL (UG/L) (39480)	METHYL PARATHION, TOTAL (UG/L) (39600)	MIREX, TOTAL (UG/L) (39755)
APR												
13...	<0.01	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01

DATE	METHYL TRITHION, TOTAL (UG/L) (39790)	NAPHTHALENES, POLYCHLOR. TOTAL (UG/L) (39250)	PARATHION, TOTAL (UG/L) (39540)	PCB, TOTAL (UG/L) (39516)	PERTHANE TOTAL (UG/L) (39034)	PICLORAM (TORDON) (AMDON) TOTAL (UG/L) (39720)	2,4-D, TOTAL (UG/L) (39730)	2, 4-DP TOTAL (UG/L) (82183)	2,4,5-T TOTAL (UG/L) (39740)	SILVEX, TOTAL (UG/L) (39760)	TOXAPHENE, TOTAL (UG/L) (39400)	TOTAL TRITHION (UG/L) (39786)
APR												
13...	<0.01	<0.10	<0.01	<0.1	<0.1	0.05	<0.01	<0.01	<0.01	<0.01	<1	<0.01

05120500 WINTERING RIVER NEAR KARLSRUHE, ND

LOCATION.--Lat 48°10'14", long 100°32'20", on line between secs.10 and 11, T.154 N., R.77 W., McHenry County, Hydrologic Unit 09010003, on left bank 30 ft upstream from county highway bridge, 4 mi upstream from mouth, and 7 mi northeast of Karlsruhe.

DRAINAGE AREA.--705 mi^2, of which about 420 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1937 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Altitude of gage is 1,480 ft, from river-profile map.

REMARKS.--Estimated daily discharges: Oct. 1 to Apr. 2. Records good except those for periods of estimated daily discharges, which are poor. Some regulation by Fish and Wildlife Service dams on Cottonwood and Wintering Lakes; controlled capacity, about 850 acre-ft.

AVERAGE DISCHARGE.--50 years, 13.3 ft^3/s, 9,640 acre-ft/yr; median of yearly mean discharges, 12 ft^3/s, 8,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,000 ft^3/s, Apr. 7, 1949, by velocity-area studies; maximum gage height, 12.0 ft, Apr. 7, 1949, channel choked by packed snow; no flow at times in many years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 240 ft^3/s, Mar. 27, gage height, 7.80 ft, backwater from ice; minimum daily, 0.20 ft^3/s, many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.3	2.5	.50	.40	.30	1.4	200	17	8.1	3.0	16	6.5
2	6.0	2.9	.50	.30	.20	1.5	190	16	7.5	3.1	12	6.4
3	5.4	3.5	.50	.30	.20	2.2	173	16	7.1	3.0	11	7.1
4	4.9	3.7	.50	.40	.20	2.6	148	17	6.7	2.0	9.7	6.4
5	4.3	3.3	.50	.50	.20	5.0	136	16	6.1	1.2	9.3	5.8
6	4.1	4.3	.50	.50	.30	20	125	15	5.7	1.4	8.6	6.0
7	4.3	4.2	.50	.50	.40	23	116	14	5.2	1.6	8.2	6.0
8	3.5	3.0	.50	.50	.60	24	105	13	4.6	3.4	7.8	5.9
9	3.5	2.0	.50	.50	.80	46	97	12	4.1	3.5	7.0	5.6
10	4.3	.50	.50	.40	1.0	92	88	12	4.1	3.1	6.2	5.2
11	4.2	.30	.50	.40	1.2	63	78	11	4.4	5.1	5.3	5.1
12	4.1	.20	.40	.50	1.4	41	75	10	3.8	6.1	4.2	5.3
13	4.1	.20	.20	.60	1.6	34	72	9.9	2.8	6.6	4.2	5.0
14	3.9	.20	.20	.60	1.5	32	64	9.4	2.1	6.7	5.2	5.0
15	3.9	.20	.20	.50	1.4	33	59	8.9	1.8	6.4	7.6	4.9
16	3.9	.20	.30	.40	1.3	32	57	8.4	1.7	5.6	6.6	4.7
17	3.5	.20	.50	.40	1.3	32	53	8.2	1.5	4.7	5.8	5.6
18	3.2	.20	.70	.40	1.4	37	48	8.0	1.1	5.1	6.0	6.4
19	2.9	.20	.70	.30	1.5	50	45	8.0	.93	7.1	5.7	5.6
20	3.4	.20	.40	.30	1.7	122	38	8.3	1.7	6.9	5.5	4.4
21	2.9	.25	.30	.30	1.9	100	35	11	.79	6.9	5.1	3.8
22	3.2	.20	.40	.30	1.8	110	33	11	.52	14	5.2	3.7
23	3.5	.20	.40	.30	2.0	115	30	11	.57	16	5.2	3.7
24	3.6	.30	.50	.20	1.9	100	30	9.9	.81	17	5.3	4.8
25	3.9	.40	.40	.20	1.7	85	27	9.2	.80	17	6.1	5.2
26	4.1	.50	.40	.20	1.6	70	28	8.7	.76	14	6.8	4.7
27	3.0	.50	.40	.20	1.5	220	25	11	.67	19	6.9	4.5
28	2.4	.50	.40	.20	1.4	208	23	12	1.3	22	7.2	4.4
29	2.6	.50	.40	.20	---	200	20	12	3.5	17	7.5	4.5
30	2.8	.50	.30	.20	---	190	19	11	3.6	27	7.2	4.5
31	2.8	---	.40	.20	---	200	---	9.2	---	22	6.8	---
TOTAL	118.5	35.85	13.40	11.20	32.30	2291.7	2237	354.1	94.35	277.5	221.2	156.7
MEAN	3.82	1.19	.43	.36	1.15	73.9	74.6	11.4	3.14	8.95	7.14	5.22
MAX	6.3	4.3	.70	.60	2.0	220	200	17	8.1	27	16	7.1
MIN	2.4	.20	.20	.20	.20	1.4	19	8.0	.52	1.2	4.2	3.7
AC-FT	235	71	27	22	64	4550	4440	702	187	550	439	311

CAL YR 1986 TOTAL 5265.37 MEAN 14.4 MAX 115 MIN .20 AC-FT 10440
WTR YR 1987 TOTAL 5843.75 MEAN 16.0 MAX 220 MIN .20 AC-FT 11590

05120500 WINTERING RIVER NEAR KARLSRUHE, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1954-56, 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	COLOR (PLAT-INUM-COBALT UNITS) (00080)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)
OCT											
06...	1645	3.8	705	--	12.5	22.5	--	--	--	--	--
NOV											
21...	1100	0.25	850	7.38	4.5	0.5	14	1.3	9	370	0
JAN											
05...	1415	0.53	680	--	1.5	0.5	--	--	--	--	--
MAR											
05...	1310	3.4	630	7.46	6.5	0.5	18	8.2	56	270	0
APR											
08...	1130	104	640	7.94	18.5	12.0	110	7.1	65	150	0
27...	1500	25	1020	8.06	19.5	15.0	110	8.4	81	230	0
JUN											
09...	1020	3.9	1060	8.04	18.0	18.0	70	6.5	67	280	0
JUL											
17...	1200	4.7	780	7.82	20.5	21.5	52	5.0	56	270	0
AUG											
24...	1515	5.2	795	7.95	20.0	18.5	46	7.6	80	260	0

DATE	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2) (00405)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)
NOV											
21...	86	37	63	27	1	5.8	408	33	80	12	0.20
MAR											
05...	66	25	39	24	1	3.5	297	20	55	8.2	0.20
APR											
08...	29	18	89	55	3	9.1	211	4.7	120	10	0.10
27...	46	27	140	56	4	8.5	362	6.1	190	13	0.20
JUN											
09...	56	33	150	53	4	6.9	438	7.7	160	16	0.20
JUL											
17...	62	29	76	37	2	5.5	339	9.9	97	9.3	0.20
AUG											
24...	58	27	83	41	2	6.3	332	7.2	76	12	0.20

DATE	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	PHOS-PHORUS, TOTAL (MG/L AS P) (00665)	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)
NOV											
21...	30	572	560	0.78	0.39	<0.100	0.090	0.070	0.040	--	--
MAR											
05...	25	388	400	0.53	3.5	0.190	0.250	0.040	0.020	20	<1
APR											
08...	17	465	420	0.63	131	<0.100	0.040	0.100	0.030	30	2
27...	10	690	650	0.94	46	<0.100	0.060	0.120	0.060	--	--
JUN											
09...	6.8	721	690	0.98	7.6	<0.100	0.060	0.150	0.060	<10	4
JUL											
17...	18	513	500	0.70	6.5	<0.100	0.030	0.170	0.070	--	--
AUG											
24...	18	514	480	0.70	7.2	<0.100	0.020	0.100	0.080	--	--

05120500 WINTERING RIVER NEAR KARLSRUHE, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)	BORON, DIS-SOLVED (UG/L AS B) (01020)	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)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)
NOV											
21...	--	140	--	--	--	--	--	--	--	--	--
MAR											
05...	170	110	<1	<10	1	1	36	<5	21	210	0.1
APR											
08...	84	190	<1	<10	<1	<1	210	<5	28	26	<0.1
27...	--	250	--	--	--	--	--	--	--	--	--
JUN											
09...	140	290	<1	<10	1	2	100	<5	52	120	<0.1
JUL											
17...	--	210	--	--	--	--	--	--	--	--	--
AUG											
24...	--	90	--	--	--	--	--	--	--	--	--

DATE	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG) (01077)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)	VANA-DIUM, DIS-SOLVED (UG/L AS V) (01085)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)	CYANIDE TOTAL (MG/L AS CN) (00720)
MAR										
05...	<1	3	3	<1	<1	160	<5	<10	6	<0.010
APR										
08...	<1	3	<1	<1	1	130	2	<10	5	<0.010
JUN										
09...	7	7	<1	<1	<1	210	4	<10	7	<0.010

05122000 SOURIS (MOUSE) RIVER NEAR BANTRY, ND

LOCATION.--Lat 48°30'20", long 100°26'04", in SE¼NW¼SE¼ sec.14, T.158 N., R.76 W., McHenry County, Hydrologic Unit 09010003, on left bank 200 ft upstream from Nelson bridge, 8 mi east of Bantry, 18 mi upstream from Willow Creek, and at mile 228.0.

DRAINAGE AREA.--12,300 mi^2 approximately, of which about 7,600 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1937 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 2113: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,427.56 ft above National Geodetic Vertical Datum of 1929. Prior to Mar. 16, 1938, nonrecording gage at same site at datum 0.17 ft lower.

REMARKS.--Estimated daily discharges: Nov. 8 to Apr. 12, July 27-28, and Aug. 14-17. Records good except those for periods of estimated daily discharges, which are fair. Flow regulated by reservoirs on Souris, Des Lacs, and Wintering Rivers, total capacity, about 249,000 acre-ft. Diversions for irrigation of about 7,600 acres at Eaton Dam about 42 mi above station and other small diversions for irrigation and municipal supply.

AVERAGE DISCHARGE.--50 years, 229 ft^3/s, 165,900 acre-ft/yr; median of yearly mean discharges, 136 ft^3/s, 98,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,330 ft^3/s, Apr. 23, 1976, gage height, 14.59 ft; no flow at times each year 1937-40, 1963.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,200 ft^3/s, Apr. 12, gage height, 11.37 ft; minimum daily discharge, 9.4 ft^3/s, July 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	37	61	43	41	37	51	450	425	122	13	309	60
2	38	61	42	40	36	50	520	389	114	12	277	52
3	42	62	41	40	36	47	660	355	111	11	280	48
4	51	62	40	39	36	46	750	323	108	9.9	298	45
5	58	62	40	38	37	45	840	289	103	10	299	41
6	63	61	40	37	37	47	950	263	95	10	277	35
7	72	60	40	37	37	48	1020	234	90	11	238	38
8	77	58	40	36	37	49	1080	210	84	9.4	197	37
9	80	54	40	36	37	48	1120	190	83	11	162	38
10	82	60	39	36	37	47	1150	172	81	23	131	31
11	80	46	38	36	37	52	1180	152	79	23	107	31
12	77	42	38	36	36	60	1190	134	74	20	87	29
13	75	40	38	36	36	78	1200	119	71	17	71	34
14	73	42	39	36	36	98	1180	100	67	20	65	34
15	69	44	40	36	37	103	1140	85	64	26	60	30
16	66	44	40	35	38	102	1090	76	62	40	55	27
17	64	46	39	35	39	101	1030	68	58	55	53	25
18	64	48	38	34	40	100	975	59	50	75	51	36
19	63	49	38	35	42	100	939	52	44	95	78	51
20	61	50	38	35	44	100	903	48	38	100	215	58
21	60	49	39	35	50	101	873	46	34	99	300	66
22	60	48	40	35	52	108	848	42	27	100	325	76
23	59	45	41	35	53	110	818	65	25	99	295	82
24	58	46	42	35	54	118	791	98	19	109	243	89
25	58	45	43	35	55	124	755	118	16	170	193	92
26	58	44	43	35	55	134	705	119	15	321	158	95
27	58	44	42	35	54	155	636	129	12	480	130	97
28	58	45	42	36	52	180	572	133	13	520	107	97
29	57	45	42	36	---	220	512	126	14	498	91	96
30	58	44	42	36	---	290	463	130	13	444	75	91
31	61	---	41	37	---	350	---	125	---	373	64	---
TOTAL	1937	1507	1248	1124	1177	3262	26340	4874	1786	3804.3	5291	1661
MEAN	62.5	50.2	40.3	36.3	42.0	105	878	157	59.5	123	171	55.4
MAX	82	62	43	41	55	350	1200	425	122	520	325	97
MIN	37	40	38	34	36	45	450	42	12	9.4	51	25
AC-FT	3840	2990	2480	2230	2330	6470	52250	9670	3540	7550	10490	3290

CAL YR 1986 TOTAL 44731.0 MEAN 123 MAX 680 MIN 22 AC-FT 88720
WTR YR 1987 TOTAL 54011.3 MEAN 148 MAX 1200 MIN 9.4 AC-FT 107100

05122000 SOURIS (MOUSE) RIVER NEAR BANTRY, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1971 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)
NOV											
20...	1300	49	1360	7.88	-10.0	0.5	6.9	48	--	--	--
JAN											
08...	1715	36	1350	7.39	-5.0	0.0	0.2	1	--	--	--
MAR											
03...	1540	47	1240	7.24	0.5	0.5	2.5	17	--	--	--
APR											
14...	1655	1190	575	7.90	17.5	10.0	9.6	84	180	13	40
20...	1815	889	760	8.30	12.0	14.0	9.5	90	--	--	--
JUN											
09...	1645	83	970	8.15	22.5	23.0	9.6	110	--	--	--
JUL											
14...	1515	22	1190	8.10	25.0	25.5	9.5	115	--	--	--
AUG											
25...	1345	191	520	7.69	15.5	18.0	6.5	67	150	0	33

DATE	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2) (00405)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)
APR											
14...	20	52	37	2	9.8	170	4.1	120	17	0.10	11
AUG											
25...	17	48	39	2	8.1	170	6.7	98	9.9	0.20	6.5

DATE	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)
APR											
14...	366	370	0.50	1180	2	190	70	0	25	20	0.3
AUG											
25...	329	330	0.45	170	2	140	30	0	20	10	0.1

DATE	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)	ALDRIN, TOTAL (UG/L) (39330)	CHLOR-DANE, TOTAL (UG/L) (39350)	DDD, TOTAL (UG/L) (39360)	DDE, TOTAL (UG/L) (39365)	DDT, TOTAL (UG/L) (39370)	DI-AZINON, TOTAL (UG/L) (39570)	DI-ELDRIN TOTAL (UG/L) (39380)
APR										
14...	0	1	250	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010
20...	--	--	--	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010
AUG										
25...	1	1	220	--	--	--	--	--	--	--

DATE	ENDO-SULFAN, TOTAL (UG/L) (39388)	ENDRIN, TOTAL (UG/L) (39390)	ETHION, TOTAL (UG/L) (39398)	HEPTA-CHLOR, TOTAL (UG/L) (39410)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L) (39420)	LINDANE TOTAL (UG/L) (39340)	MALA-THION, TOTAL (UG/L) (39530)	METH-OXY-CHLOR, TOTAL (UG/L) (39480)	METHYL PARA-THION, TOTAL (UG/L) (39600)	MIREX, TOTAL (UG/L) (39755)	METHYL TRI-THION, TOTAL (UG/L) (39790)
APR											
14...	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01	<0.01
20...	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01	<0.01

05122000 SOURIS (MOUSE) RIVER NEAR BANTRY, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	NAPHTHALENES, POLYCHLOR. TOTAL (UG/L) (39250)	PARATHION, TOTAL (UG/L) (39540)	PCB, TOTAL (UG/L) (39516)	PERTHANE TOTAL (UG/L) (39034)	DICAMBA (MEDIBEN) (BANVEL D) TOTAL (UG/L) (82052)	PICLORAM (TORDON) (AMDON) TOTAL (UG/L) (39720)	2,4-D, TOTAL (UG/L) (39730)	2, 4-DP TOTAL (UG/L) (82183)	2,4,5-T TOTAL (UG/L) (39740)	SILVEX, TOTAL (UG/L) (39760)	TOXAPHENE, TOTAL (UG/L) (39400)	TOTAL TRITHION (UG/L) (39786)
APR												
14...	<0.10	<0.01	<0.1	<0.1	<0.01	<0.01	0.08	<0.01	<0.01	<0.01	<1	<0.01
20...	<0.10	<0.01	<0.1	<0.1	0.01	0.07	0.02	<0.01	<0.01	<0.01	<1	<0.01
AUG												
04...	--	--	--	--	0.02	0.08	0.02	<0.01	<0.01	<0.01	--	--
10...	--	--	--	--	0.01	0.07	0.06	<0.01	<0.01	<0.01	--	--
17...	--	--	--	--	<0.01	0.05	0.10	<0.01	<0.01	<0.01	--	--
24...	--	--	--	--	0.02	0.15	0.03	<0.01	<0.01	<0.01	--	--
25...	--	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	0.01	0.09	0.16	<0.01	<0.01	<0.01	--	--

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	DISCHARGE, IN CUBIC FEET PER SECOND (00060)	STREAMFLOW, INSTANTANEOUS (CFS) (00061)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
NOV							
20...	1300	0.5	--	49	55	7.3	97
MAR							
03...	1540	0.5	--	47	30	3.8	38
23...	1440	0.0	110	--	18	5.3	--
24...	1410	0.5	118	--	205	65	--
30...	1351	0.5	290	--	52	41	--
31...	1342	1.0	350	--	35	33	--
APR							
01...	1300	0.5	450	--	29	35	--
02...	1320	0.5	520	--	25	35	--
03...	1240	0.5	660	--	28	50	--
04...	1250	--	750	--	27	54	--
05...	1100	--	840	--	34	76	--
06...	1150	--	950	--	34	88	--
07...	1140	--	1020	--	27	75	--
08...	1110	--	1080	--	32	92	--
09...	1140	8.5	1120	--	51	153	--
10...	1143	6.0	1150	--	54	166	--
11...	1130	5.0	1180	--	40	127	--
12...	1150	7.0	1190	--	27	88	--
13...	1151	7.0	1200	--	19	61	--
14...	1405	9.0	1180	--	16	52	--
14...	1655	10.0	--	1190	32	103	95
15...	1140	10.0	1140	--	15	48	--
16...	1205	10.5	1090	--	17	50	--
17...	1210	12.0	1030	--	12	34	--
18...	1215	12.5	975	--	19	49	--
20...	1335	13.0	903	--	28	69	--
21...	1315	12.0	873	--	16	39	--
22...	1112	12.0	848	--	15	34	--
23...	1335	13.0	818	--	21	46	--
24...	1100	13.0	791	--	20	42	--
25...	1055	13.5	755	--	13	28	--
26...	1110	13.5	705	--	11	22	--
27...	1135	13.0	626	--	13	23	--
28...	1127	14.0	572	--	12	18	--
29...	1115	14.0	512	--	12	17	--
30...	1055	14.0	463	--	15	19	--
30...	1200	15.5	--	457	11	14	98
MAY							
01...	1052	14.0	425	--	12	14	--
02...	1047	14.0	389	--	14	15	--
03...	1057	14.0	355	--	15	14	--
04...	1105	14.0	323	--	13	11	--
05...	1045	15.0	289	--	46	36	--
06...	1050	16.0	263	--	37	26	--
07...	1050	16.0	234	--	28	18	--
08...	1342	18.5	210	--	24	14	--
09...	1052	18.0	190	--	25	13	--
10...	1115	18.0	172	--	26	12	--
11...	1045	18.0	152	--	32	13	--
12...	1146	18.0	134	--	27	9.9	--
13...	1103	18.0	119	--	26	8.4	--
14...	1040	17.0	100	--	32	8.5	--
15...	1029	19.0	85	--	25	5.7	--
16...	1030	19.5	76	--	29	5.9	--
JUN							
09...	1645	23.0	--	83	52	12	95
JUL							
14...	1515	25.5	--	22	24	1.4	85
AUG							
25...	1345	18.0	--	191	54	28	98

05123000 LAKE METIGOSHE NEAR BOTTINEAU, ND

LOCATION.--Lat 48°59'05", long 100°20'52", in SE¼SW¼ sec.35, T.164 N., R.75 W., Bottineau County, Hydrologic Unit 09010004, 25 ft east from northeast corner of bridge over Lake Metigoshe, and 11.7 mi northeast of Bottineau.

DRAINAGE AREA.--59 mi^2.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--June 1931 to September 1932, September 1953 to September 1987 (discontinued).

GAGE.--Water-stage recorder. Datum of gage is 2,130.00 ft above National Geodetic Vertical Datum of 1929. 1931-32, nonrecording gage on north abutment of bridge at datum 6.32 ft lower (reduced to elevations NGVD). Sept. 4, 1953, to Jan. 19, 1955, nonrecording gage at present datum on east end of south abutment of bridge.

REMARKS.--Outlet of lake is a concrete dam with removable stoplogs; average crest elevation without stoplogs about 2,138.00 ft National Geodetic Vertical Datum of 1929. Lake level regulated since 1959 by dam and control works in the outlet of Sharpe Lake located on the principal tributary in Manitoba.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 9.70 ft, May 3, 1975; minimum, 4.28 ft, Sept. 17, 1932, present datum.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 8.71 ft, Apr. 19; minimum, 7.66 ft, Sept. 30.

MONTHEND GAGE HEIGHT, IN FEET, AT 2400, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

Oct. 31	7.97	Jan. 31	8.11	Apr. 30	8.63	July 31	8.16
Nov. 30	8.06	Feb. 28	8.17	May 31	8.42	Aug. 31	7.89
Dec. 31	8.07	Mar. 31	8.38	June 30	8.11	Sept. 30	7.66

05123400 WILLOW CREEK NEAR WILLOW CITY, ND

LOCATION.--Lat 48°35'20", long 100°26'30", in NE¼NW¼ sec.23, T.159 N., R.76 W., McHenry County, Hydrologic Unit 09010004, on left bank 50 ft downstream from bridge on county road, 1.5 mi upstream from Snake Creek, and 7 mi west of Willow City.

DRAINAGE AREA.--1,160 mi^2, approximately, of which about 430 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1956 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 1,430 ft, from topographic map. Prior to Oct. 5, 1956, non-recording gage at site 50 ft upstream at same datum.

REMARKS.--Estimated daily discharges: Mar. 1 to Sept. 30. Records poor.

AVERAGE DISCHARGE.--31 years, 43.0 ft^3/s, 31,150 acre-ft/yr; median of yearly mean discharges, 24 ft^3/s, 17,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,900 ft^3/s, Apr. 12, 1969, gage height, 16.76 ft; no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 50 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 30	0900	*770	*12.95	Aug. 25	0645	166	9.25
Apr. 15	1230	308	----				

No flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	565	72	2.1	.00	.00	55
2	.00	.00	.00	.00	.00	.00	518	62	2.6	.00	.00	49
3	.00	.00	.00	.00	.00	.00	478	61	2.1	.00	.00	43
4	.00	.00	.00	.00	.00	.00	434	59	2.1	.00	.00	37
5	.00	.00	.00	.00	.00	.00	377	54	2.5	.00	.00	32
6	.00	.00	.00	.00	.00	.00	316	49	3.6	.00	.00	26
7	.00	.00	.00	.00	.00	.00	213	44	3.0	.00	.00	23
8	.00	.00	.00	.00	.00	.00	229	39	2.0	.00	.00	19
9	.00	.00	.00	.00	.00	.00	226	35	2.1	.00	.00	15
10	.00	.00	.00	.00	.00	.00	226	31	2.2	.00	.00	13
11	.00	.00	.00	.00	.00	.00	221	27	2.6	.00	.00	9.4
12	.00	.00	.00	.00	.00	.00	230	23	2.6	.00	.00	5.7
13	.00	.00	.00	.00	.00	.00	264	22	3.2	.00	.00	4.3
14	.00	.00	.00	.00	.00	.00	296	22	2.4	.00	19	3.3
15	.00	.00	.00	.00	.00	.00	307	22	2.3	.00	95	2.0
16	.00	.00	.00	.00	.00	.00	296	19	2.4	.00	81	.40
17	.00	.00	.00	.00	.00	.00	265	14	2.8	.00	73	.00
18	.00	.00	.00	.00	.00	.00	232	12	2.7	.00	90	.00
19	.00	.00	.00	.00	.00	.00	208	10	1.7	.00	111	.00
20	.00	.00	.00	.00	.00	.00	186	7.1	.66	.00	121	.00
21	.00	.00	.00	.00	.00	6.0	167	8.8	.33	.00	125	.00
22	.00	.00	.00	.00	.00	14	154	8.0	.00	.00	134	.00
23	.00	.00	.00	.00	.00	23	143	7.4	.00	.00	147	.00
24	.00	.00	.00	.00	.00	13	132	6.8	.00	.00	160	.00
25	.00	.00	.00	.00	.00	56	122	6.2	.00	.00	165	.00
26	.00	.00	.00	.00	.00	150	111	5.6	.00	.00	157	.00
27	.00	.00	.00	.00	.00	200	102	4.6	.00	.00	138	.00
28	.00	.00	.00	.00	.00	300	93	3.6	.00	.00	114	.00
29	.00	.00	.00	.00	---	450	85	2.1	.00	.00	93	.00
30	.00	.00	.00	.00	---	700	77	2.9	.00	.00	75	.00
31	.00	---	.00	.00	---	660	---	1.6	---	.00	64	---
TOTAL	.00	.00	.00	.00	.00	2572.00	7273	741.7	47.99	.00	1962.00	337.10
MEAN	.00	.00	.00	.00	.00	83.0	242	23.9	1.60	.00	63.3	11.2
MAX	.00	.00	.00	.00	.00	700	565	72	3.6	.00	165	55
MIN	.00	.00	.00	.00	.00	.00	77	1.6	.00	.00	.00	.00
AC-FT	.0	.0	.0	.0	.0	5100	14430	1470	95	.0	3890	669

CAL YR 1986 TOTAL 6630.87 MEAN 18.2 MAX 150 MIN .00 AC-FT 13150
WTR YR 1987 TOTAL 12933.76 MEAN 35.4 MAX 700 MIN .00 AC-FT 25650

05123400 WILLOW CREEK NEAR WILLOW CITY, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1960-62, 1964-65, 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	COLOR (PLAT-INUM-COBALT UNITS) (00080)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)
APR											
16...	1145	299	670	7.96	15.0	12.5	75	8.0	75	240	28
30...	1200	80	865	8.05	17.5	14.0	55	7.3	71	330	61
JUN											
10...	1645	2.7	970	8.15	17.5	19.5	50	8.0	87	390	48
AUG											
27...	1445	137	555	7.18	22.5	18.0	69	3.7	38	170	2

DATE	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2) (00405)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)
APR											
16...	43	31	51	31	1	11	207	4.4	110	13	<0.10
30...	59	44	60	28	1	11	268	--	180	26	0.20
JUN											
10...	62	57	74	28	2	12	342	4.7	190	27	0.20
AUG											
27...	35	20	49	37	2	12	168	21	110	12	0.10

DATE	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	PHOS-PHORUS, TOTAL (MG/L AS P) (00665)	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)
APR											
16...	26	451	410	0.61	364	<0.100	0.040	0.070	0.030	<10	3
30...	16	590	560	0.80	127	<0.100	0.060	0.100	0.040	--	--
JUN											
10...	2.7	658	630	0.89	4.8	<0.100	0.050	0.070	0.030	<10	4
AUG											
27...	33	389	370	0.53	144	<0.100	<0.010	0.360	0.290	--	--

DATE	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)	BORON, DIS-SOLVED (UG/L AS B) (01020)	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)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)
APR											
16...	57	90	1	<10	<1	<1	79	<5	63	10	<0.1
30...	--	100	--	--	--	--	--	--	--	--	--
JUN											
10...	55	140	<1	<10	1	2	14	<5	91	6	0.1
AUG											
27...	--	90	--	--	--	--	--	--	--	--	--

DATE	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG) (01077)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)	VANA-DIUM, DIS-SOLVED (UG/L AS V) (01085)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)	CYANIDE TOTAL (MG/L AS CN) (00720)
APR										
16...	2	1	2	<1	<1	190	5	<10	6	<0.010
JUN										
10...	5	2	<1	<1	<1	300	<5	<10	9	<0.010
AUG										
27...	--	--	--	--	--	--	--	--	--	--

05123400 WILLOW CREEK NEAR WILLOW CITY, ND--CONTINUED

WATER-QUALITY RECORDS

INSTANTANEOUS SUSPENDED SEDIMENT AND PARTICLE SIZE, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	DISCHARGE, IN CUBIC FEET PER SECOND (00060)	STREAMFLOW, INSTANTANEOUS (CFS) (00061)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
MAR							
23...	1521	0.5	23	--	20	1.2	--
24...	1327	0.5	13	--	22	0.79	--
25...	1250	0.0	56	--	29	4.4	--
26...	1335	1.0	150	--	26	11	--
27...	1335	0.0	200	--	31	17	--
28...	1330	0.5	300	--	20	16	--
29...	1305	0.5	450	--	17	20	--
30...	1428	1.0	700	--	15	28	--
31...	1422	1.0	660	--	15	27	--
APR							
01...	1340	2.0	565	--	18	28	--
02...	1400	3.5	518	--	16	22	--
03...	1323	4.5	478	--	18	23	--
04...	1330	--	434	--	17	20	--
05...	1130	--	377	--	18	19	--
06...	1230	--	316	--	15	13	--
07...	1210	--	213	--	16	9.2	--
08...	1140	--	229	--	18	11	--
09...	1218	12.0	226	--	17	11	--
10...	1240	7.0	226	--	13	8.2	--
11...	1209	5.0	221	--	17	10	--
12...	1230	7.0	230	--	17	11	--
13...	1222	9.0	264	--	13	9.2	--
14...	1450	12.0	296	--	11	8.9	--
15...	1217	11.5	307	--	18	15	--
16...	1145	12.5	--	299	7	5.9	82
16...	1250	12.5	296	--	11	8.6	--
17...	1252	12.5	265	--	26	19	--
18...	1251	14.0	232	--	5	3.1	--
20...	1412	13.5	186	--	7	3.3	--
21...	1356	12.0	167	--	6	2.8	--
22...	1143	11.5	154	--	4	1.6	--
23...	1415	13.5	143	--	6	2.1	--
24...	1140	12.5	132	--	4	1.4	--
25...	1136	14.0	122	--	4	1.4	--
26...	1142	13.5	111	--	3	0.84	--
27...	1240	14.0	102	--	8	2.1	--
28...	1157	14.0	93	--	10	2.4	--
29...	1150	15.0	85	--	2	0.53	--
30...	1130	13.5	77	--	4	0.83	--
30...	1200	14.0	--	80	7	1.5	98
MAY							
01...	1129	13.5	72	--	3	0.56	--
02...	1127	13.0	62	--	7	1.2	--
03...	1135	12.5	61	--	4	0.71	--
04...	1140	13.0	59	--	6	0.96	--
05...	1125	15.0	54	--	7	1.0	--
06...	1127	15.5	49	--	5	0.61	--
07...	1127	16.0	44	--	14	1.7	--
08...	1420	19.0	39	--	16	1.7	--
09...	1126	18.0	35	--	12	1.2	--
10...	1157	18.0	31	--	6	0.49	--
11...	1127	18.0	27	--	7	0.52	--
12...	1227	17.5	23	--	8	0.52	--
13...	1140	19.0	22	--	11	0.67	--
14...	1127	16.0	22	--	3	0.15	--
15...	1127	18.0	22	--	3	0.19	--
16...	1105	19.0	19	--	25	1.3	--
JUN							
10...	1645	19.5	--	2.7	31	0.23	78
AUG							
27...	1445	18.0	--	137	4	1.5	82

05123500 STONE CREEK NEAR KRAMER, ND

LOCATION.--Lat 48°40'42", long 100°42'40", in NW¼NW¼NW¼ sec.23, T.160 N., R.78 W., Bottineau County, Hydrologic Unit 09010003, on left bank 60 ft upstream from bridge on State Highway 14, 1.0 mi south of Kramer.

DRAINAGE AREA.--168 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1986 to current year (seasonal record only).

GAGE.--Water-stage recorder. Datum of gage is 1,425 ft above National Geodetic Vertical Datum of 1929, from topographic map. Prior to September 16, 1986, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Mar. 29,30 and Apr. 19. Records fair.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 620 ft^3/s, Mar. 24, 1986, gage height, 6.2 ft, from flood mark; no flow most of the time.

EXTREMES FOR CURRENT PERIOD.--Maximum discharge, 620 ft^3/s, Mar. 24, gage height, 6.2 ft, from flood mark; no flow most of the time.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						.00	63	.72	.00	.00	.00	.00
2						.00	57	.37	.00	.00	.00	.00
3						.00	44	.30	.00	.00	.00	.00
4						.00	32	.20	.00	.00	.00	.00
5						.00	30	.16	.00	.00	.00	.00
6						.00	26	.14	.00	.00	.00	.00
7						.00	26	.08	.00	.00	.00	.00
8						.00	22	.07	.00	.00	.00	.00
9						.00	18	.05	.00	.00	.00	.00
10						.00	15	.04	.00	.00	.00	.00
11						.00	12	.02	.00	.00	.00	.00
12						.00	11	.01	.00	.00	.00	.00
13						.00	9.8	.00	.00	.00	.00	.00
14						.00	9.2	.00	.00	.00	.00	.00
15						.00	6.1	.00	.00	.00	.00	.00
16						.00	8.0	.00	.00	.00	.00	.00
17						.00	6.1	.00	.00	.00	.00	.00
18						.00	3.6	.00	.00	.00	.00	.00
19						.00	3.5	.00	.00	.00	.00	.00
20						.00	3.5	.00	.00	.00	.00	.00
21						2.0	3.6	.00	.00	.00	.00	.00
22						30	3.1	.00	.00	.00	.00	.00
23						480	2.8	.00	.00	.00	.00	.00
24						498	2.2	.00	.00	.00	.00	.00
25						338	2.4	.00	.00	.00	.00	.00
26						286	1.9	.00	.00	.00	.00	.00
27						305	1.6	.00	.00	.00	.00	.00
28						95	1.7	.00	.00	.00	.00	.00
29						80	.90	.00	.00	.00	.00	.00
30						65	.78	.00	.00	.00	.00	.00
31						70	---	.00	---	.00	.00	---
TOTAL						2249.00	426.78	2.16	.00	.00	.00	.00
MEAN						72.5	14.2	.07	.00	.00	.00	.00
MAX						498	63	.72	.00	.00	.00	.00
MIN						.00	.78	.00	.00	.00	.00	.00
AC-FT						4460	847	4.3	.0	.0	.0	.0

05123500 STONE CREEK NEAR KRAMER, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--March 1986 to current year (seasonal record only).

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	COLOR (PLAT-INUM-COBALT UNITS) (00080)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)
APR											
09...	1445	20	620	7.77	9.0	11.0	110	7.6	69	200	56
29...	1725	1.0	1500	8.08	17.5	18.5	75	9.2	97	510	170

DATE	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	CARBON DIOXIDE DIS SOLVED (MG/L AS CO2) (00405)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)
APR											
09...	42	24	48	32	2	18	148	4.9	160	8.5	0.10
29...	92	67	150	38	3	19	331	5.3	520	26	0.20

DATE	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	PHOS-PHORUS, TOTAL (MG/L AS P) (00665)	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)
APR											
09...	24	427	410	0.58	23	0.290	0.110	0.470	0.280	100	6
29...	24	1120	1100	1.5	3.1	<0.100	0.080	0.560	0.450	--	--

DATE	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)	BORON, DIS-SOLVED (UG/L AS B) (01020)	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)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)
APR											
09...	74	110	<1	<10	1	<1	72	<5	49	23	<0.1
29...	--	290	--	--	--	--	--	--	--	--	--

DATE	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG) (01077)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)	VANA-DIUM, DIS-SOLVED (UG/L AS V) (01085)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)	CYANIDE TOTAL (MG/L AS CN) (00720)
APR										
09...	1	5	1	<1	<1	200	11	10	8	<0.010

05123500 STONE CREEK NEAR KRAMER, ND--CONTINUED

WATER-QUALITY RECORDS

INSTANTANEOUS SUSPENDED SEDIMENT AND PARTICLE SIZE, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	DISCHARGE, IN CUBIC FEET PER SECOND (00060)	STREAMFLOW, INSTANTANEOUS (CFS) (00061)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
MAR							
23...	1206	1.0	480	--	35	45	--
24...	1052	0.5	472	--	31	40	--
25...	1005	1.0	338	--	38	35	--
26...	0941	0.5	286	--	32	24	--
27...	0958	0.0	305	--	32	26	--
28...	1046	0.0	95	--	23	6.0	--
29...	1010	0.0	80	--	36	7.7	--
30...	1010	0.0	65	--	50	8.8	--
31...	1000	1.0	70	--	25	4.8	--
APR							
01...	1020	2.0	63	--	19	3.2	--
02...	1020	2.0	57	--	48	7.4	--
03...	1000	4.0	44	--	38	4.6	--
04...	1000	3.0	32	--	28	2.4	--
05...	0942	--	30	--	27	2.2	--
06...	0927	--	26	--	19	1.3	--
07...	0940	--	26	--	30	2.1	--
08...	0945	--	22	--	56	3.3	--
09...	1010	10.0	18	--	108	5.2	--
09...	1445	11.0	--	20	65	3.5	98
10...	0945	5.0	15	--	64	2.6	--
11...	1000	4.0	12	--	53	1.7	--
12...	1020	5.0	11	--	47	1.4	--
13...	1000	7.0	9.8	--	40	1.1	--
14...	1100	9.0	9.2	--	31	0.78	--
15...	1015	10.0	6.1	--	23	0.38	--
16...	0750	10.0	8.0	--	19	0.41	--
17...	1040	11.0	6.1	--	15	0.24	--
18...	1035	12.0	3.6	--	12	0.12	--
20...	1009	11.0	3.5	--	12	0.11	--
21...	1020	10.0	3.6	--	18	0.17	--
22...	0940	10.0	3.1	--	8	0.07	--
23...	1118	12.0	2.8	--	23	0.17	--
24...	0945	12.0	2.2	--	19	0.11	--
25...	0930	12.0	2.4	--	9	0.06	--
26...	0935	14.0	1.9	--	28	0.14	--
27...	0947	11.0	1.6	--	11	0.05	--
28...	1005	13.0	1.7	--	7	0.03	--
29...	1002	14.0	0.90	--	5	0.01	--
29...	1725	18.5	--	1.0	7	0.02	97
30...	0937	13.0	0.78	--	7	0.02	--
MAY							
01...	0930	11.0	0.72	--	8	0.02	--
02...	0925	13.0	0.37	--	7	0.01	--
03...	0932	10.0	0.30	--	14	0.01	--
04...	0945	11.0	0.20	--	18	0.01	--
05...	0930	14.0	0.16	--	16	0.01	--
06...	0942	15.0	0.14	--	11	0.00	--
07...	0935	15.0	0.08	--	7	0.00	--
08...	1030	18.0	0.07	--	12	0.00	--
09...	0927	15.0	0.05	--	9	0.00	--
10...	0930	14.0	0.04	--	7	0.00	--
11...	0915	12.0	0.02	--	8	0.00	--
12...	1000	14.0	0.01	--	11	0.00	--
13...	0940	16.0	<0.01	--	12	--	--

05123510 DEEP RIVER NEAR UPHAM, ND

LOCATION.--Lat 48°35'03", long 100°51'44", in SW¼NW¼ sec.22, T.159 N., R.79 W., McHenry County, Hydrologic Unit 09010005, 60 ft downstream from county highway bridge, 0.8 mi downstream from Little Deep River, and 6.3 mi west of Upham.

DRAINAGE AREA.--975 mi^2, of which about 605 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1957 to September 1980, March 1985 to September 1985 (seasonal records only since 1985).

GAGE.--Water-stage recorder. Elevation of gage is 1,430 ft, from topographic map.

REMARKS.--Estimated daily discharges: Mar. 1 to Apr. 5. Records good except those for periods of estimated daily discharges, which are fair.

AVERAGE DISCHARGE.--23 years (water years 1958-80), 20.4 ft^3/s, 14,780 acre-ft/yr; median of yearly mean discharges, 0.90 ft^3/s, 650 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,760 ft^3/s, Apr. 12, 1969, gage height, 18.18 ft; no flow at times each year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in April 1951 reached a stage of about 16 ft, discharge, 2,700 ft^3/s, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, about 850 ft^3/s, Mar. 27, gage height, 13.07 ft, backwater from ice; no flow for several months.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						.00	450	7.3	.76	.00	.04	.00
2						.00	370	6.6	.54	.00	.02	.00
3						.00	320	6.1	.34	.00	.01	.00
4						.00	270	5.7	.29	.00	.00	.00
5						.00	230	5.2	.24	.00	.00	.00
6						.00	207	4.8	.19	.00	.00	.00
7						.00	172	4.2	.16	.00	.00	.00
8						.00	153	3.5	.12	.00	.00	.00
9						.00	133	2.9	.10	.00	.00	.00
10						.00	114	2.5	.08	.00	.00	.00
11						.00	102	2.2	.10	.00	.00	.00
12						.00	92	2.0	.08	.00	.00	.00
13						.00	85	1.9	.07	.00	.00	.00
14						.00	76	1.7	.06	.00	.00	.00
15						.00	68	1.3	.04	.00	.00	.00
16						.00	61	1.3	.02	.00	.00	.00
17						.00	53	1.0	.02	.00	.00	.00
18						.00	51	.85	.00	.00	.00	.00
19						.00	46	.74	.00	.08	.00	.00
20						.00	41	.71	.00	.08	.00	.00
21						5.0	34	.73	.00	.08	.00	.00
22						50	29	.80	.00	.12	.00	.00
23						90	25	.84	.00	.11	.00	.00
24						128	21	.81	.00	.09	.00	.00
25						135	19	.73	.00	.07	.00	.00
26						400	16	.69	.00	.06	.00	.00
27						810	14	.77	.00	.05	.00	.00
28						630	12	.93	.00	.04	.00	.00
29						610	9.6	.97	.00	.03	.00	.00
30						680	8.1	1.0	.00	.04	.00	.00
31						550	---	.91	---	.04	.00	---
TOTAL						4088.00	3281.7	71.68	3.21	.89	.07	.00
MEAN						132	109	2.31	.11	.03	.0	.00
MAX						810	450	7.3	.76	.12	.04	.00
MIN						.00	8.1	.69	.00	.00	.00	.00
AC-FT						8110	6510	142	6.4	1.8	.1	.0

05123510 DEEP RIVER NEAR UPHAM, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972-80, 1985 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
APR											
08...	2000	147	420	7.84	15.5	12.5	160	31	33	19	16
a08...	2001	147	420	7.84	15.5	12.5	160	39	33	19	16
29...	1025	9.5	673	--	12.5	15.5	--	--	--	--	--
JUN											
10...	1015	0.08	865	8.07	16.0	19.5	380	100	68	51	44

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
08...	17	0.6	12	130	61	24	0.0	14	249	260	0.34
a08...	16	0.6	14	122	62	19	<0.10	14	266	250	0.36
JUN											
10...	19	1	15	280	140	46	0.10	2.0	570	550	0.78

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR										
08...	1	130	90	<1	14	20	0.3	<1	1	190
a08...	1	30	89	<5	18	17	--	2	<1	100
JUN										
10...	3	30	60	<1	39	70	0.3	<1	<1	310

a - Split sample analysis for quality assurance.

05123750 CUT BANK CREEK AT UPHAM, ND

LOCATION.--Lat 48°34'29", long 100°44'39", in SE¼SE¼SW¼ sec.21, T.159 N., R.78 W., McHenry County, Hydrologic Unit 09010005, on left bank 50 ft downstream from county highway bridge, and 0.5 mi southwest of Upham.

DRAINAGE AREA.--722 mi^2, of which about 450 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1974 to September 1980. March 1986 to current year (seasonal records only since 1986).

GAGE.--Water-stage recorder. Datum of gage is 1,422.77 ft above National Geodetic Vertical Datum of 1929. From March to September 1986 nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Mar. 21-31. Records fair except those for period of estimated daily discharges which are poor.

AVERAGE DISCHARGE.--6 years (1975-80), 13.8 ft^3/s, 10,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 820 ft^3/s, Apr. 1, 1976, gage height, 7.24 ft from high water mark; no flow for several months each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 136 ft^3/s, Apr. 7, gage height, 5.03 ft; no flow much of the time.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						.00	7.1	31	17	2.8	4.5	5.1
2						.00	6.3	30	17	2.7	4.5	4.8
3						.00	10	29	16	2.5	4.2	4.5
4						.00	40	29	16	2.2	4.1	4.2
5						.00	90	29	15	2.2	3.9	4.0
6						.00	122	29	14	2.1	3.6	3.8
7						.00	134	29	13	2.2	3.4	3.6
8						.00	132	29	11	2.1	3.2	3.4
9						.00	125	29	10	2.2	3.0	3.2
10						.00	113	29	9.8	2.5	2.8	3.0
11						.00	110	28	9.6	2.6	2.6	2.9
12						.00	107	27	9.0	2.6	2.3	2.9
13						.00	94	26	8.5	2.6	2.1	2.8
14						.00	86	23	7.9	2.6	2.7	2.7
15						.00	82	22	7.3	2.5	4.1	2.6
16						.00	76	21	6.8	2.3	4.8	2.4
17						.00	71	19	6.2	2.2	6.0	2.4
18						.00	69	17	5.7	2.3	8.2	2.3
19						.00	63	16	5.3	3.6	10	2.2
20						.00	57	15	4.9	3.6	12	2.1
21						.00	53	15	4.6	3.6	13	2.0
22						3.0	50	14	4.3	3.9	13	1.9
23						7.0	45	14	4.2	3.9	12	1.8
24						15	43	14	3.9	3.9	10	1.7
25						19	40	13	3.6	4.0	9.1	1.6
26						18	37	13	3.3	4.0	8.4	1.6
27						18	36	15	3.1	4.1	7.8	1.5
28						14	35	15	3.0	4.1	7.1	1.5
29						12	33	15	3.1	4.2	6.5	1.5
30						10	32	16	2.9	4.3	6.0	1.5
31						8.5	---	17	---	4.4	5.5	---
TOTAL						124.50	1998.4	668	246.0	94.8	190.4	81.5
MEAN						4.02	66.6	21.5	8.20	3.06	6.14	2.72
MAX						19	134	31	17	4.4	13	5.1
MIN						.00	6.3	13	2.9	2.1	2.1	1.5
AC-FT						247	3960	1320	488	188	378	162

05123750 CUT BANK CREEK AT UPHAM, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1974-80, 1986 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
APR											
08...	1755	132	610	7.70	23.0	15.0	210	49	34	30	48
29...	1230	33	1040	--	14.0	15.5	--	--	--	--	--
JUN											
10...	1330	9.7	1060	7.30	16.5	18.5	380	37	52	60	110
AUG											
25...	0950	9.1	905	--	15.0	16.5	--	--	--	--	--

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
08...	32	1	13	160	140	23	0.10	16	391	400	0.53
JUN											
10...	38	3	12	340	220	26	0.20	2.0	745	720	1.0

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR										
08...	2	170	100	<1	32	10	0.4	<1	1	220
JUN										
10...	2	100	50	<1	62	20	0.4	<1	<1	350

05123760 DEEP RIVER BELOW CUT BANK CREEK NEAR UPHAM, ND

LOCATION.--Lat 48°36'14", long 100°47'41", in SW¼SW¼SW¼ sec.7, T.159 N., R.78 W., McHenry County, Hydrologic Unit 09010005, at bridge 0.5 mi below Cut Bank Creek, and about 3.5 mi northwest of Upham at bridge on county highway.

DRAINAGE AREA.--1,722 mi^2, of which about 1,070 mi^2 is probably noncontributing.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1975 to September 1980, March 1986 to current year.

REMARKS.--Discharge computed from records at stations 05123510 Deep River near Upham and 05123750 Cut Bank Creek at Upham.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	DISCHARGE, IN CUBIC FEET PER SECOND (00060)	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH (STANDARD UNITS) (00400)	TEMPERATURE AIR (DEG C) (00020)	TEMPERATURE WATER (DEG C) (00010)	COLOR (PLATINUM-COBALT UNITS) (00080)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)	HARDNESS (MG/L AS CACO3) (00900)	HARDNESS NONCARBONATE (MG/L AS CACO3) (95902)
APR											
10...	1000	227	540	7.73	0.0	8.0	75	7.9	67	200	52
29...	1445	43	895	7.82	15.5	16.0	65	7.1	71	310	62
JUN											
11...	1650	9.7	1090	7.88	27.5	21.5	75	7.5	85	380	21
JUL											
16...	1545	2.3	1120	8.28	27.0	24.0	55	101	1200	380	0

DATE	CALCIUM DISSOLVED (MG/L AS CA) (00915)	MAGNESIUM, DISSOLVED (MG/L AS MG) (00925)	SODIUM, DISSOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM ADSORPTION RATIO (00931)	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	ALKALINITY LAB (MG/L AS CACO3) (90410)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2) (00405)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)
APR											
10...	35	27	36	27	1	14	147	5.3	97	19	<0.10
29...	51	45	66	30	2	17	251	7.3	210	34	0.10
JUN											
11...	54	60	100	35	2	14	361	9.2	210	32	0.30
JUL											
16...	54	60	110	38	2	12	386	3.9	220	29	0.20

DATE	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG C DISSOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301)	SOLIDS, DISSOLVED (TONS PER AC-FT) (70303)	SOLIDS, DISSOLVED (TONS PER DAY) (70302)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P) (00671)	ALUMINUM, DISSOLVED (UG/L AS AL) (01106)	ARSENIC DISSOLVED (UG/L AS AS) (01000)
APR											
10...	16	363	330	0.49	222	<0.100	0.070	0.140	0.040	50	2
29...	14	623	590	0.85	72	<0.100	0.050	0.090	0.040	--	--
JUN											
11...	3.8	752	690	1.0	20	<0.100	0.070	0.320	0.080	<10	2
JUL											
16...	11	784	730	1.1	4.9	<0.100	0.270	0.220	0.070	--	--

DATE	BARIUM, DISSOLVED (UG/L AS BA) (01005)	BORON, DISSOLVED (UG/L AS B) (01020)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COBALT, DISSOLVED (UG/L AS CO) (01035)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, DISSOLVED (UG/L AS PB) (01049)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	LITHIUM DISSOLVED (UG/L AS LI) (01130)	NESE, DISSOLVED (UG/L AS MN) (01056)
APR											
10...	61	50	<1	<10	--	<1	89	<5	25		12
29...	--	70	--	--	--	--	--	--	--		--
JUN											
11...	92	120	<1	<10	2	1	48	<5	68		90
JUL											
16...	--	140	--	--	--	--	--	--	--		--

05123760 DEEP RIVER BELOW CUT BANK CREEK NEAR UPHAM, ND

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG) (01077)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)	VANA-DIUM, DIS-SOLVED (UG/L AS V) (01085)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)	CYANIDE TOTAL (MG/L AS CN) (00720)
APR											
10...	<0.1	1	4	<1	<1	<1	130	2	<10	6	<0.01
JUN											
11...	0.1	--	1	<1	<1	<1	260	1	<10	8	<0.01

INSTANTANEOUS SUSPENDED SEDIMENT AND PARTICLE SIZE, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	TEMPER-ATURE WATER (DEG C) (00010)	DIS-CHARGE, IN CUBIC FEET PER SECOND (00060)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
MAR						
23...	1240	2.0	97	16	4.2	--
24...	1140	1.0	143	19	7.2	--
25...	1040	0.0	154	18	7.4	--
26...	1050	1.0	418	13	14	--
27...	1100	0.0	828	19	43	--
28...	1125	0.0	644	10	18	--
29...	1115	0.0	622	18	30	--
30...	1042	0.5	690	10	19	--
31...	1033	1.0	558	13	19	--
APR						
01...	1050	0.5	457	13	16	--
02...	1052	0.5	376	12	13	--
03...	1041	1.0	330	12	10	--
04...	1027	1.0	310	12	9.6	--
05...	1007	--	320	13	11	--
06...	0955	--	329	10	8.4	--
07...	1003	--	306	100	83	--
08...	1012	--	285	58	45	--
09...	1040	1.0	258	24	16	--
10...	1000	8.0	227	15	9.5	89
10...	1015	7.0	227	20	12	--
11...	1030	5.0	212	3	1.8	--
12...	1051	6.0	199	4	1.9	--
13...	1030	7.0	179	2	1.2	--
14...	1135	9.0	162	4	1.6	--
15...	1045	10.0	150	8	3.4	--
16...	0715	11.0	137	2	0.85	--
17...	1110	12.0	124	6	2.0	--
18...	1105	13.0	120	1	0.39	--
20...	1050	13.0	98	5	1.3	--
21...	1055	12.0	87	4	1.0	--
22...	1010	11.0	79	0	0.0	--
23...	1145	12.5	70	2	0.34	--
24...	1010	12.5	64	4	0.71	--
25...	1005	13.0	59	4	0.57	--
26...	1005	13.5	53	1	0.19	--
27...	1015	13.0	50	11	1.4	--
28...	1032	14.0	47	6	0.70	--
29...	1031	14.0	43	14	1.7	--
29...	1445	16.0	43	21	2.4	80
30...	1003	13.5	40	1	0.13	--
MAY						
01...	0956	13.0	38	61	6.3	--
02...	0953	13.0	37	7	0.71	--
03...	1000	12.5	35	2	0.16	--
04...	1013	12.0	35	37	3.5	--
05...	0955	14.0	34	19	1.8	--
06...	1005	15.0	34	19	1.7	--
07...	1005	15.5	33	4	0.39	--
08...	1100	17.0	33	3	0.28	--
09...	1000	17.0	32	35	3.0	--
10...	1027	17.0	32	3	0.21	--
11...	0947	16.5	30	5	0.42	--
12...	1030	17.0	29	5	0.39	--
14...	0951	16.0	25	3	0.17	--
15...	0945	17.0	23	5	0.32	--
16...	0940	18.0	22	6	0.38	--
JUN						
11...	1650	21.5	9.7	6	0.16	66
JUL						
16...	1545	24.0	2.3	49	0.30	78

05123900 BOUNDARY CREEK NEAR LANDA, ND

LOCATION.--Lat 48°48'46", long 100°51'46" at east line sec.35, T.162 N., R.79 W., Bottineau County, Hydrologic Unit 09010002, on right bank 80 ft downstream from bridge on county road, 5 mi upstream from mouth, and 6 mi southeast of Landa.

DRAINAGE AREA.--230 mi^2, of which about 60 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1957 to September 1981, March 1985 to September 1985 (seasonal records only since 1985).

REVISED RECORDS.--WSP 1728: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,420.03 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Mar. 1-21, Mar. 28 to Apr. 1, and Apr. 19 to Sept. 30. Records fair.

AVERAGE DISCHARGE.--24 years (1958-1981, 1985), 12.3 ft3/s, 8,910 acre-ft/yr; median of yearly mean discharges, 5.5 ft3/s, 4,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,580 ft^3/s, Apr. 9, 1969, gage height, 12.70 ft; maximum gage height, 12.90 ft, Apr. 1, 1976, backwater from ice and snow; no flow for several months each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,070 ft^3/s, Mar. 22, gage height, 11.62 ft; no flow for several months.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						.00	160	3.1	.00	.00	.00	.00
2						.00	185	2.8	.00	.00	.00	.00
3						.00	192	2.9	.00	.00	.01	.00
4						.00	144	2.9	.00	.00	1.8	.00
5						.00	127	2.4	.00	.00	1.9	.00
6						.05	113	2.1	.00	.00	1.6	.00
7						5.0	88	2.0	.00	.00	.98	.00
8						10	77	2.3	.00	.00	.57	.00
9						2.0	64	2.5	.00	.00	.40	.00
10						.80	47	2.5	.00	.00	.00	.00
11						.40	38	2.0	.00	.00	.00	.00
12						.10	31	1.6	.00	.00	.00	.00
13						4.0	26	1.1	.00	.00	.00	.00
14						10	23	.86	.00	.00	.19	.00
15						50	20	.66	.00	.00	.22	.00
16						45	16	.54	.00	.00	.43	.00
17						40	15	.41	.00	.00	.78	.00
18						35	13	.27	.00	.00	.99	.00
19						50	11	.17	.00	.00	1.2	.00
20						70	9.5	.09	.00	.00	1.6	.00
21						200	8.0	.14	.00	.00	1.6	.00
22						1030	7.0	.00	.00	.00	1.1	.00
23						905	6.0	.00	.00	.00	.75	.00
24						754	5.4	.00	.00	.00	.44	.00
25						556	4.9	.00	.00	.00	.20	.00
26						380	4.5	.00	.00	.00	.12	.00
27						308	4.2	.00	.00	.00	.04	.00
28						200	4.0	.00	.00	.00	.00	.00
30						140	3.3	.00	.00	.00	.00	.00
31						130	---	.00				
TOTAL						5095.35	1450.1	33.34	.00	.00	16.92	.00
MEAN						164	48.3	1.08	.00	.00	.55	.00
MAX						1030	192	3.1	.00	.00	1.9	.00
MIN						.00	3.3	.00	.00	.00	.00	.00
AC-FT						10110	2880	66	.0	.0	34	.0

05123900 BOUNDARY CREEK NEAR LANDA, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972-81, 1985 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	COLOR (PLAT-INUM-COBALT UNITS) (00080)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)
APR											
09...	1030	68	750	7.82	8.0	10.5	65	7.4	66	240	63
28...	1900	4.0	1420	8.19	27.0	18.0	50	10.0	105	500	110

DATE	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2) (00405)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)
APR											
09...	50	28	70	37	2	12	177	5.2	200	10	0.10
28...	90	67	140	37	3	11	386	4.8	450	16	0.20

DATE	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	PHOS-PHORUS, TOTAL (MG/L AS P) (00665)	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)
APR											
09...	21	513	500	0.70	94	0.100	0.100	0.230	0.120	60	4
28...	8.2	1040	1000	1.4	11	<0.100	0.080	0.160	0.100	--	--

DATE	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)	BORON, DIS-SOLVED (UG/L AS B) (01020)	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)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)
APR											
09...	57	90	<1	<10	<1	16	71	<5	50	24	0.1
28...	--	150	--	--	--	--	--	--	--	--	--

DATE	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG) (01077)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)	VANA-DIUM, DIS-SOLVED (UG/L AS V) (01085)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)	CYANIDE TOTAL (MG/L AS CN) (00720)
APR										
09...	3	5	5	<1	1	190	<4	<10	4	<0.010

05123900 BOUNDARY CREEK NEAR LANDA, ND--CONTINUED

WATER-QUALITY RECORDS

INSTANTANEOUS SUSPENDED SEDIMENT AND PARTICLE SIZE, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	DISCHARGE, IN CUBIC FEET PER SECOND (00060)	STREAMFLOW, INSTANTANEOUS (CFS) (00061)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
MAR							
23...	1111	1.0	905	--	43	106	--
24...	1007	0.0	754	--	33	67	--
25...	0914	0.0	556	--	34	52	--
26...	0852	0.0	380	--	27	27	--
27...	0900	0.0	308	--	34	28	--
28...	0942	0.0	200	--	28	15	--
29...	0905	0.0	170	--	23	11	--
30...	0900	5.0	140	--	19	7.1	--
31...	0901	1.0	130	--	30	11	--
APR							
01...	0920	5.0	160	--	34	15	--
02...	0935	1.0	185	--	46	23	--
03...	0920	1.5	192	--	76	39	--
04...	0900	2.5	144	--	57	22	--
05...	0900	--	127	--	33	11	--
06...	0843	--	113	--	34	10	--
07...	0902	--	88	--	35	8.4	--
08...	0900	--	77	--	72	15	--
09...	0920	10.0	64	--	31	5.4	--
09...	1030	10.5	--	68	18	3.4	98
10...	0856	5.0	47	--	35	4.5	--
11...	0915	4.0	38	--	36	3.7	--
12...	0925	5.0	31	--	26	2.2	--
13...	0910	6.0	26	--	69	4.8	--
14...	0927	8.0	23	--	16	0.99	--
15...	0925	9.0	20	--	26	1.4	--
16...	0830	10.0	16	--	21	0.89	--
17...	0942	11.0	15	--	15	0.62	--
18...	0942	12.0	13	--	14	0.51	--
20...	0917	11.0	9.5	--	35	0.90	--
21...	0920	9.0	8.0	--	23	0.50	--
22...	0852	10.0	7.0	--	15	0.28	--
23...	0900	10.0	6.0	--	20	0.33	--
24...	0854	11.0	5.4	--	19	0.27	--
25...	0845	11.0	4.9	--	24	0.32	--
26...	0852	13.0	4.5	--	27	0.33	--
27...	0857	11.0	4.2	--	19	0.21	--
28...	0912	13.0	4.0	--	18	0.19	--
28...	1900	18.0	--	4.0	25	0.27	100
29...	0905	14.0	3.3	--	30	0.27	--
30...	0850	13.0	3.3	--	28	0.25	--
MAY							
01...	0835	11.0	3.1	--	29	0.25	--
02...	0840	13.0	2.8	--	34	0.26	--
03...	0850	11.0	2.9	--	64	0.50	--
04...	0857	10.0	2.9	--	33	0.26	--
05...	0847	13.0	2.4	--	24	0.15	--
06...	0855	15.0	2.1	--	39	0.22	--
07...	0850	15.0	2.0	--	22	0.12	--
08...	0852	16.0	2.3	--	16	0.10	--
09...	0846	18.0	2.5	--	27	0.18	--
10...	0854	15.0	2.5	--	24	0.16	--
11...	0840	15.0	2.0	--	14	0.08	--
12...	0850	15.0	1.6	--	55	0.24	--
13...	0900	17.0	1.1	--	34	0.10	--
14...	0901	16.0	0.86	--	12	0.03	--
15...	0849	16.5	0.66	--	20	0.03	--
16...	0835	17.0	0.54	--	24	0.03	--

05124000 SOURIS (MOUSE) RIVER NEAR WESTHOPE, ND
(International gaging station)
(National stream quality accounting network station and radiochemical program station)

LOCATION.--Lat 48°59'47", long 100°57'29", in SW1/4SE1/4 sec.30, T.164 N., R.79 W., Bottineau County, Hydrologic Unit 09010003, on left bank 1,200 ft upstream from second crossing of international boundary, 1 mi downstream from Fish and Wildlife Service Dam 357, 7 mi northeast of Westhope, 11 mi downstream from Boundary Creek, and at mile 154.5.

DRAINAGE AREA.--16,900 mi^2, approximately, of which about 10,300 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July to October 1929, April 1930 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1338: 1932. WSP 2113: Drainage area.

GAGE.--Water-stage recorder and control. Datum of gage is 1,402.45 ft above National Geodetic Vertical Datum of 1929. Prior to Mar. 28, 1938, nonrecording gage at site 6.3 mi upstream at datum 2.52 ft higher.

REMARKS.--Estimated daily discharges: Nov. 7-11, Mar. 8, Mar. 21 to Apr. 10. Records good. Flow regulated by dams on Souris River and tributaries, combined capacity, about 321,000 acre-ft. Diversion at Eaton Dam for irrigation of about 7,600 acres and other small diversions for irrigation and municipal supply upstream from station.

COOPERATION.--This station is one of the international gaging stations maintained by the United States under agreement with Canada.

AVERAGE DISCHARGE.--57 years (water years 1931-87), 261 ft^3/s, 189,100 acre-ft/yr; median of yearly mean discharges, 143 ft^3/s, 103,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,600 ft^3/s, Apr. 26, 1976, gage height, 19.16 ft; maximum daily reverse flow, 35 ft^3/s, Apr. 8, 1943, caused by backwater from downstream tributary inflow; no flow at times in some years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,290 ft^3/s, Apr. 15, gage height, 10.08 ft; minimum daily discharge, 11.0 ft^3/s, Nov. 20.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	184	170	24	27	27	29	850	1310	173	230	216	130
2	182	90	24	27	27	29	820	1200	115	224	217	129
3	184	88	24	27	27	29	800	1120	122	217	216	125
4	184	88	25	27	27	29	780	1050	146	212	217	111
5	162	88	24	27	27	29	760	958	203	210	220	82
6	127	88	25	26	27	29	850	858	194	211	218	81
7	124	79	25	27	27	29	900	807	143	207	194	82
8	124	53	25	27	28	28	1150	784	134	203	151	82
9	128	51	24	27	28	29	1500	701	201	142	149	83
10	142	50	24	27	28	29	1750	635	237	50	140	83
11	186	50	24	27	28	28	1960	556	175	31	115	83
12	190	50	24	27	28	27	2070	597	167	39	99	83
13	196	30	25	27	28	28	2110	350	157	35	56	83
14	202	27	25	27	28	29	2180	158	152	26	60	83
15	205	25	25	28	28	28	2260	241	225	28	56	82
16	206	18	26	27	28	29	2160	202	237	25	53	82
17	208	17	26	27	28	30	2060	165	176	23	67	82
18	208	14	26	27	28	31	2020	373	140	27	147	81
19	207	12	26	27	29	31	1960	340	158	30	152	80
20	208	11	26	27	29	32	1740	172	183	29	152	78
21	209	15	26	27	29	40	1900	87	183	29	169	78
22	207	26	26	27	29	100	1850	301	176	28	232	79
23	208	26	26	27	29	140	1620	344	165	42	294	78
24	208	26	26	26	29	240	1600	349	158	93	397	65
25	210	25	26	27	29	400	1570	325	137	96	402	37
26	210	25	26	27	29	650	1540	234	103	97	403	54
27	210	25	26	27	29	650	1420	312	97	111	403	78
28	205	22	27	27	29	700	1430	280	118	142	404	77
29	206	22	27	27	---	750	1370	192	226	144	400	78
30	211	22	27	27	---	800	1390	182	231	191	395	78
31	200	---	26	27	---	820	---	302	---	238	311	---
TOTAL	5841	1333	786	836	787	5872	46370	15485	5032	3410	6705	2507
MEAN	188	44.4	25.4	27.0	28.1	189	1546	500	168	110	216	83.6
MAX	211	170	27	28	29	820	2260	1310	237	238	404	130
MIN	124	11	24	26	27	27	760	87	97	23	53	37
AC-FT	11590	2640	1560	1660	1560	11650	91970	30710	9980	6760	13300	4970

CAL YR 1986 TOTAL 55161 MEAN 151 MAX 786 MIN 2.0 AC-FT 109400
WTR YR 1987 TOTAL 94964 MEAN 260 MAX 2260 MIN 11 AC-FT 188400

05124000 SOURIS RIVER NR WESTHOPE, ND--CONTINUED

WATER-QUALITY RECORD

PERIOD OF RECORD.--Water years 1954-64, 1966 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	HARD-NESS (MG/L AS CACO3) (00900)
NOV												
19...	1215	12	1540	7.96	-1.0	0.5	4.3	8.4	59	K2	92	490
JAN												
08...	1050	28	2200	7.50	-6.0	0.5	--	1.0	7	--	--	--
MAR												
04...	1230	30	2000	7.45	6.5	1.0	2.5	4.4	31	<1	1	700
31...	0805	--	500	--	--	1.0	--	--	--	--	--	--
APR												
02...	0900	806	530	7.40	3.0	1.0	4.5	7.8	54	<1	390	160
15...	1145	1550	415	8.40	16.0	6.5	--	11.8	95	--	--	--
21...	1330	1870	565	8.00	12.0	10.0	--	9.4	81	--	--	--
28...	1430	1370	620	7.90	28.5	15.5	--	8.2	81	--	--	--
JUN												
11...	1045	168	875	8.20	20.5	18.5	--	7.5	80	--	--	--
JUL												
15...	1415	28	940	8.96	28.0	20.5	5.1	10.4	116	5	160	300
AUG												
04...	1000	--	900	--	18.0	21.0	--	--	--	--	--	--
10...	1000	--	--	--	--	20.0	--	--	--	--	--	--
17...	1218	--	--	--	--	17.0	--	--	--	--	--	--
26...	1230	416	935	8.43	18.5	17.5	--	9.2	94	--	--	--
31...	1135	--	--	--	--	15.5	--	--	--	--	--	--

DATE	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY, CARBON-ATE IT-FLD (MG/L CACO3) (00419)	BICAR-BONATE WATER WHOLE IT-FLD (MG/L) (00450)	CAR-BONATE WATER WHOLE IT-FLD (MG/L) (00447)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2) (00405)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)
NOV												
19...	0	90	65	180	43	4	17	--	--	--	11	330
JAN												
08...	--	--	--	--	--	--	--	725	885	0	44	--
MAR												
04...	27	140	86	240	42	4	18	681	831	0	47	470
APR												
02...	4	34	18	44	35	2	12	156	190	0	12	95
28...	--	--	--	--	--	--	--	193	235	0	4.6	--
JUN												
11...	--	--	--	--	--	--	--	279	341	0	3.4	--
JUL												
15...	7	53	41	110	43	3	13	301	284	41	0.6	190
AUG												
26...	--	--	--	--	--	--	--	283	306	19	2.0	--

DATE	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS NH4) (71846)
NOV												
19...	47	0.30	13	1080	1000	1.5	34	0.010	0.510	0.400	0.390	0.50
MAR												
04...	85	0.40	24	1500	1500	2.0	121	0.010	0.170	0.460	0.450	0.58
APR												
02...	11	0.10	12	333	320	0.45	725	0.030	0.930	0.160	0.160	0.21
JUL												
15...	25	0.20	12	664	620	0.90	49	<0.010	0.120	0.040	0.050	0.06

05124000 SOURIS RIVER NR WESTHOPE, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	PHOSPHORUS TOTAL (MG/L AS PO4) (71886)	PHOSPHORUS, DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P) (00671)	ALUMINUM, DISSOLVED (UG/L AS AL) (01106)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BARIUM, DISSOLVED (UG/L AS BA) (01005)	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)
NOV 19...	3.8	0.180	--	0.160	0.120	<10	4	130	<0.5	1	<1
MAR 04...	3.2	0.680	--	0.550	0.500	20	4	180	<2	<3	<1
APR 02...	1.9	0.300	--	0.260	0.190	70	2	46	<0.5	<1	<1
JUL 15...	4.5	0.730	--	0.690	0.600	10	5	75	<0.5	<1	<1

DATE	COBALT, DISSOLVED (UG/L AS CO) (01035)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, DISSOLVED (UG/L AS PB) (01049)	LITHIUM DISSOLVED (UG/L AS LI) (01130)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY DISSOLVED (UG/L AS HG) (71890)	MOLYBDENUM, DISSOLVED (UG/L AS MO) (01060)	NICKEL, DISSOLVED (UG/L AS NI) (01065)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	SILVER, DISSOLVED (UG/L AS AG) (01075)
NOV 19...	<3	2	15	<5	90	72	0.1	10	<1	<1	<1
MAR 04...	<9	2	47	<5	120	1400	0.1	<30	7	<1	<1
APR 02...	<3	2	110	<5	26	110	<0.1	<10	3	<1	<1
JUL 15...	<3	6	34	<5	56	370	0.2	<10	3	<1	<1

DATE	STRONTIUM, DISSOLVED (UG/L AS SR) (01080)	VANADIUM, DISSOLVED (UG/L AS V) (01085)	ZINC, DISSOLVED (UG/L AS ZN) (01090)	GROSS ALPHA, DISSOLVED (UG/L AS U-NAT) (80030)	GROSS ALPHA, SUSP. TOTAL (UG/L AS U-NAT) (80040)	GROSS BETA, DISSOLVED (PCI/L AS CS-137) (03515)	GROSS BETA, SUSP. TOTAL (PCI/L AS CS-137) (03516)	GROSS BETA, DISSOLVED (PCI/L AS SR/YT-90) (80050)	GROSS BETA, SUSP. TOTAL (PCI/L AS SR/YT-90) (80060)	RADIUM 226, DISSOLVED, RADON METHOD (PCI/L) (09511)	URANIUM DISSOLVED, EXTRACTION (UG/L) (80020)
NOV 19...	430	<6	12	--	--	--	--	--	--	--	--
MAR 04...	600	<18	11	--	--	--	--	--	--	--	--
APR 02...	140	<6	20	<0.4	<0.4	15	1.1	11	1.1	0.04	0.87
JUL 15...	280	<6	<3	--	--	--	--	--	--	--	--

DATE	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)	ALDRIN, TOTAL (UG/L) (39330)	CHLORDANE, TOTAL (UG/L) (39350)	DDD, TOTAL (UG/L) (39360)	DDE, TOTAL (UG/L) (39365)	DDT, TOTAL (UG/L) (39370)	DIAZINON, TOTAL (UG/L) (39570)	DICAMBA (MEDIBEN) (BANVEL D) TOTAL (UG/L) (82052)	DIELDRIN TOTAL (UG/L) (39380)
APR 28...	13	48	97	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01	<0.01	<0.010
AUG 04...	--	--	--	--	--	--	--	--	--	<0.01	--
10...	--	--	--	--	--	--	--	--	--	<0.01	--
17...	--	--	--	--	--	--	--	--	--	<0.01	--
24...	--	--	--	--	--	--	--	--	--	<0.01	--
31...	--	--	--	--	--	--	--	--	--	<0.01	--

05124000 SOURIS RIVER NR WESTHOPE, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	ENDOSULFAN, TOTAL (UG/L) (39388)	ENDRIN, TOTAL (UG/L) (39390)	ETHION, TOTAL (UG/L) (39398)	HEPTACHLOR, TOTAL (UG/L) (39410)	HEPTACHLOR EPOXIDE TOTAL (UG/L) (39420)	LINDANE TOTAL (UG/L) (39340)	MALATHION, TOTAL (UG/L) (39530)	METHOXYCHLOR, TOTAL (UG/L) (39480)	METHYL PARATHION, TOTAL (UG/L) (39600)	MIREX, TOTAL (UG/L) (39755)	METHYL TRITHION, TOTAL (UG/L) (39790)
APR											
28...	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01	<0.01

DATE	NAPHTHALENES, POLYCHLOR. TOTAL (UG/L) (39250)	PARATHION, TOTAL (UG/L) (39540)	PCB, TOTAL (UG/L) (39516)	PERTHANE TOTAL (UG/L) (39034)	PICLORAM (TORDON) (AMDON) TOTAL (UG/L) (39720)	2,4-D, TOTAL (UG/L) (39730)	2, 4-DP TOTAL (UG/L) (82183)	2,4,5-T TOTAL (UG/L) (39740)	SILVEX, TOTAL (UG/L) (39760)	TOXAPHENE, TOTAL (UG/L) (39400)	TOTAL TRITHION (UG/L) (39786)
APR											
02...	140	<6	20	<0.4	<0.4	15	1.1	11	1.1	0.04	0.87
APR											
28...	<0.10	<0.01	<0.1	<0.1	0.07	0.03	<0.01	<0.01	<0.01	<1	<0.01
AUG											
04...	--	--	--	--	0.01	0.01	<0.01	<0.01	<0.01	--	--
10...	--	--	--	--	0.02	0.01	<0.01	<0.01	<0.01	--	--
17...	--	--	--	--	0.02	0.04	<0.01	<0.01	<0.01	--	--
24...	--	--	--	--	0.02	0.01	<0.01	<0.01	<0.01	--	--
31...	--	--	--	--	0.02	0.01	<0.01	<0.01	<0.01	--	--

DATE	TIME	SAMPLE LOCATION, CROSS SECTION (FT FM L BANK) (00009)	DEPTH TO TOP OF SAMPLE INTERVAL (FT) (72015)	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH (STANDARD UNITS) (00400)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)
MAR								
04...	1133	5	0.50	1.0	2000	7.45	--	--
04...	1136	10	0.50	1.0	2000	7.45	--	--
04...	1139	15	0.50	1.0	2000	7.45	4.4	30
04...	1142	20	0.50	1.0	2000	7.45	--	--
04...	1145	25	0.50	1.0	2000	7.45	4.3	30
04...	1148	30	0.50	1.0	2000	7.45	--	--
04...	1151	35	0.50	1.0	2000	7.45	4.4	30
04...	1154	40	0.50	1.0	2000	7.45	--	--
04...	1157	45	0.50	1.0	2000	7.45	--	--
JUL								
15...	1313	8	0.50	20.5	930	8.97	--	--
15...	1316	16	0.50	20.5	940	8.98	10.3	114
15...	1319	24	0.50	20.5	940	8.98	--	--
15...	1322	32	0.50	20.5	940	8.98	10.4	116
15...	1324	40	0.50	20.5	940	8.98	--	--
15...	1327	48	0.50	20.5	940	8.98	10.3	114
15...	1330	58	0.50	20.5	940	8.98	--	--

05124000 SOURIS RIVER NR WESTHOPE, ND--CONTINUED

WATER-QUALITY RECORDS

INSTANTANEOUS SUSPENDED SEDIMENT AND PARTICLE SIZE, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	DISCHARGE, IN CUBIC FEET PER SECOND (00060)	STREAMFLOW, INSTANTANEOUS (CFS) (00061)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
NOV							
19...	1215	0.5	--	12	138	4.4	88
MAR							
04...	1230	1.0	--	30	36	2.9	57
23...	0930	2.0	140	--	77	29	--
24...	0845	2.0	240	--	148	96	--
25...	0800	1.0	400	--	79	85	--
26...	0750	0.5	650	--	44	76	--
27...	0800	0.0	650	--	39	68	--
28...	0810	0.0	700	--	46	88	--
29...	0800	0.0	750	--	28	56	--
30...	0750	0.5	800	--	83	180	--
31...	0805	1.0	820	--	30	66	--
APR							
01...	0815	0.0	850	--	46	106	--
02...	0820	0.5	820	--	12	28	--
02...	0900	1.0	--	806	14	30	98
03...	0830	1.0	800	--	20	44	--
04...	0807	0.0	780	--	25	53	--
05...	0806	--	760	--	8	16	--
06...	0756	--	850	--	11	26	--
07...	0800	--	900	--	13	32	--
08...	0800	--	1150	--	24	76	--
09...	0815	2.0	1500	--	9	38	--
10...	0800	1.0	1750	--	9	41	--
11...	0811	1.0	1960	--	19	99	--
12...	0820	1.0	2070	--	15	82	--
13...	0810	2.0	2110	--	7	42	--
14...	0815	4.0	2180	--	10	61	--
15...	0820	4.5	2260	--	26	158	--
16...	0950	8.0	2160	--	24	137	--
17...	0826	10.0	2060	--	11	62	--
18...	0832	11.0	2020	--	10	52	--
20...	0815	11.0	1740	--	17	80	--
21...	0820	10.0	1900	--	22	110	--
22...	0757	10.0	1850	--	8	40	--
23...	0800	10.5	1620	--	27	119	--
24...	0757	12.0	1600	--	17	73	--
25...	0750	12.0	1570	--	20	86	--
26...	0757	12.0	1540	--	24	101	--
27...	0800	12.0	1420	--	41	159	--
28...	0900	12.0	1430	--	19	74	--
28...	1430	15.5	--	1370	13	48	97
29...	0800	12.0	1360	--	5	19	--
30...	0757	12.0	1390	--	12	44	--
MAY							
01...	0752	12.0	1310	--	8	28	--
02...	0745	14.0	1200	--	5	17	--
03...	0745	12.0	1120	--	60	181	--
04...	0800	12.0	1050	--	30	84	--
05...	0750	13.5	958	--	30	79	--
06...	0800	14.0	858	--	44	101	--
07...	0757	15.0	807	--	39	85	--
08...	0800	16.0	784	--	22	47	--
09...	0757	16.5	701	--	12	23	--
10...	0755	16.0	635	--	73	126	--
11...	0750	16.0	556	--	24	36	--
12...	0745	15.0	597	--	22	35	--
13...	0757	17.5	350	--	45	43	--
14...	0750	15.0	158	--	39	17	--
15...	0800	16.0	241	--	32	21	--
16...	0746	18.0	202	--	61	33	--
JUN							
11...	1045	18.5	--	168	4	1.8	81
JUL							
15...	1415	20.5	--	28	7	0.52	87
AUG							
26...	1230	17.5	--	416	7	7.9	90

06185500 MISSOURI RIVER NEAR CULBERTSON, MT

LOCATION.--Lat 48°07'30", long 104°28'20", in SE¼NW¼ sec.3, T.27 N., R.56 E., Richland County, Hydrologic Unit 10060005, on right bank at downstream side of bridge on State Highway 16, 2.5 mi southeast of Culbertson, 10 mi downstream from Big Muddy Creek, and at mile 1,620.76.

DRAINAGE AREA.--91,557 mi^2.

PERIOD OF RECORD.--July 1941 to December 1951, April 1958 to current year.

REVISED RECORDS.--WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,883.4 ft above National Geodetic Vertical Datum of 1929 (U.S. Army Corps of Engineers bench mark). July 1 to Nov. 6, 1941, water-stage recorder at site 400 ft upstream at datum 0.11 ft. Nov. 7, 1941, to Aug. 17, 1950, water-stage recorder at site 580 ft downstream at present datum. Aug. 18, 1950, to Dec. 31, 1951, nonrecording gage on bridge at present datum. Apr. 1, 1958, to Nov. 1, 1967, waterstage recorder at site 580 ft downstream at present datum.

REMARKS.--Estimated daily discharges: Nov. 10 to Mar. 16. Records good except those for estimated daily discharges, which are poor. Flow partly regulated by Fort Peck Lake (station number 06131500) and many other reservoirs upstream from station. Diversions for irrigation of about 1,030,400 acres upstream from station. Water-quality records for the current year are also available. These records, which have been published in U.S. Geological Survey Report MT-87-1, can also be accessed through the U.S. Geological Survey's WATSTORE data system.

AVERAGE DISCHARGE.--37 years (1943-51, 1958-87, after operational level at Fort Peck Lake was reached), 10,870 ft^3/s, 7,875,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 78,200 ft^3/s, Mar. 26, 1943, gage height, 14.80 ft, from rating curve extended above 30,000 ft^3/s; maximum gage height observed, 19.66 ft, Apr. 14, 1979 (backwater from ice jam); minimum daily discharge, 575 ft^3/s, Nov. 22, 1941.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 17,300 ft^3/s, Aug. 1, gage height, 8.22 ft; maximum gage height, 10.10 ft, Mar. 5, backwater from ice, but may have been higher during period of no gage height record, Dec. 3-11; minimum daily discharge, 5,500 ft^3/s, Nov. 11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12500	8440	6300	7400	11600	11500	7860	5730	6850	7740	15900	6710
2	13200	8460	6600	7200	11400	11400	7540	5810	6950	7470	11000	6700
3	13600	8390	6600	7100	11500	11100	7510	5920	7190	7520	9400	6590
4	13800	8410	6600	7100	11400	11800	8190	5880	7060	7540	9230	6570
5	13100	8420	6600	7400	11600	11800	8880	5820	6790	7600	9410	6630
6	12400	8450	6600	7200	11400	11900	9790	5710	6940	7820	9290	6570
7	12500	8380	6500	7300	11300	11800	10100	5710	6820	7590	8720	6580
8	14000	8270	6500	7300	11600	9800	10300	5680	6890	7580	8240	6570
9	15400	8280	6400	7400	11200	7800	9880	5660	6920	7410	8270	6520
10	16100	7000	6400	7200	11300	7000	9140	5640	6890	7450	8220	6810
11	16400	5500	6400	7600	11200	6800	8440	5680	6810	7570	8120	6930
12	16000	5600	6300	7600	11100	6800	7790	5750	6750	7570	8120	6730
13	15600	6000	6000	7800	11200	7000	7570	5620	6820	7710	8020	6690
14	15300	6500	6000	7400	11300	7500	7290	5840	7180	7630	8010	6600
15	15500	7000	6500	7300	11700	7800	6770	6040	7500	7470	7860	6610
16	15500	7000	7000	7100	11600	8100	6600	6690	7600	7420	7540	6700
17	15500	7000	7500	7300	11600	9220	6450	7340	7630	7400	7880	6810
18	15100	6700	7500	7600	11800	8800	6300	7080	7550	7600	8020	6780
19	14200	6400	7600	7500	11800	8500	6090	6900	7700	7720	7990	6850
20	12700	6400	7600	7200	11900	8290	6090	6800	7870	7690	7840	6760
21	11500	6400	7500	8700	11900	8220	6080	6770	7760	7690	7680	6660
22	10700	6400	7700	10300	11900	8360	5910	6830	7610	7940	7640	6690
23	10200	6800	7600	10500	12000	8520	5780	6590	7590	10500	7770	6530
24	9710	6900	7400	10500	11800	8680	5650	6500	7530	9560	7730	6670
25	9320	6600	7300	10600	11700	8500	5620	6520	7510	8240	7720	6620
26	8860	6600	7400	10400	11600	8280	5550	6390	7420	8110	7660	6580
27	8790	6700	7400	10300	11800	9140	5660	6500	7430	8200	7630	6610
28	8660	6000	7400	10000	11600	10500	5850	6900	7490	8200	7800	6910
29	8580	7100	7500	10100	---	10800	5800	7120	7570	8160	7760	7110
30	8450	6400	7400	10200	---	10700	5740	7160	7720	9030	7580	6860
31	8400	---	7300	10200	---	9240	---	6940	---	12300	7050	---
TOTAL	391570	212500	215400	258800	323800	285650	216220	195520	218340	249430	261100	200950
MEAN	12630	7083	6948	8348	11560	9215	7207	6307	7278	8046	8423	6698
MAX	16400	8460	7700	10600	12000	11900	10300	7340	7870	12300	15900	7110
MIN	8400	5500	6000	7100	11100	6800	5550	5620	6750	7400	7050	6520
AC-FT	776700	421500	427200	513300	642300	566600	428900	387800	433100	494700	517900	398600

CAL YR 1986 TOTAL 3647700 MEAN 9994 MAX 22000 MIN 5500 AC-FT 7235000
WTR YR 1987 TOTAL 3029280 MEAN 8299 MAX 16400 MIN 5500 AC-FT 6009000

06185600 MISSOURI RIVER STAGE GAGE NO. 4 NEAR NOHLY, MT

LOCATION.--Lat 48°02'10", long 104°09'40", in NE1/4 sec.1, T.26 N., R.58 E., Richland County, Hydrologic Unit 10060005, on right bank 4.5 mi northwest of Nohly, and at mile 1,595.7.

DRAINAGE AREA.--93,000 mi^2, approximately.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--March 1959 to current year (seasonal).

GAGE.--Water-stage recorder. Datum of gage is 1,860.00 ft above National Geodetic Vertical Datum of 1929. Prior to Apr. 18, 1962 at datum 60.00 ft lower.

REMARKS.--Stage regulated by Fort Peck Reservoir.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height recorded, 21.20 ft, Mar. 23, 1960, present datum; minimum daily recorded, 6.87 ft, Apr. 18, 1963.

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12.78	11.69	---	---	---	---	---	10.73	11.25	11.61	13.78	10.48
2	13.21	11.72	---	---	---	---	---	10.73	11.25	11.41	13.08	10.42
3	13.37	11.66	---	---	---	---	---	10.84	11.39	11.42	11.97	10.41
4	13.53	11.66	---	---	---	---	---	10.79	11.40	11.44	11.68	10.36
5	13.47	11.66	---	---	---	---	---	10.78	11.22	11.44	11.72	10.37
6	13.14	11.67	---	---	---	---	---	10.70	11.19	11.59	11.76	10.38
7	13.08	11.66	---	---	---	---	---	10.68	11.18	11.49	11.58	10.38
8	13.46	11.65	---	---	---	---	---	10.66	11.14	11.46	11.29	10.36
9	13.97	11.62	---	---	---	---	12.13	10.63	11.16	11.41	11.20	10.31
10	14.30	11.49	---	---	---	---	11.84	10.62	11.16	11.42	11.19	10.32
11	14.42	11.41	---	---	---	---	11.54	10.59	11.12	11.44	11.18	10.39
12	14.39	11.58	---	---	---	---	11.20	10.64	11.03	11.47	11.15	10.43
13	14.27	11.59	---	---	---	---	11.01	10.62	11.04	11.48	11.19	10.44
14	14.21	---	---	---	---	---	10.90	10.57	11.12	11.05	11.07	10.41
15	14.20	---	---	---	---	---	11.22	10.77	11.37	10.48	11.25	10.37
16	14.22	---	---	---	---	---	11.42	10.98	11.48	10.43	10.87	10.44
17	14.23	---	---	---	---	---	11.32	11.47	11.52	10.41	11.03	10.51
18	14.18	---	---	---	---	---	11.21	11.45	11.48	10.50	11.10	10.52
19	13.97	---	---	---	---	---	11.13	11.32	11.52	10.59	11.09	10.50
20	13.57	---	---	---	---	---	11.04	11.28	11.66	10.63	11.05	10.51
21	13.13	---	---	---	---	---	11.04	11.23	11.63	10.65	10.97	10.41
22	12.77	---	---	---	---	---	11.00	11.24	11.57	10.66	10.90	10.44
23	12.55	---	---	---	---	---	10.88	11.20	11.52	11.34	10.93	10.37
24	12.34	---	---	---	---	---	10.75	11.03	11.50	12.01	10.93	10.39
25	12.18	---	---	---	---	---	10.70	11.05	11.46	11.21	10.95	10.41
26	12.02	---	---	---	---	---	10.70	10.97	11.42	10.93	10.94	10.36
27	11.89	---	---	---	---	---	10.67	10.98	11.39	10.96	10.92	10.38
28	11.87	---	---	---	---	---	10.83	11.14	11.41	10.98	10.96	10.48
29	11.81	---	---	---	---	---	10.80	11.34	11.44	10.97	11.04	10.60
30	11.74	---	---	---	---	---	10.77	11.37	11.46	11.17	10.95	10.59
31	11.70	---	---	---	---	---	---	11.32	---	11.80	10.78	---
MEAN	13.2	---	---	---	---	---	---	11.0	11.3	11.2	11.3	10.4
MAX	14.42	---	---	---	---	---	---	11.47	11.66	12.01	13.78	10.60
MIN	11.70	---	---	---	---	---	---	10.57	11.03	10.41	10.78	10.31

MISSOURI RIVER MAIN STEM

06185650 MISSOURI RIVER STAGE GAGE NO. 5 AT NOHLY, MT

LOCATION.--Lat 48°00'10", long 104°05'30", in SE1/4 sec.16, T.26 N., R.59 E., Richland County, Hydrologic Unit 10060005, at downstream side of bridge, 0.2 mi northwest of Nohly, and at mile 1,587.7.

DRAINAGE AREA.--93,000 mi^2, approximately.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--April 1959 to current year (seasonal).

GAGE.--Water-stage recorder. Datum of gage is 1,800.00 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Stage regulated by Fort Peck Reservoir.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height recorded, 77.22 ft, Mar. 15, 1972; minimum daily recorded, 59.12 ft, Nov. 22, 1964.

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	65.72	64.59	---	---	---	---	---	62.59	---	63.51	66.32	63.21
2	66.08	64.62	---	---	---	---	---	62.60	---	63.36	66.07	63.13
3	66.26	64.59	---	---	---	---	---	62.75	63.40	63.34	64.89	63.12
4	66.41	64.58	---	---	---	---	---	62.76	63.39	63.36	64.48	63.07
5	66.41	64.59	---	---	---	---	---	62.76	63.36	63.36	64.47	63.06
6	66.14	64.59	---	---	---	---	---	62.72	63.37	63.49	64.51	63.07
7	66.06	64.58	---	---	---	---	---	62.69	63.27	63.44	64.35	63.07
8	66.33	64.55	---	---	---	---	---	62.62	63.19	63.37	64.05	63.06
9	66.83	64.50	---	---	---	---	64.88	62.55	63.15	63.33	63.91	63.02
10	67.18	64.49	---	---	---	---	64.62	62.54	63.11	63.35	63.90	63.02
11	67.27	63.46	---	---	---	---	64.33	62.51	63.06	63.38	63.88	63.08
12	67.26	64.63	---	---	---	---	64.00	62.55	63.06	63.40	63.84	63.12
13	67.12	---	---	---	---	---	63.79	62.56	63.17	63.40	63.85	63.13
14	67.06	---	---	---	---	---	63.69	62.49	63.24	63.52	63.75	63.09
15	67.05	---	---	---	---	---	63.44	62.67	63.39	63.43	63.89	63.05
16	67.08	---	---	---	---	---	63.24	62.82	63.44	63.41	63.57	63.09
17	67.07	---	---	---	---	---	63.15	63.24	63.45	63.37	63.64	63.15
18	67.01	---	---	---	---	---	63.04	63.34	63.39	63.46	63.67	63.18
19	66.80	---	---	---	---	---	62.97	63.25	63.41	63.53	63.79	63.15
20	66.41	---	---	---	---	---	62.87	63.22	63.58	63.54	63.76	63.18
21	65.98	---	---	---	---	---	62.86	63.30	63.57	63.60	63.68	63.09
22	65.64	---	---	---	---	---	62.83	63.36	63.50	63.62	63.61	63.10
23	65.44	---	---	---	---	---	62.72	63.34	63.44	64.09	63.63	63.04
24	65.24	---	---	---	---	---	62.62	63.22	63.42	64.97	63.64	63.03
25	65.08	---	---	---	---	---	62.55	---	63.39	64.28	63.63	63.05
26	64.93	---	---	---	---	---	62.56	---	63.35	63.92	63.64	63.01
27	64.80	---	---	---	---	---	62.50	---	63.31	63.94	63.60	63.03
28	64.78	---	---	---	---	---	62.64	---	63.32	63.90	63.63	63.12
29	64.71	---	---	---	---	---	62.64	---	63.36	63.88	63.72	63.24
30	64.63	---	---	---	---	---	62.62	---	63.37	63.99	63.65	63.28
31	64.60	---	---	---	---	---	---	---	---	64.50	63.53	---
MEAN	66.1	---	---	---	---	---	---	---	---	63.6	64.0	63.1
MAX	67.27	---	---	---	---	---	---	---	---	64.97	66.32	63.28
MIN	64.60	---	---	---	---	---	---	---	---	63.33	63.53	63.01

06329500 YELLOWSTONE RIVER NEAR SIDNEY, MT

LOCATION.--Lat 47°40'42", long 104°09'22", in SW¼NE¼SW¼ sec.9, T.22 N., R.59 E., Richland County, Hydrologic Unit 10100004, on left bank at Montana-Dakota Utilities Company powerplant, 0.2 mi downstream from bridge on State Highway 23, 2.5 mi south of Sidney, 3.0 mi downstream from Fox Creek, and at mile 29.2.

DRAINAGE AREA.--69,103 mi^2. Area at site 4.5 mi upstream, 68,812 mi^2.

PERIOD OF RECORD.--October 1910 to September 1931 (published as "at Intake"), October 1933 to current year. If monthly figures of diversions to Lower Yellowstone Canal at Intake are added to records at this site, records equivalent to those published as Yellowstone River at Glendive (1898-1910, 1931-34) can be obtained. Monthly discharge only for some periods, published in WSP 1309. Monthly figures of diversions into Lower Yellowstone Canal prior to 1951 published in WSP 1309, 1951-60 published in WSP 1729, 1961-65 published in WSP 1916, 1966-70 published in WSP 2116, and 1971 to current year are published in annual reports.

GAGE.--Water-stage recorder. Datum of gage is 1,881.3 ft National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Jan. 1, 1911, to Sept. 30, 1931, nonrecording gage at site 32 miles upstream at different datum. Apr. 9, 1934, water-stage recorder at two sites within 500 ft of highway bridge 0.2 mi upstream and May 17, 1945, to Apr. 3, 1952, nonrecording gage on same bridge at datum 1.36 ft higher. Apr. 4, 1952, to Nov. 19, 1967, water-stage recorder at site 4.5 mi upstream at different datum.

REMARKS.--Estimated daily discharges: Nov. 11 to Mar. 12. Records good except those for estimated daily discharges, which are poor. Some regulation on tributary streams. Diversion for irrigation of about 1,250,000 acres upstream from station. Lower Yellowstone Project Main Canal diverts from left bank in NW¼ sec.36, T.18 N., R.56 E., at Lower Yellowstone diversion dam at Intake about 36.6 mi upstream for irrigation of about 52,000 acres of which about one-third lies upstream from station. Water-quality records for the current year are also available. These records, which have been published in U.S. Geological Survey Report MT-87-1, can also be accessed through the U.S. Geological Survey's WATSTORE data system.

AVERAGE DISCHARGE.--75 years, 12,960 ft^3/s, 9,390,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge observed, 159,000 ft^3/s, June 2, 1921, gage height, 12.6 ft, site and datum then in use; maximum gage height observed, 21.85 ft, Mar. 22, 1947, site and datum then in use (backwater from ice); minimum discharge, 470 ft^3/s, May 17, 1961, gage height, 2.73 ft, site and datum then in use.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 23,000 ft^3/s, May 31, gage height, 9.33 ft; maximum gage height, 10.32 ft, Nov. 11, result of ice jam; minimum discharge, 4,150 ft^3/s, Aug. 13.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13900	9950	9500	7500	7000	7000	9270	11000	20800	6880	7040	8060
2	12600	9920	9000	7500	7500	7000	9370	12400	20500	6390	7260	7680
3	11900	9910	9000	7000	7000	8000	9160	14300	19600	6120	7320	7270
4	11600	9910	8500	7500	6500	8500	9170	14500	19500	5840	7050	6860
5	11500	9970	9000	8000	7000	9000	9300	14900	18700	5670	6750	6600
6	11700	10000	8500	7500	7500	9000	9220	14500	17100	5960	6080	6430
7	11600	9850	8500	7500	8000	9000	9010	12700	15700	6150	5480	6320
8	11200	9870	8500	7000	7500	8500	8880	10700	14600	6270	4940	6570
9	11200	9900	7500	7000	7500	8000	8700	9510	13700	6110	4600	6550
10	11200	10200	7500	6500	7000	8500	8670	9210	13400	5650	4370	6510
11	10900	9000	8000	7000	7500	9000	8700	9800	14500	5360	4220	6400
12	10900	8500	7500	7500	7500	9500	8820	10500	17300	5310	4180	6280
13	10800	9500	8000	8000	7500	9560	8720	11000	18600	5590	4150	6060
14	10600	10500	8500	7500	7500	8850	7790	11100	17600	7160	4200	5990
15	10500	10000	8500	7000	7500	8430	7490	10600	16400	12900	5730	5970
16	10300	11000	8000	7000	7000	8240	7270	9870	15000	12800	8080	5860
17	10200	10500	8000	7000	7000	7900	7160	10900	14100	10600	5820	5770
18	10200	9500	8000	7500	7500	7870	7020	11700	13200	9020	5440	5750
19	9210	10500	7500	7000	7000	7740	6830	12200	13700	8690	5660	5720
20	8330	10000	7500	7000	7000	7760	6700	14100	14400	8760	5460	5660
21	10100	11000	8000	7500	7500	8000	6870	16900	13300	11800	5220	5650
22	10200	11500	8500	6500	7000	8010	7250	16200	12900	11900	5070	5690
23	10100	11000	8500	5500	7000	7930	7970	16300	12200	12200	4950	5640
24	9960	11000	9000	6000	7000	7730	8540	16000	11500	11000	4730	5480
25	9910	11000	8000	6000	6500	7530	8260	15000	10800	10200	4650	5410
26	9860	10500	8500	6500	6500	7380	7690	13800	10100	10300	5250	5400
27	10000	10500	8500	6500	6500	7420	7490	13800	9560	10200	6360	5420
28	11400	10000	8500	6000	6500	7520	7950	16200	8890	9330	6870	5660
29	10600	10000	7500	6500	---	7410	8910	19000	8210	8430	8540	5660
30	10300	9500	8000	6500	---	7360	9770	19400	7500	8390	9130	5570
31	10100	---	8000	7000	---	8060	---	22100	---	7750	8600	---
TOTAL	332870	304480	256000	216000	200000	251700	247950	420190	433360	258730	183200	183890
MEAN	10740	10150	8258	6968	7143	8119	8265	13550	14450	8346	5910	6130
MAX	13900	11500	9500	8000	8000	9560	9770	22100	20800	12900	9130	8060
MIN	8330	8500	7500	5500	6500	7000	6700	9210	7500	5310	4150	5400
AC-FT	660200	603900	507800	428400	396700	499200	491800	833400	859600	513200	363400	364700

CAL YR 1986 TOTAL 5079170 MEAN 13920 MAX 58800 MIN 4000 AC-FT 10070000
WTR YR 1987 TOTAL 3288370 MEAN 9009 MAX 22100 MIN 4150 AC-FT 6522000

06329590 YELLOWSTONE RIVER STAGE GAGE NO. 1 NEAR FAIRVIEW, MT

LOCATION.--Lat 47°48'34", long 104°02'36", sec. 18, T.150 N., R.104 W., McKenzie County, Hydrologic Unit 10100004, on left bank 3 mi south of Fairview, and at mile 15.2.

DRAINAGE AREA.--70,000 mi^2, approximately.

PERIOD OF RECORD.--March 1959 to current year (seasonal).

GAGE.--Water-stage recorder. Datum of gage is 1,860.00 ft above National Geodetic Vertical Datum of 1929. Prior to Feb. 19, 1962, at datum 60.00 ft lower.

REVISED RECORDS.--WDR ND-82: 1980-81.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height recorded, 23.78 ft, Mar. 21, 1960, present datum; minimum daily recorded, 9.10 ft, May 16-17, Aug. 12-13, 1961, present datum.

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13.46	11.79	---	---	---	---	---	12.16	15.31	11.14	11.00	11.32
2	13.06	11.74	---	---	---	---	---	12.62	15.18	10.90	10.89	11.17
3	12.87	11.73	---	---	---	---	---	13.20	14.98	10.82	11.04	11.02
4	12.77	11.73	---	---	---	---	---	13.50	14.85	10.68	10.91	10.89
5	12.72	11.74	---	---	---	---	---	13.54	14.69	10.61	10.80	10.78
6	12.71	11.74	---	---	---	---	---	13.61	14.29	---	10.59	10.70
7	12.71	11.69	---	---	---	---	---	13.14	13.86	---	10.37	10.65
8	12.52	11.68	---	---	---	---	11.67	12.35	13.47	---	10.15	10.70
9	12.60	11.72	---	---	---	---	11.55	11.79	13.16	---	10.0	9.10
10	12.49	---	---	---	---	---	11.57	11.58	12.98	---	9.89	8.90
11	12.50	---	---	---	---	---	11.59	11.76	13.16	---	9.79	8.90
12	12.57	---	---	---	---	---	11.62	12.01	13.99	---	9.77	8.90
13	12.51	---	---	---	---	---	11.63	12.17	14.46	---	9.77	8.90
14	12.31	---	---	---	---	---	11.34	12.28	14.37	---	9.81	8.89
15	12.28	---	---	---	---	---	11.16	12.24	14.04	12.36	9.93	8.89
16	12.23	---	---	---	---	---	11.08	11.98	13.56	12.74	11.41	9.62
17	12.22	---	---	---	---	---	11.03	12.14	13.26	12.18	10.58	10.41
18	12.24	---	---	---	---	---	10.97	12.60	12.96	11.65	10.26	10.41
19	12.02	---	---	---	---	---	10.86	12.74	13.11	11.49	10.39	10.40
20	11.53	---	---	---	---	---	10.82	13.09	13.28	11.45	10.32	---
21	12.03	---	---	---	---	---	10.86	14.40	12.98	12.18	10.22	---
22	12.19	---	---	---	---	---	10.97	14.32	12.86	12.42	10.15	---
23	12.18	---	---	---	---	---	11.24	14.36	12.59	12.48	10.12	---
24	12.14	---	---	---	---	---	11.47	14.23	12.46	12.25	10.03	---
25	12.08	---	---	---	---	---	11.41	13.94	12.23	11.91	9.96	---
26	11.80	---	---	---	---	---	11.21	13.50	12.12	11.92	10.11	---
27	11.79	---	---	---	---	---	11.12	13.38	11.96	11.95	10.55	---
28	12.25	---	---	---	---	---	11.19	13.67	11.73	11.69	10.79	---
29	12.13	---	---	---	---	---	11.54	14.98	11.50	11.39	11.29	---
30	11.93	---	---	---	---	---	11.82	14.84	11.30	11.35	11.66	---
31	11.83	---	---	---	---	---	---	15.66	---	11.13	11.54	---
MEAN	12.3	---	---	---	---	---	---	13.2	13.4	---	10.5	---
MAX	13.46	---	---	---	---	---	---	15.66	15.31	---	11.66	---
MIN	11.53	---	---	---	---	---	---	11.58	11.30	---	9.77	---

06329610 YELLOWSTONE RIVER STAGE GAGE NO. 2 NEAR CARTWRIGHT, ND

LOCATION.--Lat 47°51'50", long 103°58'06", on south line sec.26, T.151 N., R.104 W., McKenzie County, Hydrologic Unit 10100004, on bridge on State Highway 23, 2 mi west of Cartwright, and at mile 8.6.

DRAINAGE AREA.--70,000 mi^2, approximately.

PERIOD OF RECORD.--April 1959 to current year (seasonal).

GAGE.--Water-stage recorder. Datum of gage is 1,800.00 ft above National Geodetic Vertical Datum of 1929.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height recorded, 87.08 ft, Mar. 23, 1978; minimum daily recorded, 58.58 ft, July 26, 1974.

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	67.91	66.31	68.98	---	---	---	---	66.40	69.50	65.61	65.48	65.78
2	67.56	66.27	68.71	---	---	---	---	66.81	69.41	65.41	65.30	65.67
3	67.30	66.36	---	---	---	---	---	67.32	69.23	65.32	65.46	65.53
4	67.18	66.44	---	---	---	---	---	67.63	69.12	65.26	65.34	65.35
5	66.97	66.42	---	---	---	---	---	67.68	69.06	65.18	65.28	65.29
6	66.95	66.22	---	---	---	---	---	67.75	68.70	65.22	65.10	65.25
7	66.99	66.12	---	---	---	---	---	67.31	68.31	65.31	64.78	65.25
8	66.86	66.15	---	---	---	---	---	66.58	67.96	65.36	64.63	65.16
9	66.83	66.13	---	---	---	---	---	66.11	67.67	65.35	64.57	65.18
10	66.84	66.12	---	---	---	---	---	65.90	67.53	65.20	64.54	65.21
11	66.71	67.73	---	---	---	---	---	65.99	67.64	65.07	64.42	65.08
12	66.69	68.49	---	---	---	---	---	66.23	68.43	65.04	64.38	65.19
13	66.67	68.27	---	---	---	---	---	66.43	68.91	65.10	64.41	65.14
14	66.61	68.21	---	---	---	---	---	66.49	68.89	65.41	64.43	65.15
15	66.58	68.14	---	---	---	---	---	66.47	68.66	66.63	64.47	64.99
16	66.54	68.17	---	---	---	---	65.38	66.26	68.24	67.15	65.77	64.97
17	66.51	68.41	---	---	---	---	65.33	66.34	67.90	66.60	65.12	64.91
18	66.52	68.72	---	---	---	---	65.31	66.78	67.56	66.06	64.80	64.87
19	66.33	68.99	---	---	---	---	65.24	66.87	67.63	65.88	64.90	64.89
20	65.80	69.56	---	---	---	---	65.15	67.16	67.83	65.80	64.87	64.89
21	66.27	69.90	---	---	---	---	65.18	68.35	67.62	66.38	64.79	64.90
22	66.48	69.90	---	---	---	---	65.30	68.33	67.45	66.84	64.68	64.92
23	66.43	69.88	---	---	---	---	65.49	68.30	67.21	66.86	64.70	64.94
24	66.36	70.11	---	---	---	---	65.75	68.28	67.03	66.69	64.63	64.89
25	66.33	69.97	---	---	---	---	65.76	68.12	66.79	66.36	64.54	64.87
26	66.33	69.92	---	---	---	---	65.56	67.73	66.62	66.34	64.64	64.89
27	66.33	70.00	---	---	---	---	65.46	67.62	66.47	66.42	65.00	64.85
28	66.68	69.85	---	---	---	---	65.55	67.73	66.24	66.19	65.24	64.90
29	66.60	69.53	---	---	---	---	65.82	69.03	66.03	65.87	65.70	64.91
30	66.40	69.20	---	---	---	---	66.13	68.94	65.83	65.80	66.06	64.88
31	66.51	---	---	---	---	---	---	69.80	---	65.62	65.98	---
MEAN	66.7	68.2	---	---	---	---	---	67.3	67.8	65.8	65.0	65.1
MAX	67.91	70.11	---	---	---	---	---	69.80	69.50	67.15	66.06	65.78
MIN	65.80	66.12	---	---	---	---	---	65.90	65.83	65.04	64.38	64.85

06329620 YELLOWSTONE RIVER STAGE GAGE NO. 3 NEAR BUFORD, ND

LOCATION.--Lat 47°55'14", long 103°57'56", in SW1/4 sec.2, T.151 N., R.104 W., McKenzie County, Hydrologic Unit 10100004, on left bank 4 mi south of Buford, and 6.5 mi southeast of Nohly.

DRAINAGE AREA.--70,000 mi^2, approximately.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--April 1959 to current year (seasonal).

GAGE.--Water-stage recorder. Datum of gage is 1,850.00 ft above National Geodetic Vertical Datum of 1929. Prior to Apr. 19, 1962, at datum 50.00 ft lower. Prior to Apr. 23, 1987, gage was located 1 mi downstream.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height recorded, 29.55 ft, Mar. 15, 1972; minimum daily recorded, 6.18 ft, Aug. 24, 1961, present datum.

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	13.09	---	---	---	---	---	11.89	15.61	11.08	11.41	11.48
2	---	13.05	---	---	---	---	---	12.46	15.49	---	11.24	11.28
3	---	13.03	---	---	---	---	---	13.03	15.24	---	11.22	11.11
4	---	13.02	---	---	---	---	---	13.47	15.11	---	11.05	10.94
5	---	13.02	---	---	---	---	---	13.52	15.01	---	10.95	10.78
6	---	13.02	---	---	---	---	---	13.62	14.60	---	10.74	10.68
7	---	12.99	---	---	---	---	---	13.31	14.17	---	10.50	10.61
8	---	13.10	---	---	---	---	---	12.58	13.82	---	10.26	10.61
9	---	13.10	---	---	---	---	---	11.97	13.50	---	10.05	10.68
10	---	13.10	---	---	---	---	---	11.62	13.31	---	9.91	10.65
11	---	13.08	---	---	---	---	---	11.68	13.35	---	9.78	10.64
12	---	13.08	---	---	---	---	---	11.90	14.08	---	9.73	10.60
13	---	13.07	---	---	---	---	---	12.09	14.61	---	9.71	10.51
14	---	---	---	---	---	---	---	12.25	14.63	10.67	9.72	10.44
15	14.14	---	---	---	---	---	---	12.27	14.32	11.98	9.77	10.41
16	14.11	---	---	---	---	---	---	12.04	13.90	13.02	11.29	10.38
17	14.06	---	---	---	---	---	---	12.08	13.56	12.52	10.75	10.32
18	14.05	---	---	---	---	---	---	12.57	13.23	11.89	10.25	10.30
19	13.88	---	---	---	---	---	---	12.73	13.34	11.63	10.29	10.29
20	13.29	---	---	---	---	---	---	13.01	13.54	11.53	10.28	10.26
21	13.35	---	---	---	---	---	---	14.25	13.36	12.05	10.18	10.25
22	13.53	---	---	---	---	---	---	14.43	13.15	12.72	10.08	---
23	13.44	---	---	---	---	---	10.93	14.47	12.87	12.71	10.03	---
24	13.36	---	---	---	---	---	11.24	14.36	12.74	12.66	9.94	---
25	13.26	---	---	---	---	---	11.26	14.13	12.45	12.23	9.83	---
26	13.22	---	---	---	---	---	11.03	13.74	12.24	12.10	9.93	---
27	13.17	---	---	---	---	---	10.88	13.60	12.03	12.18	10.36	---
28	13.54	---	---	---	---	---	10.90	13.68	11.80	11.96	10.69	---
29	13.57	---	---	---	---	---	11.24	14.98	11.58	11.61	11.22	---
30	13.29	---	---	---	---	---	11.60	15.02	11.33	11.45	11.76	---
31	13.14	---	---	---	---	---	---	15.86	---	11.34	11.74	---
MEAN	---	---	---	---	---	---	---	13.2	13.6	---	10.5	---
MAX	---	---	---	---	---	---	---	15.86	15.61	---	11.76	---
MIN	---	---	---	---	---	---	---	11.62	11.33	---	9.71	---

06329640 MISSOURI RIVER STAGE GAGE NO. 5A AT BUFORD, ND

LOCATION.--Lat 47°59'06", long 103°59'05", in SE1/4 sec.15, T.152 N., R.104 W., Williams County, Hydrologic Unit 10110101, on left bank 1.5 mi southwest of Buford, and at mile 1,580.7.

DRAINAGE AREA.--164,000 mi^2, approximately.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--April 1960 to current year (seasonal).

GAGE.--Water-stage recorder. Datum of gage is 1,850.00 ft above National Geodetic Vertical Datum of 1929. Prior to Mar. 8, 1962, at datum 50.00 ft lower.

REMARKS.--Stage regulated by upstream reservoirs.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height recorded, 19.37 ft, Mar. 23, 1978; minimum daily recorded, 2.63 ft, Aug. 15, 16, 1966.

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10.56	8.50	---	---	---	---	---	---	11.50	7.38	9.35	7.98
2	10.47	8.49	---	---	---	---	---	---	11.33	7.16	9.33	7.71
3	10.36	8.45	---	---	---	---	---	---	11.24	7.01	8.48	7.54
4	10.36	8.41	---	---	---	---	---	---	11.13	6.92	8.02	7.35
5	10.35	8.40	---	---	---	---	---	---	11.01	6.84	7.88	7.19
6	10.14	8.43	---	---	---	---	---	---	10.58	6.90	7.74	7.09
7	10.04	8.38	---	---	---	---	---	---	10.13	6.98	7.44	7.03
8	10.12	8.35	---	---	---	---	---	---	9.74	6.98	7.03	7.02
9	10.43	8.33	---	---	---	---	8.58	---	9.45	6.96	6.73	7.08
10	10.70	8.66	---	---	---	---	8.45	---	9.22	6.87	6.60	7.05
11	10.81	11.10	---	---	---	---	8.28	---	9.21	6.77	6.44	7.06
12	10.83	10.81	---	---	---	---	8.05	---	9.81	6.75	6.39	7.06
13	10.76	10.86	---	---	---	---	7.92	---	10.39	6.76	6.39	7.03
14	10.65	---	---	---	---	---	7.69	---	10.54	6.98	6.37	6.92
15	10.58	---	---	---	---	---	7.31	---	10.33	8.00	6.46	6.86
16	10.56	---	---	---	---	---	7.09	---	10.00	9.06	7.52	6.83
17	10.52	---	---	---	---	---	6.96	---	9.69	8.74	7.38	6.83
18	10.49	---	---	---	---	---	6.86	---	9.38	8.24	6.93	6.83
19	10.32	---	---	---	---	---	6.70	---	9.43	8.03	6.97	6.83
20	9.61	---	---	---	---	---	6.61	9.13	9.71	7.94	7.04	6.83
21	9.37	---	---	---	---	---	---	10.07	9.63	8.31	6.90	6.78
22	9.39	---	---	---	---	---	---	10.35	9.34	9.03	6.77	6.75
23	9.20	---	---	---	---	---	---	10.30	9.07	9.12	6.72	6.75
24	9.03	---	---	---	---	---	---	10.27	8.94	9.71	6.70	6.66
25	8.87	---	---	---	---	---	---	10.05	8.64	9.10	6.59	6.64
26	8.74	---	---	---	---	---	---	9.66	8.42	8.65	6.63	6.59
27	8.61	---	---	---	---	---	---	9.40	8.20	8.69	6.99	6.54
28	8.84	---	---	---	---	---	---	9.43	7.98	8.51	7.37	6.62
29	7.44	---					9.35	10.88	12.56	---	6.96	12.26
30	7.29	---					9.45	11.25	13.64	---	6.92	11.07
31	7.24	---					---	12.44	---	---	6.88	---
MEAN	7.48	---					---	10.88	---	---	---	8.69
MAX	8.67	---					---	13.00	---	---	---	13.35
MIN	6.99	---					---	8.87	---	---	---	6.92

06329650 MISSOURI RIVER STAGE GAGE NO. 6 NEAR BUFORD, ND

LOCATION.--Lat 47°57'18", long 103°54'36", in SE1/4 sec.30, T.152 N., R.103 W., Williams County, Hydrologic Unit 10110101, on right bank 5 mi southeast of Buford, and at mile 1,576.0.

DRAINAGE AREA.--164,000 mi^2, approximately.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--December 1959 to current year (seasonal).

GAGE.--Water-stage recorder. Datum of gage is 1,840.00 ft above National Geodetic Vertical Datum of 1929. Prior to Apr. 17, 1962, at datum 40.00 ft lower.

REMARKS.--Stage regulated by upstream reservoirs.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height recorded, 24.18 ft, June 10, 1986; minimum daily recorded, 8.23 ft, Aug. 15 and 22, 1963.

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	---	---	---	16.52	15.13
2	---	---	---	---	---	---	---	---	---	---	16.61	14.86
3	---	---	---	---	---	---	---	---	18.52	---	15.81	14.72
4	---	---	---	---	---	---	---	---	18.40	---	15.37	14.57
5	---	---	---	---	---	---	---	---	18.29	---	15.24	14.43
6	---	---	---	---	---	---	---	---	17.91	---	15.12	14.35
7	---	---	---	---	---	---	---	---	17.47	---	14.87	14.29
8	---	---	---	---	---	---	---	---	17.08	---	14.63	14.29
9	---	---	---	---	---	---	---	---	16.77	---	14.25	14.35
10	---	---	---	---	---	---	---	---	16.55	---	14.14	14.32
11	---	---	---	---	---	---	---	---	16.54	---	13.98	14.32
12	---	---	---	---	---	---	---	---	17.05	---	13.89	14.33
13	---	---	---	---	---	---	---	---	17.65	---	13.88	14.28
14	---	---	---	---	---	---	---	---	17.85	---	13.80	14.20
15	---	---	---	---	---	---	---	---	17.63	15.73	13.96	14.14
16	---	---	---	---	---	---	---	---	17.34	16.28	14.84	14.13
17	---	---	---	---	---	---	---	---	17.02	15.98	14.80	14.12
18	---	---	---	---	---	---	---	---	16.71	15.49	14.38	14.15
19	---	---	---	---	---	---	---	---	16.71	15.24	14.42	14.13
20	---	---	---	---	---	---	---	---	16.98	15.17	14.43	14.13
21	---	---	---	---	---	---	---	---	16.97	15.45	14.30	14.08
22	---	---	---	---	---	---	---	---	16.67	16.19	14.17	14.05
23	---	---	---	---	---	---	---	---	16.41	16.34	14.12	14.05
24	---	---	---	---	---	---	---	---	16.28	16.88	14.08	13.97
25	---	---	---	---	---	---	---	---	16.01	16.34	13.97	13.94
26	---	---	---	---	---	---	---	---	15.82	15.90	14.03	13.89
27	---	---	---	---	---	---	---	---	---	15.94	14.29	13.86
28	---	---	---	---	---	---	---	---	---	15.80	14.61	13.96
29	---	---	---	---	---	---	---	---	---	15.48	14.99	14.04
30	---	---	---	---	---	---	---	---	---	15.34	15.47	14.05
31	---	---	---	---	---	---	---	---	---	15.53	15.49	---
MEAN	---	---	---	---	---	---	---	---	---	---	14.7	14.2
MAX	---	---	---	---	---	---	---	---	---	---	16.61	15.13
MIN	---	---	---	---	---	---	---	---	---	---	13.80	13.86

06329660 MISSOURI RIVER STAGE GAGE NO. 7 NEAR TRENTON, ND

LOCATION.--Lat 47°59'21", long 103°47'57", in NE¼ sec.13, T.152 N., R.103 W., McKenzie County, Hydrologic Unit 10110101, on right bank 5 mi south of Trenton, and at mile 1,566.7.

DRAINAGE AREA.--164,000 mi^2, approximately.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--March 1959 to current year (seasonal).

GAGE.--Water-stage recorder. Datum of gage is 1,840.00 ft above National Geodetic Vertical Datum of 1929. Prior to Aug. 7, 1962, at site 0.8 mi upstream. Prior to May 29, 1963, at datum 40.00 ft lower.

REMARKS.--Stage regulated by upstream reservoirs.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height recorded, 21.56 ft, July 10, 1975; minimum daily recorded, 4.34 ft, Aug. 19, 22, 1963.

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14.55	12.61	---	---	---	---	---	11.37	15.05	11.09	12.63	11.49
2	14.33	12.59	---	---	---	---	---	11.70	14.90	10.87	12.98	11.22
3	14.17	12.57	---	---	---	---	---	12.22	14.77	10.65	12.19	11.08
4	14.15	12.54	---	---	---	---	---	12.68	14.60	10.58	11.66	10.90
5	14.15	12.53	---	---	---	---	---	12.74	14.48	10.49	11.53	10.74
6	13.98	12.58	---	---	---	---	---	12.83	14.13	10.53	11.41	10.66
7	13.85	12.58	---	---	---	---	---	12.69	13.69	10.61	11.18	10.55
8	13.89	12.50	---	---	---	---	---	12.09	13.28	10.60	10.80	10.53
9	14.11	12.48	---	---	---	---	---	11.46	12.97	10.62	10.51	10.61
10	14.44	14.03	---	---	---	---	---	11.15	12.75	10.57	10.41	10.57
11	14.59	15.64	---	---	---	---	---	11.09	12.72	10.52	10.29	10.59
12	14.64	14.84	---	---	---	---	---	11.27	13.15	10.43	10.21	10.59
13	14.60	14.76	---	---	---	---	---	11.48	13.72	10.45	10.22	10.55
14	14.52	---	---	---	---	---	---	11.52	13.96	10.63	10.22	10.47
15	14.42	---	---	---	---	---	---	11.64	13.81	11.56	10.27	10.41
16	14.38	---	---	---	---	---	11.09	11.60	13.54	12.65	11.06	10.40
17	14.35	---	---	---	---	---	10.96	11.70	13.23	12.26	11.21	10.38
18	14.32	---	---	---	---	---	10.87	12.13	12.92	11.85	10.72	10.41
19	14.20	---	---	---	---	---	10.78	12.33	12.89	11.64	10.72	10.38
20	13.69	---	---	---	---	---	10.64	12.48	13.14	11.57	10.76	10.37
21	13.37	---	---	---	---	---	10.59	13.29	13.19	12.06	10.65	10.33
22	13.41	---	---	---	---	---	10.65	13.83	12.92	12.57	10.50	10.31
23	13.26	---	---	---	---	---	10.73	13.80	12.66	12.65	10.45	10.32
24	13.13	---	---	---	---	---	10.93	13.74	12.52	13.12	10.41	10.24
25	12.98	---	---	---	---	---	10.96	13.53	12.27	12.71	10.34	10.22
26	12.86	---	---	---	---	---	10.86	13.20	12.04	12.21	10.39	10.19
27	12.75	---	---	---	---	---	10.66	12.86	11.85	12.22	10.61	10.16
28	12.83	---	---	---	---	---	10.67	12.83	11.65	12.10	10.95	10.25
29	13.03	---	---	---	---	---	10.88	13.85	11.46	11.80	11.30	10.31
30	12.88	---	---	---	---	---	11.14	14.31	11.27	11.63	11.78	10.32
31	12.68	---	---	---	---	---	---	14.81	---	11.81	11.84	---
MEAN	13.8	---	---	---	---	---	---	12.5	13.2	11.5	11.0	10.5
MAX	14.64	---	---	---	---	---	---	14.81	15.05	13.12	12.98	11.49
MIN	12.68	---	---	---	---	---	---	11.09	11.27	10.43	10.21	10.16

MISSOURI RIVER MAIN STEM

06330000 MISSOURI RIVER NEAR WILLISTON, ND

LOCATION.--Lat 48°06'45", long 103°43'04", in SE1/4 sec.31, T.154 N., R.101 W., Williams County, Hydrologic Unit 10110101, at city waterplant on left bank, 5 mi southwest of Williston, 29.3 mi downstream from Yellowstone River, and at mile 1,552.7.

DRAINAGE AREA.--164,500 mi^2, approximately.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--April 1966 to current year. Operated as a stage-discharge station October 1897 to July 1965.

GAGE.--Water-stage recorder. Datum of gage is 1,830.20 ft above National Geodetic Vertical Datum of 1929. See WSP 1917 for history of changes prior to April 1966.

REMARKS.--Stage regulated by upstream reservoirs and backwater from Lake Sakakawea.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height recorded, 26.46 ft, Mar. 26, 1978; minimum daily recorded, 7.80 ft, Nov. 2, 1966.

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18.53	17.35	18.36	17.44	18.30	17.74	16.14	15.39	17.70	15.26	16.05	15.37
2	18.35	17.36	18.17	17.48	18.46	17.72	15.99	15.67	17.60	15.19	16.37	15.20
3	18.27	17.32	17.95	17.54	18.56	17.81	16.12	15.85	17.65	15.16	15.98	15.05
4	18.10	17.30	17.69	17.33	18.61	18.21	16.19	16.18	17.65	15.07	15.68	14.93
5	18.11	17.25	17.19	17.29	18.65	18.61	16.14	16.26	17.52	15.01	15.53	14.85
6	18.12	17.27	16.85	17.23	18.70	18.93	16.08	16.27	17.28	14.92	15.38	14.78
7	17.96	17.37	16.73	17.19	18.72	19.13	16.08	16.33	16.99	14.96	15.34	14.70
8	18.06	16.71	16.80	17.30	18.78	19.11	15.99	16.05	16.79	15.10	15.10	14.72
9	18.25	16.96	16.79	17.30	18.83	18.90	15.95	15.69	16.69	15.15	14.88	14.76
10	18.10	18.02	16.74	17.16	18.87	18.46	15.92	15.36	16.53	15.02	14.96	14.71
11	18.17	18.18	16.44	17.17	18.90	18.10	15.92	15.41	16.36	14.91	14.63	14.73
12	18.35	17.61	16.13	17.13	18.92	17.93	15.75	15.51	16.53	14.86	14.57	14.75
13	18.40	17.50	16.23	17.13	19.00	17.94	15.69	15.45	16.81	14.87	14.68	14.75
14	18.44	17.46	16.85	17.30	19.05	18.09	15.67	15.67	17.10	14.93	14.69	14.68
15	18.32	17.57	17.31	17.28	19.07	18.16	15.38	15.71	17.06	15.31	14.56	14.63
16	18.32	17.61	17.39	17.22	19.07	18.24	15.20	15.68	16.91	15.99	14.95	14.59
17	18.39	17.90	17.37	16.83	19.06	18.36	15.11	15.88	16.70	16.06	15.25	14.52
18	18.40	18.20	17.36	16.38	19.09	17.05	15.11	16.07	16.52	16.06	14.90	14.58
19	18.31	18.23	17.36	16.21	19.10	16.16	14.87	16.12	16.57	15.68	14.82	14.56
20	18.19	18.22	17.35	16.30	19.13	16.41	14.77	16.08	16.66	15.56	14.91	14.57
21	18.04	18.24	17.29	16.59	19.15	16.42	14.89	16.45	16.69	15.75	14.76	14.57
22	18.03	18.40	17.28	16.89	19.13	16.41	14.86	16.91	16.47	16.16	14.70	14.51
23	17.98	18.52	17.19	17.04	19.05	16.41	14.95	16.92	16.25	16.15	14.71	14.52
24	17.91	18.63	17.09	17.21	18.88	16.42	15.15	16.92	16.18	16.40	14.73	14.50
25	17.78	18.77	17.20	17.38	18.65	16.44	15.14	16.89	16.04	16.36	14.70	14.46
26	17.66	18.81	17.40	17.52	18.45	16.49	15.06	16.72	15.98	16.19	14.63	14.43
27	17.65	18.78	17.54	17.57	18.14	16.65	14.98	16.53	15.83	15.99	14.73	14.35
28	17.51	18.78	17.56	17.64	17.81	16.42	14.91	16.41	15.67	15.97	14.95	14.36
29	17.82	18.67	17.56	17.87	---	16.21	15.15	16.76	15.58	15.93	15.10	14.44
30	17.89	18.53	17.57	18.09	---	16.14	15.34	17.24	15.47	15.78	15.41	14.48
31	17.27	---	17.54	18.20	---	16.17	---	17.51	---	15.75	15.54	---
MEAN	18.1	17.9	17.2	17.2	18.8	17.5	15.5	16.2	16.7	15.5	15.1	14.7
MAX	18.53	18.81	18.36	18.20	19.15	19.13	16.19	17.51	17.70	16.40	16.37	15.37
MIN	17.27	16.71	16.13	16.21	17.81	16.14	14.77	15.36	15.47	14.86	14.56	14.35

06330110 MISSOURI RIVER STAGE GAGE NO. 9 AT WILLISTON, ND

LOCATION.--Lat 48°08'13", long 103°36'16", in NE¼NE¼ sec.25, T.154 N., R.101 W., Williams County, Hydrologic Unit 10110101, on left bank levee at southeast edge of Williston 0.5 mi upstream from Little Muddy Creek, and at mile 1,546.2.

DRAINAGE AREA.--164,500 mi^2, approximately.

PERIOD OF RECORD.--April 1959 to current year (seasonal).

GAGE.--Water-stage recorder. Datum of gage is 1,820.00 ft above National Geodetic Vertical Datum of 1929. Prior to May 13, 1969, at site 900 ft downstream. At datum 20.00 ft lower prior to Apr. 7, 1962.

REMARKS.--Stage regulated by upstream reservoirs and backwater from Lake Sakakawea.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height recorded, 34.22 ft, July 25, 28, 1975; minimum daily recorded, 5.44 ft, Aug. 20, 1961, present datum.

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	26.68	26.20	25.86	25.09	25.66	25.16	24.20	23.39	24.77	23.42	23.82	23.27
2	26.62	26.22	25.68	25.08	25.80	25.14	24.15	23.68	24.69	23.50	24.06	23.30
3	26.68	26.21	25.53	25.13	25.89	25.17	24.00	23.63	24.73	23.93	23.77	23.07
4	26.40	26.15	25.47	25.02	25.92	25.40	24.17	23.86	24.83	23.57	23.70	22.92
5	26.52	26.07	25.28	24.95	25.97	25.69	24.06	23.85	24.90	23.55	23.63	22.89
6	26.55	26.04	25.03	24.91	25.99	25.89	24.07	23.89	24.72	23.37	23.33	22.80
7	26.49	26.18	24.96	24.88	26.04	25.93	23.85	23.96	24.47	23.27	23.44	22.70
8	26.63	24.82	24.91	24.95	26.08	25.73	23.69	23.87	24.44	23.61	23.28	22.73
9	26.94	25.67	24.85	25.00	26.14	25.84	23.49	23.70	24.71	23.70	23.14	22.75
10	26.36	25.85	24.88	24.87	26.17	25.53	23.46	23.30	24.52	23.43	23.53	22.72
11	26.41	25.77	24.71	24.86	26.20	25.12	23.72	23.51	24.14	23.13	22.84	22.71
12	26.75	25.38	24.56	24.85	26.21	24.98	23.48	23.64	24.21	23.27	22.80	22.77
13	26.83	25.64	24.55	24.78	26.24	24.83	23.46	23.26	24.31	23.32	23.14	22.84
14	26.75	25.47	24.76	24.92	26.24	24.94	23.62	23.69	24.60	23.26	23.16	22.74
15	26.82	25.51	25.06	24.93	26.25	25.01	23.30	23.64	24.79	23.49	22.80	22.70
16	26.85	25.44	25.15	24.89	26.24	24.87	23.12	23.59	24.71	23.78	22.94	22.55
17	27.01	25.59	25.14	24.70	26.18	24.90	23.08	23.92	24.29	23.93	23.27	22.56
18	27.01	25.69	25.12	24.36	26.16	24.66	23.15	24.07	24.35	24.26	23.00	22.57
19	26.90	25.74	25.12	24.17	26.13	23.85	22.66	23.94	24.52	23.82	22.90	22.56
20	26.95	25.67	25.13	24.27	26.14	23.33	22.57	23.61	24.44	23.68	23.07	22.60
21	26.94	25.68	25.09	24.37	26.17	23.18	23.10	23.96	24.39	23.94	22.78	22.63
22	26.85	25.70	25.06	24.60	26.14	23.36	22.88	24.38	24.12	24.12	22.79	22.60
23	26.89	25.82	25.02	24.74	26.08	23.48	23.03	24.30	23.98	23.98	22.89	22.61
24	26.87	25.90	24.93	24.74	25.96	23.42	23.29	24.37	24.01	24.07	23.00	22.59
25	26.74	25.95	24.95	24.96	25.79	23.39	23.14	24.53	23.83	24.18	22.90	22.62
26	26.62	26.03	25.07	25.09	25.65	23.36	22.97	24.38	23.95	24.23	22.78	22.62
27	26.68	26.01	25.16	25.20	25.47	22.94	23.13	24.34	23.94	23.98	22.79	22.46
28	26.41	26.03	25.18	25.23	25.26	23.68	23.03	24.16	23.72	24.02	22.99	22.35
29	26.74	25.99	25.17	25.36	---	23.69	23.58	24.19	23.76	24.19	22.98	22.48
30	26.96	25.93	25.18	25.52	---	23.67	23.59	24.44	23.87	24.04	23.15	22.56
31	25.91	---	25.15	25.60	---	23.61	---	24.68	---	23.78	23.33	---
MEAN	26.7	25.8	25.1	24.9	26.0	24.5	23.4	23.9	24.4	23.7	23.2	22.7
MAX	27.01	26.22	25.86	25.60	26.25	25.93	24.20	24.68	24.90	24.26	24.06	23.30
MIN	25.91	24.82	24.55	24.17	25.26	22.94	22.57	23.26	23.72	23.13	22.78	22.35

CAL YR 1986 MEAN 25.7 MAX 30.72 MIN 22.20
WTR YR 1987 MEAN 24.5 MAX 27.01 MIN 22.35

06331000 LITTLE MUDDY RIVER BELOW COW CREEK NEAR WILLISTON, ND

LOCATION.--Lat 48°17'04", long 103°34'21", in NE¼NW¼ sec.5, T.155 N., R.100 W., Williams County, Hydrologic Unit 10110102, on left bank 37 ft downstream from centerline of highway, 1 mi downstream from Cow Creek, 4 mi upstream from Camp Creek, 10 mi northeast of Williston, and 13 mi upstream from mouth.

DRAINAGE AREA.--875 mi^2, approximately, of which about 100 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1954 to current year (seasonal records only since 1984).

GAGE.--Water-stage recorder. Datum of gage is 1,863.18 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Feb. 1-8, 14, and Mar. 17-29. Records good except those for period of estimated daily discharges, which are poor. Some small diversions for irrigation. Some regulation by Lake Zahl, Fish and Wildlife Service reservoir 22 mi upstream and Blacktail Dam about 15 mi upstream.

AVERAGE DISCHARGE.--29 years (water years 1955-1983), 38.8 ft^3/s, 28,110 acre-ft/yr; median of yearly mean discharges, 31 ft^3/s, 22,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,180 ft^3/s, Apr. 18, 1979, gage height, 12.77 ft; maximum gage height, 13.57 ft, Mar. 27, 1960; minimum discharge, 0.20 ft^3/s, Nov. 27, 1960, Feb. 5, 1963, and June 4, 1968.

EXTREMES FOR CURRENT YEAR.--Maximum recorded discharge, 1,400 ft^3/s, Apr. 1, gage height, 9.35 ft, minimum recorded daily discharge, 4.1 ft^3/s, Sept. 4, 8, and 9, but may have been less during period of nonoperation.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1					7.0	12	848	14	25	5.1	6.8	4.5
2					7.5	12	373	14	18	4.7	6.3	4.4
3					8.0	13	472	17	14	4.4	5.9	4.2
4					10	16	566	17	12	4.3	5.7	4.1
5					15	20	292	16	10	4.6	5.7	4.2
6					25	26	183	15	9.5	4.9	5.2	4.2
7					45	35	123	13	8.3	5.0	5.0	4.2
8					70	30	92	13	7.1	4.5	5.0	4.1
9					66	24	73	14	6.9	4.4	4.8	4.1
10					50	22	61	13	6.5	7.3	4.8	4.3
11					44	18	53	11	6.7	8.3	4.7	4.5
12					48	16	47	10	6.4	6.3	4.5	4.5
13					43	15	41	9.6	6.1	5.9	6.6	4.6
14					75	15	37	8.5	5.7	5.6	4.6	4.7
15					26	14	34	9.1	5.4	5.4	5.1	4.8
16					28	15	31	9.6	5.1	5.1	5.1	4.8
17					24	16	28	13	5.3	5.0	5.1	5.3
18					20	16	26	14	5.1	18	5.1	5.2
19					18	18	24	14	5.0	56	5.1	5.0
20					17	22	21	16	5.1	28	5.0	5.0
21					17	33	22	15	5.2	18	4.8	5.1
22					16	94	22	14	5.1	17	4.2	5.1
23					15	145	20	13	5.2	14	4.2	5.1
24					14	122	21	13	4.8	12	4.2	5.0
25					14	80	21	12	4.5	11	4.4	4.8
26					14	59	19	12	4.4	9.5	4.8	4.8
27					13	90	17	12	4.5	8.5	5.3	4.9
28					13	400	17	14	4.9	7.5	5.1	5.5
29					---	160	15	13	5.4	7.0	5.0	5.4
30					---	125	15	13	5.6	6.9	4.9	5.3
31					---	189	---	23	---	7.1	4.7	---
TOTAL					762.5	1872	3614	414.8	222.8	311.3	157.7	141.7
MEAN					27.2	60.4	120	13.4	7.43	10.0	5.09	4.72
MAX					75	400	848	23	25	56	6.8	5.5
MIN					7.0	12	15	8.5	4.4	4.3	4.2	4.1
AC-FT					1510	3710	7170	823	442	617	313	281

06331000 LITTLE MUDDY RIVER BELOW COW CREEK NEAR WILLISTON, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
FEB 12...	1300	48	1290	8.05	4.5	1.5	290	0	50	41	180
MAR 12...	0915	15	1240	--	-4.0	0.5	--	--	--	--	--
APR 08...	0840	95	610	--	11.5	11.0	--	--	--	--	--
MAY 06...	1135	15	2100	--	21.5	16.0	--	--	--	--	--
JUN 08...	1245	7.3	2140	--	23.0	20.5	--	--	--	--	--
JUL 08...	0840	4.5	2220	8.30	20.5	20.0	400	0	48	67	380
AUG 20...	1405	5.0	2200	--	29.5	19.5	--	--	--	--	--

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
FEB 12...	56	5	12	350	330	4.4	0.10	12	847	840	1.2
JUL 08...	67	8	12	620	620	11	0.40	5.6	1520	1500	2.1

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
FEB 12...	1	230	140	<1	46	60	0.2	<1	<1	580
JUL 08...	7	290	30	<1	87	10	0.6	2	2	700

06332515 BEAR DEN CREEK NEAR MANDAREE, ND
(Hydrologic bench-mark station)
(National stream quality accounting network station and radiochemical program station)

LOCATION.--Lat 47°47'14", long 102°46'05", in NW¼ sec.30, T.150 N., R.94 W., McKenzie County, Hydrologic Unit 10110101, on right bank 0.5 mi upstream from county highway culvert, and 5.5 mi northwest of Mandaree.

DRAINAGE AREA.--74 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1966 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,947.58 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Oct. 1-14, Nov. 9-24, Nov. 30 to May 13, May 28 to June 10, and Aug. 1 to Sept. 9. Records poor.

AVERAGE DISCHARGE.--21 years, 8.09 ft^3/s, 5,860 acre-ft/yr; median of yearly mean discharges, 8.1 ft^3/s, 5,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,840 ft^3/s, Mar. 13, 1972, gage height, 9.02 ft; maximum gage height, 10.03 ft Apr. 6, 1969; no flow at times most years.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 26	2230	260	[a]4.76	Mar. 31	2115	*650	*[a]5.77

Minimum daily discharge: 0.04 ft^3/s, Jan. 26-28 and July 17.

a - Backwater from ice

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.4	.38	.65	.19	.09	.12	275	.32	.18	.08	.21	.12
2	3.9	.38	.62	.18	.12	.14	35	.30	.20	.05	.17	.14
3	2.7	.38	.55	.17	.14	1.5	25	.35	.22	.05	.13	.15
4	2.6	.41	.45	.16	.16	30	20	.40	.18	.05	.13	.14
5	2.2	.34	.35	.16	.20	55	15	.35	.15	.06	.14	.13
6	1.8	.45	.30	.14	.30	30	10	.38	.14	.20	.13	.18
7	1.9	.46	.28	.12	.50	25	6.2	.35	.12	.13	.12	.16
8	1.6	.40	.25	.11	1.0	18	4.1	.30	.11	.08	.11	.15
9	1.5	.35	.22	.10	2.0	10	3.2	.26	.10	.23	.10	.14
10	1.5	.30	.24	.10	3.5	7.0	3.0	.24	.15	.44	.11	.15
11	1.3	.32	.26	.12	6.0	4.0	2.5	.22	.19	.38	.14	.13
12	1.1	.35	.24	.13	10	2.5	1.8	.21	.14	.27	.16	.15
13	.80	.32	.24	.15	8.0	2.0	1.5	.20	.11	.14	1.7	.17
14	.42	.28	.26	.14	6.0	2.0	1.4	.21	.09	.08	1.2	.17
15	.45	.30	.28	.12	3.0	2.2	1.2	.22	.08	.07	.80	.13
16	.37	.32	.25	.10	1.5	2.4	1.0	.20	.07	.05	.60	.15
17	.27	.32	.22	.09	.90	2.6	.85	.19	.09	.04	.30	.20
18	.25	.35	.18	.08	.60	3.0	.75	.18	.09	19	.12	.19
19	.22	.35	.16	.08	.55	3.5	.70	.18	.10	12	.10	.22
20	.23	.35	.14	.07	.60	4.5	.65	.16	.11	2.9	.09	.28
21	.24	.38	.12	.07	.60	30	.60	.18	.12	1.8	.09	.26
22	.26	.40	.12	.06	.55	60	.55	.24	.11	2.3	.08	.22
23	.27	.50	.13	.06	.45	90	.50	.27	.09	1.0	.10	.23
24	.27	.75	.15	.05	.35	60	.48	.27	.06	.45	.14	.22
25	.27	1.0	.16	.05	.25	32	.45	.26	.06	.31	.21	.21
26	.31	1.1	.18	.04	.20	60	.48	.24	.07	.22	.25	.18
27	.33	1.3	.18	.04	.16	100	.50	.29	.08	.30	.21	.18
28	.35	1.2	.19	.04	.14	38	.45	.30	.08	.27	.18	.27
29	.35	1.0	.20	.05	---	35	.42	.28	.09	.26	.15	.25
30	.35	.85	.22	.06	---	18	.40	.22	.09	.24	.13	.19
31	.38	---	.20	.07	---	200	---	.16	---	.20	.12	---
TOTAL	34.89	15.59	7.99	3.10	47.86	928.46	413.68	7.93	3.47	43.65	8.22	5.46
MEAN	1.13	.52	.26	.10	1.71	30.0	13.8	.26	.12	1.41	.27	.18
MAX	6.4	1.3	.65	.19	10	200	275	.40	.22	19	1.7	.28
MIN	.22	.28	.12	.04	.09	.12	.40	.16	.06	.04	.08	.12
AC-FT	69	31	16	6.1	95	1840	821	16	6.9	87	16	11

CAL YR 1986 TOTAL 2060.04 MEAN 5.64 MAX 250 MIN .00 AC-FT 4090
WTR YR 1987 TOTAL 1520.28 MEAN 4.17 MAX 275 MIN .04 AC-FT 3020

06332515 BEAR DEN CREEK NEAR MANDAREE, ND--CONTINUED
(Hydrologic bench-mark station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1978 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	HARD-NESS (MG/L AS CACO3) (00900)
DEC												
01...	1130	0.65	2880	8.28	-2.0	0.5	54	13.0	100	55	70	320
JAN												
05...	1155	0.16	3080	8.18	2.5	0.5	16	12.9	98	--	--	240
FEB												
18...	1045	0.59	3200	8.03	-2.0	0.0	20	12.4	92	--	--	250
MAR												
06...	1015	26	515	7.83	9.5	0.5	--	13.0	99	--	--	--
MAY												
15...	1005	0.21	2830	8.46	29.5	21.5	4.0	8.3	103	--	--	200
JUL												
31...	0920	0.22	2200	8.53	27.5	25.5	31	7.8	104	--	--	160
SEP												
[a]09...	0945	0.14	3380	8.80	20.0	13.0	--	9.5	99	--	--	--

DATE	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY, CARBON-ATE IT-FLD (MG/L CACO3) (00419)	BICAR-BONATE WATER WHOLE IT-FLD (MG/L) (00450)	CAR-BONATE WATER WHOLE IT-FLD (MG/L) (00447)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2) (00405)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)
DEC												
01...	0	62	41	560	79	14	7.9	554	676	0	5.6	870
JAN												
05...	0	51	27	620	85	18	4.4	755	922	0	9.5	730
FEB												
18...	0	52	28	430	78	12	8.9	450	549	0	7.9	660
MAR												
06...	--	--	--	--	--	--	--	96	118	0	2.7	--
MAY												
15...	0	32	30	620	86	19	7.6	800	781	96	4.9	770
JUL												
31...	0	31	20	500	87	18	7.8	560	488	96	3.1	630

DATE	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS NH4) (71846)
DEC												
01...	5.9	0.50	14	1950	1900	2.7	3.4	<0.010	<0.100	0.180	0.150	0.19
JAN												
05...	4.5	0.30	17	1970	1900	2.7	0.85	<0.010	0.120	0.210	0.220	0.28
FEB												
18...	7.4	0.30	15	1510	1500	2.1	2.4	0.010	0.220	0.150	0.130	0.17
MAY												
15...	4.3	0.40	7.0	1950	1900	2.7	1.1	0.020	<0.100	0.030	0.060	0.08
JUL												
31...	3.5	2.5	11	1560	1500	2.1	0.93	<0.010	<0.100	0.010	0.010	0.01
SEP												
09...	--	--	--	--	--	--	--	<0.010	<0.100	0.020	0.020	0.03

a - Laboratory analysis incomplete prior to report publication.

06332515 BEAR DEN CREEK NEAR MANDAREE, ND--CONTINUED
(Hydrologic bench-mark station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	PHOSPHORUS, DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P) (00671)	ALUMINUM, DISSOLVED (UG/L AS AL) (01106)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BARIUM, DISSOLVED (UG/L AS BA) (01005)	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COBALT, DISSOLVED (UG/L AS CO) (01035)	COPPER, DISSOLVED (UG/L AS CU) (01040)
DEC												
01...	1.5	0.060	0.010	<0.010	40	1	100	<10	<1	<1	<1	4
JAN												
05...	0.50	<0.010	0.020	0.020	--	--	--	--	--	--	--	--
FEB												
18...	0.80	0.140	0.010	0.040	50	2	<100	<10	<1	<1	1	3
MAY												
15...	0.80	0.030	0.010	0.020	10	2	100	<10	<1	<1	<1	3
JUL												
31...	1.3	0.080	0.010	<0.010	--	--	--	--	--	--	--	--
SEP												
09...	0.50	--	0.010	0.010	--	--	--	--	--	--	--	--

DATE	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, DISSOLVED (UG/L AS PB) (01049)	LITHIUM DISSOLVED (UG/L AS LI) (01130)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY DISSOLVED (UG/L AS HG) (71890)	MOLYBDENUM, DISSOLVED (UG/L AS MO) (01060)	NICKEL, DISSOLVED (UG/L AS NI) (01065)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	SILVER, DISSOLVED (UG/L AS AG) (01075)	STRONTIUM, DISSOLVED (UG/L AS SR) (01080)	VANADIUM, DISSOLVED (UG/L AS V) (01085)	ZINC, DISSOLVED (UG/L AS ZN) (01090)
DEC												
01...	80	<5	70	140	<0.1	2	6	<1	<1	630	24	100
FEB												
18...	140	<5	50	190	<0.1	1	5	<1	<1	470	<4	10
MAY												
15...	<10	<5	70	<10	<0.1	1	3	<1	<1	460	<200	60

DATE	GROSS ALPHA, DISSOLVED (UG/L AS U-NAT) (80030)	GROSS ALPHA, SUSP. TOTAL (UG/L AS U-NAT) (80040)	GROSS BETA, DISSOLVED (PCI/L AS CS-137) (03515)	GROSS BETA, SUSP. TOTAL (PCI/L AS CS-137) (03516)	GROSS BETA, DISSOLVED (PCI/L AS SR/YT-90) (80050)	GROSS BETA, SUSP. TOTAL (PCI/L AS SR/YT-90) (80060)	RADIUM 226, DISSOLVED, RADON METHOD (PCI/L) (09511)	URANIUM DISSOLVED, EXTRACTION (UG/L) (80020)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
DEC											
01...	--	--	--	--	--	--	--	--	306	0.54	98
JAN											
05...	--	--	--	--	--	--	--	--	116	0.05	71
FEB											
18...	--	--	--	--	--	--	--	--	102	0.16	82
MAR											
06...	<0.4	0.7	11	1.1	8.6	1.1	0.05	0.45	--	--	--
MAY											
15...	--	--	--	--	--	--	--	--	43	0.02	87
JUL											
31...	--	--	--	--	--	--	--	--	91	0.05	96
SEP											
09...	--	--	--	--	--	--	--	--	54	0.02	97

DATE	TIME	SAMPLE LOCATION, CROSS SECTION (FT FM L BANK) (00009)	DEPTH TO TOP OF SAMPLE INTERVAL (FT) (72015)	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH (STANDARD UNITS) (00400)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)
DEC								
01...	1205	0.5	0.38	0.5	2880	8.27	13.0	98
01...	1207	1.0	0.33	0.5	2880	8.28	13.1	99
01...	1209	1.5	0.38	0.5	2880	8.28	13.0	98
01...	1211	2.0	0.44	0.5	2880	8.28	13.0	98
01...	1213	2.5	0.34	0.5	2880	8.29	13.0	98
FEB								
18...	1102	0.5	0.80	0.0	2200	8.03	12.4	91
18...	1104	1.0	0.86	0.0	2200	8.03	12.4	91
18...	1106	1.5	0.88	0.0	2200	8.03	12.4	91
18...	1108	2.0	0.82	0.0	2200	8.02	12.4	91
MAY								
15...	1020	0.3	0.0	--	--	--	--	--
15...	1022	0.6	0.29	21.5	2830	8.46	8.3	101
15...	1024	0.9	0.27	21.5	2830	8.46	8.3	101
15...	1026	1.3	0.0	--	--	--	--	--
SEP								
09...	0952	0.30	0.40	13.0	3370	8.80	9.4	98
09...	0954	0.60	0.35	13.0	3370	8.80	9.4	98
09...	0956	0.90	0.36	13.0	3380	8.80	9.5	99
09...	0958	1.20	0.32	13.0	3380	8.80	9.5	99
09...	1000	1.50	0.33	13.0	3380	8.80	9.5	99

06335500 LITTLE MISSOURI RIVER AT MARMARTH, ND

LOCATION.--Lat 46°17'44", long 103°55'06", in SW¼ sec.30, T.133 N., R.105 W., Slope County, Hydrologic Unit 10110203, on left bank 90 ft downstream from bridge on U.S. Highway 12 in Marmarth, and 1.5 mi downstream from Little Beaver Creek.

DRAINAGE AREA.--4,640 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1938 to current year.

REVISED RECORDS (WATER YEARS).--WSP 896: 1938-39. WSP 1086: 1943-44. WSP 1279: 1943(M), 1945-46, 1948. WSP 1439: 1950 (calendar year figures).

GAGE.--Water-stage recorder. Datum of gage is 2,686.32 ft above National Geodetic Vertical Datum of 1929. Prior to June 23, 1950, various nonrecording gages on former highway bridge at present site and datum. June 23, 1950, to Sept. 2, 1957, nonrecording gage at site 90 ft upstream at present datum.

REMARKS.--Estimated daily discharges: Nov. 8 to Mar. 3, and June 16 to Sept. 30. Records poor. Small diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--49 years, 329 ft^3/s, 238,400 acre-ft/yr; median of yearly mean discharges, 264 ft^3/s, 191,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 45,000 ft^3/s, Mar. 23, 1947, gage height, 21.7 ft; maximum gage height, 23.4 ft, Mar. 31, 1952, backwater from ice; no flow for part of most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--According to local residents, the greatest known flood prior to 1953 occurred in June 1907 (stage unknown). Other major floods occurred in March 1913, May 1929, and March 1920 and reached stages of about 21.5 ft, 20.2 ft, and 19.7 ft, respectively. These stages are not comparable to stages during period of record, owing to construction of levees.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Apr. 5	0800	*4,010	7.41	No other peak greater than base discharge.			

Minimum daily discharge, 10 ft^3/s, Aug. 22.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1710	112	80	40	100	75	82	59	230	30	149	42
2	1350	98	90	40	120	90	189	57	165	27	168	40
3	985	87	80	45	130	75	436	175	125	24	93	38
4	719	82	70	45	120	90	1160	207	105	20	62	36
5	524	77	85	45	120	115	3270	113	88	18	38	36
6	463	71	75	45	125	120	3340	75	72	17	21	90
7	414	66	60	40	150	90	3610	64	62	16	14	110
8	372	70	65	40	160	55	3560	58	52	17	12	80
9	402	64	50	40	150	95	2850	57	48	18	12	60
10	361	67	50	35	160	100	2120	52	48	20	20	50
11	278	75	35	45	170	105	1480	50	44	39	14	60
12	221	75	40	45	190	69	1040	46	41	104	53	55
13	186	85	35	50	200	59	690	48	42	116	107	50
14	164	85	40	60	210	41	488	45	38	64	136	45
15	145	90	45	50	200	32	356	41	34	32	101	40
16	131	95	45	45	190	26	291	39	33	28	136	38
17	120	100	40	50	180	29	222	37	32	20	152	36
18	119	105	40	50	180	25	202	37	31	42	77	34
19	110	105	45	45	175	25	166	40	30	340	36	32
20	102	110	40	50	150	27	138	57	52	274	23	30
21	97	110	45	55	155	22	131	142	39	167	15	29
22	93	115	45	60	145	38	119	200	39	302	10	28
23	93	120	50	60	120	31	105	118	30	232	11	27
24	93	130	45	65	110	14	93	101	60	117	14	26
25	91	170	40	70	100	16	89	93	58	148	18	25
26	85	195	45	70	100	31	84	79	56	378	26	25
27	82	130	45	90	95	44	77	73	49	319	100	24
28	76	100	45	95	90	40	72	86	45	884	70	24
29	120	80	40	100	---	30	68	99	42	348	60	23
30	164	90	45	100	---	35	59	206	35	169	50	23
31	136	---	40	105	---	40	---	351	---	124	45	---
TOTAL	10006	2959	1595	1775	4095	1684	26587	2905	1825	4454	1843	1256
MEAN	323	98.6	51.5	57.3	146	54.3	886	93.7	60.8	144	59.5	41.9
MAX	1710	195	90	105	210	120	3610	351	230	884	168	110
MIN	76	64	35	35	90	14	59	37	30	16	10	23
AC-FT	19850	5870	3160	3520	8120	3340	52740	5760	3620	8830	3660	2490

CAL YR 1986 TOTAL 201881 MEAN 553 MAX 8520 MIN 1.2 AC-FT 400400
WTR YR 1987 TOTAL 60984 MEAN 167 MAX 3610 MIN 10 AC-FT 121000

06335500 LITTLE MISSOURI RIVER AT MARMARTH, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1950-51, 1970 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
OCT											
08...	1145	376	649	--	8.0	11.0	--	--	--	--	--
NOV											
25...	1315	147	1400	--	4.0	0.0	--	--	--	--	--
JAN											
07...	1330	40	2020	--	4.0	0.0	--	--	--	--	--
FEB											
19...	1210	230	890	8.30	2.0	0.0	180	19	40	19	130
MAR											
11...	1405	102	1340	--	2.5	0.5	--	--	--	--	--
APR											
07...	1235	3880	692	--	22.0	9.0	--	--	--	--	--
MAY											
19...	1115	43	1770	--	22.0	12.5	--	--	--	--	--
JUN											
10...	1400	49	1550	--	25.5	23.0	--	--	--	--	--
JUL											
22...	1330	405	810	--	32.0	24.0	--	--	--	--	--
AUG											
27...	1140	108	1070	8.60	19.0	16.5	69	0	17	6.5	200

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
FEB											
19...	60	4	6.1	160	290	7.5	0.20	10	621	600	0.84
AUG											
27...	85	11	7.7	200	340	4.3	0.40	14	714	710	0.97

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
FEB										
19...	1	110	90	<1	52	10	0.2	2	<1	340
AUG										
27...	1	230	30	1	40	10	0.1	3	2	240

06336600 BEAVER CREEK NEAR TROTTERS, ND

LOCATION.--Lat 47°09'47", long 103°59'32", in SW¼SW¼NE¼ sec.33, T.143 N., R.105 W., Golden Valley County, Hydrologic Unit 10110204, on left bank 100 ft upstream from bridge on county road, 2.4 mi east of Montana-North Dakota State line, 13 mi southwest of Trotters, 17 mi north of Beach, 20 mi upstream from Elk Creek, and 27 mi above mouth.

DRAINAGE AREA.--616 mi^2, revised.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1977 to current year (seasonal records only since 1984).

REVISED RECORDS.--1977: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 2,370 ft, from topographic map.

REMARKS.--Estimated daily discharges: Feb. 1 to Mar. 29, and June 11 to Sept. 30. Records fair.

AVERAGE DISCHARGE.--6 years (water years 1978-83), 33.3 ft^3/s, 24,130 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,720 ft^3/s, Mar. 29, 1978, gage height, 18.61 ft; maximum gage height, 19.27 ft, Mar. 22, 1978, ice jam; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 623 ft^3/s, Apr. 7, gage height, 9.50 ft; minimum recorded daily discharge, 0.22 ft^3/s, Sept. 25.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1					.50	18	25	12	7.5	1.8	30	1.3
2					1.0	18	27	12	6.8	1.4	23	1.0
3					2.0	22	30	17	6.2	1.1	14	.80
4					3.0	30	48	20	5.9	.85	9.2	.65
5					5.0	35	221	19	5.6	.90	6.7	.60
6					10	30	239	17	5.0	1.0	5.4	.65
7					18	26	505	15	4.8	.95	4.0	.60
8					25	20	276	14	4.5	.85	3.5	.55
9					32	14	166	13	4.1	.90	2.8	.60
10					45	10	109	12	3.7	.95	2.0	.75
11					100	12	78	11	3.5	1.0	1.4	.85
12					175	15	62	9.9	3.0	1.0	1.2	.78
13					140	16	50	9.2	2.6	1.0	1.2	.70
14					110	18	43	8.4	2.2	1.0	1.5	.65
15					110	20	38	8.3	1.9	1.1	1.4	.80
16					90	18	33	8.2	1.9	1.3	1.2	1.0
17					85	16	30	9.8	1.7	1.5	1.1	.75
18					70	15	29	11	1.8	1.6	1.0	.65
19					65	15	27	10	2.2	1.9	.94	.52
20					70	16	24	9.4	2.8	1.6	.85	.38
21					55	22	22	9.0	2.6	2.0	.75	.32
22					50	26	21	8.6	2.2	2.4	.64	.30
23					40	35	18	8.5	2.2	2.2	.52	.28
24					35	36	17	8.1	1.9	1.9	.50	.25
25					28	25	16	7.5	1.6	1.6	1.0	.22
26					25	20	15	7.2	1.3	1.5	2.2	.28
27					20	18	13	8.0	1.5	1.3	4.5	.36
28					20	16	13	7.9	1.7	1.1	3.5	.75
29					---	15	13	8.1	2.1	1.0	3.0	.55
30					---	16	12	7.7	2.2	.85	2.4	.40
31					---	19	---	7.4	---	2.5	1.7	---
TOTAL					1429.50	632	2220	334.2	97.0	42.05	133.10	18.29
MEAN					51.1	20.4	74.0	10.8	3.23	1.36	4.29	.61
MAX					175	36	505	20	7.5	2.5	30	1.3
MIN					.50	10	12	7.2	1.3	.85	.50	.22
AC-FT					2840	1250	4400	663	192	83	264	36

06336600 BEAVER CREEK NEAR TROTTERS, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1978 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
FEB											
09...	1130	32	1870	8.23	6.5	0.5	450	160	81	60	250
MAR											
10...	1125	9.3	1580	--	0.0	0.5	--	--	--	--	--
APR											
03...	1345	40	1900	--	6.5	3.0	--	--	--	--	--
MAY											
07...	0930	15	2170	--	22.0	17.0	--	--	--	--	--
JUN											
04...	1355	6.0	2340	--	27.5	21.0	--	--	--	--	--
JUL											
06...	1045	0.99	2610	8.28	20.0	22.0	570	210	72	94	400
AUG											
17...	1105	1.1	2370	--	15.5	17.5	--	--	--	--	--

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
FEB											
09...	54	5	11	290	680	6.2	0.20	8.7	1300	1300	1.8
JUL											
06...	60	7	14	360	1100	11	0.20	1.3	1920	1900	2.6

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
FEB										
09...	1	320	70	<1	40	30	0.3	<1	1	1000
JUL										
06...	1	680	20	1	69	10	0.7	2	1	1200

06337000 LITTLE MISSOURI RIVER NEAR WATFORD CITY, ND

LOCATION.--Lat 47°35'25", long 103°15'05", in NW1/4SE1/4SE1/4 sec.35, T.148 N., R.99 W., McKenzie County, Hydrologic Unit 10110205, at bridge on U.S. Highway 85, 17 mi upstream from Cherry Creek, and 17.5 mi south of Watford City.

DRAINAGE AREA.--8,310 mi^2 approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1934 to current year.

REVISED RECORDS (WATER YEARS).--WSP 926: 1935. WSP 1270: 1943.

GAGE.--Water-stage recorder and supplemental nonrecording gage. Datum of gage is 1,929.03 ft above National Geodetic Vertical Datum of 1929. Oct. 2, 1959, to June 17, 1963, water-stage recorder at present site and datum. June 18, 1963, to Nov. 28, 1964, at site 700 ft upstream at present datum. See WSP 1729 or 1917 for history of changes prior to Oct. 2, 1959.

REMARKS.--Estimated daily discharges: Nov. 8 to Mar. 31. Records fair except those for estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--53 years, 583 ft^3/s, 424,600 acre-ft/yr; median of yearly mean discharges, 460 ft^3/s, 340,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 110,000 ft^3/s, Mar. 25, 1947, gage height, 24.0 ft from flood-mark, site then in use; no flow at times in most years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 6,740 ft^3/s, Apr. 1, gage height, 5.47 ft. No peak discharge greater than base discharge of 8,000 ft^3/s; minimum daily, 25 ft^3/s, Jan. 24-26.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2350	146	175	42	32	100	5520	284	213	74	464	168
2	2010	161	171	41	34	110	3650	272	191	78	541	146
3	2250	129	160	40	36	130	3120	305	160	73	1080	140
4	2030	135	140	40	45	150	3310	438	159	68	1120	129
5	1860	187	120	40	60	200	3310	535	203	64	517	119
6	1490	205	110	39	90	250	3620	359	242	82	405	104
7	1180	180	100	38	150	240	4430	327	204	71	323	86
8	935	140	90	37	200	230	4800	387	178	62	272	84
9	809	120	80	35	250	220	4560	372	161	74	212	76
10	710	100	75	34	350	200	4970	300	141	103	212	66
11	696	95	70	34	450	150	4910	247	124	141	181	61
12	606	90	65	36	600	140	3980	207	112	179	171	76
13	554	100	62	38	650	120	3290	179	98	140	149	111
14	529	110	63	36	700	110	2760	157	93	161	184	97
15	487	140	65	34	720	100	2220	148	84	179	191	82
16	420	150	68	32	600	80	1790	140	94	140	168	78
17	339	140	70	30	500	70	1480	198	100	181	194	119
18	305	120	68	30	400	65	1220	190	82	231	379	124
19	275	100	65	29	300	60	1040	162	256	647	566	114
20	252	90	60	28	250	55	881	160	582	589	420	108
21	235	90	56	28	200	50	770	147	361	433	293	95
22	218	100	54	27	180	48	674	143	179	240	256	86
23	207	110	52	26	160	46	612	143	162	394	230	78
24	200	130	52	25	140	44	541	155	133	617	187	68
25	191	150	51	25	130	42	475	148	121	491	149	59
26	181	170	50	25	120	41	420	142	100	372	140	55
27	171	200	49	26	110	40	374	200	93	345	143	56
28	161	220	48	27	105	40	341	266	85	295	152	60
29	155	200	46	28	---	50	330	274	82	237	155	56
30	152	185	45	29	---	100	298	255	76	198	161	53
31	140	---	43	30	---	1000	---	219	---	400	198	---
TOTAL	22098	4193	2423	1009	7562	4281	69696	7459	4869	7359	9813	2754
MEAN	713	140	78.2	32.5	270	138	2323	241	162	237	317	91.8
MAX	2350	220	175	42	720	1000	5520	535	582	647	1120	168
MIN	140	90	43	25	32	40	298	140	76	62	140	53
AC-FT	43830	8320	4810	2000	15000	8490	138200	14790	9660	14600	19460	5460

CAL YR 1986 TOTAL 332703 MEAN 912 MAX 13500 MIN .00 AC-FT 659900
WTR YR 1987 TOTAL 143516 MEAN 393 MAX 5520 MIN 25 AC-FT 284700

06337000 LITTLE MISSOURI RIVER NEAR WATFORD CITY, ND--CONTINUED
(National stream-quality accounting network station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
OCT 23...	1105	211	1240	8.28	11.0	8.5	--	11.0	97	--	--
DEC 02...	1500	170	2380	8.25	-5.5	0.5	400	13.1	98	K50	60
JAN 12...	1330	35	2550	8.02	6.0	0.0	--	13.0	97	--	--
APR 04...	1235	3220	700	8.05	17.0	5.0	2900	11.7	99	--	--
MAY 29...	1010	266	1860	8.52	20.5	17.5	1800	8.9	101	--	--
JUL 27...	1150	349	1150	8.16	23.0	25.0	--	7.9	104	--	--
SEP 10...	1030	67	1820	8.43	13.0	14.0	220	9.5	100	--	--

DATE	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY, CARBON-ATE IT-FLD (MG/L CACO3) (00419)	BICAR-BONATE WATER WHOLE IT-FLD (MG/L) (00450)	CAR-BONATE WATER WHOLE IT-FLD (MG/L) (00447)
OCT 23...	--	--	--	--	--	--	--	--	161	196	0
DEC 02...	480	200	110	49	410	65	8	8.8	281	343	0
APR 04...	110	17	26	11	100	65	4	6.3	96	118	0
MAY 29...	280	61	59	31	320	71	9	8.9	217	226	19
SEP 10...	270	0	65	27	310	70	8	11	320	293	48

DATE	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2) (00405)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)
OCT 23...	1.6	--	--	--	--	--	--	--	--	--	--
DEC 02...	3.1	930	20	0.30	7.8	1710	1700	2.3	785	<0.010	0.550
APR 04...	1.6	210	4.0	0.20	6.4	433	420	0.59	3760	0.010	0.530
MAY 29...	1.2	720	10	0.40	8.5	1290	1300	1.8	926	<0.010	0.300
SEP 10...	2.3	610	11	<0.10	9.9	1250	1200	1.7	227	<0.100	<0.100

DATE	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS NH4) (71846)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHORUS, TOTAL (MG/L AS P) (00665)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P) (00666)	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)
DEC 02...	0.080	0.070	0.09	1.2	0.350	<0.010	<0.010	10	1	100
APR 04...	1.20	0.080	0.10	8.6	0.030	0.020	0.010	10	<1	20
MAY 29...	0.030	0.020	0.03	3.6	1.40	<0.010	<0.010	<10	2	48
SEP 10...	<0.010	<0.010	--	1.6	0.050	0.010	<0.010	<10	1	61

06337000 LITTLE MISSOURI RIVER NEAR WATFORD CITY, ND--CONTINUED
(National stream-quality accounting network station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COBALT, DISSOLVED (UG/L AS CO) (01035)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, DISSOLVED (UG/L AS PB) (01049)	LITHIUM DISSOLVED (UG/L AS LI) (01130)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY DISSOLVED (UG/L AS HG) (71890)
DEC										
02...	<10	<1	<1	<1	4	20	<5	60	<10	<0.1
APR										
04...	<0.5	<1	<1	<3	4	28	<5	16	6	<0.1
MAY										
29...	<0.5	2	<1	<3	4	14	<5	72	5	<0.1
SEP										
10...	<0.5	<1	<1	<3	5	3	<5	61	<1	0.1

DATE	MOLYBDENUM, DISSOLVED (UG/L AS MO) (01060)	NICKEL, DISSOLVED (UG/L AS NI) (01065)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	SILVER, DISSOLVED (UG/L AS AG) (01075)	STRONTIUM, DISSOLVED (UG/L AS SR) (01080)	VANADIUM, DISSOLVED (UG/L AS V) (01085)	ZINC, DISSOLVED (UG/L AS ZN) (01090)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
DEC										
02...	4	5	2	<1	830	1	10	1010	462	97
APR										
04...	<10	5	1	<1	230	<6	10	8410	73100	97
MAY										
29...	10	6	12	<1	570	<6	49	3780	2710	100
SEP										
10...	<10	4	2	<1	640	<6	<3	503	91	99

DATE	TIME	SAMPLE LOCATION, CROSS SECTION (FT FM L BANK) (00009)	DEPTH TO TOP OF SAMPLE INTERVAL (FT) (72015)	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH (STANDARD UNITS) (00400)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)
DEC								
02...	1530	5	1.1	0.5	2400	8.28	13.0	96
02...	1532	10	1.7	0.5	2390	8.26	13.0	96
02...	1534	15	2.2	0.5	2380	8.25	13.1	97
02...	1536	20	2.5	0.5	2380	8.25	13.1	97
02...	1538	25	2.7	0.5	2380	8.25	13.1	97
02...	1540	30	2.7	0.5	2380	8.25	13.1	97
02...	1542	35	3.0	0.5	2380	8.25	13.1	97
02...	1544	40	3.4	0.5	2380	8.27	13.1	97
02...	1546	45	3.2	0.5	2380	8.25	13.1	97
02...	1548	50	1.7	0.5	2390	8.26	13.0	96
APR								
04...	1302	30	3.5	5.0	700	8.05	11.7	98
04...	1305	60	3.8	5.0	700	8.05	11.7	98
04...	1308	90	5.7	5.0	700	8.05	11.7	98
04...	1310	120	4.8	5.0	700	8.05	11.7	98
04...	1312	150	2.6	5.0	710	8.05	11.7	98
04...	1315	180	2.6	5.0	710	8.07	11.8	99
04...	1318	210	1.6	5.0	720	8.07	11.8	99
04...	1320	240	1.8	5.0	720	8.07	11.8	99
04...	1322	270	3.3	5.0	700	8.06	11.7	98
04...	1330	340	1.8	5.0	720	8.06	11.8	99
04...	1333	360	2.5	5.0	710	8.05	11.8	99
04...	1337	380	2.6	5.0	710	8.05	11.7	98
MAY								
29...	1012	15	0.88	17.5	1850	8.50	8.9	99
29...	1014	30	1.5	17.5	1850	8.50	8.9	99
29...	1016	45	1.8	17.5	1850	8.50	8.8	99
29...	1018	60	0.70	17.5	1870	8.51	8.8	99
29...	1020	75	0.78	17.5	1870	8.51	8.9	99
29...	1022	90	0.70	17.5	1860	8.52	8.9	99
29...	1024	105	0.60	17.5	1860	8.52	8.9	99
29...	1026	120	0.85	17.5	1860	8.52	8.9	99
29...	1028	135	1.0	17.5	1860	8.52	8.9	99
29...	1030	150	1.5	17.5	1860	8.52	8.9	99
29...	1032	165	1.5	17.5	1860	8.51	8.9	99
SEP								
10...	1037	20.0	0.20	14.0	--	8.42	9.6	--
10...	1039	40.0	0.45	14.0	--	8.42	9.6	--
10...	1041	50.0	0.58	14.0	--	8.43	9.5	--
10...	1043	53.0	0.62	14.0	--	8.43	9.5	--
10...	1045	56.0	0.70	14.0	--	8.43	9.5	--
10...	1047	59.0	1.2	14.0	--	8.44	9.5	--
10...	1049	62.0	1.8	14.0	--	8.44	9.5	--
10...	1051	65.0	1.8	14.0	--	8.44	9.5	--
10...	1053	68.0	1.7	14.0	--	8.43	9.5	--
10...	1055	71.0	1.7	14.0	--	8.43	9.5	--
10...	1057	74.0	1.4	14.0	--	8.43	9.5	--
10...	1059	77.0	1.0	14.0	--	8.43	9.5	--

06338000 LAKE SAKAKAWEA NEAR RIVERDALE, ND

LOCATION.--Lat 47°30'10", long 101°25'50", in S½ sec.31, T.147 N., R.84 W., Mercer County, Hydrologic Unit 10110101, in control structure of Garrison Dam, 2.5 mi west of Riverdale, 14 mi upstream from Knife River, and at mile 1,389.9.

DRAINAGE AREA.--181,400 mi^2, approximately.

MONTHEND-ELEVATION AND CONTENTS RECORDS

PERIOD OF RECORD.--October 1953 to current year. Prior to October 1966, published as Garrison Reservoir near Riverdale.

REVISED RECORDS.--WSP 1559: 1957(M).

GAGE.--Water-stage recorder. Datum of gage is at National Geodetic Vertical Datum of 1929.

REMARKS.--Reservoir is formed by earth-fill dam; storage began in November 1953. Maximum capacity, 24,200,000 acre-ft below elevation 1,854.0 ft, top of 29-ft gates. Normal maximum, 22,700,000 acre-ft below elevation 1,850.0 ft, of which about 4,300,000 acre-ft is designated for flood control. Elevation of crest of spillway, 1,825.0 ft, surmounted by radial gates. Inactive storage, 5,000,000 acre-ft below elevation 1,775.0 ft. Dead storage, zero at elevation 1,672.0 ft. Snake Creek arm of the reservoir has connecting gate to main reservoir, with sill at elevation, 1,810 ft. Figures herein represent total contents.

COOPERATION.--Elevations and contents are furnished by the U.S. Army Corps of Engineers. Elevations are observed elevations at midnight on the last day of each month. Contents are computed based on reservoir inflow, reservoir outflow, evaporation, and rainfall; and are adjusted for wind effect.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 24,368,000 acre-ft, July 25, 1975, elevation, 1,854.6 ft; minimum since first reaching normal maximum level in July of 1969, 14,742,000 acre-ft Mar. 13, 1978, elevation, 1,825.2 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 21,281,000 acre-ft, Oct. 19, elevation, 1,846.8 ft; minimum, 18,928,000 acre-ft, Mar. 4, elevation, 1,839.8 ft.

MONTHEND ELEVATION AND CONTENTS, AT 2400, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	1846.3	21,106,000	--
Oct. 31	1846.4	21,141,000	+35,000
Nov. 30	1844.7	20,552,000	-589,000
Dec. 31	1843.5	20,144,000	-408,000
CAL YR 1986	--	--	+2,480,000
Jan. 31	1841.4	19,445,000	-699,000
Feb. 28	1840.1	19,023,000	-422,000
Mar. 31	1841.0	19,314,000	+291,000
Apr. 30	1842.2	19,708,000	+394,000
May 31	1843.2	20,043,000	+335,000
June 30	1843.0	19,975,000	-68,000
July 31	1842.7	19,875,000	-100,000
Aug. 31	1841.6	19,511,000	-364,000
Sept. 30	1840.5	19,152,000	-359,000
WTR YR 1987	--	--	-1,954,000

06338490 MISSOURI RIVER AT GARRISON DAM, ND
(National stream-quality accounting network station)

LOCATION.--Lat 47°30'08", long 101°25'50", in S sec.31, T.147 N., R.84 W., Mercer County, Hydrologic Unit 10130101, downstream from dam at National Fish Hatchery's supply line from penstocks 4 and 5, in control structure of Garrison Dam, 2.5 mi west of Riverdale, 14 mi upstream from Knife River, and at mile 1,389.9.

DRAINAGE AREA.--181,400 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1969 to current year.

GAGE.--Flow meter and gate readings.

REMARKS.--Records good. Many diversions above station. Flow regulated by Lake Sakakawea (station 06338000). Prior to October 1969 records were obtained at a site 9.1 mi downstream. Discharges at the downstream site were generally about 7 percent greater than those furnished by the U.S. Army Corps of Engineers for the present site.

COOPERATION.--Records furnished by the U.S. Army Corps of Engineers.

AVERAGE DISCHARGE.--18 years, 24,190 ft^3/s, 17,530,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 65,200 ft^3/s, July 25, 1975; minimum daily, 6,000 ft^3/s, Sept. 29, 1974.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 28,300 ft^3/s, Feb. 14; minimum daily, 9,600 ft^3/s, Apr. 20-22.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22000	25800	19900	23900	26600	19700	11800	10000	17400	18200	18400	17500
2	22000	26000	20000	24000	26700	19900	12400	10300	17700	18300	18100	16800
3	21700	25900	20400	24300	27900	20400	11900	10200	17900	18800	18400	16900
4	21900	25900	19900	24300	27900	20100	12600	10100	17900	18500	18000	16900
5	21900	25800	19900	24000	27900	19200	12200	10600	17700	18200	18300	16800
6	18900	25500	20400	23600	27800	16100	12100	10300	18100	18300	18200	16600
7	18100	25700	20100	24800	27700	15200	12400	10300	18600	17900	18700	17100
8	19100	24900	20200	24800	28000	15000	10100	10300	17800	17600	18500	17000
9	18900	25200	20500	23600	27800	15700	10400	11100	18700	18100	18400	17000
10	19500	25400	20400	23000	28000	18300	10300	10900	18200	18500	18300	16600
11	19200	25300	18300	20700	26800	19300	10100	12600	18100	18200	18100	16300
12	18600	25400	16000	19800	27100	19000	9900	15500	18400	17900	17800	15900
13	19200	25200	15500	20000	28000	19200	9900	17500	18100	18300	18000	16100
14	19300	25200	15700	20000	28300	19400	9800	17900	18100	18000	18200	16000
15	19500	22400	15800	19900	28100	19100	10100	18100	18600	18600	18200	15900
16	19100	22800	16000	20800	28200	18700	10000	18100	19200	18600	18200	16400
17	19300	22800	16600	22100	28100	18500	9900	18500	17400	17900	18000	15500
18	19100	23100	19000	21900	27900	19300	9900	18300	18500	18500	18100	16000
19	19400	22800	19200	21900	27700	19200	10200	17700	17500	18800	18500	15800
20	21500	22800	18800	23200	28000	19100	9600	17900	17700	18800	18900	16100
21	22700	21500	19000	23200	27900	19000	9600	17500	17900	18000	18200	16200
22	24900	23000	19800	24500	28000	17600	9600	18400	18200	18500	18500	16200
23	24800	23100	21200	24500	28000	15000	9700	17900	17800	18500	18400	15900
24	24700	23100	21800	25200	28100	13600	10900	18100	17700	18500	18200	15600
25	25100	23300	22100	25100	27300	11200	10300	18200	18000	18400	18200	15800
26	25000	23200	23500	26400	23000	11300	10400	18400	17900	18000	18300	16300
27	25100	22700	23100	26000	19600	11300	10600	18100	17600	18900	18200	15900
28	24800	23300	23200	26500	19500	11700	10600	17800	17600	18200	18600	15600
29	25100	19900	24200	26400	---	11800	10400	17800	17500	18600	17200	15800
30	25600	20700	23900	26700	---	11800	10000	18000	17200	18600	17400	16000
31	25700	---	24300	26700	---	11200	---	18500	---	18300	17300	---
TOTAL	671700	717700	618700	731800	755900	515900	317700	474900	539000	568500	563800	488500
MEAN	21670	23920	19960	23610	27000	16640	10590	15320	17970	18340	18190	16280
MAX	25700	26000	24300	26700	28300	20400	12600	18500	19200	18900	18900	17500
MIN	18100	19900	15500	19800	19500	11200	9600	10000	17200	17600	17200	15500
AC-FT	1332000	1424000	1227000	1452000	1499000	1023000	630200	942000	1069000	1128000	1118000	968900

CAL YR 1986 TOTAL 7581300 MEAN 20770 MAX 28700 MIN 9700 AC-FT 15040000
WTR YR 1987 TOTAL 6964100 MEAN 19080 MAX 28300 MIN 9600 AC-FT 13810000

06338490 MISSOURI RIVER AT GARRISON DAM, ND--CONTINUED
(National stream-quality accounting network station)

LOCATION.--Samples collected at National Fish Hatchery's supply line from penstocks 4 and 5, in control structure of Garrison Dam.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1971 to current year.
WATER TEMPERATURES: October 1971 to current year.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum observed, 870 microsiemens, May 4, 18, 19, July 4, 1980; minimum observed, 500 microsiemens, Mar. 20, 1986.
WATER TEMPERATURES: Maximum observed, 21.0°C Aug. 26, 1986; minimum observed, 0.0°C on many days during winter months.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum observed, 690 microsiemens, Mar. 3, Apr. 8-10; minimum observed, 510 microsiemens, May 4.
WATER TEMPERATURES: Maximum observed, 16.8°C, Oct. 2-3; minimum observed, 1.7°C Jan. 25 and Feb. 24.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH (STANDARD UNITS) (00400)	TEMPERATURE AIR (DEG C) (00020)	TEMPERATURE WATER (DEG C) (00010)	TURBIDITY (NTU) (00076)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)	COLIFORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREPTOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	HARDNESS (MG/L AS CACO3) (00900)	HARDNESS NONCARBONATE (MG/L AS CACO3) (95902)
OCT												
29...	0915	660	8.60	9.0	12.5	0.60	9.3	87	<1	K3	220	48
DEC												
17...	0920	640	8.48	-0.5	4.0	--	12.1	92	<1	<1	--	--
JAN												
28...	0915	630	8.44	-10.0	2.5	0.20	12.6	94	<1	<1	220	11
APR												
01...	0935	660	8.28	3.0	3.0	0.50	11.6	86	<1	<1	220	0
MAY												
06...	0900	655	8.41	18.0	8.0	--	11.9	100	--	--	--	--
JUL												
01...	0935	650	8.21	20.5	13.0	1.3	7.8	75	<1	<1	210	60
29...	0855	620	8.20	28.5	15.5	--	7.3	74	--	--	--	--
SEP												
02...	0945	650	7.77	20.0	13.0	1.3	6.5	62	K1	<1	220	64

DATE	CALCIUM DISSOLVED (MG/L AS CA) (00915)	MAGNESIUM, DISSOLVED (MG/L AS MG) (00925)	SODIUM, DISSOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM ADSORPTION RATIO (00931)	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	ALKALINITY, CARBONATE IT-FLD (MG/L CACO3) (00419)	BICARBONATE WATER WHOLE IT-FLD (MG/L) (00450)	CARBONATE WATER WHOLE IT-FLD (MG/L) (00447)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2) (00405)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)
OCT												
29...	53	22	58	36	2	4.2	176	178	18	0.8	170	10
DEC												
17...	--	--	--	--	--	--	152	168	9	1	--	--
JAN												
28...	53	21	58	36	2	3.9	212	210	24	1.4	160	9.6
APR												
01...	54	21	62	37	2	4.0	276	337	0	2.8	190	10
MAY												
06...	--	--	--	--	--	--	170	205	1	1.3	--	--
JUL												
01...	51	20	58	37	2	4.1	150	183	0	1.8	170	12
29...	--	--	--	--	--	--	157	191	0	1.9	--	--
SEP												
02...	53	21	61	37	2	4.1	--	--	--	5.1	170	10

06338490 MISSOURI RIVER AT GARRISON DAM, ND--CONTINUED
(National stream-quality accounting network station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301)	SOLIDS, DISSOLVED (TONS PER AC-FT) (70303)	SOLIDS, DISSOLVED (TONS PER DAY) (70302)	NITROGEN, NITRITE DISSOLVED (MG/L AS N) (00613)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, AMMONIA DISSOLVED (MG/L AS NH4) (71846)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)
OCT 29...	0.50	5.7	426	430	0.58	0.0	<0.010	<0.100	<0.010	0.020	0.03	0.90
DEC 17...	--	--	--	--	--	--	<0.010	<0.100	0.020	0.070	0.09	0.50
JAN 28...	0.50	6.4	425	440	0.58	0.0	<0.010	0.100	0.040	0.040	0.05	0.50
APR 01...	0.50	7.6	432	510	0.59	0.0	0.010	0.120	0.040	0.040	0.05	1.2
JUL 01...	4.8	7.5	418	420	0.57	0.0	<0.010	0.210	0.030	0.040	0.05	0.50
SEP 02...	0.50	7.8	414	420	0.56	0.0	<0.010	0.150	<0.010	<0.010	--	0.40

DATE	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	PHOSPHORUS, DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P) (00671)	ALUMINUM, DISSOLVED (UG/L AS AL) (01106)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BARIUM, DISSOLVED (UG/L AS BA) (01005)	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COBALT, DISSOLVED (UG/L AS CO) (01035)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, DISSOLVED (UG/L AS FE) (01046)
OCT 29...	0.020	0.010	0.030	10	2	50	<0.5	<1	<1	<3	12	5
DEC 17...	0.050	0.020	0.020	--	--	--	--	--	--	--	--	--
JAN 28...	0.020	<0.010	<0.010	<10	2	44	<0.5	<1	<1	<3	14	4
APR 01...	0.030	0.010	0.010	<10	2	51	<0.5	<1	<1	<3	5	7
JUL 01...	0.030	0.010	<0.010	--	--	--	--	--	--	--	--	--
SEP 02...	0.040	0.010	<0.010	<10	2	46	<0.5	<1	<1	<3	20	5

DATE	LEAD, DISSOLVED (UG/L AS PB) (01049)	LITHIUM DISSOLVED (UG/L AS LI) (01130)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY DISSOLVED (UG/L AS HG) (71890)	MOLYBDENUM, DISSOLVED (UG/L AS MO) (01060)	NICKEL, DISSOLVED (UG/L AS NI) (01065)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	SILVER, DISSOLVED (UG/L AS AG) (01075)	STRONTIUM, DISSOLVED (UG/L AS SR) (01080)	VANADIUM, DISSOLVED (UG/L AS V) (01085)	ZINC, DISSOLVED (UG/L AS ZN) (01090)
OCT 29...	7	47	<1	<0.1	<10	3	<1	<1	520	<6	9
JAN 28...	<5	48	<1	<0.1	<10	1	1	<1	510	<6	15
APR 01...	<5	49	4	<0.1	<10	2	<1	<1	510	<6	21
SEP 02...	<5	38	1	--	<10	4	<1	<1	500	<6	28

06338490 MISSOURI RIVER AT GARRISON DAM, ND--CONTINUED
(National stream-quality accounting network station)

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
ONCE DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16.2	12.6	---	2.4	2.0	2.7	2.6	5.5	8.2	10.0	14.1	12.0
2	16.8	12.5	8.8	2.6	2.4	2.2	2.6	5.6	9.3	10.0	13.9	12.3
3	16.8	14.9	9.2	1.9	2.0	2.0	2.8	6.1	8.8	10.6	12.2	12.6
4	16.7	12.5	8.1	2.3	2.4	2.1	2.7	6.1	9.4	10.6	12.1	12.0
5	15.7	14.0	8.2	3.2	2.4	2.2	2.8	6.9	9.3	10.7	11.6	11.9
6	15.2	13.7	8.1	1.9	2.6	2.3	3.1	6.5	9.5	10.5	11.9	12.2
7	15.4	14.7	8.3	1.8	2.3	2.4	4.0	6.1	10.2	10.5	12.1	12.6
8	15.0	13.3	---	2.9	2.2	2.4	4.1	6.5	10.0	10.4	12.0	12.0
9	16.1	12.3	---	2.1	4.0	3.0	3.5	6.3	10.0	10.7	12.4	12.1
10	15.6	---	---	2.3	8.9	2.1	3.7	6.6	9.9	10.9	11.9	12.2
11	14.9	13.3	4.6	2.0	12.9	3.6	2.7	7.3	10.1	10.4	12.2	12.0
12	13.7	---	4.5	3.2	6.3	3.1	3.1	6.5	9.7	11.0	12.0	12.3
13	14.0	12.5	4.5	5.6	2.8	2.6	4.4	6.0	9.7	10.5	11.8	12.6
14	14.0	11.2	6.0	5.6	3.3	3.6	5.1	8.3	9.7	11.0	12.0	12.0
15	13.3	---	4.1	4.0	3.8	4.0	4.6	7.2	10.0	10.4	12.0	12.2
16	15.0	9.5	6.1	5.4	2.5	3.1	5.6	7.4	10.3	11.3	12.9	15.9
17	14.0	10.5	3.9	4.8	2.7	3.1	5.0	6.9	10.4	11.4	11.7	12.1
18	13.2	11.0	3.5	5.1	4.2	2.7	4.3	7.6	10.2	11.0	11.8	12.2
19	14.0	9.4	5.0	4.8	2.9	2.6	4.6	8.6	10.2	10.4	12.0	12.3
20	14.1	10.3	3.0	3.2	2.5	2.5	4.7	7.8	10.7	11.5	12.2	12.2
21	15.2	10.1	3.0	7.7	2.6	2.9	5.0	7.6	10.9	11.4	12.4	11.9
22	15.8	---	5.3	4.5	2.3	2.7	4.5	9.6	9.7	12.8	12.4	12.1
23	15.4	11.6	3.1	2.5	8.0	3.3	5.2	8.5	9.9	11.6	11.9	12.2
24	14.8	8.9	3.7	2.2	1.7	3.3	5.1	8.2	9.7	11.3	13.4	12.7
25	15.3	---	3.5	1.7	2.1	3.2	5.8	8.1	9.6	11.2	12.5	12.7
26	15.6	9.1	3.5	2.0	2.0	2.9	6.6	8.5	9.6	11.1	12.7	15.4
27	14.5	10.2	3.1	2.2	3.0	3.5	6.2	8.8	9.8	11.7	12.9	15.8
28	16.5	10.3	3.8	1.9	2.4	3.6	5.6	9.0	9.7	12.6	12.4	12.2
29	15.7	---	3.0	1.9	---	3.3	6.0	8.5	10.3	11.8	12.2	16.6
30	15.4	9.8	2.6	1.9	---	2.8	5.5	8.3	9.7	14.6	12.5	16.5
31	14.4	---	3.0	1.9	---	3.0	---	8.2	---	12.5	12.2	---
MEAN	15.1	---	---	3.15	3.54	2.86	4.38	7.39	9.82	11.2	12.3	12.9
MAX	16.8	---	---	7.7	12.9	4.0	6.6	9.6	10.9	14.6	14.1	16.6
MIN	13.2	---	---	1.7	1.7	2.0	2.6	5.5	8.2	10.0	11.6	11.9

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
ONCE DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	650	625	---	620	615	630	680	645	610	600	650	640
2	600	625	600	620	620	650	680	620	600	600	650	620
3	590	630	600	610	625	690	675	600	580	600	620	625
4	590	620	610	610	620	640	680	510	560	630	620	610
5	620	620	620	610	640	600	680	560	610	625	620	610
6	600	620	610	625	630	630	660	610	610	620	610	610
7	610	620	610	600	625	650	680	620	620	630	610	610
8	620	620	645	600	625	655	690	565	620	610	620	610
9	600	610	645	600	650	640	690	610	610	610	620	620
10	620	600	645	610	650	620	690	600	620	620	610	610
11	610	635	645	600	655	600	670	600	610	610	625	610
12	610	620	630	630	655	615	640	610	610	610	625	610
13	610	620	645	610	600	650	640	605	610	605	625	610
14	610	610	650	610	625	640	650	600	610	600	625	600
15	640	610	640	610	625	600	670	600	610	600	625	600
16	600	600	630	610	620	640	660	620	620	605	625	600
17	620	610	625	640	620	650	660	610	610	600	600	600
18	640	610	610	625	620	640	650	600	610	600	625	600
19	610	610	630	630	620	650	580	600	600	610	650	610
20	610	610	620	625	620	640	650	600	610	600	640	610
21	610	610	640	650	620	650	620	600	610	620	640	610
22	610	600	650	630	610	660	645	600	610	630	650	610
23	620	610	630	650	625	650	650	605	610	620	650	610
24	630	610	630	630	625	660	650	620	610	610	635	610
25	605	620	625	630	625	645	580	640	610	605	635	610
26	600	620	625	615	625	640	620	630	610	610	650	610
27	610	620	640	620	620	650	650	640	620	610	650	610
28	630	630	635	620	640	610	660	620	610	610	625	630
29	620	630	630	620	---	610	655	640	600	620	640	640
30	620	630	620	610	---	670	655	600	600	610	625	640
31	620	---	620	610	---	660	---	610	---	560	640	---
MEAN	614	617	---	619	627	640	655	606	608	609	630	613
MAX	650	635	---	650	655	690	690	645	620	630	650	640
MIN	590	600	---	600	600	600	580	510	560	560	600	600

06339010 MISSOURI RIVER ABOVE STANTON, ND

LOCATION.--Lat 47°21'45", long 101°21'25", SE¼NE¼SE¼ sec.22, T.145 N., R.84 W., McLean County, Hydrologic Unit 10130101, on left bank 9 mi south of Riverdale, and at mile 1,379.

DRAINAGE AREA.--181,400 mi^2, approximately.

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

GAGE.--Water-stage recorder. Datum of gage is 1600.00 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Stage regulated completely by releases from Garrison Dam (station 06338490) 13 mi upstream.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height recorded, 72.24 ft, Jan. 29, 1977; minimum daily recorded, 64.21 ft, May 7, 1987.

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	67.53	66.33	---	---	---	---	64.40	66.00	---	---	66.15
2	---	67.61	66.37	---	---	---	---	64.51	66.08	---	---	---
3	---	67.56	66.45	---	---	---	---	64.40	66.07	---	---	---
4	---	67.58	66.48	---	---	---	---	64.58	66.08	---	---	---
5	---	67.57	66.56	---	---	---	---	64.48	65.97	---	---	---
6	---	67.50	66.46	---	---	---	---	64.45	65.86	---	---	---
7	---	67.56	66.49	---	---	---	---	64.21	66.19	---	---	---
8	---	67.26	66.53	---	---	---	---	64.58	66.14	---	---	---
9	---	67.37	66.44	---	---	---	---	64.52	66.26	---	---	---
10	---	67.43	66.47	---	---	---	---	64.62	66.12	---	---	---
11	---	67.42	66.21	---	---	---	---	65.00	66.22	---	---	---
12	---	67.39	65.94	---	---	---	---	65.40	65.97	---	---	---
13	---	67.48	65.54	---	---	---	---	65.88	66.16	---	66.46	---
14	---	67.38	65.64	---	---	---	---	66.12	65.89	---	66.55	---
15	---	67.13	65.76	---	---	---	---	65.90	66.02	---	66.61	---
16	---	67.01	65.79	---	---	---	---	66.02	66.01	---	66.61	---
17	---	66.99	---	---	---	---	---	66.21	66.07	---	66.64	---
18	---	67.02	---	---	---	---	---	66.03	66.03	---	66.28	---
19	---	66.97	---	---	---	---	---	66.08	66.14	---	66.52	---
20	---	67.00	---	---	---	---	---	66.21	66.07	---	66.52	---
21	---	66.84	---	---	---	---	---	65.68	65.96	---	66.57	---
22	---	67.10	---	---	---	---	64.51	65.75	65.99	---	66.42	---
23	---	67.00	---	---	---	---	64.46	66.19	66.19	---	66.70	---
24	---	67.12	---	---	---	---	64.65	66.17	66.25	---	66.34	---
25	---	67.10	---	---	---	---	64.51	66.20	66.25	---	66.42	---
26	---	67.12	---	---	---	---	64.38	66.24	66.29	---	66.48	---
27	---	67.02	---	---	---	---	64.54	66.17	65.86	---	66.37	---
28	---	67.07	---	---	---	---	64.48	66.21	66.16	---	66.48	---
29	---	66.62	---	---	---	---	64.48	66.17	66.23	---	66.39	---
30	67.55	66.80	---	---	---	---	64.58	66.11	---	---	66.16	---
31	67.50	---	---	---	---	---	---	66.21	---	---	66.06	---
MEAN	---	67.2	---	---	---	---	---	65.5	---	---	---	---
MAX	---	67.61	---	---	---	---	---	66.24	---	---	---	---
MIN	---	66.62	---	---	---	---	---	64.21	---	---	---	---

06339100 KNIFE RIVER AT MANNING, ND

LOCATION.--Lat 47°14'10", long 102°46'10", in SE¼NW¼ sec.6, T.143 N., R.95 W., Dunn County, Hydrologic Unit 10130201, on left bank 50 ft downstream from bridge on State Highway 22, and 0.4 mi north of Manning.

DRAINAGE AREA.--205 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1967 to current year.

GAGE.--Water-stage recorder. Datum of gage is 2,156.55 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Nov. 9-20, Dec. 1-23, Jan. 15 to Feb. 26, and Mar. 7-30. Records good except those for periods of estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--20 years, 22.7 ft^3/s, 16,450 acre-ft/yr; median of yearly mean discharges, 24 ft^3/s, 17,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,940 ft^3/s, June 15, 1970, gage height, 16.20 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 300 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 5	1530	360	8.60	Apr. 1	1845	*2260	*15.51
Mar. 23	----	580	Ice jam				

Minimum daily discharge, 0.44 ft^3/s, July 1.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	77	2.5	8.0	2.5	10	4.5	1500	4.0	1.9	.44	2.9	1.0
2	42	2.5	7.0	2.2	20	4.7	725	4.1	1.5	.54	3.5	.74
3	25	2.5	5.6	1.9	80	7.4	330	4.1	1.4	.55	12	.47
4	14	2.5	4.5	2.0	65	43	281	4.6	1.4	.53	11	.48
5	10	2.9	3.8	2.0	55	292	157	4.7	1.4	.56	6.6	.48
6	8.5	3.8	2.6	2.3	50	181	76	4.7	1.3	.46	4.0	.64
7	6.9	5.0	2.8	1.9	65	110	51	4.5	1.2	.48	2.8	.58
8	6.3	6.0	3.2	1.9	85	80	37	3.9	1.2	.49	2.0	.56
9	6.1	5.0	2.8	1.8	90	90	29	3.7	1.1	1.1	1.5	.67
10	5.3	4.0	2.4	1.8	55	75	23	3.1	1.1	1.6	1.1	.67
11	4.5	4.5	2.2	1.8	40	45	21	2.9	1.1	8.8	1.1	.64
12	4.3	5.0	2.0	2.1	35	25	19	2.7	1.1	10	1.0	.74
13	4.0	4.5	2.2	2.3	40	18	14	2.5	.98	11	.88	.72
14	3.6	4.0	2.2	2.5	35	12	13	2.5	.96	9.6	1.4	.58
15	3.6	4.0	2.5	2.2	30	9.0	11	2.4	.85	5.1	1.7	.71
16	3.6	3.8	2.8	1.8	28	7.5	10	2.3	.99	3.4	1.4	1.0
17	3.6	3.8	3.0	1.8	25	7.0	9.3	2.3	1.0	2.8	1.7	1.1
18	3.6	3.6	3.0	1.6	28	6.5	8.6	2.2	.90	2.7	1.7	1.2
19	3.5	3.6	2.8	1.6	22	6.5	8.3	2.3	.91	2.5	1.7	1.4
20	3.1	3.8	2.6	1.4	16	7.5	7.0	2.0	1.2	8.4	1.4	2.1
21	3.1	4.0	2.5	1.4	10	40	6.5	2.8	1.3	12	1.0	1.4
22	2.8	4.3	2.8	1.2	8.0	225	6.0	2.9	1.2	18	.86	1.1
23	2.6	4.6	3.0	1.2	7.5	525	5.7	3.1	1.2	145	.83	1.1
24	2.7	5.0	3.2	1.0	6.0	384	5.4	2.8	1.1	79	.85	.96
25	2.7	5.8	2.9	1.0	5.4	220	5.0	2.6	1.1	39	1.3	1.5
26	2.4	7.1	2.6	1.2	5.2	140	4.9	2.6	.97	20	1.7	1.6
27	2.3	8.5	2.7	1.5	5.0	300	4.7	3.0	.75	11	2.0	1.7
28	2.4	10	2.4	2.0	4.5	180	4.5	2.8	.65	7.8	1.8	2.1
29	2.5	11	2.7	2.5	---	100	4.2	2.8	.45	5.7	1.7	2.4
30	2.5	10	2.3	3.5	---	80	3.8	2.5	.50	4.1	1.4	1.9
31	2.5	---	2.6	5.0	---	214	---	2.1	---	3.2	1.1	---
TOTAL	267.0	147.6	97.7	60.9	925.6	3439.6	3380.9	95.5	32.71	415.85	75.92	32.24
MEAN	8.61	4.92	3.15	1.96	33.1	111	113	3.08	1.09	13.4	2.45	1.07
MAX	77	11	8.0	5.0	90	525	1500	4.7	1.9	145	12	2.4
MIN	2.3	2.5	2.0	1.0	4.5	4.5	3.8	2.0	.45	.44	.83	.47
AC-FT	530	293	194	121	1840	6820	6710	189	65	825	151	64

CAL YR 1986 TOTAL 11379.99 MEAN 31.2 MAX 1090 MIN .32 AC-FT 22570
WTR YR 1987 TOTAL 8971.39 MEAN 24.6 MAX 1500 MIN .44 AC-FT 17790

06339100 KNIFE RIVER AT MANNING, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
OCT											
22...	1215	2.8	1160	--	15.5	8.5	--	--	--	--	--
NOV											
21...	1100	3.9	2050	--	5.0	0.0	--	--	--	--	--
DEC											
06...	1210	1.1	3720	--	0.0	0.0	--	--	--	--	--
JAN											
08...	1210	2.0	2730	--	-2.0	0.0	--	--	--	--	--
FEB											
13...	1225	38	680	7.55	0.0	0.5	100	0	22	12	95
MAR											
06...	1215	3170	540	--	15.0	1.0	--	--	--	--	--
24...	1040	406	450	--	0.5	0.5	--	--	--	--	--
APR											
01...	1340	1530	680	--	-1.0	0.5	--	--	--	--	--
17...	1025	9.0	1100	--	20.0	12.0	--	--	--	--	--
MAY											
14...	1325	2.6	--	--	24.0	18.0	--	--	--	--	--
JUN											
15...	1115	0.75	2020	--	30.0	23.5	--	--	--	--	--
JUL											
09...	0950	1.0	2140	8.35	22.0	20.0	260	0	46	36	410
AUG											
27...	1910	2.0	1530	--	14.0	14.5	--	--	--	--	--

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
FEB											
13...	64	4	9.2	150	150	6.5	0.20	13	428	400	0.58
JUL											
09...	76	11	11	550	620	9.1	0.60	1.8	1470	1500	2.0

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
FEB										
13...	1	110	410	<1	11	40	0.1	<1	<1	210
JUL										
09...	2	430	50	<1	48	50	0.5	2	2	660

KNIFE RIVER BASIN

06339500 KNIFE RIVER NEAR GOLDEN VALLEY, ND

LOCATION.--Lat 47°09'40", long 102°03'39", in SE¼ sec.34, T.143 N., R.90 W., Mercer County, Hydrologic Unit 10130201, on left bank 6 ft downstream from highway bridge, 4.5 mi downstream from Elm Creek, and 9 mi south of Golden Valley.

DRAINAGE AREA.--1,230 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1903 to November 1906, April 1907 to November 1915, April 1916 to October 1919, and October 1921 to September 1924 (published as "at Broncho" or "near Broncho"), and April 1943 to current year. Monthly discharge only for some periods published in WSP 1309.

REVISED RECORDS (WATER YEARS).--WSP 1006:0 Drainage area. WSP 1279: 1904, 1914-19(M), 1922-24(M), 1944.

GAGE.--Water-stage recorder. Datum of gage is 1,847.13 ft above National Geodetic Vertical Datum of 1929. See WSP 1729 or 1917 for history of changes prior to May 1, 1946.

REMARKS.--Estimated daily discharges: Nov. 8 to Dec. 1, Jan. 16-27, Feb. 7-13, and Mar. 5-22; ice backwater. Records good except those for periods of estimated daily discharges, which are fair.

AVERAGE DISCHARGE.--61 years, 97.5 ft^3/s, 70,600 acre-ft/yr; median of yearly mean discharges, 88 ft^3/s, 63,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,200 ft^3/s, May 9, 1970, gage height, 25.84 ft; maximum gage height, 26.7 ft, Mar. 26, 27, 1943, from floodmark; no flow at times in some years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Mar. 26, 27, 1943 reached a stage of 26.7 ft, from floodmark, 11,500 ft^3/s. The 1943 flood was the highest since 1903 according to information from local residents.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 6	----	1,750	Ice jam	Apr. 4	0215	1,800	12.34
Mar. 22	----	*5,000	*[a]21.15				

Minimum daily, 6.3 ft^3/s, July 4, 6.
a - Ice jam

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	176	17	55	14	13	22	298	31	30	8.3	348	17
2	285	16	58	14	13	22	788	29	27	7.4	353	15
3	275	16	55	14	14	22	1570	30	25	6.8	225	13
4	154	17	43	15	21	43	1370	32	24	6.3	268	12
5	102	17	33	15	34	500	612	30	21	6.6	165	11
6	73	20	25	14	50	1600	537	30	20	6.3	99	10
7	59	22	21	14	130	1060	374	29	18	6.9	84	9.7
8	46	15	19	14	325	900	246	28	16	6.6	65	9.4
9	39	16	16	13	350	450	188	27	14	7.1	46	8.9
10	34	18	12	13	300	250	158	26	14	7.8	33	8.3
11	30	16	12	14	325	200	134	23	14	7.8	26	7.8
12	28	14	12	14	320	175	116	21	13	20	20	7.8
13	26	12	13	14	230	125	102	20	13	36	19	7.5
14	25	13	13	14	151	110	96	19	13	36	19	7.5
15	25	14	14	13	142	95	93	18	11	43	17	7.5
16	24	15	14	12	150	80	87	18	9.6	41	16	7.2
17	22	15	14	12	125	65	78	16	9.5	32	87	7.6
18	21	16	13	11	83	58	73	16	10	28	91	7.9
19	21	16	12	11	72	55	68	18	9.0	25	60	7.6
20	20	17	11	11	57	80	60	19	9.9	22	57	6.7
21	20	18	12	10	58	1800	54	25	12	16	42	6.6
22	20	20	12	9.5	48	4000	51	25	10	139	28	7.4
23	19	20	12	9.0	42	4620	48	25	11	182	22	7.7
24	18	22	13	9.0	33	3760	45	26	12	245	18	7.0
25	18	24	12	9.5	30	2360	42	30	58	163	20	7.1
26	18	25	12	10	29	1210	41	29	32	215	21	7.2
27	18	28	13	10	26	863	37	37	19	148	22	7.8
28	18	30	13	11	24	1000	36	33	13	88	23	8.7
29	17	35	13	12	---	816	34	32	11	60	25	8.2
30	19	45	14	12	---	489	31	31	9.1	43	24	8.4
31	17	---	14	12	---	353	---	31	---	46	20	---
TOTAL	1687	589	605	380.0	3195	27183	7467	804	508.1	1705.9	2363	265.5
MEAN	54.4	19.6	19.5	12.3	114	877	249	25.9	16.9	55.0	76.2	8.85
MAX	285	45	58	15	350	4620	1570	37	58	245	353	17
MIN	17	12	11	9.0	13	22	31	16	9.0	6.3	16	6.6
AC-FT	3350	1170	1200	754	6340	53920	14810	1590	1010	3380	4690	527

CAL YR 1986 TOTAL 46000.0 MEAN 126 MAX 4000 MIN 3.1 AC-FT 91240
WTR YR 1987 TOTAL 46752.4 MEAN 128 MAX 4620 MIN 6.3 AC-FT 92730

06339500 KNIFE RIVER NEAR GOLDEN VALLEY, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1950, 1964-65, 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
OCT											
22...	0935	19	1530	--	9.5	9.0	--	--	--	--	--
DEC											
04...	1045	44	2350	--	-6.5	0.5	--	--	--	--	--
JAN											
14...	1030	13	3280	--	-3.0	0.0	--	--	--	--	--
FEB											
20...	1050	45	1600	--	3.0	0.5	--	--	--	--	--
MAR											
05...	1230	172	920	7.88	15.0	1.0	160	0	29	20	140
a05...	1231	172	920	7.88	15.0	1.0	150	0	29	19	140
23...	1120	4630	440	--	1.5	0.5	--	--	--	--	--
26...	1200	1150	580	--	7.0	1.0	--	--	--	--	--
APR											
10...	1015	164	830	--	0.0	7.5	--	--	--	--	--
MAY											
14...	0940	19	1970	--	19.5	18.5	--	--	--	--	--
JUN											
16...	1050	9.6	2430	--	30.5	23.5	--	--	--	--	--
JUL											
30...	0935	44	1490	--	26.0	25.5	--	--	--	--	--
SEP											
08...	1215	9.9	1630	8.36	23.5	18.5	270	0	54	32	270
a08...	1216	9.9	1630	8.36	23.5	18.5	270	0	56	31	270

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
05...	65	5	10	170	270	4.2	0.10	9.1	617	590	0.84
a05...	65	5	8.4	170	280	5.1	0.20	7.3	617	590	0.84
SEP											
08...	68	7	11	400	460	2.7	0.50	0.6	1090	1100	1.5
a08...	68	7	9.0	404	470	4.1	0.40	9.3	1090	850	1.5

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
MAR										
05...	<1	100	210	<1	17	80	0.3	<1	<1	370
a05...	<1	100	82	<5	19	66	--	<1	<1	360
SEP										
08...	1	210	20	<1	31	10	<0.1	3	1	690
a08...	1	290	13	<5	26	4	--	1	<1	660

a - Split sample analysis for quality assurance.

06339560 BRUSH CREEK NEAR BEULAH, ND

LOCATION.--Lat 47°10'43", long 101°47'05", in NW¼SW¼NW¼ sec.25, T.143 N., R.88 W., Mercer County, Hydrologic Unit 10130201, on right bank 60 ft upstream from bridge on State Highway 49, and 6 mi south of Beulan.

DRAINAGE AREA.--23.92 mi^2, approximately.

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder. Elevation of gage is 1,948 ft above National Geodetic Vertical Datum of 1929, from State Highway Department levels.

REMARKS.--Estimated daily discharges: Nov. 7 to Mar. 21, Apr. 30 to May 5, and June 5-11. Records fair except those for periods of estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--13 years, 1.91 ft^3/s, 1,380 acre-ft/yr; median of yearly mean discharges, 1.6 ft^3/s, 1,160 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 940 ft^3/s, Mar. 29, 1982, gage height, 8.40 ft, backwater from ice; maximum gage height, 9.26 ft, Mar. 21, 1978; no flow at times.

EXTREMES FOR CURRENT YEAR.--

Date	Time	Discharge (ft^3/s)	Gage Height (ft)	Date	Time	Discharge (ft^3/s)	Gage Height (ft)
Mar. 5	1800	130	*[a]6.22	Mar. 21	1730	*230	[a]6.07
Aug. 2	1945	88	5.07				

Minimum daily discharge, 0.13 ft^3/s, June 19.
a - Backwater from ice

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.2	.71	.70	.61	1.0	.62	5.5	.68	.77	.16	9.5	.47
2	.81	.73	.78	.58	2.0	.62	4.8	.67	.58	.16	29	.40
3	.75	.81	.82	.54	1.5	.66	2.8	.65	.46	.17	16	.35
4	.75	.81	.80	.52	1.2	5.0	2.6	.85	.38	.17	5.2	.35
5	.87	.86	.78	.50	1.1	65	2.3	.80	.30	.17	2.5	.39
6	.78	1.3	.74	.52	1.0	30	1.3	.77	.26	.17	1.5	.50
7	.75	.80	.72	.50	17	10	1.5	.70	.24	.16	1.0	.43
8	.76	.35	.68	.48	15	5.0	1.3	.63	.24	.17	.68	.38
9	.81	.28	.66	.45	10	3.4	1.3	.55	.22	.39	.60	.38
10	.80	.25	.66	.45	5.7	2.8	1.2	.51	.24	.39	.49	.37
11	.71	.25	.68	.50	5.2	2.0	1.2	.44	.26	.52	.38	.37
12	.69	.24	.70	.56	5.4	1.8	1.1	.35	.24	1.2	.33	.33
13	.69	.24	.70	.64	3.9	1.6	1.1	.39	.20	1.2	.43	.35
14	.71	.26	.72	.52	2.4	1.4	1.1	.34	.19	.75	.50	.35
15	.73	.28	.74	.45	1.7	1.3	.95	.30	.16	.49	.52	.31
16	.73	.30	.76	.40	1.3	1.2	.87	.30	.15	.33	.60	.29
17	.73	.40	.77	.38	1.3	1.1	.90	.28	.15	.24	.84	.32
18	.71	.42	.78	.38	1.2	1.2	.90	.30	.15	.72	.61	.36
19	.66	.45	.76	.40	1.0	1.3	.86	.34	.13	1.2	.71	.36
20	.71	.50	.72	.42	1.0	15	.73	.62	.18	.76	.65	.33
21	.72	.56	.68	.44	1.2	140	.71	1.7	.17	.75	.52	.32
22	.75	.68	.66	.40	1.0	117	.69	1.2	.17	1.5	.44	.33
23	.71	.74	.68	.38	.90	64	.66	1.1	.16	.73	.36	.34
24	.69	.78	.68	.36	.73	36	.68	.87	.17	.52	.49	.29
25	.69	.82	.66	.34	.62	15	.69	.77	.15	.50	1.4	.28
26	.71	.80	.64	.34	.57	11	.68	.83	.15	.41	1.6	.30
27	.72	.80	.63	.36	.57	13	.62	4.0	.15	.40	1.3	.29
28	.73	.80	.62	.38	.57	4.5	.62	3.2	.17	.35	.83	.29
29	.70	.80	.60	.40	---	2.7	.62	1.6	.17	.39	.66	.32
30	.71	.74	.60	.45	---	2.0	.69	1.1	.16	.35	.57	.30
31	.77	---	.64	.50	---	2.5	---	.80	---	5.8	.52	---
TOTAL	23.25	17.76	21.76	14.15	86.06	558.70	40.97	27.64	7.12	21.22	80.73	10.45
MEAN	.75	.59	.70	.46	3.07	18.0	1.37	.89	.24	.68	2.60	.35
MAX	1.2	1.3	.82	.64	17	140	5.5	4.0	.77	5.8	29	.50
MIN	.66	.24	.60	.34	.57	.62	.62	.28	.13	.16	.33	.28
AC-FT	46	35	43	28	171	1110	81	55	14	42	160	21

CAL YR 1986 TOTAL 1107.72 MEAN 3.03 MAX 240 MIN .00 AC-FT 2200
WTR YR 1987 TOTAL 909.80 MEAN 2.49 MAX 140 MIN .13 AC-FT 1800

06339560 BRUSH CREEK NEAR BEULAH, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1975 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)
OCT 30...	1106	0.69	1980	8.15	6.5	6.0	8.8	73	590	74	100	83
DEC 17...	1402	0.77	2200	7.93	0.5	1.5	8.8	64	--	--	--	--
JAN 29...	1203	0.40	2100	7.98	5.0	1.5	9.4	69	520	0	97	68
FEB 12...	1233	5.4	840	--	0.0	0.0	--	--	--	--	--	--
MAR 05...	1130	48	470	--	11.0	0.0	--	--	--	--	--	--
22...	1147	61	195	--	4.0	2.0	--	--	--	--	--	--
APR 02...	0945	4.7	790	8.01	5.5	2.0	11.1	81	250	50	54	29
MAY 05...	1434	0.80	1860	8.06	26.0	22.0	9.6	111	--	--	--	--
JUN 11...	1317	0.27	1890	8.01	26.0	20.5	6.2	70	460	14	82	62
JUL 30...	1029	0.34	1790	7.78	29.0	27.5	3.9	51	--	--	--	--
[a]SEP 09...	1350	0.37	1760	8.05	20.0	16.0	8.0	83	500	30	89	68

DATE	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2) (00405)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)
OCT 30...	280	50	5	10	517	7.0	680	10	0.20	6.6	1520	1500
JAN 29...	300	55	6	8.5	--	0	610	11	0.30	17	1510	--
APR 02...	79	39	2	8.0	204	3.8	210	4.6	0.10	13	531	520
JUN 11...	270	56	6	8.2	446	8.4	580	13	0.20	6.9	1360	1300
SEP 09...	250	51	5	10	472	8.1	580	7.2	0.30	12	1280	1300

DATE	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHORUS, TOTAL (MG/L AS P) (00665)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P) (00666)	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BERYL-LIUM, TOTAL RECOV-ERABLE (UG/L AS BE) (01012)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE) (01010)	BORON, DIS-SOLVED (UG/L AS B) (01020)
OCT 30...	2.1	2.8	<0.100	0.030	1.0	0.050	<0.010	--	--	--	--	340
JAN 29...	2.1	1.6	0.330	0.320	1.2	0.040	<0.010	--	--	--	--	310
APR 02...	0.72	6.8	0.790	0.300	1.7	0.130	0.060	2	1	<10	<0.5	100
JUN 11...	1.8	0.99	<0.100	0.070	0.90	0.070	0.030	--	--	--	--	390
SEP 09...	1.7	1.3	<0.100	0.040	1.6	0.050	0.040	<1	<1	<10	<0.5	330

a - Laboratory analysis (radiochemical) incomplete prior to report publication.

06339560 BRUSH CREEK NEAR BEULAH, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD) (01027)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR) (01034)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB) (01051)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG) (71900)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)
OCT 30...	--	--	--	--	--	30	--	--	50	--	--
JAN 29...	--	--	--	--	--	40	--	--	350	--	--
APR 02...	<1	<1	<10	<10	<1	140	<5	<5	120	<0.10	<0.1
JUN 11...	--	--	--	--	--	36	--	--	77	--	--
SEP 09...	<1	<1	<10	<10	2	80	15	<5	92	0.10	0.2

DATE	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, TOTAL (UG/L AS SE) (01147)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C) (00681)	CYANIDE TOTAL (MG/L AS CN) (00720)	PHENOLS TOTAL (UG/L) (32730)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)
OCT 30...	--	--	--	--	--	--	10	--	--	--	--
JAN 29...	--	--	--	--	--	--	7.6	--	--	26	0.03
APR 02...	4	2	<1	<1	10	13	11	<0.010	5	41	0.52
JUN 11...	--	--	--	--	--	--	9.8	--	--	52	0.04
SEP 09...	<1	3	<1	<1	<10	5	13	<0.010	3	14	0.01

06340000 SPRING CREEK AT ZAP, ND

LOCATION.--Lat 47°17'10", long 101°55'31", in SW1/4 sec.14, T.144 N., R.89 W., Mercer County, Hydrologic Unit 10130201, on right bank 250 ft downstream from Burlington Northern Railway bridge in Zap, and 9 mi upstream from mouth.

DRAINAGE AREA.--549 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March to September 1924, October 1945 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,819.39 ft above National Geodetic Vertical Datum of 1929. Mar. 4 to Sept. 30, 1924, nonrecording gage at site 250 ft upstream at different datum. Oct. 1, 1945, to Sept. 30, 1947, nonrecording gage 250 ft upstream at datum 1.12 ft higher.

REMARKS.--Estimated daily discharges: Nov. 8 to Mar. 27 and June 3-11. Records good except those for periods of estimated daily discharges, which are poor. Flow slightly regulated by Lake Ilo, 56 mi upstream, capacity 7,130 acre-ft.

AVERAGE DISCHARGE.--42 years, 44.2 ft^3/s, 32,000 acre-ft/yr; median of yearly mean discharges, 41 ft^3/s, 29,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,130 ft^3/s, Apr. 7, 1952, gage height, 20.03 ft; maximum gage height, 20.70 ft, Mar. 15, 1972; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage known occurred in about 1902, from ice jam. Floods of February 1913 and March 1943 reached a stage of about 20 ft and 19.5 ft, respectively, from information by local residents.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage Height (ft)
Mar. 6	----	2,170	ice backwater	Mar. 23	1100	*3,060	*[b]16.48

Minimum daily discharge, 9.0 ft^3/s, Jan. 25.
b - From high water mark.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	29	17	17	15	12	20	162	23	19	14	63	12
2	28	18	16	15	13	21	202	23	18	14	24	12
3	37	18	16	15	16	22	273	24	17	13	19	11
4	45	18	15	15	22	30	216	26	17	12	15	11
5	42	19	14	15	29	550	172	26	17	12	14	11
6	36	20	14	15	42	1900	147	26	16	12	13	11
7	31	22	14	15	76	1000	129	25	16	12	12	11
8	31	11	14	15	110	600	115	24	16	11	12	10
9	28	10	14	14	130	350	104	22	15	12	12	10
10	25	10	14	14	90	250	93	21	15	14	11	9.5
11	23	10	14	14	75	200	86	19	15	18	10	9.6
12	21	11	14	14	70	150	88	18	15	37	9.8	9.9
13	20	11	14	14	68	120	75	18	14	33	11	10
14	19	12	16	15	63	100	65	17	14	32	11	10
15	18	12	17	15	60	85	59	17	13	26	12	10
16	18	13	17	14	57	76	55	18	12	20	12	9.8
17	17	14	16	14	50	66	51	17	12	17	20	10
18	17	15	16	14	50	60	48	17	12	16	25	11
19	16	15	16	12	43	50	45	18	12	16	19	11
20	16	14	15	11	38	70	42	19	12	17	17	11
21	16	15	13	11	30	1000	38	23	13	18	14	10
22	16	16	13	10	32	2500	35	23	13	361	13	10
23	16	16	13	10	29	2650	40	22	13	158	12	10
24	16	17	14	9.5	28	2000	36	22	37	100	11	11
25	16	17	14	9.0	27	1000	31	21	30	59	13	13
26	16	18	14	9.5	25	500	28	21	23	39	15	13
27	17	18	14	9.5	23	450	27	29	18	34	15	11
28	16	18	14	9.5	21	436	27	27	15	27	14	11
29	16	18	14	9.6	---	291	25	23	14	25	14	12
30	16	18	14	9.6	---	271	24	22	14	20	13	12
31	16	---	15	10	---	183	---	21	---	26	13	---
TOTAL	694	461	455	392.2	1329	17001	2538	672	487	1225	488.8	323.8
MEAN	22.4	15.4	14.7	12.7	47.5	548	84.6	21.7	16.2	39.5	15.8	10.8
MAX	45	22	17	15	130	2650	273	29	37	361	63	13
MIN	16	10	13	9.0	12	20	24	17	12	11	9.8	9.5
AC-FT	1380	914	902	778	2640	33720	5030	1330	966	2430	970	642

CAL YR 1986 TOTAL 24248.8 MEAN 66.4 MAX 2100 MIN 7.0 AC-FT 48100
WTR YR 1987 TOTAL 26066.8 MEAN 71.4 MAX 2650 MIN 9.0 AC-FT 51700

ERRATA

p. 237 The following table replaces that found on page 237.

06340000 SPRING CREEK AT ZAP, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1969-70, 1974 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
OCT 30...	0920	16	1790	--	2.0	5.5	--	--	--	--	--
DEC 18...	0935	16	1440	--	-1.0	1.5	--	--	--	--	--
JAN 29...	1002	9.6	1930	--	5.0	1.5	--	--	--	--	--
MAR 06...	1046	2030	260	7.80	15.5	1.0	75	0	16	8.5	21
APR 27...	1013	27	1440	--	17.0	13.5	--	--	--	--	--
JUN 11...	0938	15	1760	--	25.0	20.0	--	--	--	--	--
JUL 30...	0851	20	1400	--	24.0	24.0	--	--	--	--	--
SEP 09...	1135	10	1430	8.48	22.5	16.0	380	0	71	48	200

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR 06...	34	1	9.6	90	55	3.1	0.10	7.4	167	170	0.23
SEP 09...	53	5	8.6	380	440	7.3	0.40	6.2	1020	1000	1.4

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
MAR 06...	1	40	410	<1	6	130	0.2	<1	<1	190
SEP 09...	1	290	20	<1	57	30	0.3	<1	<1	1400

p. 270 table heading should read "DISCHARGE.....OCTOBER 1986 TO SEPTEMBER 1987".

p. 356-358 table heading should read "Discharge....water year 1987".

06340500 KNIFE RIVER AT HAZEN, ND
(National stream-quality accounting network station)

LOCATION.--Lat 47°17'07", long 101°37'18", in SW¼SE¼SE¼ sec.18, T.144 N., R.86 W., Mercer County, Hydrologic Unit 10130201, on left bank at downstream side of highway bridge, 0.5 mi south of Hazen, and 3 mi upstream from Antelope Creek.

DRAINAGE AREA.--2,240 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October to November 1928, March 1929 to September 1933, August 1937 to current year. Monthly discharge only for some periods, published in WSP 1309.

REVISED RECORDS.--WSP 1146: 1943. WSP 1279: 1930-31, 1932-33(M). WSP 1917: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,712.35 ft above National Geodetic Vertical Datum of 1929. Prior to Sept. 25, 1947, nonrecording gages at same site and datum.

REMARKS.--Estimated daily discharges: Nov. 7 to Mar. 22, Apr. 22-27, Aug. 13-17, Aug. 23 to Sept. 30. Records good except for estimated periods, which are poor. Slight regulation by Lake Ilo 81 mi upstream, capacity 7,130 acre-ft.

AVERAGE DISCHARGE.--54 years (1930-33, 1938-87), 181 ft^3/s, 131,100 acre-ft/yr; median of yearly mean discharges, 161 ft^3/s, 116,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 35,300 ft^3/s, June 24, 1966, gage height, 27.01 ft; no flow at times in 1933, 1959, 1962.

EXTREMES OUTSIDE PERIOD OF RECORD.--According to local residents, the floods of 1943 and 1950 were not exceeded during the period 1884 to 1942.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 6	----	4600	Ice jam	Mar. 23	1130	*8550	*23.80
Apr. 4	1815	1880	10.44				

Minimum daily discharge, 33 ft^3/s, Sept. 26, 27, 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	308	58	64	53	38	56	675	101	96	44	180	38
2	248	58	66	51	41	54	633	99	83	42	486	38
3	347	59	68	51	43	54	1330	99	76	40	586	37
4	349	60	66	51	47	57	1820	100	72	37	367	37
5	224	61	60	50	54	700	1270	101	69	37	314	45
6	170	69	56	51	64	4500	871	99	65	36	169	43
7	137	62	53	51	78	2500	714	96	61	35	108	42
8	121	50	50	51	150	1700	527	94	59	34	85	41
9	110	40	48	50	140	900	386	90	57	37	70	41
10	98	38	44	50	120	500	315	84	56	43	55	40
11	91	40	44	50	170	330	276	79	55	49	45	41
12	85	40	45	51	230	270	255	76	55	66	44	40
13	80	41	44	51	220	220	234	73	51	81	43	38
14	76	43	47	52	160	180	207	69	48	85	43	37
15	73	47	48	50	120	150	191	66	47	87	42	37
16	71	50	50	48	115	130	182	66	44	84	41	36
17	70	54	50	46	113	120	174	63	43	79	40	36
18	66	54	52	44	105	105	162	63	42	75	56	38
19	65	58	50	43	92	95	153	63	41	76	100	37
20	63	59	50	42	82	160	144	68	41	73	68	36
21	61	60	49	41	80	2000	135	85	44	72	57	36
22	60	61	47	40	77	7000	130	91	44	138	50	35
23	59	63	49	38	74	7980	122	90	46	542	42	35
24	58	64	50	36	66	6810	118	87	43	336	41	34
25	58	65	50	35	63	4460	113	84	60	335	48	34
26	58	66	50	34	62	2580	110	86	67	225	45	33
27	57	66	50	34	58	1840	109	134	77	250	42	33
28	57	66	50	34	57	1590	108	143	60	200	41	35
29	57	66	50	35	---	1350	105	166	50	142	40	34
30	56	66	52	37	---	1020	101	135	46	113	39	33
31	56	---	50	37	---	763	---	110	---	95	39	---
TOTAL	3489	1684	1602	1387	2719	50174	11670	2860	1698	3588	3426	1120
MEAN	113	56.1	51.7	44.7	97.1	1619	389	92.3	56.6	116	111	37.3
MAX	349	69	68	53	230	7980	1820	166	96	542	586	45
MIN	56	38	44	34	38	54	101	63	41	34	39	33
AC-FT	6920	3340	3180	2750	5390	99520	23150	5670	3370	7120	6800	2220

CAL YR 1986 TOTAL 95302 MEAN 261 MAX 8520 MIN 22 AC-FT 189000
WTR YR 1987 TOTAL 85417 MEAN 234 MAX 7980 MIN 33 AC-FT 169400

06340500 KNIFE RIVER AT HAZEN--CONTINUED
(National stream-quality accounting network station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1950, 51, 1969 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
OCT											
28...	1013	58	1580	8.51	17.0	8.0	7.0	12.5	106	390	87
DEC											
16...	1114	50	2380	8.14	1.0	1.5	--	11.0	79	--	--
JAN											
27...	1127	34	2360	7.95	4.5	1.5	2.6	10.6	77	<1	80
APR											
27...	1227	106	1400	--	20.0	16.0	--	--	--	--	--
MAY											
05...	1021	101	1490	8.48	25.0	16.5	1.2	9.2	94	<1	72
JUN											
10...	1301	56	1760	8.27	23.0	20.0	--	7.6	85	--	--
JUL											
28...	1036	203	1660	8.39	26.0	24.5	74	6.2	75	1800	K1700
SEP											
09...	0846	40	1460	8.47	10.0	14.5	--	8.3	82	--	--

DATE	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY, CARBON-ATE IT-FLD (MG/L CACO3) (00419)	BICAR-BONATE WATER WHOLE IT-FLD (MG/L) (00450)	CAR-BONATE WATER WHOLE IT-FLD (MG/L) (00447)
OCT											
28...	370	0	74	45	240	58	6	7.8	414	453	26
DEC											
16...	--	--	--	--	--	--	--	--	561	685	0
JAN											
27...	470	0	93	58	360	62	7	7.7	624	761	0
MAY											
05...	360	0	75	42	210	55	5	8.8	404	449	22
JUN											
10...	--	--	--	--	--	--	--	--	442	539	0
JUL											
28...	260	0	48	33	330	73	9	10	338	373	19
SEP											
09...	--	--	--	--	--	--	--	--	363	431	6

DATE	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2) (00405)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)
OCT											
28...	2.4	450	8.2	0.30	9.0	1120	1100	1.5	174	<0.010	0.180
DEC											
16...	7.8	--	--	--	--	--	--	--	--	--	--
JAN											
27...	13	680	8.7	0.40	15	1600	1600	2.2	146	<0.010	0.450
MAY											
05...	2.6	440	7.7	0.30	11	1060	1000	1.4	289	<0.010	0.110
JUN											
10...	4.6	--	--	--	--	--	--	--	--	--	--
JUL											
28...	2.6	590	4.9	0.50	8.9	1270	1200	1.7	696	0.020	0.220
SEP											
09...	2.3	--	--	--	--	--	--	--	--	--	--

Note: Field-parameter cross sections were not made during current year.

06340500 KNIFE RIVER AT HAZEN--CONTINUED
(National stream-quality accounting network station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, AMMONIA DISSOLVED (MG/L AS NH4) (71846)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	PHOSPHORUS, DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P) (00671)	ALUMINUM, DISSOLVED (UG/L AS AL) (01106)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BARIUM, DISSOLVED (UG/L AS BA) (01005)
OCT 28...	0.030	0.200	0.26	0.80	0.020	0.020	0.030	10	1	77
JAN 27...	0.140	0.130	0.17	0.90	0.020	0.010	0.010	<10	2	200
MAY 05...	0.120	0.110	0.14	1.5	0.160	0.070	0.060	<10	3	83
JUL 28...	0.080	0.070	0.09	1.6	0.210	0.100	0.020	20	2	80

DATE	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COBALT, DISSOLVED (UG/L AS CO) (01035)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, DISSOLVED (UG/L AS PB) (01049)	LITHIUM DISSOLVED (UG/L AS LI) (01130)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY DISSOLVED (UG/L AS HG) (71890)
OCT 28...	<0.5	<1	<1	<3	3	13	<5	50	36	<0.1
JAN 27...	<10	<1	<1	1	3	20	<5	60	140	<0.1
MAY 05...	<0.5	<1	<1	<3	4	9	<5	44	14	<0.1
JUL 28...	<0.5	<1	<1	<3	6	28	<5	41	1	<0.1

DATE	MOLYBDENUM, DISSOLVED (UG/L AS MO) (01060)	NICKEL, DISSOLVED (UG/L AS NI) (01065)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	SILVER, DISSOLVED (UG/L AS AG) (01075)	STRONTIUM, DISSOLVED (UG/L AS SR) (01080)	VANADIUM, DISSOLVED (UG/L AS V) (01085)	ZINC, DISSOLVED (UG/L AS ZN) (01090)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT 28...	<10	<1	<1	<1	1100	<6	13	--	--	--
JAN 27...	3	<1	<1	<1	1700	2	20	40	3.7	59
MAY 05...	<10	2	<1	<1	1000	<6	5	70	19	76
JUL 28...	<10	8	<1	<1	700	<6	<3	165	90	96

06340700 MISSOURI RIVER NEAR STANTON, ND

LOCATION.--Lat 47°17'14", long 101°20'25", in SW¼ sec.16, T.144 N., R.84 W., McLean County, Hydrologic Unit 10130101, on right bank 3 mi southeast of Stanton, 0.1 mi below Ft. Clark irrigation pumping station, 0.4 mi above the United Power Association power plant, and at mile 1,372.

DRAINAGE AREA.--182,000 mi^2, approximately.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--October 1959 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,650.00 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Sept. 30, 1964, at datum 50.00 ft lower.

REMARKS.--Stage regulated completely by releases from Garrison Dam (station 06338490) 18 mi upstream.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height recorded, 24.56 ft, Feb. 22, 1965; minimum daily recorded, 9.72 ft, Apr. 21, 1987.

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12.74	13.70	12.31	13.46	15.63	12.56	10.97	---	11.87	12.21	12.28	11.96
2	13.01	13.79	12.23	13.50	15.11	12.63	10.38	10.05	11.91	12.10	12.18	11.92
3	13.04	13.76	12.43	13.47	15.01	12.62	11.06	9.93	12.00	12.31	12.35	12.00
4	12.84	13.75	12.52	13.44	14.77	12.64	10.93	10.13	12.04	12.29	12.57	12.01
5	12.93	13.76	12.59	13.41	14.60	12.53	11.42	---	11.93	12.28	12.21	11.59
6	12.62	13.72	12.47	13.35	14.35	12.54	10.83	---	11.89	12.41	12.09	12.00
7	11.85	13.82	12.52	13.61	14.32	12.34	10.69	---	12.17	12.13	12.18	11.83
8	12.39	13.40	12.53	13.54	14.16	12.10	10.46	10.12	12.10	12.13	12.31	11.90
9	12.08	13.51	12.44	13.78	14.25	11.93	10.28	10.02	12.18	12.16	12.19	11.69
10	12.16	13.60	12.68	13.75	14.35	12.27	10.18	10.15	12.11	12.17	12.15	11.87
11	12.33	13.60	12.30	13.42	14.10	12.53	10.09	10.60	12.23	12.40	12.20	11.67
12	12.09	13.57	11.97	12.50	14.16	12.47	9.94	11.07	12.10	12.21	12.10	11.55
13	12.21	13.67	11.31	12.36	14.26	12.47	10.38	11.74	12.26	12.26	12.09	11.59
14	12.34	13.59	11.42	12.52	14.35	12.48	9.95	12.06	12.16	12.17	12.17	11.75
15	12.27	13.31	11.58	12.65	14.38	12.57	10.06	12.09	12.09	12.33	12.27	11.65
16	12.29	13.05	11.62	13.36	14.21	12.23	9.99	12.00	12.41	12.13	12.27	11.65
17	12.30	13.12	11.53	13.63	14.26	12.47	10.13	12.22	12.06	12.26	12.30	11.44
18	12.26	13.10	12.05	14.20	14.17	12.46	---	11.98	12.16	12.20	11.88	11.44
19	12.25	13.08	12.12	14.08	14.25	12.45	10.02	12.04	12.09	12.34	12.23	11.53
20	12.75	13.10	12.25	15.04	14.19	12.45	10.01	12.28	12.01	12.18	12.26	11.53
21	12.97	12.92	12.06	15.58	14.16	12.77	9.72	11.82	12.16	12.31	12.36	11.90
22	13.41	13.17	12.47	16.51	14.29	13.89	9.98	12.03	12.13	12.33	12.16	11.67
23	13.54	13.07	12.72	17.29	14.14	13.34	9.93	12.08	12.17	12.34	12.51	11.67
24	13.49	13.22	12.72	17.56	14.27	13.43	10.17	12.06	12.21	12.36	11.98	11.25
25	13.62	13.18	12.93	18.27	14.15	11.92	10.06	12.06	12.17	12.24	12.18	11.51
26	13.54	13.20	13.14	18.71	13.46	11.30	---	12.08	12.24	12.36	12.28	12.05
27	13.68	13.15	13.22	18.21	12.76	11.00	10.02	12.06	11.80	12.33	12.17	11.87
28	13.58	13.15	13.21	17.94	12.65	10.97	10.0	12.07	12.07	12.28	12.34	11.19
29	13.53	12.74	13.34	17.29	---	10.96	9.99	12.11	12.17	12.36	12.30	11.42
30	13.72	12.88	13.57	16.74	---	10.99	10.10	12.11	12.01	12.22	11.87	11.65
31	13.67	---	13.33	16.26	---	10.57	---	12.31	---	12.38	11.74	---
MEAN	12.8	13.4	12.4	14.8	14.2	12.3	---	---	12.1	12.3	12.2	11.7
MAX	13.72	13.82	13.57	18.71	15.63	13.89	---	---	12.41	12.41	12.57	12.05
MIN	11.85	12.74	11.31	12.36	12.65	10.57	---	---	11.80	12.10	11.74	11.19

06340900 MISSOURI RIVER NEAR HENSLER, ND

LOCATION.--Lat 47°16'45", long 101°11'03", in SW1/4 sec.22, T.144 N., R.83 W., McLean County, Hydrologic Unit 10130101, on left bank about 7.5 mi west of Washburn, and at mile 1,362.

DRAINAGE AREA.--183,000 mi^2, approximately.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--May 1959 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,640.00 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Sept. 30, 1964, at datum 40 ft lower.

REMARKS.--Stage regulated by releases from Garrison Dam (station 06338490) 28 mi upstream.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height recorded, 27.77 ft, Mar. 20, 1965; minimum daily recorded, 13.65 ft, June 04, 1986.

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16.87	17.84	16.38	---	21.91	16.86	15.24	14.13	16.31	16.37	16.58	16.21
2	17.31	17.97	16.58	17.85	21.47	16.82	14.59	14.35	16.06	16.40	16.48	16.20
3	17.41	18.01	16.77	17.83	21.14	16.83	15.34	14.20	16.41	16.46	16.61	16.21
4	17.18	17.96	16.86	17.77	20.76	16.90	15.09	14.47	16.36	16.56	16.86	16.26
5	17.26	18.00	16.92	17.74	20.44	16.85	15.74	14.17	16.27	16.58	16.57	15.93
6	17.15	17.98	---	17.67	19.92	16.89	15.09	14.32	16.14	16.62	16.41	16.38
7	16.25	18.04	16.91	17.91	19.47	16.67	14.93	14.14	16.43	16.55	16.50	16.07
8	16.76	17.69	16.66	17.86	18.95	16.46	14.97	14.41	16.48	16.38	16.60	15.99
9	16.59	---	---	18.14	18.83	16.27	14.53	14.28	16.40	16.42	16.50	15.95
10	16.51	---	---	18.09	18.77	16.59	14.46	14.47	16.43	16.47	16.35	16.12
11	16.71	---	17.03	18.04	18.52	16.84	14.43	14.77	16.49	16.60	16.53	16.00
12	16.45	---	---	17.06	18.43	16.75	14.22	15.17	16.42	16.54	16.38	15.95
13	16.54	---	16.06	16.74	18.51	16.69	14.61	15.98	16.55	16.47	16.36	15.84
14	16.69	17.79	16.02	---	18.72	16.70	14.28	16.43	16.39	16.48	16.43	15.92
15	16.61	---	16.05	---	18.84	16.78	14.35	16.33	16.44	16.49	16.55	15.92
16	16.67	---	16.05	---	18.47	16.45	14.26	16.41	16.54	16.43	16.63	15.91
17	16.64	---	15.94	---	18.49	16.68	14.46	16.54	16.55	16.71	16.50	15.85
18	16.64	---	16.36	---	18.45	16.65	13.95	16.33	16.39	16.41	16.11	15.60
19	16.45	17.33	16.64	---	18.46	16.65	14.27	16.39	16.44	16.61	16.43	15.90
20	17.05	---	---	---	18.43	16.67	14.31	16.62	16.32	16.41	16.48	15.79
21	17.28	17.25	---	---	18.37	17.03	14.08	16.21	16.41	16.65	16.60	16.23
22	17.69	17.28	16.82	---	18.50	18.00	14.23	16.33	16.32	16.60	16.44	15.92
23	17.87	17.31	17.02	---	18.33	17.82	14.19	16.40	16.47	16.59	16.85	15.91
24	17.80	17.45	17.11	---	18.42	17.80	14.37	16.40	16.52	16.61	16.14	15.37
25	17.95	17.40	17.28	---	18.33	16.45	14.51	16.41	16.46	16.46	16.47	15.76
26	17.86	17.47	---	---	17.98	15.64	14.15	16.40	16.48	16.66	16.53	16.40
27	17.96	17.46	17.58	---	17.02	15.33	14.25	16.42	16.09	16.61	16.43	16.17
28	17.88	17.41	17.54	---	17.09	15.24	14.34	16.39	16.29	16.57	16.55	15.32
29	17.84	17.11	17.61	22.73	---	15.21	14.28	16.47	16.40	16.49	16.77	15.47
30	17.96	17.14	17.98	22.55	---	15.29	14.42	16.43	16.34	16.57	16.16	15.84
31	17.93	---	17.69	22.35	---	14.94	---	16.53	---	16.74	15.86	---
MEAN	17.2	---	---	---	19.0	16.5	14.5	15.6	16.4	16.5	16.5	15.9
MAX	17.96	---	---	---	21.91	18.00	15.74	16.62	16.55	16.74	16.86	16.40
MIN	16.25	---	---	---	17.02	14.94	13.95	14.13	16.06	16.37	15.86	15.32

06340905 COAL LAKE COULEE NEAR HENSLER, ND

LOCATION.--Lat 47°18'09", long 101°07'52", in SW¼SE¼SE¼ sec.12, T.144 N., R.83 W., McLean County, Hydrologic Unit 10130101, on right bank 100 ft upstream from bridge, on county road 4.5 mi west of Washburn, 3.6 mi northwest of Hensler, and 0.3 mi upstream from mouth.

DRAINAGE AREA.--70.5 mi^2, of which 53.3 mi^2 is probably noncontributing, revised.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1977 to current year.

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

REMARKS.--Estimated daily discharges: Nov. 7 to Apr. 1, June 25 to July 1, Aug. 5-10, and Sept. 4-11. Records fair.

AVERAGE DISCHARGE.--10 years, 2.82 ft^3/s, 2,040 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 926 ft^3/s, Aug. 20, 1980, gage height, 8.61 ft, from rating extended above 600 ft^3/s on basis of a culvert computation of peak flow; no flow for many months each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 40 ft^3/s and maximum (*).

Date	Time	Discharge (ft^3/s)	Gage Height (ft)	Date	Time	Discharge (ft^3/s)	Gage Height (ft)
Mar. 6	1630	*280	*4.66	Aug. 14	2130	52	2.46
Mar. 21	----	a200	unknown				

a - Estimated
No flow for several months.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.03	.25	48	8.6	6.5	.47	.96	.39
2	.00	.00	.00	.00	1.0	.25	45	8.0	5.6	.36	1.1	.29
3	.00	.00	.00	.00	.70	1.0	49	9.0	5.6	.21	.55	.14
4	.00	.00	.00	.00	.35	2.0	47	9.1	6.1	.15	.34	.10
5	.00	.00	.00	.00	.40	4.0	45	8.4	6.3	.15	.23	.09
6	.00	.00	.00	.00	.50	100	44	7.6	6.4			
7	.00	.00	.00	.00	5.0	50	43	7.0	6.5	.0	.10	.05
8	.00	.00	.00	.00	4.5	20	41	6.5	6.3	.0	.05	.04
9	.00	.00	.00	.00	3.5	12	38	5.9	5.3	.41	.02	.03
10	.00	.00	.00	.00	2.5	6.0	36	5.4	5.4	.58	.01	.02
11	.00	.00	.00	.00	1.3	5.0	35	4.5	5.2	.58	.00	.01
12	.00	.00	.00	.00	1.8	3.5	32	4.4	4.5	1.1	.00	.00
13	.00	.00	.00	.00	1.2	3.2	30	3.9	3.9	.66	.00	.00
14	.00	.00	.00	.00	.90	3.0	27	3.1	3.3	.49	7.3	.00
15	.00	.00	.00	.00	.70	3.0	24	3.1	3.0	.34	6.8	.00
16	.00	.00	.00	.00	.80	2.9	23	3.2	2.4	.21	2.7	.00
17	.00	.00	.00	.00	.60	2.8	22	3.0	2.1	.12	2.2	.00
18	.00	.00	.00	.00	.50	3.0	21	3.0	1.6	.52	2.1	.00
19	.00	.00	.00	.00	.48	5.0	19	2.9	1.2	1.3	1.4	.00
20	.00	.00	.00	.00	.45	10	17	3.0	1.1	.72	1.2	.00
21	.00	.00	.00	.00	.43	150	16	4.7	1.0	.62	1.0	.00
22	.00	.01	.00	.00	.40	100	16	3.8	.97	.68	.77	.00
23	.00	.01	.00	.00	.37	60	15	3.2	1.6	.62	.56	.00
24	.00	.02	.00	.00	.35	50	15	3.0	.95	.43	.54	.00
25	.00	.03	.00	.00	.33	45	14	3.0	.90	.30	.86	.00
26	.00	.05	.00	.00	.30	40	14	3.0	.80	.24	1.3	.00
27	.00	.01	.00	.00	.27	35	12	12	.70	.24	1.1	.00
28	.00	.00	.00	.00	.26	30	12	7.7	.64	.26	.97	.00
29	.00	.00	.00	.00	---	27	10	7.1	.60	.76	.79	.00
30	.00	.00	.00	.01	---	25	9.4	6.8	.54	.55	.62	.00
31	.00	---	.00	.02	---	55	---	6.3	---	.64	.51	---
TOTAL	.00	.13	.00	.03	29.92	853.90	819.4	170.2	97.00	13.81	36.21	1.23
MEAN	.00	.0	.00	.00	1.07	27.5	27.3	5.49	3.23	.45	1.17	.04
MAX	.00	.05	.00	.02	5.0	150	49	12	6.5	1.3	7.3	.39
MIN	.00	.00	.00	.00	.03	.25	9.4	2.9	.54	.00	.00	.00
AC-FT	.0	.3	.0	.1	59	1690	1630	338	192	27	72	2.4

CAL YR 1986 TOTAL 803.28 MEAN 2.20 MAX 30 MIN .00 AC-FT 1590
WTR YR 1987 TOTAL 2021.81 MEAN 5.54 MAX 150 MIN .00 AC-FT 4010

06340905 COAL LAKE COULEE NEAR HENSLER, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1978 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)
FEB										
06...	1221	0.49	710	--	10.0	0.0	--	--	--	--
12...	1636	1.7	700	--	1.0	0.0	--	--	--	--
MAR										
03...	1052	0.97	1320	--	-2.5	-0.5	--	--	--	--
05...	1442	3.6	1400	--	10.5	0.0	--	--	--	--
06...	1630	270	250	--	20.0	0.0	--	--	--	--
09...	1324	13	2300	8.34	-5.0	-0.5	12.1	81	760	200
24...	1315	51	1060	--	3.5	1.5	--	--	--	--
31...	1412	56	1040	--	8.0	2.0	--	--	--	--
APR										
21...	1142	17	1320	--	11.5	9.0	--	--	--	--
MAY										
06...	1442	7.7	1470	8.46	24.5	19.5	8.0	87	500	150
JUL										
01...	1334	0.47	1830	8.66	24.0	24.0	8.5	102	620	140
29...	1338	0.84	1540	8.61	33.0	26.5	8.4	106	440	84
SEP										
02...	1359	0.27	1760	8.41	26.0	18.0	8.8	94	510	110

DATE	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM AD-SORP-TION RATIO (00931)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2) (00405)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, RESIDUE AT 105 DEG. C, SUS-PENDED (MG/L) (00530)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE) (01045)
MAR										
09...	92	130	250	4	568	5.0	780	1760	20	430
MAY										
06...	66	81	160	3	343	2.3	490	1090	30	820
JUL										
01...	82	100	230	4	490	2.0	660	1420	7	20
29...	56	74	230	5	403	1.7	510	1210	20	540
SEP										
02...	69	82	240	5	451	2.9	570	1350	5	330

MISSOURI RIVER MAIN STEM

06341000 MISSOURI RIVER AT WASHBURN, ND

LOCATION.--Lat 47°17'20", long 101°02'15", in SE¼SW¼ sec.14, T.144 N., R.82 W., McLean County, Hydrologic Unit 10130101, on left bank near municipal water plant in Washburn, and at mile 1,355.

DRAINAGE AREA.--184,000 mi^2, approximately.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--August 1960 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,640.00 ft above National Geodetic Vertical Datum of 1929. Prior to Sept. 30, 1964, at datum 40 ft lower.

REMARKS.--Stage regulated by releases from Garrison Dam (station 06338490) 35 mi upstream.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height recorded, 22.76 ft, Jan. 11, 1964; minimum daily recorded, 9.73 ft, May 7, 1978.

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12.35	13.45	12.39	13.29	18.10	12.66	11.04	---	12.08	12.03	12.30	11.96
2	12.80	13.53	12.31	13.51	17.91	12.60	10.55	10.16	11.72	12.12	12.18	11.97
3	12.91	13.51	12.39	13.52	17.78	12.65	11.13	---	12.13	12.12	12.28	11.95
4	12.74	13.51	12.48	13.32	17.60	12.83	10.94	10.27	12.04	12.24	12.48	12.00
5	12.78	13.52	12.52	13.31	17.37	12.67	11.54	---	11.97	12.29	12.29	11.75
6	12.76	13.50	12.44	13.22	16.89	12.72	10.96	---	11.84	12.28	12.12	12.15
7	11.91	13.52	12.50	13.40	16.30	12.54	10.80	---	12.08	12.31	12.19	11.89
8	12.30	13.28	12.47	13.48	15.48	12.27	10.90	10.21	12.16	12.11	12.29	11.71
9	12.23	13.26	12.38	13.67	15.08	12.09	10.37	10.11	12.06	12.14	12.21	11.79
10	12.10	13.37	13.13	13.68	14.68	12.48	10.32	10.28	12.15	12.20	12.02	11.92
11	12.28	13.35	12.78	13.91	14.27	12.62	10.30	10.48	12.16	12.27	12.27	11.86
12	12.09	13.38	12.15	12.76	14.00	12.59	10.09	10.92	12.12	12.26	12.11	11.84
13	12.14	13.41	12.09	12.40	14.02	12.38	10.36	11.68	12.24	12.16	12.08	11.74
14	12.25	13.36	11.67	12.50	14.26	12.22	10.18	12.17	12.05	12.21	12.14	11.74
15	12.22	13.30	11.63	12.60	14.40	12.21	10.20	12.04	12.16	12.18	12.27	---
16	12.27	12.93	11.60	13.35	14.04	12.15	10.13	12.14	12.16	12.16	12.36	---
17	12.24	12.96	11.55	---	14.05	12.17	10.28	---	12.28	12.38	12.20	---
18	12.24	12.94	12.01	---	14.05	12.27	---	---	12.05	12.10	11.86	11.49
19	12.02	13.00	12.18	---	14.04	12.43	10.16	---	12.12	12.31	12.15	11.81
20	12.56	12.98	12.20	---	14.05	12.42	10.12	---	12.01	12.12	12.25	11.71
21	12.77	12.98	12.17	---	14.00	12.77	10.03	---	12.06	12.32	12.30	12.08
22	13.12	12.88	12.29	---	14.11	13.70	10.04	---	11.98	12.29	12.18	11.83
23	13.31	12.96	12.52	---	13.99	13.71	---	---	12.17	12.29	12.51	11.80
24	13.25	13.07	12.63	---	14.04	13.55	10.17	---	12.20	12.30	11.88	11.29
25	13.40	13.04	12.81	---	13.99	12.39	10.40	---	12.14	12.16	12.17	11.66
26	13.36	13.07	12.97	---	13.79	11.52	---	---	12.12	12.32	12.22	12.22
27	13.43	13.07	13.10	---	12.77	11.20	10.11	12.12	11.82	12.30	12.15	12.05
28	13.39	12.99	13.06	---	12.97	11.11	10.19	12.07	11.99	12.27	12.23	11.31
29	13.33	12.75	13.11	18.75	---	11.08	10.13	12.14	12.07	12.18	12.49	11.38
30	13.44	12.74	13.48	18.53	---	11.13	10.27	12.10	12.08	12.25	11.94	11.74
31	13.45	---	13.20	18.36	---	10.88	---	12.13	---	12.43	11.59	---
MEAN	12.7	13.2	12.5	---	14.9	12.3	---	---	12.1	12.2	12.2	---
MAX	13.45	13.53	13.48	---	18.10	13.71	---	---	12.28	12.43	12.51	---
MIN	11.91	12.74	11.55	---	12.77	10.88	---	---	11.72	12.03	11.59	---

06341410 TURTLE CREEK ABOVE WASHBURN, ND

LOCATION.--Lat 47°23'06", long 100°54'43", in NW¼NE¼NE¼ sec.18, T.145 N., R.80 W., McLean County, Hydrologic Unit 10130101, on right bank 250 ft downstream from bridge on county highway, 8.5 mi northeast of Washburn, and 8.8 mi south of Turtle Lake.

DRAINAGE AREA.--350 mi^2, approximately, of which 195 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1986 to September 1987.

GAGE.--Water-stage recorder. Elevation of gage is 1,780 ft from topographic map.

REMARKS.--Estimated daily discharges: Oct. 1-6, 16-25, Nov. 7 to Mar. 6, 9-20, and 23-31. Records good except for periods of estimated daily discharges, which are fair.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 845 ft^3/s, Mar. 21, gage height, 6.94 ft; minimum daily discharge, 0.04 ft^3/s, Nov. 12-14.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.54	.48	.20	.11	4.0	1.1	118	19	20	2.1	8.1	12
2	.54	.49	.19	.11	3.0	1.1	111	18	19	1.8	7.7	12
3	.56	.46	.18	.12	2.0	1.0	111	19	18	1.2	7.6	12
4	.56	.45	.17	.13	1.2	1.0	106	25	18	.92	7.8	12
5	.54	.57	.15	.14	1.4	4.0	97	24	17	.82	7.5	12
6	.54	1.1	.14	.13	7.0	200	81	22	14	.66	7.2	14
7	.52	.50	.13	.11	25	435	68	21	12	.47	7.1	16
8	.52	.10	.12	.11	23	121	61	20	10	.28	6.9	17
9	.52	.07	.11	.10	23	100	58	19	9.3	.22	7.1	18
10	.58	.06	.11	.10	20	60	56	18	9.6	.20	7.0	19
11	.63	.05	.10	.11	18	40	57	16	9.9	.55	6.6	20
12	.54	.04	.10	.13	12	30	54	15	9.0	2.0	6.2	21
13	.52	.04	.10	.15	9.3	28	52	13	7.7	2.0	5.9	21
14	.47	.04	.11	.14	8.0	27	50	12	6.7	1.9	7.0	21
15	.41	.05	.12	.12	6.0	25	48	11	5.7	1.4	9.9	20
16	.36	.06	.13	.10	4.0	24	47	11	4.8	1.6	13	19
17	.35	.08	.12	.09	3.0	24	47	9.9	4.0	.34	18	19
18	.34	.07	.11	.08	2.0	23	46	8.9	3.2	.83	15	19
19	.32	.07	.12	.09	1.7	24	42	8.0	2.7	7.6	12	19
20	.31	.08	.12	.09	1.5	170	40	7.9	2.6	14	11	19
21	.30	.10	.11	.10	1.5	767	44	13	2.4	12	11	18
22	.30	.15	.11	.09	1.6	439	37	16	2.6	6.2	10	17
23	.29	.17	.12	.09	1.5	330	32	14	7.3	3.8	9.3	16
24	.29	.16	.13	.08	1.5	180	31	11	15	2.6	9.2	15
25	.40	.20	.13	.08	1.3	112	29	10	14	1.9	12	15
26	.71	.19	.12	.08	1.3	100	27	10	8.0	1.1	16	14
27	.82	.20	.12	.10	1.3	85	26	50	4.9	.95	17	14
28	.84	.21	.13	.20	1.2	75	25	64	3.7	1.1	17	14
29	.68	.21	.12	.50	---	60	23	32	3.1	3.0	15	15
30	.66	.19	.11	.85	---	50	21	22	2.5	6.4	14	15
31	.70	---	.12	2.5	---	60	---	20	---	6.5	12	---
TOTAL	15.66	6.64	3.95	6.93	186.3	3597.2	1645	579.7	266.7	86.44	321.1	495
MEAN	.51	.22	.13	.22	6.65	116	54.8	18.7	8.89	2.79	10.4	16.5
MAX	.84	1.1	.20	2.5	25	767	118	64	20	14	18	21
MIN	.29	.04	.10	.08	1.2	1.0	21	7.9	2.4	.20	5.9	12
AC-FT	31	13	7.8	14	370	7140	3260	1150	529	171	637	982

WTR YR 1987 TOTAL 7210.59 MEAN 19.8 MAX 767 MIN .04 AC-FT 14300

06341410 TURTLE CREEK ABOVE WASHBURN, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--March 1987 to September 1987.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)
OCT										
06...	1349	--	--	--	24.0	14.5	--	--	--	--
DEC										
15...	1100	0.12	3800	--	3.5	1.5	--	--	--	--
JAN										
30...	1107	0.85	4200	--	-1.0	1.5	--	--	--	--
FEB										
13...	1059	9.3	1700	--	-1.5	-0.5	--	--	--	--
MAR										
07...	1517	411	640	8.80	9.0	1.0	16	130	0	13
APR										
01...	1434	123	940	--	5.0	0.5	--	--	--	--
MAY										
06...	1221	22	1480	8.59	22.0	18.0	2.3	280	0	23
JUN										
30...	1238	2.8	1680	8.60	26.5	21.5	2.0	300	0	23
JUL										
31...	1039	6.5	1500	8.23	27.0	26.0	14	280	0	23
SEP										
10...	1052	20	1830	8.42	15.5	15.0	5.4	380	0	21

DATE	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2) (00405)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)
MAR										
07...	24	89	56	3	16	226	0.7	110	4.9	<0.10
MAY										
06...	55	240	63	6	19	585	2.9	270	8.9	0.20
JUN										
30...	60	310	67	8	23	626	3.0	360	11	0.20
JUL										
31...	53	280	67	7	23	590	6.7	310	9.7	0.20
SEP										
10...	79	320	62	7	32	740	5.4	350	11	0.20

DATE	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	PHOS-PHORUS, ORTHO, DIS-SOLVED (MG/L AS P) (00671)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)
MAR									
07...	11	447	410	0.61	496	0.540	0.310	190	620
MAY									
06...	7.4	1020	980	1.4	60	<0.100	0.070	610	39
JUN									
30...	0.6	1190	1200	1.6	9.0	<0.100	0.100	760	78
JUL									
31...	13	1120	1100	1.5	20	<0.100	0.330	810	85
SEP									
10...	8.3	1290	1300	1.8	69	--	--	890	200

06341800 PAINTED WOODS CREEK NEAR WILTON, ND

LOCATION.--Lat 47°16'30", long 100°47'30", in SW1/4SW1/4 sec.23, T.144 N., R.80 W., McLean County, Hydrologic Unit 10130101, on right bank 600 ft upstream from county highway bridge, 7 mi upstream from Yanktonai Creek, and 8 mi north of Wilton.

DRAINAGE AREA.--427 mi^2, approximately, of which about 310 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1957 to September 1981, August 1982 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,760 ft, from topographic map.

REMARKS.--Estimated daily discharges: Nov. 7 to Apr. 4. Records good except those for period of estimated daily discharges, which are fair. Since the fall of 1982 Missouri River basin water has been diverted into the stream at a point several miles upstream.

AVERAGE DISCHARGE.--5 years (1982-87), 34.2 ft^3/s, 24,780 acre-ft/yr; 24 years prior to the diversion of Missouri River water into the basin, (1958-81), 8.07 ft^3/s, 5,850 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,050 ft^3/s, Apr. 19, 1979, gage height, 9.64 ft; no flow for many days most years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,050 ft^3/s, Mar. 22, gage height, 7.60; minimum daily discharge 3.0 ft^3/s, Nov. 10.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	42	35	34	29	37	20	130	47	44	32	48	36
2	43	34	34	29	37	21	170	47	43	35	53	36
3	43	35	34	29	36	19	120	48	44	34	56	34
4	41	35	33	30	35	19	110	54	40	32	49	36
5	42	38	33	29	37	36	104	50	40	34	45	36
6	41	38	33	29	41	150	84	47	43	31	45	35
7	40	35	33	27	56	200	64	45	44	29	44	34
8	41	30	33	28	64	150	50	45	43	23	42	34
9	41	15	32	28	60	110	41	44	39	25	42	33
10	38	3.0	31	29	58	80	36	42	41	34	41	33
11	41	10	31	29	60	50	33	43	42	40	38	36
12	38	13	32	29	110	20	30	39	40	39	39	34
13	37	14	34	27	60	15	27	42	38	26	39	16
14	37	12	37	25	33	12	26	49	37	24	42	9.1
15	37	15	42	26	24	13	37	45	36	33	46	11
16	37	19	42	27	23	9.0	40	48	35	32	45	33
17	38	18	39	28	20	7.0	42	48	33	36	42	37
18	38	19	38	28	18	6.0	41	45	34	41	41	36
19	38	23	35	32	17	6.5	36	44	33	66	41	36
20	37	30	35	30	16	50	38	48	33	52	41	35
21	37	32	37	30	18	400	33	61	34	48	39	35
22	37	33	35	28	16	920	32	50	32	51	39	33
23	37	36	34	27	15	820	33	46	34	45	37	32
24	36	36	33	29	14	650	32	46	33	45	38	31
25	37	37	32	31	13	350	35	46	31	46	44	31
26	37	37	33	33	15	270	45	45	32	47	47	34
27	37	35	33	35	20	230	45	68	31	46	43	34
28	36	34	31	36	19	118	43	57	32	46	40	35
29	36	34	30	37	---	109	43	52	34	51	39	34
30	36	34	29	37	---	80	43	49	33	48	39	33
31	35	---	29	36	---	88	---	46	---	46	37	---
TOTAL	1191	819.0	1051	927	972	5028.5	1643	1486	1108	1217	1321	962.1
MEAN	38.4	27.3	33.9	29.9	34.7	162	54.8	47.9	36.9	39.3	42.6	32.1
MAX	43	38	42	37	110	920	170	68	44	66	56	37
MIN	35	3.0	29	25	13	6.0	26	39	31	23	37	9.1
AC-FT	2360	1620	2080	1840	1930	9970	3260	2950	2200	2410	2620	1910

CAL YR 1986 TOTAL 14438.4 MEAN 39.6 MAX 400 MIN 1.6 AC-FT 28640
WTR YR 1987 TOTAL 17725.6 MEAN 48.6 MAX 920 MIN 3.0 AC-FT 35160

06341800 PAINTED WOODS CREEK NEAR WILTON, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1959-64, 1970 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)
OCT										
29...	1450	35	--	8.66	9.0	9.0	4.5	450	190	58
DEC										
15...	1317	42	1320	8.20	7.5	1.5	--	--	--	--
JAN										
26...	1430	33	1340	--	2.5	1.5	--	--	--	--
FEB										
13...	1229	59	1050	--	1.0	0.0	--	--	--	--
MAR										
05...	1702	--	--	--	8.0	0.0	--	--	--	--
09...	1101	110	420	7.87	-10.0	0.0	6.7	120	39	22
24...	1118	647	275	--	3.0	2.0	--	--	--	--
APR										
21...	1329	31	1400	8.55	15.5	12.0	6.5	430	110	66
JUN										
30...	1012	33	1170	8.26	23.0	21.0	6.0	460	210	62
JUL										
31...	1301	45	1350	8.14	29.5	28.5	18	440	180	60
SEP										
10...	1313	32	1390	8.52	19.0	17.0	4.9	430	180	59

DATE	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2) (00405)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)
OCT										
29...	74	180	45	4	17	263	1.1	590	20	0.40
MAR										
09...	15	31	34	1	12	78	2.0	120	2.8	<0.10
APR										
21...	64	160	44	3	14	319	1.7	460	17	0.30
JUN										
30...	73	170	44	4	17	246	2.6	600	20	0.50
JUL										
31...	70	160	43	3	16	255	3.6	440	16	0.40
SEP										
10...	69	160	43	3	17	247	1.4	540	17	0.40

DATE	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	PHOS-PHORUS, ORTHO, DIS-SOLVED (MG/L AS P) (00671)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)
OCT									
29...	7.1	1120	1100	1.5	106	<0.100	0.030	350	8
MAR									
09...	8.6	270	260	0.37	80	0.740	0.120	50	200
APR									
21...	12	1000	990	1.4	85	<0.100	0.030	300	46
JUN									
30...	3.2	1060	1100	1.4	93	0.100	0.020	330	9
JUL									
31...	10	1010	930	1.4	123	<0.100	0.020	340	18
SEP									
10...	5.4	1010	1000	1.4	88	<0.100	<0.010	300	<3

06342020 MISSOURI RIVER AT PRICE, ND

LOCATION.--Lat 47°04'47", long 100°55'55", in NW1/4 sec.34, T.142 N., R.81 W., Oliver County, Hydrologic Unit 10130101, on right bank 0.5 mi south of Price, and at mile 1,338.

DRAINAGE AREA.--185,000 mi^2, approximately.

GAGE-HEIGHT RECORDS

PERIOD OF RECORD.--November 1959 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,620.00 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Sept. 30, 1964, at datum 20 ft lower.

REMARKS.--Stage regulated by releases from Garrison Dam (station 06338490) 52 mi upstream.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height recorded, 30.12 ft, Jan. 22, 1967; minimum daily recorded, 17.68 ft, Apr. 22, 1987.

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20.09	21.28	20.33	21.47	25.64	20.84	18.72	17.72	20.05	19.80	20.19	19.70
2	20.58	21.34	20.14	22.09	25.51	20.73	18.54	17.77	19.63	19.95	20.09	19.72
3	20.75	21.35	20.15	22.76	25.38	20.74	18.77	17.84	19.90	19.89	20.09	19.67
4	20.70	21.36	20.29	22.58	25.37	20.64	18.75	17.86	19.87	20.06	20.22	19.71
5	20.66	21.36	20.29	21.65	25.31	20.50	19.08	17.78	19.82	20.09	20.21	19.62
6	20.68	21.35	20.26	21.34	25.18	20.51	18.88	17.83	19.73	20.05	20.04	19.72
7	20.01	21.34	20.32	21.39	25.11	20.61	18.62	17.82	19.83	20.15	20.02	19.63
8	20.04	21.26	20.34	21.95	24.97	20.30	18.70	17.73	19.95	19.94	20.11	19.46
9	20.12	21.09	20.28	22.28	24.82	19.93	18.21	17.83	19.87	19.95	20.07	19.58
10	19.98	21.19	21.08	22.77	24.96	20.15	18.13	17.91	19.98	20.04	19.91	19.56
11	20.10	21.21	21.68	23.47	24.87	20.67	18.10	17.99	19.95	20.05	20.09	19.55
12	19.99	21.24	21.19	22.53	24.11	20.51	17.96	18.47	19.98	20.15	20.00	19.48
13	19.93	21.27	21.80	21.32	23.28	20.33	17.98	19.16	20.02	19.99	19.93	19.36
14	20.05	21.26	23.05	20.89	23.16	20.25	18.02	19.80	19.91	20.05	19.96	19.38
15	20.07	21.24	22.44	21.52	24.85	20.35	17.93	19.80	19.98	20.00	20.07	19.45
16	20.10	20.91	21.37	24.17	24.47	20.15	17.89	19.92	19.94	20.05	20.14	19.42
17	20.07	20.84	20.60	24.83	23.43	20.17	17.94	19.86	20.16	20.12	20.02	19.46
18	20.08	20.83	20.33	25.06	22.83	20.23	17.78	19.89	19.88	19.98	19.86	19.19
19	19.88	20.89	20.63	25.32	22.45	20.24	17.87	19.85	19.97	20.15	19.90	19.39
20	20.27	20.81	20.65	24.81	22.26	20.28	17.84	19.96	19.90	20.07	20.02	19.38
21	20.55	20.87	20.99	25.28	22.05	20.85	17.80	19.90	19.87	20.11	20.08	19.55
22	20.87	20.65	20.95	25.37	22.04	21.70	17.68	19.76	19.82	20.12	20.04	19.53
23	21.16	20.80	20.81	25.48	21.95	22.03	17.78	19.85	19.99	20.14	20.12	19.44
24	21.15	20.87	20.79	25.65	21.90	21.64	17.80	19.88	19.99	20.13	19.92	19.13
25	21.25	20.87	20.84	25.69	21.96	20.78	18.09	19.89	19.96	20.06	19.95	19.26
26	21.28	20.86	21.03	25.69	21.85	19.66	17.76	19.89	19.91	20.10	19.99	19.63
27	21.25	20.89	21.15	25.95	20.80	19.26	17.81	20.00	19.80	20.13	19.99	19.69
28	21.28	20.80	21.11	26.00	20.80	19.03	17.86	19.92	19.76	20.13	19.98	19.25
29	21.19	20.71	21.07	26.00	---	18.96	17.82	19.98	19.83	20.08	20.19	19.08
30	21.22	20.46	21.52	25.89	---	18.89	17.89	19.95	19.92	20.14	19.83	19.34
31	21.31	---	21.31	25.79	---	18.78	---	19.93	---	20.22	19.53	---
MEAN	20.5	21.0	20.9	23.8	23.6	20.3	18.1	19.1	19.9	20.1	20.0	19.5
MAX	21.31	21.36	23.05	26.00	25.64	22.03	19.08	20.00	20.16	20.22	20.22	19.72
MIN	19.88	20.46	20.14	20.89	20.80	18.78	17.68	17.72	19.63	19.80	19.53	19.08

06342260 SQUARE BUTTE CREEK BELOW CENTER, ND

LOCATION.--Lat 47°03'25", long 101°11'35", in SE¼ sec.4, T.141 N., R.83 W., Oliver County, Hydrologic Unit 10130101, on right bank at southeast corner of farmyard, and 6 mi southeast of Center.

DRAINAGE AREA.--146 mi^2.

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder. Elevation of gage is 1,865 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Estimated daily discharges: Oct. 1 to Mar. 6 and May 17 to Sept. 30. Records fair. Flow regulated by Nelson Lake 1.5 miles upstream beginning Aug. 24, 1967, capacity 5,000 acre-ft. The capacity of Nelson Lake was increased to 10,000 acre-ft in Aug. 1975.

AVERAGE DISCHARGE.--22 years, 12.3 ft^3/s, 8,910 acre-ft/yr; median of yearly mean discharges, 13 ft^3/s, 9,420 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,700 ft^3/s, June 24, 1966, gage height, 14.35 ft; no flow Feb. 14-26, 1966.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,180 ft^3/s, Mar. 21, gage height, 9.92 ft; minimum daily 0.70 ft^3/s, Sept. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.1	1.3	1.3	1.1	1.3	1.0	68	2.1	1.8	1.5	1.7	.90
2	1.2	1.3	1.3	1.1	1.3	1.0	57	2.1	1.7	1.4	2.3	.85
3	1.2	1.4	1.3	1.1	1.3	1.1	77	2.5	1.7	1.4	1.7	.80
4	1.3	1.5	1.3	1.2	1.3	2.0	110	2.2	1.7	1.4	1.5	.87
5	1.2	1.5	1.3	1.3	1.3	5.0	77	2.1	1.6	1.3	1.4	.86
6	1.2	1.5	1.2	1.2	1.4	800	52	2.0	1.6	1.3	1.4	.85
7	1.2	1.5	1.2	1.2	2.5	724	33	1.8	1.6	1.2	1.3	.84
8	1.1	1.3	1.2	1.2	2.3	237	32	1.8	1.6	1.2	1.3	.82
9	1.1	1.1	1.2	1.2	2.0	117	32	1.9	1.6	1.3	1.3	.82
10	1.1	1.1	1.2	1.2	1.7	71	31	1.7	1.6	2.5	1.2	.84
11	1.0	1.0	1.2	1.3	1.6	68	31	1.6	1.8	2.0	1.2	.86
12	1.0	1.0	1.1	1.4	1.8	65	9.4	1.4	1.8	2.3	1.2	.82
13	1.0	.90	1.1	1.3	1.6	59	4.3	1.4	1.7	1.9	1.1	.80
14	1.0	1.0	1.1	1.3	1.4	56	3.9	1.4	1.6	1.5	1.1	.80
15	1.1	1.0	1.1	1.3	1.2	29	3.7	1.2	1.6	1.3	2.0	.80
16	1.2	1.0	1.2	1.3	1.1	25	3.7	1.2	1.6	1.3	1.6	.78
17	1.3	1.0	1.2	1.2	1.1	24	3.8	1.2	1.8	1.2	1.5	.78
18	1.5	.95	1.2	1.2	1.1	47	3.7	1.1	1.7	1.2	1.5	.78
19	1.6	1.0	1.2	1.3	1.1	47	3.3	1.1	1.6	2.6	1.4	.76
20	1.5	1.0	1.1	1.3	1.2	63	3.3	1.1	1.5	2.3	1.2	.76
21	1.5	1.1	1.1	1.3	1.1	1490	3.2	2.8	2.5	1.5	1.1	.76
22	1.5	1.2	1.1	1.2	1.1	972	3.3	2.3	2.8	1.5	1.1	.75
23	1.4	1.3	1.2	1.2	1.1	785	2.9	2.0	2.0	1.4	1.0	.74
24	1.3	1.4	1.2	1.2	1.0	398	2.8	1.9	2.0	1.5	1.2	.74
25	1.3	1.4	1.1	1.2	1.0	183	2.9	1.8	1.8	1.4	2.5	.73
26	1.4	1.4	1.1	1.2	1.0	30	2.9	1.8	1.7	1.3	1.8	.72
27	1.4	1.4	1.1	1.2	1.0	6.8	2.6	2.5	1.7	1.3	1.5	.72
28	1.4	1.4	1.2	1.3	1.0	5.8	2.4	2.0	1.6	1.3	1.2	.72
29	1.4	1.3	1.1	1.3	---	35	2.2	1.9	1.5	1.5	1.0	.71
30	1.3	1.3	1.1	1.3	---	169	2.1	1.9	1.5	1.3	1.0	.70
31	1.3	---	1.1	1.3	---	170	---	1.8	---	1.4	.95	---
TOTAL	39.1	36.55	36.4	38.4	37.9	6686.7	666.4	55.6	52.3	47.5	43.25	23.68
MEAN	1.26	1.22	1.17	1.24	1.35	216	22.2	1.79	1.74	1.53	1.40	.79
MAX	1.6	1.5	1.3	1.4	2.5	1490	110	2.8	2.8	2.6	2.5	.90
MIN	1.0	.90	1.1	1.1	1.0	1.0	2.1	1.1	1.5	1.2	.95	.70
AC-FT	78	72	72	76	75	13260	1320	110	104	94	86	47

CAL YR 1986 TOTAL 4963.71 MEAN 13.6 MAX 600 MIN .55 AC-FT 9850
WTR YR 1987 TOTAL 7763.71 MEAN 21.3 MAX 1490 MIN .70 AC-FT 15400

06342260 SQUARE BUTTE CREEK BELOW CENTER, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
OCT											
27...	1139	1.4	1370	--	16.5	9.0	--	--	--	--	--
DEC											
10...	1201	1.2	1350	--	-2.0	1.5	--	--	--	--	--
JAN											
26...	1101	1.2	1340	--	2.5	2.0	--	--	--	--	--
FEB											
12...	0910	1.8	1140	--	1.0	1.0	--	--	--	--	--
MAR											
07...	1140	558	1150	8.62	18.0	10.0	240	5	45	32	170
26...	0949	41	560	--	8.0	8.5	--	--	--	--	--
MAY											
07...	1234	1.8	1360	--	25.0	18.0	--	--	--	--	--
JUN											
10...	1036	1.6	1290	--	17.0	19.0	--	--	--	--	--
AUG											
06...	1118	1.4	1230	--	26.0	22.5	--	--	--	--	--
SEP											
08...	1351	0.82	1270	8.26	25.0	18.0	320	0	71	35	180

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
07...	58	5	15	240	340	11	0.30	3.4	760	760	1.0
SEP											
08...	54	4	6.9	400	310	7.2	0.40	16	842	870	1.1

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
MAR										
07...	1	460	60	<1	40	40	0.3	5	1	710
SEP										
08...	1	1200	20	<1	40	30	<0.1	1	<1	880

06342450 BURNT CREEK NEAR BISMARCK, ND

LOCATION.--Lat 46°54'54", long 100°48'48", in SW¼NW¼SW¼ sec.29, T.140 N., R.80 W., Burleigh County, Hydrologic Unit 10130101, on left bank on upstream side of county highway bridge, and 7 mi northwest of Bismarck.

DRAINAGE AREA.--108 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1967 to current year (seasonal records only since 1982).

GAGE.--Water-stage recorder. Altitude of gage is 1,690 ft, from topographic map.

REMARKS.--Estimated daily discharges: Feb. 1 to Mar. 20, Mar. 28-31, Apr. 10 to May 14, Sept. 24-30. Records poor.

AVERAGE DISCHARGE.--15 years (water years 1968-82), 8.03 ft^3/s, 5,820 acre-ft/yr; median of yearly mean discharges, 4.7 ft^3/s, 3,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,000 ft^3/s, Apr. 18, 1979, gage height, 16.93 ft from rating curve extended above 2,200 ft^3/s on basis of culvert and flow-over-road measurement of peak flow; no flow for many days each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,350 ft^3/s, Mar. 21, gage height, 14.70 ft; no flow for several months.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1					.00	.90	439	3.7	2.7	.04	.03	.01
2					.00	.66	71	3.6	1.7	.04	.05	.01
3					.00	.54	41	3.5	1.1	.04	.03	.00
4					.00	.40	37	3.3	.94	.03	.02	.00
5					1.0	.30	30	3.0	.74	.03	.02	.00
6					8.0	10	24	3.7	.60	.03	.02	.01
7					10	25	19	3.0	.50	.03	.01	.00
8					15	55	16	2.8	.41	.02	.01	.00
9					22	150	14	2.3	.38	.02	.01	.00
10					28	100	12	1.6	.39	.01	.01	.00
11					37	90	11	1.3	.37	.04	.00	.00
12					48	50	10	1.1	.31	.04	.00	.00
13					45	40	9.0	.90	.28	.01	.00	.00
14					35	20	8.5	.70	.22	.02	.04	.00
15					25	15	8.0	.68	.18	.01	.05	.00
16					19	10	7.5	.52	.16	.01	.02	.00
17					14	8.0	7.0	.39	.18	.01	.02	.00
18					11	6.0	6.5	.39	.14	.02	.02	.00
19					8.0	40	6.0	.41	.11	.05	.02	.00
20					7.0	190	5.8	.84	.11	.05	.01	.00
21					6.0	1630	5.4	3.4	.12	.03	.01	.00
22					5.0	1030	5.2	10	.11	.03	.00	.00
23					4.0	659	5.0	11	.11	.02	.00	.00
24					3.5	336	4.8	7.8	.10	.02	.00	.00
25					2.8	102	4.6	5.9	.08	.02	.03	.00
26					2.0	116	4.4	4.9	.07	.02	.03	.00
27					1.5	271	4.2	6.1	.06	.02	.02	.00
28					1.1	89	4.0	6.0	.06	.02	.02	.00
29					---	52	3.9	6.9	.05	.03	.02	.00
30					---	42	3.8	5.2	.04	.03	.01	.00
31					---	122	---	3.7	---	.02	.01	---
TOTAL					358.90	5260.80	827.6	108.63	12.32	.81	.54	.03
MEAN					12.8	170	27.6	3.50	.41	.03	.02	.00
MAX					48	1630	439	11	2.7	.05	.05	.01
MIN					.00	.30	3.8	.39	.04	.01	.00	.00
AC-FT					712	10430	1640	215	24	1.6	1.1	.1

06342450 BURNT CREEK NEAR BISMARCK, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD - NESS NONCAR-BONATED MG/L AS CACO3 (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)
FEB												
10...	1100	28	--	--	1.0	0.0	--	--	--	--	--	--
12...	1140	48	380	--	1.0	0.0	--	--	--	--	--	--
25...	1010	2.8	--	--	-2.0	0.0	--	--	--	--	--	--
MAR												
09...	1610	101	--	--	-10.0	0.5	--	--	--	--	--	--
21...	1230	2060	143	8.18	3.5	4.0	39	0	9.0	4.0	5.0	19
23...	1015	651	130	--	2.0	1.0	--	--	--	--	--	--
MAY												
01...	1410	3.7	640	--	21.0	10.0	--	--	--	--	--	--
JUN												
11...	0930	0.38	1220	--	22.0	20.0	--	--	--	--	--	--
JUL												
24...	1110	0.01	1050	--	29.0	26.0	--	--	--	--	--	--
SEP												
01...	1015	<0.01	1550	7.15	22.0	18.5	400	20	56	63	220	54

DATE	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2) (00405)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
21...	0.4	5.6	60	0.8	9.9	2.0	0.10	3.7	55	76	0.08
SEP											
01...	5	9.3	380	52	520	11	0.20	2.6	1140	1100	1.6

DATE	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
MAR											
21...	0.0	1	20	280	<1	4	60	0.2	<1	<1	130
SEP											
01...	0.0	<1	290	20	1	140	10	0.1	<1	1	670

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^2, approximately.

WATER-DISCHARGE RECORDS

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. Estimated daily discharges, Dec. 10 to Apr. 12. Many diversions from tributaries. Flow regulated by Lake Sakakawea (station 06338000) 75.4 mi upstream since November 1953.

AVERAGE DISCHARGE.--59 years (water years 1929-86), 22,710 ft^3/s, 16,450,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 500,000 ft^3/s, Apr. 6, 1952, gage height, 27.90 ft. Since completion of Garrison Dam in 1953, maximum discharge, 68,900 ft^3/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^3/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, about 35,000 ft^3/s, Feb. 25, gage height, 13.92 ft, backwater from ice; minimum daily, 10,300 ft^3/s, May 2.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21600	27800	23200	26500	28900	21600	14000	11400	20800	19600	22100	18400
2	22200	27900	21800	26100	28800	21800	14500	10300	19900	19800	21600	19400
3	24100	28200	21300	26200	28900	22000	15000	11200	19000	19900	21000	19400
4	24600	28100	21900	26500	30100	22600	15200	11100	20000	20200	21400	19500
5	23900	28200	23900	26500	30100	22300	16400	11500	19800	20700	22200	19600
6	24000	28300	23300	26200	30100	22000	15500	10600	19300	20800	21300	18500
7	22900	28200	22500	25800	30000	22700	15000	11000	19000	21000	20500	19800
8	19600	28800	22300	27000	30000	19800	15100	10300	20000	20600	20800	19000
9	21200	27000	22000	27000	30300	18800	12600	11100	20100	20100	21300	18600
10	20800	26800	22600	25800	30100	18700	12800	10800	20100	20600	20800	18500
11	20500	27300	22500	25200	30300	20900	12600	11400	20300	20700	20200	18900
12	21000	27400	20400	22900	29100	21700	12300	12700	20400	21400	20900	18400
13	20100	27400	18100	21900	29500	21400	12100	14900	20100	20900	20300	18000
14	20300	27600	17500	22100	30400	21500	13100	18100	20500	20600	20400	17800
15	20800	27300	17800	22100	30700	21700	12000	20100	19900	20600	20900	18000
16	20700	26300	17900	22000	30400	21300	12000	20100	20100	20700	21200	18000
17	20700	24900	18100	23000	30500	20900	11700	20100	20600	20400	21400	18100
18	20600	24900	18700	24300	30400	20700	12100	20500	20500	21200	20900	17700
19	20500	25000	21100	24100	30200	21500	10800	20100	19800	20800	19500	17100
20	20000	24800	21300	24100	30000	21400	11400	20400	20000	21500	20500	17800
21	22400	24900	20900	25400	30300	21300	11300	21400	19600	20700	20900	17700
22	23800	24300	21100	25400	30200	23100	10600	19800	19800	21400	21200	19100
23	25800	24600	21900	26700	30300	26800	11000	19900	19800	21400	20700	18200
24	26900	24900	23400	26700	30300	25100	10900	20200	20400	21400	21900	17800
25	26900	25400	24000	27400	30400	22500	11600	20200	20400	21300	20100	16200
26	27500	25200	24300	27300	29500	17700	11800	20200	20200	20700	20800	17500
27	27300	25400	25700	28600	25200	15900	10700	20800	20000	21300	21000	19700
28	27700	25200	25300	28200	21700	15100	11100	20400	18700	21400	20700	19000
29	27400	24900	25400	28700	---	15300	11200	20300	19400	21400	21200	16300
30	27000	23300	26400	28600	---	15200	11000	20500	19800	21100	21600	16600
31	27900	---	26100	28900	---	15000	---	20400	---	21200	19400	---
TOTAL	720700	790300	682700	797200	826700	638300	377400	511800	598300	645400	648700	548600
MEAN	23250	26340	22020	25720	29520	20590	12580	16510	19940	20820	20930	18290
MAX	27900	28800	26400	28900	30700	26800	16400	21400	20800	21500	22200	19800
MIN	19600	23300	17500	21900	21700	15000	10600	10300	18700	19600	19400	16200
AC-FT	1430000	1568000	1354000	1581000	1640000	1266000	748600	1015000	1187000	1280000	1287000	1088000

CAL YR 1986 TOTAL 8491000 MEAN 23260 MAX 34700 MIN 10100 AC-FT 16840000
WTR YR 1987 TOTAL 7786100 MEAN 21330 MAX 30700 MIN 10300 AC-FT 15440000

06343500 E.A. PATTERSON LAKE NEAR DICKINSON, ND

LOCATION.--Lat 46°52'11", long 102°49'37", in NE¼NW¼SW sec.8, T.139 N., R.96 W., Stark County, Hydrologic Unit 10130202, at left edge of spillway, and 2 mi southwest of Dickinson.

DRAINAGE AREA.--400 mi^2, approximately.

RESERVOIR-ELEVATION AND CONTENTS RECORDS

PERIOD OF RECORD.--May 1950 to current year. Prior to October 1958, published as Dickinson Reservoir near Dickinson.

GAGE.--Water-stage recorder. Datum of gage is 2,400.00 ft above National Geodetic Vertical Datum of 1929 (levels by Water and Power Resources Service); gage readings have been reduced to elevations NGVD. Prior to Jan. 4, 1961; nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed by earthfill dam; storage began May 23, 1950; dam completed Aug. 9, 1950. Total capacity is 24,600 acre-ft at maximum pool, elevation, 2,428.9 ft. Dead storage is 1,000 acre-ft below lowest point of outlet, elevation, 2,404.0 ft. Conservation storage is 9,100 acre-ft between elevation 2,404.0 ft and 2,420.0 ft, crest of spillway. The crest of the spillway was raised 3.5 ft in 1981 from 2,416.5 ft. Figures given herein represent total contents based on capacity table dated Jan. 1, 1965. The reservoir is for flood control, irrigation and municipal supply.

COOPERATION.--Record of elevation and contents furnished by U.S. Bureau of Reclamation. Monthend elevations interpolated from once-daily readings. Extremes are those observed.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 11,590 acre-ft, June 9, 1982, elevation, 2,421.13 ft; minimum since initial filling of reservoir, 2,950 acre-ft, Mar. 16, 1962, elevation, 2,410.41 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents recorded, 11,160 acre-ft, Apr. 5, elevation, 2,420.80 ft; minimum, 8,950 acre-ft, July 17, elevation 2,418.92 ft.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	2,420.43	9,520	--
Oct. 31	2,420.03	10,210	+690
Nov. 30	2,419.58	9,690	-520
Dec. 31	2,420.07	10,260	+570
CAL YR 1986	--	--	+4,280
Jan. 31	2,419.98	10,150	-110
Feb. 28	2,420.06	10,240	+90
Mar. 31	2,420.44	10,720	+480
Apr. 30	2,420.04	10,220	-500
May 31	2,419.85	10,000	-220
June 30	2,419.18	9,240	-760
July 31	2,419.84	9,990	+750
Aug. 31	2,419.62	9,740	-250
Sept. 30	2,419.30	9,370	-370
WTR YR 1987	--	--	-150

06343500 E.A. PATTERSON LAKE NEAR DICKINSON, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1971, 1975, 1980 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	SAMPLING DEPTH (FEET) (00003)	RESERVOIR DEPTH (FEET) (72025)	TEMPERATURE AIR (DEG C) (00020)	CLOUD COVER (PERCENT) (00032)	WIND DIRECTION (DEG. FROM TRUE NORTH) (00036)	WIND SPEED (MILES PER HOUR) (00035)	BAROMETRIC PRESSURE (MM OF HG) (00025)	ICE THICKNESS (FEET) (82130)	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH (STANDARD UNITS) (00400)	TEMPERATURE WATER (DEG C) (00010)
OCT												
01...	0941	0.0	--	--	--	--	--	--	--	730	8.30	12.5
01...	0943	1.6	--	--	--	--	--	--	--	730	8.30	12.5
01...	0945	3.3	28.0	12.0	100	65	5.0	695	--	730	8.30	12.5
01...	0947	6.6	--	--	--	--	--	--	--	740	8.30	12.0
01...	0949	13.1	--	--	--	--	--	--	--	760	8.30	12.0
01...	0951	19.7	--	--	--	--	--	--	--	770	8.30	12.0
01...	0953	26.4	--	--	--	--	--	--	--	780	8.30	12.0
JAN												
09...	1555	0.0	--	--	--	--	--	--	--	1030	9.20	2.0
09...	1558	1.6	--	--	--	--	--	--	--	1020	9.30	3.5
09...	1600	3.3	27.0	-4.0	50	330	10	700	1.3	1030	9.20	3.5
09...	1602	6.6	--	--	--	--	--	--	--	940	9.10	3.5
09...	1605	13.1	--	--	--	--	--	--	--	1140	8.40	4.0
09...	1607	19.7	--	--	--	--	--	--	--	1660	8.80	4.5
09...	1610	26.4	--	--	--	--	--	--	--	2440	7.80	5.0
APR												
13...	1415	0.0	--	--	--	--	--	--	--	468	7.57	9.5
13...	1418	1.6	--	--	--	--	--	--	--	468	7.77	8.0
13...	1420	3.3	29.0	15.0	30	350	<5.0	701	--	468	7.80	7.0
13...	1422	6.6	--	--	--	--	--	--	--	468	7.78	7.0
13...	1425	13.1	--	--	--	--	--	--	--	460	7.80	7.0
13...	1427	19.7	--	--	--	--	--	--	--	460	7.80	7.0
13...	1430	26.4	--	--	--	--	--	--	--	460	7.81	6.5
JUL												
07...	0940	0.0	--	--	--	--	--	--	--	710	8.25	21.0
07...	0943	1.6	--	--	--	--	--	--	--	704	8.29	21.0
07...	0945	3.3	27.0	23.0	0	315	5.0	695	--	710	8.30	21.0
07...	0947	6.6	--	--	--	--	--	--	--	710	8.25	21.0
07...	0950	13.1	--	--	--	--	--	--	--	710	8.30	21.0
07...	0953	19.7	--	--	--	--	--	--	--	704	8.31	20.0
07...	0955	26.4	--	--	--	--	--	--	--	704	8.24	19.5

DATE	COLOR (PLATINUM-COBALT UNITS) (00080)	TRANSPARENCY (SECCHI DISK) (IN) (00077)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)	HARDNESS (MG/L AS CACO3) (00900)	HARDNESS NONCARBONATE (MG/L AS CACO3) (95902)	CALCIUM DISSOLVED (MG/L AS CA) (00915)	MAGNESIUM, DISSOLVED (MG/L AS MG) (00925)	SODIUM, DISSOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM ADSORPTION RATIO (00931)	POTASSIUM, DISSOLVED (MG/L AS K) (00935)
OCT												
01...	--	--	8.4	86	--	--	--	--	--	--	--	--
01...	--	--	8.4	86	--	--	--	--	--	--	--	--
01...	37	12.0	8.4	86	150	5	35	16	94	55	3	8.6
01...	--	--	8.4	86	--	--	--	--	--	--	--	--
01...	--	--	8.3	85	--	--	--	--	--	--	--	--
01...	--	--	8.3	85	--	--	--	--	--	--	--	--
01...	--	--	7.9	81	--	--	--	--	--	--	--	--
JAN												
09...	--	--	21.0	165	--	--	--	--	--	--	--	--
09...	--	--	21.0	165	--	--	--	--	--	--	--	--
09...	37	39.0	21.0	173	230	12	49	25	150	58	4	8.8
09...	--	--	20.6	162	--	--	--	--	--	--	--	--
09...	--	--	4.2	33	--	--	--	--	--	--	--	--
09...	--	--	3.8	30	--	--	--	--	--	--	--	--
09...	--	--	0.3	2	--	--	--	--	--	--	--	--
APR												
13...	--	--	9.4	90	--	--	--	--	--	--	--	--
13...	--	--	9.4	92	--	--	--	--	--	--	--	--
13...	85	8.00	9.3	83	95	14	20	11	55	54	3	5.8
13...	--	--	9.3	93	--	--	--	--	--	--	--	--
13...	--	--	9.5	93	--	--	--	--	--	--	--	--
13...	--	--	9.5	93	--	--	--	--	--	--	--	--
13...	--	--	8.6	84	--	--	--	--	--	--	--	--
JUL												
07...	--	--	6.8	84	--	--	--	--	--	--	--	--
07...	--	--	6.8	84	--	--	--	--	--	--	--	--
07...	80	22.0	7.0	87	160	10	35	17	93	55	3	7.8
07...	--	--	7.2	89	--	--	--	--	--	--	--	--
07...	--	--	7.2	89	--	--	--	--	--	--	--	--
07...	--	--	7.2	89	--	--	--	--	--	--	--	--
07...	--	--	6.2	76	--	--	--	--	--	--	--	--

06343500 E.A. PATTERSON LAKE NEAR DICKINSON, ND--CONTINUED

WATER-QUALITY RECORDS

DATE	ALKALINITY LAB (MG/L AS CACO3) (90410)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301)	SOLIDS, SOLIDS, DISSOLVED (TONS PER AC-FT) (70303)	GEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROPHOSPHORUS, DISSOLVED (MG/L AS P) (00666)	BORON, DISSOLVED (UG/L AS B) (01020)
OCT											
01...	148	200	4.6	0.40	8.1	567	460	0.77	0.650	0.020	160
JAN											
09...	213	340	8.2	0.30	6.5	727	720	0.99	<0.100	<0.010	230
APR											
13...	81	120	3.0	0.20	7.8	304	270	0.41	0.580	0.060	80
JUL											
07...	147	210	5.5	0.20	3.1	475	460	0.65	0.460	0.040	120

06344300 HEART RIVER AT DICKINSON, ND

LOCATION.--Lat 46°51'56", long 102°44'10", in SW¼NW¼SE¼ sec.12, T.139 N., R.96 W., Stark County, Hydrologic Unit 101302202, on left bank near the southeast corner of Dickinson sewage lagoon cell No. 3, 1.9 mi southeast of Dickinson and 9.5 mi downstream from Edward Arthur Patterson Lake.

DRAINAGE AREA.--440 mi^2, approximately.

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 2,360 ft from topographic map.

REMARKS.--Estimated daily discharges: Nov. 8-20, Jan. 16-26, Feb. 26-28, Mar. 1. Records good except those for period of estimated discharges, which are poor. Flow regulated by Edward Arthur Patterson Lake (station 06343500) 10 mi upstream.

EXTREME FOR PERIOD OF RECORD.--Maximum discharge, about 3,500 ft^3/s, Mar. 3, 1986, gage height 10.56, backwater from ice; maximum gage height, 10.93 ft, Mar. 1, 1986, backwater from ice; minimum daily discharge, .10 ft^3/s, Mar. 27, 1985.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,070 ft^3/s, Apr. 2, gage height, 10.15 ft; minimum daily discharge, 1.4 ft^3/s, June 13.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	112	3.3	12	3.8	2.6	7.6	2460	3.5	4.4	3.8	13	2.1
2	92	3.5	14	3.8	3.8	7.2	2650	3.0	3.5	3.4	4.5	2.1
3	67	3.5	14	3.6	2.3	10	1850	7.3	4.6	3.3	3.2	2.0
4	57	3.6	14	3.7	1.9	22	1670	5.9	3.3	4.7	2.4	2.0
5	42	3.6	13	3.7	2.1	20	1150	3.3	2.3	8.9	2.2	2.2
6	33	7.6	11	3.7	11	27	617	2.9	2.3	6.8	2.0	2.3
7	27	3.9	9.8	3.7	18	36	433	2.8	2.1	5.0	2.0	2.2
8	23	3.8	9.4	3.6	21	43	27	2.8	1.9	6.8	2.1	2.0
9	19	3.8	7.2	3.5	27	40	57	2.8	1.8	22	2.0	2.0
10	18	6.6	6.4	3.3	30	31	56	2.9	1.9	13	1.9	1.9
11	15	3.8	6.6	3.5	33	27	41	3.2	1.9	27	2.0	1.9
12	11	3.3	5.6	3.5	34	22	40	3.2	1.7	29	2.0	2.0
13	9.2	3.3	4.9	3.5	34	19	36	2.9	1.4	6.9	7.8	2.1
14	8.7	3.7	4.7	3.2	31	17	32	3.2	2.2	6.0	13	2.2
15	8.4	3.7	4.6	2.9	28	16	29	3.1	3.5	5.4	8.5	2.1
16	8.6	3.7	4.6	2.7	25	15	25	2.5	3.5	3.5	7.1	2.0
17	7.1	3.7	4.3	2.9	24	14	22	2.2	13	2.5	13	4.6
18	6.3	3.7	4.0	3.0	20	16	19	2.3	2.5	2.5	4.1	2.8
19	5.7	3.6	3.9	2.7	17	19	21	2.6	2.0	6.1	2.8	2.1
20	5.5	3.6	3.8	2.9	14	24	21	8.0	18	4.1	2.4	1.9
21	6.3	3.7	3.7	3.1	13	63	8.5	15	3.9	3.3	2.4	1.9
22	6.1	13	3.7	2.9	10	94	8.2	4.1	4.7	87	2.2	1.9
23	6.0	10	3.7	2.8	9.8	115	5.8	2.9	6.2	7.7	2.1	1.9
24	6.0	9.6	3.7	2.9	8.5	265	4.5	2.7	3.5	4.0	2.0	2.0
25	6.0	10	3.7	2.9	7.3	271	4.0	2.4	2.6	2.9	5.1	1.8
26	6.0	8.3	3.6	2.9	9.2	203	3.8	2.4	2.1	2.7	8.0	1.8
27	6.0	8.8	3.6	2.0	8.3	257	3.6	5.1	2.2	2.9	3.6	1.7
28	5.9	9.0	3.7	1.8	8.0	175	3.8	3.4	2.8	2.8	2.7	1.9
29	5.7	10	3.6	1.8	---	141	3.7	2.9	3.3	3.1	2.5	2.2
30	6.9	11	3.8	1.8	---	108	3.6	3.2	3.4	2.7	2.2	2.2
31	6.1	---	4.0	2.0	---	365	---	2.7	---	2.8	2.1	---
TOTAL	642.5	172.7	198.6	94.1	453.8	2489.8	11305.5	117.2	112.5	292.6	132.9	63.8
MEAN	20.7	5.76	6.41	3.04	16.2	80.3	377	3.78	3.75	9.44	4.29	2.13
MAX	112	13	14	3.8	34	365	2650	15	18	87	13	4.6
MIN	5.5	3.3	3.6	1.8	1.9	7.2	3.6	2.2	1.4	2.5	1.9	1.7
AC-FT	1270	343	394	187	900	4940	22420	232	223	580	264	127

CAL YR 1986 TOTAL 25248.7 MEAN 69.2 MAX 3000 MIN .98 AC-FT 50080
WTR YR 1987 TOTAL 16075.9 MEAN 44.0 MAX 2650 MIN 1.4 AC-FT 31890

06344300 HEART RIVER AT DICKINSON, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1984 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
OCT											
10...	1140	19	960	--	8.0	9.5	--	--	--	--	--
DEC											
02...	1450	15	1250	--	-2.0	-0.5	--	--	--	--	--
JAN											
09...	1245	33	1840	--	-4.0	0.0	--	--	--	--	--
FEB											
24...	1440	8.4	1330	--	-4.0	0.0	--	--	--	--	--
MAR											
05...	1440	17	1100	8.30	22.0	0.5	240	18	49	28	150
APR											
04...	1105	1700	655	--	14.0	3.0	--	--	--	--	--
14...	1315	32	723	--	17.0	9.5	--	--	--	--	--
MAY											
14...	1145	3.3	1570	--	23.0	18.5	--	--	--	--	--
JUN											
04...	1155	3.3	1470	--	25.0	19.0	--	--	--	--	--
30...	0935	3.7	1600	--	24.0	19.0	--	--	--	--	--
JUL											
27...	1535	2.9	1410	--	32.0	27.5	--	--	--	--	--
AUG											
31...	1405	2.2	1610	8.50	25.0	20.5	290	0	62	32	260

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
05...	56	4	12	220	320	20	0.20	6.9	744	720	1.0
AUG											
31...	66	7	7.5	360	460	41	0.50	9.2	1090	1100	1.5

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
MAR										
05...	1	180	60	<1	20	180	0.2	1	<1	450
AUG										
31...	<1	420	20	1	36	10	0.1	2	<1	650

06344600 GREEN RIVER NEAR NEW HRADEC, ND

LOCATION.--Lat 47°01'40", long 103°03'10", on line between secs.13 and 14, T.141 N., R.98 W., Billings County, Hydrologic Unit 10130202, on left bank above county highway bridge, and 8 mi west of New Hradec.

DRAINAGE AREA.--152 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--February 1964 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 2,510 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Estimated daily discharges: Oct. 10 to Mar. 30, Apr. 14 to Sept. 30. Records fair except those for estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--23 years, 17.9 ft^3/s, 12,970 acre-ft/yr; median of yearly mean discharge, 18 ft^3/s, 13,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,120 ft^3/s May 9, 1970, gage height, 16.88 ft; maximum gage height, 17.60 ft, Mar. 22, 1978, backwater from ice; no flow for several days in some years.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 8	----	215	ice backwater	July 19	1300	433	9.13
Apr. 1	0600	*1,700	*14.41	July 23	0315	445	9.21
July 10	0500	252	7.67	Aug. 3	0630	311	8.19

Minimum daily discharge, 0.48 ft3/s on June 15-16.
a - Backwater from ice

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	28	3.8	4.6	2.7	10	5.2	1320	2.1	2.1	.80	9.3	2.2
2	34	3.8	4.4	2.6	35	5.2	524	2.2	1.3	.72	104	2.0
3	20	4.0	4.2	2.5	90	8.0	950	2.6	1.4	.64	210	1.8
4	14	4.4	3.8	2.4	80	25	967	3.5	1.2	.60	42	1.6
5	10	4.6	3.4	2.4	55	70	259	3.4	1.2	.65	20	1.8
6	7.9	4.6	3.0	2.3	60	71	83	3.0	1.1	.60	13	2.2
7	6.1	5.0	2.8	2.2	140	47	36	3.1	.90	.55	9.7	2.0
8	5.4	5.5	2.8	2.1	205	30	24	3.4	S.75	.50	7.8	1.7
9	5.0	5.3	2.4	2.0	120	20	18	3.3	.70	5.0	6.4	1.6
10	4.1	5.0	1.9	1.7	74	13	15	2.8	.70	140	6.2	1.5
11	3.9	4.6	1.8	1.6	56	9.2	13	2.1	.64	51	6.2	1.3
12	3.9	4.4	1.6	1.8	44	7.0	12	1.7	.60	49	5.7	1.5
13	3.8	4.2	1.5	2.4	39	5.8	11	1.7	.58	39	5.3	1.3
14	3.7	4.0	1.6	2.8	28	5.6	9.5	1.5	.52	26	5.2	1.2
15	3.6	4.2	1.7	2.5	25	5.6	8.6	1.1	.48	20	5.0	1.0
16	3.8	4.3	1.8	2.2	19	5.8	8.0	1.1	.48	16	5.3	1.4
17	3.9	4.4	2.0	1.8	15	6.0	7.4	1.1	.60	13	5.2	1.5
18	4.0	4.2	2.1	1.5	13	6.2	6.8	1.2	.60	12	5.0	1.6
19	4.0	4.0	2.0	1.4	12	6.5	6.2	1.7	.66	228	4.5	1.5
20	4.2	3.8	1.9	1.3	10	7.6	5.4	2.4	1.5	126	4.4	1.3
21	4.2	3.8	1.7	1.3	10	10	4.8	2.8	1.3	42	4.3	1.2
22	4.1	3.9	1.8	1.2	9.2	22	4.4	3.1	1.1	235	3.9	1.1
23	4.0	3.9	2.0	1.2	8.4	32	4.1	3.0	.85	313	3.7	1.0
24	3.9	4.1	2.2	1.1	7.6	40	3.8	2.4	.98	84	3.5	.95
25	4.0	4.5	2.4	1.0	6.8	35	3.5	2.1	.84	36	3.8	1.1
26	4.0	4.8	2.5	1.1	6.2	40	3.1	2.5	.78	24	3.7	1.1
27	4.0	5.0	2.5	1.3	5.8	60	2.7	3.5	.68	18	3.5	1.3
28	4.2	5.2	2.6	1.5	5.5	40	2.5	3.2	.70	15	3.3	1.5
29	4.2	5.4	2.6	1.8	---	25	2.3	3.2	.66	13	3.1	1.3
30	4.2	5.0	2.8	2.4	---	20	2.2	2.7	.72	11	2.8	1.2
31	4.0	---	3.0	3.2	---	248	---	2.0	---	9.9	2.5	---
TOTAL	218.1	133.7	77.4	59.3	1189.5	931.7	4317.3	75.5	26.62	1530.96	518.3	43.75
MEAN	7.04	4.46	2.50	1.91	42.5	30.1	144	2.44	.89	49.4	16.7	1.46
MAX	34	5.5	4.6	3.2	205	248	1320	3.5	2.1	313	210	2.2
MIN	3.6	3.8	1.5	1.0	5.5	5.2	2.2	1.1	.48	.50	2.5	.95
AC-FT	433	265	154	118	2360	1850	8560	150	53	3040	1030	87

CAL YR 1986 TOTAL 8544.21 MEAN 23.4 MAX 1150 MIN .25 AC-FT 16950
WTR YR 1987 TOTAL 9122.05 MEAN 25.0 MAX 1320 MIN .48 AC-FT 18090

06344600 GREEN RIVER NEAR NEW HRADEC, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
OCT											
10...	1345	4.1	1010	--	5.0	9.0	--	--	--	--	--
NOV											
21...	1235	3.8	1680	--	4.0	0.0	--	--	--	--	--
JAN											
08...	1410	2.1	1670	--	-1.5	0.0	--	--	--	--	--
FEB											
13...	1425	41	520	[a]7.68	1.0	0.5	100	0	21	12	65
MAR											
06...	1450	75	640	--	20.5	1.0	--	--	--	--	--
27...	1550	63	750	--	-6.0	0.5	--	--	--	--	--
APR											
01...	1550	1240	510	--	1.0	0.5	--	--	--	--	--
13...	1045	11	720	--	7.0	14.0	--	--	--	--	--
MAY											
04...	1000	3.3	1160	--	19.0	13.0	--	--	--	--	--
JUN											
08...	0835	0.77	1310	--	20.0	20.0	--	--	--	--	--
JUL											
09...	1120	0.73	1330	--	20.5	22.0	--	--	--	--	--
SEP											
01...	1425	2.2	1060	8.40	25.0	19.0	250	0	47	31	150

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
FEB											
13...	56	3	7.3	110	130	4.1	0.10	15	328	320	0.45
SEP											
01...	56	4	6.8	300	270	3.9	0.40	5.3	716	700	0.97

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
FEB										
13...	1	120	400	<1	9	70	0.1	<1	<1	180
SEP										
01...	1	410	30	<1	25	10	<0.1	1	1	420

a - Laboratory value

06345500 HEART RIVER NEAR RICHARDTON, ND

LOCATION.--Lat 46°44'46", long 102°18'27", in NE¼ sec.29, T.138 N., R.92 W., Stark County, Hydrologic Unit 10130202, on right bank 5 ft upstream from bridge on State Highway 8, 0.5 mi downstream from Plum Creek, and 9.5 mi south of Richardton.

DRAINAGE AREA.--1,240 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1903 to September 1922, April 1943 to current year. Monthly discharge only for some periods, published in WSP 1309.

REVISED RECORDS (WATER YEARS).--WSP 1209: Drainage area. WSP 1239: 1906, 1918(M), 1947(M).

GAGE.--Water-stage recorder. Datum of gage is 2,153.67 ft above National Geodetic Vertical Datum of 1929. May 18, 1903, to Sept. 30, 1922, nonrecording gage at 3 sites in 1 mi reach below present site at different datums. Apr. 14, 1943, to July 7, 1947, nonrecording gage at present site and datum.

REMARKS.--Estimated daily discharges: Nov. 9-15, Dec. 8 to Apr. 3. Records good except those for period of estimated daily discharges, which are fair. Flow is regulated by Patterson Lake Reservoir (station 06343500) 85 river miles upstream from station and some diversions for irrigation and water supply at low flow.

AVERAGE DISCHARGE.--63 years (water years 1904-07, 1909-22, 1944-85), 107 ft^3/s, 76,450 acre-ft/yr; median of yearly mean discharges, 100 ft^3/s, 72,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 23,400 ft^3/s, Apr. 16, 1950, gage height, 28.05 ft, from high-water mark in gage well; no flow at times in some years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of July 5, 1938, reached a stage of about 26 ft, from information by local residents, discharge, 16,000 ft^3/s; flood of Mar. 25, 1943, reached a stage of 24.2 ft from floodmarks, discharge, 11,700 ft^3/s.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,500 ft^3/s, Apr. 1, gage height, 18.20 ft, backwater from ice; minimum daily 7.7 ft^3/s, Sept. 27.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	212	26	45	21	30	35	3770	30	23	8.9	81	13
2	188	26	44	21	45	40	4550	30	21	9.8	42	12
3	207	24	43	21	45	40	4400	32	20	9.9	36	11
4	170	24	39	19	40	60	4010	34	19	9.1	32	10
5	147	23	35	19	40	240	3810	35	18	9.0	158	10
6	124	25	34	20	45	465	2750	35	17	9.2	196	11
7	96	27	33	21	185	440	1400	32	17	8.3	97	11
8	81	19	30	21	330	355	740	29	15	9.3	57	10
9	69	16	25	21	175	245	309	29	14	12	41	11
10	61	14	23	20	445	220	228	27	14	13	31	11
11	54	16	19	19	530	205	210	25	14	19	26	10
12	49	16	19	22	425	155	168	24	13	35	21	9.0
13	44	18	19	25	325	125	141	23	12	33	18	8.7
14	39	20	21	22	255	90	123	21	11	87	17	8.7
15	36	24	21	22	245	70	106	21	10	54	20	8.6
16	33	27	23	20	205	55	96	21	9.7	46	30	8.4
17	32	30	23	22	195	50	85	21	9.5	43	57	9.8
18	32	31	21	22	135	50	75	21	9.1	35	40	9.2
19	30	33	21	22	120	50	68	21	9.4	31	34	8.4
20	33	33	20	25	110	65	62	24	19	37	27	8.7
21	33	33	19	25	95	1230	60	30	20	27	20	11
22	31	34	18	22	75	1640	57	34	18	41	18	13
23	32	35	18	21	60	1800	49	41	23	272	16	12
24	33	36	18	21	52	1430	45	33	18	153	14	11
25	34	42	20	22	45	1280	43	29	15	194	14	9.7
26	33	49	21	24	40	1140	39	27	16	245	16	8.8
27	35	49	21	26	35	1620	36	32	13	130	17	7.7
28	36	47	21	28	35	1080	35	31	11	76	18	8.1
29	32	48	21	28	---	660	33	29	10	54	20	8.5
30	29	47	21	26	---	510	31	28	9.2	42	17	7.9
31	28	---	20	30	---	620	---	26	---	35	16	---
TOTAL	2093	892	776	698	4362	16065	27529	875	447.9	1787.5	1247	297.2
MEAN	67.5	29.7	25.0	22.5	156	518	918	28.2	14.9	57.7	40.2	9.91
MAX	212	49	45	30	530	1800	4550	41	23	272	196	13
MIN	28	14	18	19	30	35	31	21	9.1	8.3	14	7.7
AC-FT	4150	1770	1540	1380	8650	31860	54600	1740	888	3550	2470	589

CAL YR 1986 TOTAL 76511.8 MEAN 210 MAX 6560 MIN 9.8 AC-FT 151800
WTR YR 1987 TOTAL 57069.5 MEAN 156 MAX 4550 MIN 7.7 AC-FT 113200

06345500 HEART RIVER NEAR RICHARDTON, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1950, 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
OCT											
06...	1340	122	950	--	23.0	12.0	--	--	--	--	--
NOV											
19...	1510	33	2120	--	--	0.0	--	--	--	--	--
JAN											
05...	1210	19	2100	--	3.5	0.0	--	--	--	--	--
FEB											
25...	1345	45	1320	--	-3.5	0.0	--	--	--	--	--
APR											
02...	1050	4220	950	--	3.5	2.0	--	--	--	--	--
09...	1230	296	585	8.10	11.0	9.0	150	18	31	17	66
a09...	1231	296	585	8.10	11.0	9.0	150	26	30	17	67
MAY											
13...	1110	22	1580	--	24.5	20.5	--	--	--	--	--
JUN											
08...	1420	14	1750	--	22.5	23.5	--	--	--	--	--
JUL											
20...	1420	39	1590	--	28.0	25.0	--	--	--	--	--
AUG											
25...	1525	15	1280	8.50	13.0	16.0	310	51	65	36	170
a25...	1526	15	1280	8.50	13.0	16.0	320	53	67	36	170

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
09...	48	2	7.4	130	170	7.0	0.20	13	376	390	0.51
a09...	49	2	7.2	119	150	3.2	0.20	7.9	386	350	0.52
AUG											
25...	53	4	10	260	410	16	0.40	7.5	878	870	1.2
a25...	53	4	9.1	264	410	16	0.30	7.3	876	880	1.2

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR										
09...	1	110	120	<1	9	10	<0.1	1	1	340
a09...	1	110	22	<5	12	17	--	<1	<1	300
AUG										
25...	<1	330	20	1	31	10	0.3	2	<1	820
a25...	1	300	6	<5	33	8	--	3	<1	800

a - Split sample analysis for quality assurance.

06346000 LAKE TSCHIDA NEAR GLEN ULLIN, ND

LOCATION.--Lat 46°35'43", long 101°48'34", in SW1/4NE1/4 sec.13, T.136 N., R.89 W., Grant County, Hydrologic Unit 10130202, 10 mi upstream from Heart Butte Creek, and 14 mi north of Elgin.

DRAINAGE AREA.--1,710 mi^2, approximately.

RESERVOIR-ELEVATION AND CONTENTS RECORDS

PERIOD OF RECORD.--August 1949 to current year. Prior to October 1957, published as Heart Butte Reservoir near Glen Ullin.

GAGE.--Nonrecording gage. Datum of gage is at National Geodetic Vertical Datum of 1929, levels by Water and Power Resources Service.

REMARKS.--Reservoir is formed by earthfill dam; storage began Sept. 29, 1949; dam completed Dec. 9, 1949. Total capacity is 430,000 acre-ft at maximum pool, elevation 2,118.2 ft. Dead storage is 6,750 acre-ft below lowest point of outlet, elevation 2,030.0 ft. Active conservation storage is 69,030 acre-ft between elevation 2,030.0 ft and 2,064.5 ft, crest of spillway. Figures given herein represent total contents. Controlled releases are through 4 by 5 ft slide gate. The spillway is uncontrolled "glory hole" type and discharges through a conduit 14 ft in diameter. The reservoir is for flood control, irrigation, and incidental water supply.

COOPERATION.--Record of elevations and contents furnished by U.S. Bureau of Reclamation. Monthend elevations interpolated from once-daily readings. Extremes are those observed.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 174,000 acre-ft, Apr. 9, 1952, elevation, 2,086.23 ft; minimum since first reaching spillway level, 40,840 acre-ft, Mar. 6, 1962, elevation, 2,052.5 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 94,910 acre-ft, Apr. 6, elevation, 2,069.80 ft; minimum, 60,710 acre-ft, Sept. 30, elevation, 2,059.83 ft.

MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	2,064.62	76,190	--
Oct. 31	2,064.86	77,010	+820
Nov. 30	2,064.86	77,010	0
Dec. 31	2,064.81	76,840	-170
CAL YR 1986	--	--	+17,160
Jan. 31	2,064.77	76,700	-140
Feb. 28	2,065.13	77,930	+1,230
Mar. 31	2,067.02	84,580	+6,650
Apr. 30	2,064.68	76,400	-8,180
May 31	2,064.82	76,870	+470
June 30	2,063.59	72,720	-4,150
July 31	2,062.67	69,690	-3,030
Aug. 31	2,061.22	65,030	-4,660
Sept. 30	2,059.83	60,710	-4,320
WTR YR 1987	--	--	-15,480

06346000 LAKE TSCHIDA NEAR GLEN ULLIN, ND--CONTINUED

WATER-QUALITY DATA

PERIOD OF RECORD.--Water years 1971, 1980 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	SAMPLING DEPTH (FEET) (00003)	RESERVOIR DEPTH (FEET) (72025)	TEMPERATURE AIR (DEG C) (00020)	CLOUD COVER (PERCENT) (00032)	WIND DIRECTION (DEG. FROM TRUE NORTH) (00036)	WIND SPEED (MILES PER HOUR) (00035)	BAROMETRIC PRESSURE (MM OF HG) (00025)	ICE THICKNESS (FEET) (82130)	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH (STANDARD UNITS) (00400)	TEMPERATURE WATER (DEG C) (00010)
JAN												
28...	1225	0.0	--	--	--	--	--	--	--	1220	8.30	1.0
28...	1227	1.60	--	--	--	--	--	--	--	1220	8.30	1.5
28...	1229	3.30	50.9	2.5	100	135	10	743	1.40	1220	8.30	3.0
28...	1231	6.60	--	--	--	--	--	--	--	1220	8.40	3.5
28...	1233	13.2	--	--	--	--	--	--	--	1230	8.40	3.5
28...	1235	19.8	--	--	--	--	--	--	--	1230	8.40	3.5
28...	1237	26.4	--	--	--	--	--	--	--	1250	8.30	3.0
28...	1239	33.0	--	--	--	--	--	--	--	1370	8.10	3.5
28...	1241	40.0	--	--	--	--	--	--	--	1760	7.80	3.5
28...	1243	46.0	--	--	--	--	--	--	--	1900	7.90	3.5
APR												
29...	1117	1.60	--	--	--	--	--	--	--	829	7.60	10.5
29...	1115	0.0	52.0	15.0	0	90	7.5	759	--	828	7.60	10.5
29...	1119	3.30	--	--	--	--	--	--	--	830	7.60	10.0
29...	1121	6.60	--	--	--	--	--	--	--	833	7.60	10.0
29...	1123	13.2	--	--	--	--	--	--	--	836	7.60	9.5
29...	1125	19.8	--	--	--	--	--	--	--	840	7.60	9.0
29...	1127	26.4	--	--	--	--	--	--	--	841	7.60	9.0
29...	1129	33.0	--	--	--	--	--	--	--	842	7.60	9.0
29...	1131	40.0	--	--	--	--	--	--	--	843	7.70	9.0
29...	1133	46.0	--	--	--	--	--	--	--	845	7.60	8.5
JUL												
21...	1150	0.0	--	--	--	--	--	--	--	849	8.00	21.0
21...	1152	1.60	--	--	--	--	--	--	--	849	8.00	21.0
21...	1154	3.30	48.2	22.5	100	105	7.0	755	--	849	8.00	21.0
21...	1156	6.60	--	--	--	--	--	--	--	850	8.00	20.5
21...	1158	13.2	--	--	--	--	--	--	--	850	8.00	20.5
21...	1200	19.8	--	--	--	--	--	--	--	851	8.00	20.5
21...	1202	26.4	--	--	--	--	--	--	--	851	7.90	20.5
21...	1204	33.0	--	--	--	--	--	--	--	851	7.90	20.5
21...	1206	40.0	--	--	--	--	--	--	--	851	7.90	20.5
21...	1208	46.0	--	--	--	--	--	--	--	851	7.70	20.0

DATE	COLOR (PLATINUM-COBALT UNITS) (00080)	TRANSPARENCY (SECCHI DISK) (IN) (00077)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)	HARDNESS (MG/L AS CACO3) (00900)	HARDNESS NONCARBONATE (MG/L AS CACO3) (95902)	CALCIUM DISSOLVED (MG/L AS CA) (00915)	MAGNESIUM, DISSOLVED (MG/L AS MG) (00925)	SODIUM, DISSOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM ADSORPTION RATIO (00931)	POTASSIUM, DISSOLVED (MG/L AS K) (00935)
JAN												
28...	--	--	11.9	--	--	--	--	--	--	--	--	--
28...	--	--	11.9	--	--	--	--	--	--	--	--	--
28...	9	161	11.9	92	300	0	59	38	160	52	4	9.6
28...	--	--	12.0	--	--	--	--	--	--	--	--	--
28...	--	--	12.1	--	--	--	--	--	--	--	--	--
28...	--	--	11.8	--	--	--	--	--	--	--	--	--
28...	--	--	9.8	--	--	--	--	--	--	--	--	--
28...	--	--	7.0	--	--	--	--	--	--	--	--	--
28...	--	--	6.4	--	--	--	--	--	--	--	--	--
28...	--	--	7.5	--	--	--	--	--	--	--	--	--
APR												
29...	--	--	9.3	--	--	--	--	--	--	--	--	--
29...	65	22.8	9.3	83	200	46	39	24	100	51	3	8.0
29...	--	--	9.4	--	--	--	--	--	--	--	--	--
29...	--	--	9.4	--	--	--	--	--	--	--	--	--
29...	--	--	9.3	--	--	--	--	--	--	--	--	--
29...	--	--	9.3	--	--	--	--	--	--	--	--	--
29...	--	--	9.2	--	--	--	--	--	--	--	--	--
29...	--	--	9.2	--	--	--	--	--	--	--	--	--
29...	--	--	9.1	--	--	--	--	--	--	--	--	--
29...	--	--	8.9	--	--	--	--	--	--	--	--	--
JUL												
21...	--	--	7.2	--	--	--	--	--	--	--	--	--
21...	--	--	7.1	--	--	--	--	--	--	--	--	--
21...	17	52.8	7.1	80	a--	a--	a--	a--	a--	a--	a--	7.8
21...	--	--	6.8	--	--	--	--	--	--	--	--	--
21...	--	--	6.8	--	--	--	--	--	--	--	--	--
21...	--	--	6.7	--	--	--	--	--	--	--	--	--
21...	--	--	6.5	--	--	--	--	--	--	--	--	--
21...	--	--	6.1	--	--	--	--	--	--	--	--	--
21...	--	--	5.8	--	--	--	--	--	--	--	--	--
21...	--	--	4.1	--	--	--	--	--	--	--	--	--

06346000 LAKE TSCHIDA NEAR GLEN ULLIN, ND--CONTINUED

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	ALKALINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLORIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUORIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTITUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	NITROGEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-PHOS-PHORUS, DIS-SOLVED (MG/L AS P) (00666)	BORON, DIS-SOLVED (UG/L AS B) (01020)
JAN 28...	--	430	9.5	0.30	1.9	859	--	1.2	0.130	0.030	260
APR 29...	150	280	5.7	0.20	6.7	564	550	0.77	0.560	0.060	150
JUL 21...	168	270	6.1	0.20	a--	584	a--	a--	0.430	0.020	170

a - Laboratory analysis incomplete at time of report publication.

06348000 HEART RIVER NEAR LARK, ND

LOCATION.--Lat 46°36'37", long 101°22'54", in NW¼NW¼SW¼ sec.9, T.136 N., R.85 W., Grant County, Hydrologic Unit 10130203, on right bank 20 ft downstream from county highway bridge, 0.6 mi downstream from Big Muddy Creek, and 10 mi north of Lark.

DRAINAGE AREA.--2,750 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1946 to current year (seasonal records only since Oct. 1982).

GAGE.--Water-stage recorder. Datum of gage is 1,802.83 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Nov. 16, 1948, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Oct. 30-31, Mar. 1-5, 10-20, July 19-20. Records good except those for period Mar. 22 to Apr. 2 which are fair and those for periods Mar. 1-5, 10-20, and July 19-20 which are poor. Flow regulated by Lake Tschida (06346000) 45 mi upstream since 1949.

AVERAGE DISCHARGE.--35 years, (1947-82) 225 ft^3/s, 163,000 acre-ft/yr; median of yearly mean discharges, 172 ft^3/s, 124,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 29,200 ft^3/s, Apr. 17, 1950, gage height, 20.70 ft, from rating curve extended above 11,000 ft^3/s on basis of contracted-opening measurement of peak flow; no flow Jan. 16 to Mar. 4, 1950, Jan. 17-26, 1962.

EXTREMES FOR CURRENT YEAR.--Maximum observed discharge, 10,900 ft^3/s, Mar. 23, gage height, 16.06 ft; minimum recorded daily discharge, 35 ft^3/s, Feb. 1-5.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	135				35	145	1570	144	190	74	152	89
2	128				35	145	2100	138	166	70	159	87
3	128				35	145	2650	137	152	60	246	87
4	134				35	150	3040	139	133	69	178	92
5	142				35	150	3060	136	109	102	164	97
6	151				40	300	3030	125	95	100	151	97
7	150				45	2160	2970	121	84	104	144	97
8	152				60	2210	2550	112	80	104	144	97
9	154				150	996	2080	106	75	106	140	93
10	149				350	500	1650	98	71	109	138	77
11	144				360	400	1280	87	70	118	135	79
12	140				330	350	1040	87	68	133	134	98
13	129				280	320	854	97	64	132	134	97
14	120				250	300	736	95	58	126	126	97
15	116				230	260	634	97	54	120	98	97
16	110				210	250	558	91	49	115	378	97
17	105				190	230	490	85	50	110	231	97
18	98				180	210	440	82	73	151	147	95
19	92				170	200	391	78	70	294	118	77
20	89				165	500	364	76	79	650	108	74
21	88				160	5500	323	93	153	544	98	74
22	83				160	8850	280	125	107	340	92	74
23	80				160	10100	261	119	102	237	90	74
24	78				155	7610	242	118	92	165	90	74
25	75				150	4430	228	119	84	141	89	74
26	74				145	2900	212	126	79	129	89	74
27	73				145	2640	195	189	76	120	90	74
28	72				145	2720	183	315	76	136	91	76
29	70				---	2000	169	479	74	121	91	75
30	68				---	1660	159	337	74	108	91	76
31	66				---	1490	---	240	---	115	91	---
TOTAL	3393				4405	59821	33739	4391	2707	5003	4227	2566
MEAN	109				157	1930	1125	142	90.2	161	136	85.5
MAX	154				360	10100	3060	479	190	650	378	98
MIN	66				35	145	159	76	49	60	89	74
AC-FT	6730				8740	118700	66920	8710	5370	9920	8380	5090

06348000 HEART RIVER NEAR LARK, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
OCT											
29...	1030	69	1080	--	5.0	3.0	--	--	--	--	--
MAR											
22...	1300	8800	315	7.97	4.5	1.0	84	0	18	9.5	30
APR											
28...	1200	185	750	--	21.0	19.0	--	--	--	--	--
JUN											
09...	0930	76	1270	--	24.0	20.0	--	--	--	--	--
JUL											
23...	1230	232	868	--	29.0	25.0	--	--	--	--	--
SEP											
09...	1515	91	1000	7.40	25.0	21.0	240	5	46	29	120

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
22...	41	1	8.1	100	75	4.5	0.10	11	193	210	0.26
SEP											
09...	51	3	9.3	230	320	4.4	0.30	6.9	689	680	0.94

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
MAR										
22...	1	50	250	<1	6	50	0.3	<1	<1	230
SEP										
09...	1	240	20	<1	24	10	0.1	2	1	630

06349000 HEART RIVER NEAR MANDAN, ND
(National stream-quality accounting network station)

LOCATION.--Lat 46°50'02", long 100°58'27", in NW¼NE¼ sec.25, T.139 N., R.82 W., Morton County, Hydrologic Unit 10130203, on left bank near downstream wingwall of bridge on county highway, 3 mi west of Mandan, and 4 mi downstream from Sweetbriar Creek.

DRAINAGE AREA.--3,310 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April to September 1924, March 1928 to June 1933, August 1937 to current year. Published as "at Sunny" 1924, 1928-33.

REVISED RECORDS.--WSP 926: 1938. WSP 1209: Drainage area. WSP 1239: 1924, 1928-29, 1948.

GAGE.--Water-stage recorder. Datum of gage is 1,638.70 ft above National Geodetic Vertical Datum of 1929, and 1,623.03 ft above Burlington Northern Railway datum. See WSP 1729 or 1917 for history of changes prior to June 30, 1958.

REMARKS.--Estimated daily discharges: Nov. 7 to Mar. 23, Mar. 27 to Apr. 3, and Aug. 11-18. Records good except those for period of estimated daily discharges, which are poor. Flow regulated by Lake Tschida (station 06346000) 105 mi upstream since 1949. Some diversions above station.

AVERAGE DISCHARGE.--54 years (water years 1929-32, 1938-87), 268 ft^3/s, 194,200 acre-ft/yr; median of yearly mean discharges, 210 ft^3/s, 152,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 30,500 ft^3/s, Apr. 19, 1950, gage height, 23.64 ft; maximum gage height, 25.75 ft, Apr. 4, 1952, ice jam; no flow for many days in some years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, about 14,000 ft^3/s, Mar. 22, gage height, 25.38 ft, backwater from ice; minimum daily discharge, 39 ft^3/s, Jan. 6-10.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	210	92	52	40	43	170	1810	227	284	68	130	103
2	178	91	51	40	44	180	2980	215	225	63	171	101
3	162	91	50	40	45	200	3190	214	190	56	191	100
4	148	90	49	41	46	240	3610	211	178	51	198	99
5	142	89	48	40	47	260	3760	204	170	48	210	101
6	142	94	47	39	50	330	3720	197	154	78	178	106
7	142	92	46	39	70	1400	3670	189	137	109	164	106
8	145	88	46	39	200	7500	3480	180	126	104	155	105
9	152	84	45	39	450	2600	2940	173	119	105	149	104
10	152	80	45	39	590	1300	2460	166	115	119	138	103
11	152	76	44	40	700	1000	2010	156	112	151	135	103
12	152	72	43	41	600	650	1620	147	104	150	130	94
13	151	68	42	42	520	450	1330	137	96	149	125	89
14	143	66	43	41	480	440	1120	134	89	133	125	105
15	135	64	45	40	590	440	949	144	84	121	130	104
16	124	63	44	40	350	420	824	143	77	107	135	104
17	123	62	44	40	300	400	733	137	72	103	144	104
18	123	60	44	40	270	410	660	129	65	107	320	103
19	123	58	43	40	250	400	592	131	67	138	200	105
20	122	56	42	40	260	420	528	129	83	186	159	105
21	119	54	42	40	240	10300	485	138	107	231	134	93
22	114	54	42	40	220	13000	451	142	112	527	115	89
23	114	54	42	40	215	12000	395	146	135	402	109	88
24	112	55	42	40	210	10900	358	159	124	280	106	87
25	105	56	42	40	200	7310	335	150	110	212	109	87
26	102	55	41	42	190	4950	306	150	97	178	112	86
27	96	54	40	42	180	4130	286	159	89	160	111	86
28	95	55	40	42	170	3760	272	175	80	151	107	87
29	94	54	40	42	---	3370	255	231	76	156	106	87
30	93	53	41	42	---	2680	240	400	75	158	101	87
31	93	---	40	42	---	2310	---	417	---	138	101	---
TOTAL	4058	2080	1365	1252	7530	93920	45369	5630	3552	4739	4498	2921
MEAN	131	69.3	44.0	40.4	269	3030	1512	182	118	153	145	97.4
MAX	210	94	52	42	700	13000	3760	417	284	527	320	106
MIN	93	53	40	39	43	170	240	129	65	48	101	86
AC-FT	8050	4130	2710	2480	14940	186300	89990	11170	7050	9400	8920	5790

CAL YR 1986 TOTAL 157460 MEAN 431 MAX 11500 MIN 12 AC-FT 312300
WTR YR 1987 TOTAL 176914 MEAN 485 MAX 13000 MIN 39 AC-FT 350900

06349000 HEART RIVER NEAR MANDAN, ND--CONTINUED
(National stream-quality accounting network station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1946-50, 1971-76, 1978 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
OCT 28...	1110	96	1380	8.65	9.5	9.5	--	10.6	92	190	48
JAN 26...	1245	42	1640	7.88	-7.0	0.0	1.3	12.5	86	1	30
MAR 08...	1205	7120	460	--	-5.5	1.0	--	--	--	--	--
APR 06...	1650	3750	905	7.84	19.0	7.0	150	10.6	86	4	360
MAY 05...	1330	204	1120	8.23	23.0	19.0	--	9.0	96	--	--
JUN 17...	1440	76	1400	8.29	30.0	28.0	--	7.5	96	--	--
[a]JUL 13...	1400	134	1050	8.27	24.5	23.5	3.8	8.4	98	--	75
SEP 01...	1240	103	1100	8.03	21.5	19.5	12	8.6	93	--	--

DATE	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY, CARBON-ATE IT-FLD (MG/L CACO3) (00419)	BICAR-BONATE WATER WHOLE IT-FLD (MG/L) (00450)	CAR-BONATE WATER WHOLE IT-FLD (MG/L) (00447)
OCT 28...	--	--	--	--	--	--	--	--	329	373	14
JAN 26...	480	0	93	59	270	55	6	8.9	498	608	0
APR 06...	230	52	45	28	110	50	3	9.0	180	220	0
MAY 05...	--	--	--	--	--	--	--	--	275	336	0
JUN 17...	--	--	--	--	--	--	--	--	329	402	0
JUL 13...	260	19	51	31	140	53	4	8.2	241	294	0
SEP 01...	270	25	54	32	150	54	4	8.4	255	311	0

DATE	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2) (00405)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)
OCT 28...	1.4	--	--	--	--	--	--	--	--	<0.010	<0.100
JAN 26...	13	580	12	0.40	6.4	1340	1300	1.8	153	<0.010	0.310
APR 06...	4.9	300	6.8	0.20	6.0	607	610	0.83	6150	0.020	0.740
MAY 05...	3.1	--	--	--	--	--	--	--	--	--	--
JUN 17...	3.2	--	--	--	--	--	--	--	--	--	--
JUL 13...	2.4	320	8.6	0.30	6.4	718	710	0.98	260	--	--
SEP 01...	4.4	340	9.3	0.30	6.2	773	750	1.1	215	<0.010	<0.100

a - Laboratory analysis incomplete prior to report publication.

06349000 HEART RIVER NEAR MANDAN, ND--CONTINUED
(National stream-quality accounting network station)

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, AMMONIA DISSOLVED (MG/L AS NH4) (71846)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	PHOSPHORUS, DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P) (00671)	ALUMINUM, DISSOLVED (UG/L AS AL) (01106)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BARIUM, DISSOLVED (UG/L AS BA) (01005)
OCT 28...	0.040	0.020	0.03	0.50	0.040	0.010	<0.010	--	--	--
JAN 26...	0.090	0.110	0.14	1.1	0.010	0.020	<0.010	10	<1	100
APR 06...	0.300	0.260	0.33	2.3	0.330	0.040	0.020	20	1	59
SEP 01...	0.020	<0.010	--	0.40	0.040	0.020	<0.010	<10	1	64

DATE	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COBALT, DISSOLVED (UG/L AS CO) (01035)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, DISSOLVED (UG/L AS PB) (01049)	LITHIUM DISSOLVED (UG/L AS LI) (01130)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY DISSOLVED (UG/L AS HG) (71890)
JAN 26...	<0.5	<1	<1	<3	2	9	<5	68	13	0.1
APR 06...	<0.5	<1	<1	<3	3	80	<5	24	8	<0.1
SEP 01...	<0.5	<1	<1	<3	1	4	<5	33	2	<0.1

DATE	MOLYBDENUM, DISSOLVED (UG/L AS MO) (01060)	NICKEL, DISSOLVED (UG/L AS NI) (01065)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	SILVER, DISSOLVED (UG/L AS AG) (01075)	STRONTIUM, DISSOLVED (UG/L AS SR) (01080)	VANADIUM, DISSOLVED (UG/L AS V) (01085)	ZINC, DISSOLVED (UG/L AS ZN) (01090)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
JAN 26...	<10	3	<1	<1	1000	<6	<3	57	6.5	76
APR 06...	<10	7	<1	<1	490	<6	7	1060	10700	54
SEP 01...	<10	4	<1	<1	580	<6	<3	52	14	93

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	SAMPLE LOCATION, CROSS SECTION (FT FM L BANK) (00009)	DEPTH TO TOP OF SAMPLE INTERVAL (FT) (72015)	TEMPERATURE WATER (DEG C) (00010)	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH (STANDARD UNITS) (00400)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)
JAN								
26...	1310	8	1.5	0.0	1640	7.87	--	--
26...	1315	16	2.0	0.0	1640	7.88	12.5	86
26...	1320	24	2.0	0.0	1640	7.88	--	--
26...	1325	32	2.0	0.0	1640	7.88	12.5	86
26...	1330	40	2.0	0.0	1640	7.88	--	--
26...	1335	48	2.5	0.0	1640	7.89	12.5	86
SEP								
01...	1203	10	0.5	18.5	1100	8.03	--	--
01...	1207	15	0.5	18.5	1100	8.03	8.7	92
01...	1210	20	0.5	18.5	1100	8.03	--	--
01...	1213	25	0.5	19.0	1100	8.03	8.6	91
01...	1217	30	0.5	19.0	1100	8.03	--	--
01...	1220	35	0.5	19.0	1100	8.03	8.6	91
01...	1223	40	0.5	19.0	1100	8.03	--	--
01...	1227	45	0.5	19.0	1100	8.03	--	--

06349070 MISSOURI RIVER BELOW MANDAN, ND

LOCATION.--Lat 46°44'32", long 100°49'54", at midsection of west half sec.30, T.138 N., R.80 W., Morton County, Hydrologic Unit 10130102, on right bank 1 mi south of Fort Lincoln State Park, 6 mi southeast of Mandan, and at mile 1,309.

DRAINAGE AREA.--189,800 mi^2, approximately.

PERIOD OF RECORD.--September 1966 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,600.00 ft above National Geodetic Vertical Datum of 1929 (U.S. Army Corps of Engineers bench mark).

REMARKS.--Stage regulated by Garrison Dam (station 06338490) 80.9 mi upstream.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height recorded, 29.71 ft, Mar. 17, 1972; minimum daily recorded, 17.40 ft, Apr. 1, 1968.

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22.64	23.90	22.98	26.92	---	24.14	---	20.33	22.41	---	22.63	21.80
2	22.70	23.89	22.66	26.28	---	24.36	---	20.09	22.27	---	22.61	22.00
3	23.10	23.97	22.55	26.34	---	24.46	---	20.26	22.03	---	22.48	22.02
4	23.26	23.96	22.59	26.81	---	---	---	20.24	22.27	---	22.54	22.07
5	23.10	23.97	22.92	27.14	---	---	---	20.31	22.22	---	22.73	22.12
6	23.06	24.01	23.33	27.02	26.33	---	---	20.13	22.14	---	22.55	21.96
7	22.87	24.00	23.09	26.35	26.39	---	---	20.21	22.04	22.41	22.39	22.23
8	22.11	24.05	22.95	26.08	26.50	---	---	20.07	22.22	22.38	22.42	22.05
9	22.32	23.79	22.82	26.07	26.52	---	---	20.21	22.29	22.24	22.52	21.92
10	22.30	23.67	24.96	25.58	26.65	---	---	20.16	22.28	22.33	22.43	21.92
11	22.55	23.76	26.99	25.68	26.86	---	---	20.29	22.29	22.44	22.31	22.05
12	22.30	23.76	28.03	26.54	26.84	22.93	---	20.57	22.28	22.56	22.47	21.92
13	22.06	23.79	27.16	26.08	26.68	23.04	---	21.04	22.24	22.50	22.36	21.82
14	22.30	23.90	26.70	25.64	26.59	22.71	---	21.71	22.30	22.40	22.37	21.79
15	22.40	23.77	27.14	24.71	26.10	22.27	---	22.17	---	22.41	22.50	21.79
16	22.36	23.59	27.27	24.02	26.52	21.81	20.50	22.19	---	22.41	22.56	21.76
17	22.36	23.33	27.17	24.30	26.69	21.39	---	22.21	---	22.39	22.61	21.79
18	22.36	23.31	26.96	24.76	26.66	21.43	---	22.27	---	22.54	22.55	21.72
19	22.34	23.29	27.04	25.18	26.59	21.40	---	22.21	---	22.43	22.27	21.54
20	22.18	23.29	27.17	25.33	26.53	---	---	22.29	---	22.58	22.43	21.67
21	---	23.29	26.95	25.29	26.58	---	---	22.50	---	22.43	22.53	21.61
22	---	23.22	26.92	25.56	26.62	---	---	22.17	---	22.59	22.63	21.95
23	23.51	23.22	27.20	25.77	26.58	---	---	22.19	---	22.60	22.52	21.83
24	23.75	23.31	27.31	26.11	26.39	---	20.21	22.27	---	22.57	22.70	21.77
25	23.75	23.39	27.26	26.38	25.77	---	20.50	22.28	---	22.57	22.26	21.51
26	23.86	23.39	27.21	26.48	26.00	---	20.44	22.29	---	22.44	22.39	21.60
27	23.83	23.43	27.25	26.66	25.64	---	20.15	22.40	---	22.52	22.45	22.12
28	23.88	23.43	27.31	---	24.20	---	20.24	22.34	---	22.55	22.31	22.08
29	23.86	23.37	27.26	---	---	---	20.27	22.34	---	22.56	22.39	21.54
30	23.77	23.06	27.11	---	---	---	20.24	22.40	---	22.49	22.54	21.58
31	23.87	---	27.31	---	---	---	---	22.40	---	22.51	22.13	---
MEAN	---	23.6	25.9	---	---	---	---	21.4	---	---	22.5	21.9
MAX	---	24.05	28.03	---	---	---	---	22.50	---	---	22.73	22.23
MIN	---	23.06	22.55	---	---	---	---	20.07	---	---	22.13	21.51

06349500 APPLE CREEK NEAR MENOKEN, ND

LOCATION.--Lat 46°47'40", long 100°39'25", in NW¼NE¼ sec.9, T.138 N., R.79 W., Burleigh County, Hydrologic Unit 10130103, on left bank 75 ft downstream from bridge on county highway, 4 mi upstream from Hay Creek, 6.3 mi west of Menoken, and 6.4 mi east of Bismarck.

DRAINAGE AREA.--1,680 mi^2, approximately, of which about 500 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March to June 1905, October 1945 to current year. Published as "near Bismarck" 1905.

REVISED RECORDS.--WSP 1209: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,638.61 ft above National Geodetic Vertical Datum of 1929. See WSP 1729 or 1917 for history of changes prior to Sept. 30, 1953.

REMARKS.--Estimated daily discharges: Nov. 2-15, 28 to Mar. 19. Records fair except those for period of estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--42 years, 35.2 ft^3/s, 25,500 acre-ft/yr; median of yearly mean discharges, 23 ft^3/s, 16,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,750 ft^3/s, Apr. 18, 1950, gage height, 17.07 ft; maximum gage height, 17.46 ft, Apr. 19, 1979; no flow at times in some years.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 14	----	350	Ice backwater	Mar. 23	0015	*3400	*16.80

Minimum daily discharge, 4.9 ft^3/s, Oct. 28.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	5.5	9.2	7.8	10	11	1060	105	60	17	29	18
2	12	5.7	9.0	7.6	10	9.9	1090	103	55	16	34	17
3	14	6.2	8.9	7.4	10	11	1130	97	51	16	32	17
4	12	6.0	8.8	7.2	10	10	1010	94	48	15	31	17
5	11	5.8	8.6	7.6	11	9.9	931	97	46	16	30	18
6	10	7.2	8.2	8.0	15	12	880	94	45	15	28	19
7	13	6.5	8.2	8.3	25	15	827	89	43	14	26	18
8	15	6.0	8.4	8.6	70	56	769	83	42	13	25	18
9	14	5.5	8.5	8.4	110	155	709	77	40	13	24	17
10	13	6.0	8.6	8.2	150	133	638	73	37	18	22	16
11	12	6.4	8.6	8.4	220	100	575	68	37	21	25	17
12	10	6.6	8.4	8.6	230	80	521	63	36	24	27	17
13	9.8	6.8	7.8	9.0	260	70	486	58	32	20	27	16
14	10	6.8	7.9	9.6	300	60	446	57	30	18	28	16
15	9.4	7.0	7.8	10	200	55	409	55	28	17	37	13
16	11	7.3	8.0	9.8	150	50	375	51	27	15	29	14
17	11	7.4	7.8	9.6	100	45	340	50	25	15	25	13
18	11	8.2	7.9	9.5	80	40	314	47	24	16	25	13
19	11	8.7	7.8	9.2	70	35	293	45	24	20	23	14
20	12	8.2	7.5	9.0	60	66	266	44	23	21	21	15
21	11	8.4	7.3	9.4	50	486	214	48	27	22	20	13
22	10	8.8	7.3	9.8	40	1760	202	60	23	21	19	12
23	8.4	9.1	7.4	9.4	35	2840	192	56	21	21	18	11
24	5.2	9.2	7.4	9.2	30	2200	178	53	22	21	18	14
25	5.1	10	7.6	9.0	19	1680	164	54	21	23	20	15
26	5.5	12	7.7	9.2	17	1490	152	60	20	22	21	10
27	5.4	12	7.4	9.6	16	1440	138	65	19	20	21	11
28	4.9	10	7.6	9.8	14	1330	127	69	19	22	20	14
29	5.1	9.0	7.0	9.2	---	1050	120	69	18	26	19	13
30	5.3	8.8	7.2	9.6	---	1010	110	66	17	28	19	14
31	5.3	---	7.6	10	---	961	---	63	---	27	18	---
TOTAL	303.4	231.1	247.4	276.0	2312	17270.8	14666	2113	960	593	761	450
MEAN	9.79	7.70	7.98	8.90	82.6	557	489	68.2	32.0	19.1	24.5	15.0
MAX	15	12	9.2	10	300	2840	1130	105	60	28	37	19
MIN	4.9	5.5	7.0	7.2	10	9.9	110	44	17	13	18	10
AC-FT	602	458	491	547	4590	34260	29090	4190	1900	1180	1510	893

CAL YR 1986 TOTAL 16595.6 MEAN 45.5 MAX 1200 MIN .09 AC-FT 32920
WTR YR 1987 TOTAL 40183.7 MEAN 110 MAX 2840 MIN 4.9 AC-FT 79700

06349500 APPLE CREEK NEAR MENOKEN, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1974 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
OCT											
23...	1540	8.6	980	--	6.0	3.0	--	--	--	--	--
DEC											
11...	1450	8.6	1630	--	21.0	0.0	--	--	--	--	--
JAN											
29...	1445	9.2	--	--	1.0	0.0	--	--	--	--	--
FEB											
25...	1550	22	1950	--	-2.0	0.0	--	--	--	--	--
MAR											
22...	1615	1400	280	7.84	4.0	1.5	59	0	12	7.0	21
23...	1245	3020	175	--	3.0	1.0	--	--	--	--	--
JUN											
11...	1330	38	1050	--	27.0	21.0	--	--	--	--	--
JUL											
22...	1530	21	1050	--	33.0	27.0	--	--	--	--	--
SEP											
01...	1345	20	1480	7.19	25.0	19.0	190	0	29	29	210

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
22...	41	1	6.2	60	52	2.9	0.10	5.8	131	140	0.18
SEP											
01...	68	7	15	490	170	11	0.30	12	819	790	1.1

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
MAR										
22...	1	30	240	<1	12	100	0.3	<1	1	150
SEP										
01...	5	610	70	<1	180	20	<0.1	<1	1	300

06349700 MISSOURI RIVER NEAR SCHMIDT, ND

LOCATION.--Lat 46°39'22", long 100°44'18", in SW¼NE¼ sec.26, T.137 N., R.80 W., Morton County, Hydrologic Unit 10130102, on right bank 2 mi southeast of abandoned townsite of Schmidt, 13 mi southeast of Mandan, and at mile 1,298.

DRAINAGE AREA.--191,700 mi^2, approximately.

PERIOD OF RECORD.--September 1966 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,600.00 ft National Geodetic Vertical Datum of 1929.

REMARKS.--Stage regulated by releases from Garrison Dam (station 06338490) 91.1 mi upstream, and backwater from Lake Oahe.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height recorded, 23.56 ft, Dec. 9, 1976; minimum daily recorded, 7.92 ft, May 30, 1967.

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15.77	16.79	15.70	18.74	19.90	17.58	15.22	15.45	---	16.18	15.59	14.67
2	15.56	16.79	15.39	18.21	19.84	17.79	15.32	15.30	---	15.89	15.58	14.93
3	15.92	16.82	15.18	18.00	19.90	18.08	15.19	15.35	---	16.02	15.43	15.03
4	16.15	16.86	15.21	18.52	19.91	18.26	15.85	15.31	---	16.08	15.46	14.82
5	16.05	16.83	15.70	18.85	19.99	18.71	16.00	15.39	---	16.09	15.72	14.86
6	16.07	16.84	16.55	19.05	20.05	18.99	16.20	15.11	---	16.14	15.52	14.71
7	15.98	16.85	17.24	18.56	20.08	19.29	16.08	---	---	16.00	15.38	14.86
8	15.27	16.89	17.46	18.01	20.19	19.20	16.05	---	---	16.01	15.38	14.78
9	15.52	16.72	17.18	18.20	20.19	17.77	15.85	---	---	15.96	15.47	14.60
10	15.63	16.56	17.75	17.64	20.22	17.41	15.66	---	---	15.91	15.53	14.60
11	15.28	16.72	18.07	17.70	20.39	19.76	15.54	---	---	15.84	15.43	14.63
12	15.41	16.70	19.34	18.37	20.41	20.82	15.66	---	---	15.82	15.33	14.60
13	15.40	16.84	19.27	18.39	20.26	21.18	15.52	---	---	15.89	15.35	14.52
14	15.33	17.03	18.36	17.91	20.15	20.75	15.76	---	---	15.74	15.41	14.43
15	15.37	16.72	18.37	17.24	19.72	19.65	15.75	---	---	15.80	15.48	14.41
16	15.39	16.43	18.61	15.95	19.81	17.76	15.69	---	---	15.84	15.40	14.42
17	15.39	16.15	18.55	16.06	20.10	16.12	15.73	---	---	15.63	15.49	14.34
18	15.37	16.09	18.36	16.76	20.10	15.63	16.12	---	16.22	15.73	15.40	14.35
19	15.35	16.10	18.24	17.33	20.03	15.44	15.87	---	16.12	15.65	15.18	14.08
20	15.12	16.07	18.43	17.68	19.98	15.45	14.99	---	16.14	15.78	15.29	14.26
21	15.52	16.05	18.31	17.55	19.99	16.54	15.70	---	16.11	15.71	15.34	14.24
22	15.77	15.98	18.10	18.21	20.00	18.68	15.78	---	16.14	15.73	15.31	14.50
23	16.14	15.89	18.31	18.06	20.00	19.07	15.53	---	16.00	15.72	15.29	14.44
24	16.48	16.02	18.49	18.38	19.83	18.79	15.59	---	16.13	15.69	15.49	14.33
25	16.54	16.07	18.56	18.97	19.37	18.29	15.64	---	16.12	15.72	15.31	13.87
26	16.65	16.14	18.53	19.19	19.36	17.41	15.66	---	16.10	15.61	15.27	14.06
27	16.66	16.13	18.53	19.27	19.33	16.51	15.55	---	16.15	15.60	15.29	14.51
28	16.64	16.15	18.68	19.60	18.02	15.73	15.69	---	15.91	15.59	15.26	14.59
29	16.69	16.06	18.75	19.74	---	15.51	15.49	---	15.82	15.62	15.28	14.00
30	16.63	15.83	18.71	19.88	---	15.49	15.87	---	16.03	15.56	15.36	13.83
31	16.65	---	18.85	19.86	---	15.32	---	---	---	15.50	15.04	---
MEAN	15.9	16.4	17.8	18.3	19.9	17.8	15.7	---	---	15.8	15.4	14.5
MAX	16.69	17.03	19.34	19.88	20.41	21.18	16.20	---	---	16.18	15.72	15.03
MIN	15.12	15.83	15.18	15.95	18.02	15.32	14.99	---	---	15.50	15.04	13.83

06350000 CANNONBALL RIVER AT REGENT, ND

LOCATION.--Lat 46°25'36", long 102°33'05", in NE¼NE¼ sec.13, T.134 N., R.95 W., Hettinger County, Hydrologic Unit 10130204, on right bank 400 ft from bridge on county highway, and 0.3 mi north of Regent.

DRAINAGE AREA.--580 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1950 to current year.

GAGE.--Water-stage recorder. Datum of gage is 2,422.90 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated discharges: Nov. 8-20, Dec. 9-15, Jan. 15-24, Feb. 28, and Mar. 21-30. Records good except those for period of estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--37 years, 48.2 ft^3/s, 34,920 acre-ft/yr; median of yearly mean discharges, 35 ft^3/s, 25,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,000 ft^3/s, Mar. 27, 1978, gage height, 20.55 ft; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage known since 1914, 26.1 ft, Apr. 16, 1950, from floodmarks, discharge, 20,300 ft^3/s, on basis of slope-area measurement at site 4 mi downstream.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Apr. 5	1345	*1600	*9.21	No other peak above base.			

Minimum daily discharge, 3.7 ft^3/s, July 4

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	51	8.7	16	7.4	6.4	9.6	1060	17	13	5.6	25	5.4
2	40	8.3	16	7.2	7.0	9.6	1200	17	11	5.1	47	5.2
3	34	8.3	15	7.2	6.8	9.6	1120	18	9.7	4.7	54	5.0
4	30	8.6	13	7.0	7.1	12	1370	20	9.4	3.7	57	4.7
5	27	9.1	13	7.0	7.3	15	1550	21	9.5	4.1	74	5.4
6	24	9.1	12	7.2	7.7	24	1100	19	9.1	4.1	57	5.8
7	21	9.7	11	7.1	8.8	40	595	17	8.4	3.9	42	5.3
8	18	10	10	7.1	9.7	45	307	16	7.7	4.1	32	4.8
9	17	9.5	9.0	6.8	11	43	191	15	7.1	5.1	25	4.7
10	15	8.5	8.5	6.7	13	29	129	14	7.1	4.5	19	4.7
11	14	9.5	8.5	6.7	15	33	96	13	7.1	5.3	15	4.8
12	12	9.0	9.0	6.8	20	31	79	12	6.6	6.9	12	4.8
13	12	9.0	9.0	7.1	24	26	66	11	6.1	6.9	10	4.9
14	12	8.5	8.5	7.1	21	23	57	11	5.8	6.6	9.9	4.9
15	12	9.0	9.5	6.5	16	21	50	10	5.4	6.3	9.2	4.7
16	14	10	9.3	6.5	19	18	46	9.9	5.2	5.5	9.7	4.7
17	14	11	9.1	7.0	19	17	42	9.6	5.2	4.4	10	4.9
18	12	10	8.8	6.5	16	16	39	9.5	4.8	4.4	8.9	4.5
19	12	10	8.4	7.0	14	16	36	9.3	4.7	5.1	8.4	4.5
20	12	11	8.2	7.0	14	18	33	12	7.5	191	7.8	4.5
21	11	11	7.8	6.5	12	40	31	17	7.7	145	7.1	4.5
22	10	11	7.6	6.5	11	60	30	17	6.5	74	6.5	4.3
23	9.9	11	7.8	6.0	11	100	28	16	5.7	47	6.0	4.3
24	9.4	12	7.8	6.5	9.9	90	26	14	6.0	37	6.0	4.3
25	9.2	14	7.8	7.1	9.7	80	25	14	5.9	37	5.9	4.2
26	9.1	14	7.6	7.1	9.6	70	24	25	5.5	48	5.8	4.3
27	9.1	15	7.6	7.1	9.6	130	22	24	5.2	46	5.8	4.5
28	9.1	15	7.6	6.8	9.0	120	21	20	5.2	71	5.8	4.6
29	9.1	16	7.6	6.8	---	110	20	18	5.1	62	5.5	4.7
30	9.1	16	7.4	6.2	---	100	18	19	5.1	44	5.0	4.5
31	9.1	---	7.4	6.1	---	89	---	16	---	33	5.4	---
TOTAL	507.1	321.8	295.8	211.6	344.6	1444.8	9411	481.3	208.3	931.3	597.7	142.4
MEAN	16.4	10.7	9.54	6.83	12.3	46.6	314	15.5	6.94	30.0	19.3	4.75
MAX	51	16	16	7.4	24	130	1550	25	13	191	74	5.8
MIN	9.1	8.3	7.4	6.0	6.4	9.6	18	9.3	4.7	3.7	5.0	4.2
AC-FT	1010	638	587	420	684	2870	18670	955	413	1850	1190	282

CAL YR 1986 TOTAL 25189.6 MEAN 69.0 MAX 2800 MIN 3.4 AC-FT 49960
WTR YR 1987 TOTAL 14897.6 MEAN 40.8 MAX 1550 MIN 3.7 AC-FT 29550

06350000 CANNONBALL RIVER AT REGENT, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1964-66, 1971 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
OCT											
06...	1640	22	1460	--	23.0	12.5	--	--	--	--	--
08...	1135	7.0	1570	--	-2.0	3.5	--	--	--	--	--
NOV											
20...	1105	11	2080	--	-1.0	0.0	--	--	--	--	--
JAN											
05...	1545	6.9	2540	--	-1.0	0.0	--	--	--	--	--
FEB											
17...	1655	18	2780	8.30	2.0	0.0	710	260	120	100	430
MAR											
10...	1130	22	1680	--	1.5	0.5	--	--	--	--	--
APR											
02...	1330	1230	800	--	3.5	1.5	--	--	--	--	--
10...	1440	124	798	--	-2.0	6.5	--	--	--	--	--
MAY											
13...	1440	11	1710	--	23.5	21.5	--	--	--	--	--
JUN											
09...	1355	7.1	2030	--	23.0	22.0	--	--	--	--	--
JUL											
21...	1120	117	820	--	25.0	17.5	--	--	--	--	--
AUG											
26...	1050	5.8	1760	8.30	14.0	16.0	380	45	76	47	220

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
FEB											
17...	56	7	12	450	1100	11	0.30	6.7	2210	2100	3.0
AUG											
26...	55	5	9.4	340	550	6.1	0.50	3.6	1160	1100	1.6

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
FEB										
17...	<1	430	50	<1	53	180	0.3	1	3	1700
AUG										
26...	<1	570	20	<1	34	130	0.2	2	2	1100

06351680 WHITE BUTTE FORK CEDAR CREEK NEAR SCRANTON, ND

LOCATION.--Lat 46°19'20", long 102°59'45", in NW1/4 sec.21, T.133 N., R.98 W., Slope County, Hydrologic Unit 10130205, on left bank 1,200 ft downstream from county highway bridge, and 13 mi northeast of Scranton.

DRAINAGE AREA.--42.9 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1965 to current year (seasonal records only since 1984).

GAGE.--Water-stage recorder. Elevation of gage is 2,825 ft above National Geodetic Vertical Datum from topographic map.

REMARKS.--Estimated daily discharges: Feb. 1 to Mar. 30. Records good except those for period of estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--18 years (water years 1966-83), 4.45 ft^3/s, 3,220 acre-ft/yr; median of yearly mean discharges, 4.54 ft^3/s, 3,290 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 645 ft^3/s, May 8, 1970, gage height, 7.20 ft; maximum gage height, 7.76 ft, May 8, 1967; no flow for many days each year.

EXTREMES FOR CURRENT YEAR.--Maximum observed discharge, 494 ft^3/s, Apr. 5, gage height, 7.12 ft, backwater from ice; no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1					.05	.20	92	.38	.22	.00	.70	.01
2					.05	.20	127	.42	.15	.00	.62	.02
3					.20	.30	177	1.1	.11	.00	.54	.01
4					.05	.50	246	1.4	.09	.00	.41	.02
5					.05	1.0	338	.90	.07	.00	.30	.06
6					.05	.75	98	.76	.05	.00	.21	.10
7					.10	.70	39	.60	.05	.00	.15	.14
8					.20	.50	16	.50	.05	.00	.14	.07
9					.20	1.0	9.0	.39	.05	.00	.14	.03
10					.15	.50	6.2	.54	.07	.00	.11	.02
11					.10	.50	4.8	.67	.07	.00	.10	.03
12					.10	.50	4.2	.35	.04	.00	.11	.04
13					.10	.50	3.4	.24	.02	.00	.12	.11
14					.10	.60	2.6	.17	.01	.00	.14	.08
15					.20	.70	2.4	.14	.00	.00	.12	.03
16					.25	.75	2.2	.14	.00	.00	.12	.02
17					.30	.60	2.0	.13	.00	.00	.17	.01
18					.30	.35	2.1	.13	.00	.00	.14	.00
19					.35	.60	2.1	.26	.00	.00	.10	.00
20					.35	2.0	1.4	.48	.00	8.4	.10	.00
21					.30	1.5	1.3	.76	.00	3.4	.07	.00
22					.30	3.0	.98	.72	.00	9.9	.04	.00
23					.25	5.0	.77	.53	.00	25	.05	.00
24					.20	5.0	.76	.39	.02	16	.03	.00
25					.20	6.0	.72	.34	.02	8.1	.07	.00
26					.20	5.0	.67	.33	.00	12	.11	.01
27					.20	7.0	.53	.54	.00	7.2	.16	.01
28					.20	3.0	.54	.69	.00	4.8	.12	.00
29					---	1.5	.48	.50	.00	2.4	.08	.00
30					---	2.0	.40	.71	.00	1.4	.05	.00
31					---	45	---	.41	---	.83	.02	---
TOTAL					5.10	96.75	1182.55	15.62	1.09	99.43	5.34	.82
MEAN					.18	3.12	39.4	.50	.04	3.21	.17	.03
MAX					.35	45	338	1.4	.22	25	.70	.14
MIN					.05	.20	.40	.13	.00	.00	.02	.00
AC-FT					10	192	2350	31	2.2	197	11	1.6

06351680 WHITE BUTTE FORK CEDAR CREEK NEAR SCRANTON, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
OCT											
09...	1535	0.18	3650	--	13.0	11.0	--	--	--	--	--
FEB											
02...	1215	0.06	4000	--	3.0	0.0	--	--	--	--	--
20...	1610	0.36	3180	--	5.0	0.0	--	--	--	--	--
APR											
05...	1200	447	560	7.90	14.0	6.5	120	9	23	15	68
08...	1425	15	698	--	22.0	12.0	--	--	--	--	--
MAY											
20...	1610	0.52	3730	--	4.0	11.0	--	--	--	--	--
JUN											
12...	1155	0.06	4600	8.59	30.0	22.5	1500	1300	210	230	650
JUL											
24...	1355	15	1300	--	23.0	22.0	--	--	--	--	--
AUG											
04...	1040	0.01	2910	--	16.0	17.0	--	--	--	--	--

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR											
05...	54	3	6.7	110	170	5.2	0.20	23	368	380	0.50
JUN											
12...	49	8	11	140	2800	20	0.10	0.3	4070	4000	5.5

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR										
05...	2	160	100	<1	11	110	<0.1	<1	1	260
JUN										
12...	1	1700	40	2	140	120	<0.1	1	8	4200

06352000 CEDAR CREEK NEAR HAYNES, ND

LOCATION.--Lat 46°09'15", long 102°28'25", in W½ sec.20, T.131 N., R.94 W., Adams County, Hydrologic Unit 10130205, on left bank 30 ft downstream from bridge on State Highway 8, and 12.5 mi north of Haynes.

DRAINAGE AREA.--553 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1950 to current year.

GAGE.--Water-stage recorder. Datum of gage is 2,472.90 ft above National Geodetic Vertical Datum of 1929, North Dakota Highway Department benchmark. Prior to May 20, 1951, nonrecording gage on former bridge 400 ft upstream at same datum.

REMARKS.--Estimated daily discharges: Nov. 7-19, Dec. 1-2, 9-16, Jan. 15-28, and Feb. 27 to Mar. 10. Records good except those for periods of estimated discharges, which are fair.

AVERAGE DISCHARGE.--37 years, 37.5 ft^3/s, 27,170 acre-ft/yr; median of yearly mean discharges, 30 ft^3/s, 21,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,870 ft^3/s, Apr. 7, 1952, gage height, 21.25 ft; maximum gage height, 22.05 ft, Mar. 28, 1978, backwater from ice and snow; no flow at times in some years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Apr. 17, 1950 reached a stage of about 23 ft, discharge, 26,900 ft^3/s, by slope-area measurement at site 9 mi upstream.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,370 ft^3/s, Apr. 6, gage height, 14.14 ft, only peak above base of 400 ft^3/s; minimum daily, 2.0 ft^3/s, July 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21	4.3	10	5.5	6.8	9.5	66	11	21	2.4	62	2.4
2	18	3.9	10	5.3	6.7	10	621	10	16	2.5	45	2.3
3	15	3.8	9.0	5.6	7.2	11	653	11	14	2.6	34	2.1
4	12	4.2	8.4	5.3	7.4	13	743	12	12	2.4	30	2.2
5	10	4.2	7.3	5.0	7.5	16	1100	13	11	2.4	24	2.3
6	8.6	4.2	6.8	5.1	7.2	19	1310	13	9.5	2.3	22	2.4
7	7.8	4.0	6.4	5.0	7.4	22	1220	13	8.2	2.1	20	2.4
8	7.6	3.5	6.5	5.4	7.9	25	550	15	7.3	2.0	21	2.4
9	7.9	3.0	6.5	5.7	7.7	24	266	14	6.2	3.3	18	2.4
10	7.0	2.5	6.0	6.0	8.5	30	180	12	5.5	3.2	14	2.4
11	6.3	2.3	4.0	6.4	8.7	27	132	10	5.3	2.9	10	3.2
12	5.8	2.4	4.2	5.9	9.0	28	95	8.5	4.9	4.1	9.7	3.3
13	5.7	3.0	4.5	5.4	8.9	28	69	8.0	4.1	4.0	8.8	2.8
14	5.6	4.5	5.0	5.3	9.6	28	55	7.3	3.8	3.7	9.4	2.4
15	5.7	6.5	5.5	4.0	11	25	50	6.5	3.4	3.2	9.4	2.4
16	5.4	7.5	6.0	2.5	12	22	45	6.1	2.8	3.0	7.9	2.7
17	5.3	8.0	6.5	2.2	11	21	40	5.9	2.8	2.9	7.4	2.8
18	5.0	7.0	6.3	2.1	12	19	35	5.8	2.5	3.1	5.9	2.7
19	4.7	8.0	6.4	2.1	16	18	32	5.4	2.2	3.3	4.9	2.8
20	4.7	8.8	6.4	2.1	25	20	28	8.6	2.9	3.3	4.7	3.1
21	4.8	8.1	6.6	2.2	18	41	25	13	2.9	3.3	3.6	3.8
22	5.4	8.3	6.8	2.4	15	93	24	14	3.0	3.3	3.3	3.3
23	4.8	8.0	6.2	2.6	13	135	22	18	3.0	3.1	3.3	2.9
24	4.6	8.5	6.3	3.0	12	145	19	22	3.5	2.8	3.0	2.8
25	4.2	9.7	6.2	4.0	10	124	18	19	3.5	3.5	3.0	2.6
26	3.8	10	6.0	5.0	10	101	16	16	3.1	3.9	3.6	2.6
27	3.8	11	6.0	5.5	9.5	76	15	16	2.6	84	3.8	2.6
28	3.8	11	5.7	6.0	9.0	84	14	16	2.3	120	3.8	2.6
29	3.9	12	6.1	6.3	---	87	12	31	2.2	83	3.6	2.5
30	4.2	11	5.8	6.8	---	63	11	33	2.2	75	2.8	2.4
31	4.5	---	5.2	6.7	---	45	---	27	---	78	2.6	---
TOTAL	216.9	193.2	198.6	142.4	294.0	1409.5	7466	421.1	173.7	518.6	404.5	79.6
MEAN	7.00	6.44	6.41	4.59	10.5	45.5	249	13.6	5.79	16.7	13.0	2.65
MAX	21	12	10	6.8	25	145	1310	33	21	120	62	3.8
MIN	3.8	2.3	4.0	2.1	6.7	9.5	11	5.4	2.2	2.0	2.6	2.1
AC-FT	430	383	394	282	583	2800	14810	835	345	1030	802	158

CAL YR 1986 TOTAL 25261.5 MEAN 69.2 MAX 3600 MIN 1.7 AC-FT 50110
WTR YR 1987 TOTAL 11518.0 MEAN 31.6 MAX 1310 MIN 2.0 AC-FT 22850

06352000 CEDAR CREEK NEAR HAYNES, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1971 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
OCT											
07...	1035	7.9	2170	--	18.0	11.5	--	--	--	--	--
NOV											
20...	1350	8.0	2410	--	3.5	0.0	--	--	--	--	--
JAN											
06...	1130	5.6	2790	--	-6.0	0.0	--	--	--	--	--
FEB											
18...	1105	11	2660	8.20	0.0	0.0	910	470	150	130	350
MAR											
10...	1450	33	2440	--	5.0	0.0	--	--	--	--	--
APR											
05...	1720	1240	1430	--	15.0	6.0	--	--	--	--	--
10...	1655	169	775	--	-2.0	6.0	--	--	--	--	--
JUN											
09...	1715	5.7	2500	--	19.0	22.0	--	--	--	--	--
JUL											
21...	1520	3.2	2200	8.40	33.5	25.5	570	240	78	90	300
AUG											
26...	1550	3.6	1750	--	15.0	16.5	--	--	--	--	--

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
FEB											
18...	45	5	11	440	1200	18	0.40	3.3	2180	2100	3.0
JUL											
21...	53	6	11	330	920	10	0.30	1.8	1620	1600	2.2

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
FEB										
18...	<1	470	30	<1	71	60	0.2	<1	2	2200
JUL										
21...	1	790	20	1	76	30	0.2	2	<1	1400

06353000 CEDAR CREEK NEAR RALEIGH, ND

LOCATION.--Lat 46°05'30", long 101°20'00", in NE¼SE¼ sec.8, T.130 N., R.85 W., Grant County, Hydrologic Unit 10130205, on left bank at upstream side of bridge on N.D. Highway 31, 6 mi upstream from mouth, and 19 mi south of Raleigh.

DRAINAGE AREA.--1,750 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April to September 1939, March 1962 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,881.23 ft above National Geodetic Vertical Datum of 1929. Prior to June 6, 1962, nonrecording gage at same site and datum, and June 6, 1962, to Sept. 7, 1972, at site 1 mi upstream at datum 9.58 ft higher.

REMARKS.--Estimated daily discharges: Nov. 7 to Mar. 22 and Apr. 12-28. Records good except those for period of estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--25 years (water years 1963-87), 105 ft^3/s, 76,070 acre-ft/yr; median of yearly mean discharges, 82 ft^3/s, 59,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,400 ft^3/s, Mar. 28, 1978, gage height, 13.70 ft; no flow at times in most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage known since 1950, about 18 ft, Apr. 18, 1950; discharge 45,000 ft^3/s, on basis of slope-area measurement 5 mi upstream.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 700 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 9	----	1200	ice jam	Apr. 9	0900	1310	[a]5.62
Mar. 22	1500	*8700	*[a]12.03	July 20	1130	782	4.64

a - observed
Minimum daily discharge, 4.6 ft^3/s, Sept.27-30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	38	15	18	13	9.2	35	436	61	161	13	25	9.9
2	41	15	17	12	10	40	414	58	164	12	21	8.7
3	37	15	16	13	12	40	436	59	113	11	46	7.9
4	42	15	16	13	14	45	520	61	99	11	81	7.4
5	47	15	16	12	16	50	692	58	92	10	96	7.1
6	39	16	16	12	18	50	1020	55	79	9.8	88	7.1
7	33	16	15	11	20	100	1120	53	70	9.0	72	6.8
8	29	14	15	11	21	600	1240	53	60	8.7	60	6.4
9	27	13	12	12	22	1000	1180	53	54	9.2	51	5.6
10	25	12	14	13	23	800	1020	51	48	10	44	5.2
11	23	13	14	14	23	500	966	48	45	9.5	38	8.4
12	23	14	14	14	24	300	500	45	40	13	37	7.8
13	21	15	13	13	23	275	400	42	36	11	34	6.8
14	20	15	13	12	22	250	300	41	33	10	31	6.6
15	20	16	14	11	21	240	250	39	30	9.5	28	6.5
16	19	16	14	10	21	200	210	38	26	8.6	27	6.4
17	19	17	13	9.8	20	190	180	41	23	8.1	27	5.9
18	18	17	13	9.6	20	175	150	42	22	11	24	5.5
19	18	18	12	9.5	21	160	120	39	20	146	22	5.7
20	18	19	13	9.4	22	500	110	43	22	434	20	5.9
21	17	19	14	9.3	23	4800	100	105	22	503	17	5.9
22	17	20	14	9.2	24	7790	95	72	19	309	16	5.9
23	17	20	13	9.0	24	7660	90	58	23	253	15	5.7
24	17	20	13	8.8	23	5770	85	308	26	145	13	5.4
25	17	20	14	8.6	22	2790	80	346	21	102	13	5.1
26	16	20	12	8.4	20	1180	76	216	18	86	14	4.7
27	16	20	13	8.3	19	1040	74	329	19	65	19	4.6
28	16	19	14	8.4	30	623	71	436	17	53	15	4.6
29	16	19	13	8.2	---	612	69	420	15	43	13	4.6
30	16	18	12	7.0	---	469	65	322	14	34	11	4.6
31	15	---	13	8.2	---	446	---	218	---	29	11	---
TOTAL	737	501	433	327.7	567.2	38730	12069	3810	1431	2386.4	1029	188.7
MEAN	23.8	16.7	14.0	10.6	20.3	1249	402	123	47.7	77.0	33.2	6.29
MAX	47	20	18	14	30	7790	1240	436	164	503	96	9.9
MIN	15	12	12	7.0	9.2	35	65	38	14	8.1	11	4.6
AC-FT	1460	994	859	650	1130	76820	23940	7560	2840	4730	2040	374

CAL YR 1986 TOTAL 56419.8 MEAN 155 MAX 2410 MIN 5.4 AC-FT 111900
WTR YR 1987 TOTAL 62209.9 MEAN 170 MAX 7790 MIN 4.6 AC-FT 123400

06353000 CEDAR CREEK NEAR RALEIGH, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
OCT											
29...	1310	16	980	--	13.0	10.0	--	--	--	--	--
DEC											
10...	1215	14	3210	--	--	0.0	--	--	--	--	--
JAN											
27...	1400	8.4	570	--	2.0	1.5	--	--	--	--	--
MAR											
09...	1310	991	--	--	-8.0	0.5	--	--	--	--	--
22...	1550	8530	--	--	3.5	--	--	--	--	--	--
25...	1410	2820	390	8.51	3.5	2.0	120	42	24	15	31
APR											
28...	1520	71	620	--	25.0	21.0	--	--	--	--	--
JUN											
09...	1510	53	2360	--	24.0	21.0	--	--	--	--	--
JUL											
23...	1453	271	1050	--	31.0	25.0	--	--	--	--	--
SEP											
09...	1230	5.5	2200	7.52	23.0	19.0	580	280	78	92	340

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
25...	33	1	10	80	110	3.8	0.10	16	257	260	0.35
SEP											
09...	56	6	15	300	1000	12	0.40	3.1	1720	1700	2.3

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
MAR										
25...	<1	60	900	<1	12	100	0.2	<1	<1	310
SEP										
09...	1	690	30	1	94	30	0.1	2	6	1400

06354000 CANNONBALL RIVER AT BREIEN, ND
(National stream-quality accounting network station)

LOCATION.--Lat 46°22'33", long 100°56'03", in sec.36, T.134 N., R.82 W., Morton County, Hydrologic Unit 10130206, on left bank at downstream side of bridge on State Highway 6, 1,100 ft downstream from Dogtooth Creek, and 0.6 mi southeast of Breien.

DRAINAGE AREA.--4,100 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1934 to current year.

REVISED RECORDS.--WSP 786: 1934. WSP 1146: 1943. WSP 1279: 1936-37(M), 1947(M). WSP 1509: 1955(M).

GAGE.--Water-stage recorder. Datum of gage is 1,673.54 ft above National Geodetic Vertical Datum of 1929. From June 12, 1973, to July 1, 1985, at site 450 ft downstream. Prior to June 12, 1973, at site 50 ft upstream at datum 3.00 ft higher. June 13, 1973, to April 8, 1980, at datum 2.00 ft higher.

REMARKS.--Estimated daily discharges: Nov. 8 to Mar. 23. Records good except those for period of estimated daily discharges, which are poor. Some storage in several small lakes above station.

AVERAGE DISCHARGE.--53 years, 258 ft^3/s, 186,900 acre-ft/yr; median of yearly mean discharges, 200 ft^3/s, 145,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 94,800 ft^3/s, Apr. 19, 1950, gage height, 22.30 ft, from floodmarks, from rating curve extended above 16,000 ft^3/s on basis of slope area and contracted-opening measurements of peak flow, site and datum then in use; no flow at times in some years.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 22	0618	*23,000	a*19.36	Apr. 1	1500	6,980	11.24

Minimum daily discharge, 17 ft^3/s, Sept. 28.
a - Backwater from ice

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	272	62	95	50	40	76	5130	171	473	41	137	38
2	286	69	94	53	50	78	3190	163	383	38	137	32
3	360	68	92	52	70	82	2610	157	348	43	138	27
4	281	66	80	50	75	88	2600	161	298	40	139	26
5	239	65	80	49	70	90	2520	158	262	37	173	26
6	234	71	79	52	85	90	2540	148	241	36	168	25
7	207	67	78	52	100	260	2680	142	215	33	157	24
8	183	66	76	52	120	920	2800	136	188	30	134	21
9	170	64	70	48	115	840	2730	125	165	28	118	22
10	152	61	64	44	110	900	2390	116	150	28	121	20
11	137	59	60	46	100	600	1760	106	135	30	110	19
12	125	57	61	52	95	430	1230	98	121	42	125	19
13	111	55	65	56	90	370	971	87	110	35	126	22
14	105	52	67	60	95	320	809	78	101	35	107	26
15	98	50	70	54	95	300	700	73	92	35	92	23
16	93	58	68	44	100	260	618	66	85	29	80	29
17	90	54	69	34	105	240	560	71	77	27	77	30
18	84	50	65	31	100	230	510	76	72	43	73	24
19	79	48	60	29	96	220	458	80	62	145	62	25
20	75	47	58	29	92	210	405	92	55	155	58	25
21	72	54	59	31	90	5000	357	265	55	571	51	24
22	74	64	58	29	88	22000	306	294	56	558	44	23
23	71	74	58	28	86	18000	284	186	60	423	40	23
24	69	84	60	28	84	15000	269	517	56	402	37	22
25	70	94	54	24	82	9480	251	599	57	427	41	21
26	74	100	56	24	80	4980	232	548	64	428	44	21
27	78	110	56	26	80	4410	215	506	54	344	42	21
28	75	112	52	26	78	3730	206	610	50	280	45	17
29	70	102	49	27	---	2860	193	790	46	228	61	18
30	69	95	51	30	---	1930	181	758	44	185	42	20
31	64	---	52	32	---	1850	---	652	---	151	39	---
TOTAL	4167	2078	2056	1242	2471	95844	39705	8029	4175	4927	2818	713
MEAN	134	69.3	66.3	40.1	88.2	3092	1323	259	139	159	90.9	23.8
MAX	360	112	95	60	120	22000	5130	790	473	571	173	38
MIN	64	47	49	24	40	76	181	66	44	27	37	17
AC-FT	8270	4120	4080	2460	4900	190100	78750	15930	8280	9770	5590	1410

CAL YR 1986 TOTAL 150129 MEAN 411 MAX 9160 MIN 10 AC-FT 297800
WTR YR 1987 TOTAL 168225 MEAN 461 MAX 22000 MIN 17 AC-FT 333700

06354000 CANNONBALL RIVER AT BREIEN, ND--CONTINUED
(National stream-quality accounting network station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1946-50, (partial-record station), 1970-72, 1974 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
OCT											
29...	1250	97	1740	8.67	15.0	9.0	--	11.5	99	--	--
NOV											
25...	1315	94	2100	8.15	1.5	0.5	16	12.2	85	130	650
DEC											
30...	1207	51	2360	--	7.5	1.5	--	--	--	--	200
JAN											
29...	1050	27	2670	8.21	6.0	1.0	1.4	13.9	100	--	200
FEB											
26...	1315	81	2290	8.32	-2.5	0.5	--	12.4	86	--	--
MAR											
30...	1340	1870	671	8.06	4.0	1.0	260	12.2	86	--	--
APR											
27...	1150	217	1330	8.61	19.0	15.5	--	9.8	97	--	--
MAY											
26...	1250	527	1230	8.45	15.5	15.0	--	8.8	88	--	--
AUG											
11...	1125	109	1590	8.55	30.5	29.0	13	8.2	108	--	--
31...	1115	36	1790	8.63	20.0	16.0	--	9.3	94	--	--
SEP											
29...	1310	19	2050	--	20.0	14.5	--	--	--	--	--

DATE	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY, CARBON-ATE IT-FLD (MG/L CACO3) (00419)	BICAR-BONATE WATER WHOLE IT-FLD (MG/L) (00450)	CAR-BONATE WATER WHOLE IT-FLD (MG/L) (00447)
OCT											
29...	--	--	--	--	--	--	--	--	346	382	0
NOV											
25...	630	190	100	91	260	47	5	8.9	438	534	0
JAN											
29...	700	150	120	97	380	54	6	9.7	554	676	0
FEB											
26...	--	--	--	--	--	--	--	--	394	412	34
MAR											
30...	170	68	33	21	56	40	2	10	100	123	0
APR											
27...	--	--	--	--	--	--	--	--	277	299	19
MAY											
26...	--	--	--	--	--	--	--	--	229	260	10
AUG											
11...	460	220	77	65	210	49	4	14	243	257	19
31...	--	--	--	--	--	--	--	--	283	321	12

Note: Field-parameter cross sections were not made during current year.

06354000 CANNONBALL RIVER AT BREIEN, ND--CONTINUED
(National stream-quality accounting network station)

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2) (00405)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)
OCT 29...	1.4	--	--	--	--	--	--	--	--	--	--
NOV 25...	5.9	770	14	0.40	8.0	1560	1500	2.1	396	<0.010	0.120
JAN 29...	6.6	1100	4.0	0.40	6.5	2040	2100	2.8	147	<0.010	0.220
FEB 26...	3.6	--	--	--	--	--	--	--	--	--	--
MAR 30...	1.7	180	3.5	0.10	8.5	397	370	0.54	2000	0.040	1.60
APR 27...	1.3	--	--	--	--	--	--	--	--	--	--
MAY 26...	1.6	--	--	--	--	--	--	--	--	--	--
AUG 11...	1.3	640	9.7	0.40	7.4	1200	1200	1.6	353	<0.010	<0.100
31...	1.3	--	--	--	--	--	--	--	--	--	--

DATE	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS NH4) (71846)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHORUS, TOTAL (MG/L AS P) (00665)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P) (00666)	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)
NOV 25...	0.070	0.070	0.09	1.1	0.030	<0.010	<0.010	20	<1	100
JAN 29...	0.060	0.050	0.06	0.90	0.020	0.010	<0.010	20	2	<100
MAR 30...	0.610	0.350	0.45	2.5	0.150	0.060	0.030	<10	17	31
AUG 11...	0.020	0.010	0.01	1.1	0.060	0.010	<0.010	<10	2	87

DATE	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)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)
NOV 25...	<10	<1	<1	1	4	<10	<5	100	40	<0.1
JAN 29...	<10	<1	<1	<1	3	40	<5	110	40	<0.1
MAR 30...	<0.5	<1	<1	<3	7	43	<5	17	18	<0.1
AUG 11...	<0.5	<1	<1	<3	2	<3	<5	59	3	<0.1

DATE	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-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
NOV 25...	4	4	1	<1	1200	1	60	260	66	97
JAN 29...	10	2	2	<1	1800	<6	30	67	4.8	12
MAR 30...	<10	6	<1	<1	340	<6	4	784	3960	62
AUG 11...	<10	4	<1	<1	1100	<6	<3	71	21	98

06354500 BEAVER CREEK AT LINTON, ND

LOCATION.--Lat 46°15'27", long 100°13'58", on line between secs.17 and 18, T.132 N., R.76 W., Emmons County, Hydrologic Unit 10130104, on left bank 60 ft downstream from bridge on U.S. Highway 83, 0.7 mi south of railway station in Linton, and 1 mi upstream from Spring Creek.

DRAINAGE AREA.--717 mi^2, of which about 100 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

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

REVISED RECORDS.--WSP 1209: Drainage area. WSP 1239: 1950(M).

GAGE.--Water-stage recorder. Datum of gage is 1,690.55 ft above National Geodetic Vertical Datum of 1929. Prior to June 18, 1958, nonrecording gage at site 60 ft upstream at same datum.

REMARKS.--Estimated daily discharges: Oct. 9-27, Nov. 13 to Mar. 23, and Apr. 26 to July 21. Records poor.

AVERAGE DISCHARGE.--38 years, 42.2 ft^3/s, 30,570 acre-ft/yr; median of yearly mean discharges, 29 ft^3/s, 21,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,800 ft^3/s, Apr. 8, 1952, gage height, 17.50 ft; maximum gage height, 18.22 ft, Mar. 23, 1987; no flow at times in some years.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 14	----	[a]240	ice jam	Mar. 23	----	*7,770	*[bc]18.22
Mar. 12	----	[a]300	ice jam	Apr. 3	0200	700	11.00

Minimum daily .63 ft^3/s, Sept. 28.
a - About
b - Backwater from ice
c - From flood mark

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	39	18	15	12	8.0	21	474	48	22	16	22	3.2
2	37	17	15	12	9.0	20	820	46	21	20	18	2.4
3	32	18	15	12	10	24	677	44	20	22	15	2.1
4	31	18	15	12	12	26	329	42	19	21	12	2.0
5	37	18	15	11	14	27	367	40	18	20	10	2.0
6	42	18	15	11	16	30	296	38	18	19	8.9	2.0
7	40	18	15	11	20	31	148	36	17	19	8.3	2.1
8	38	19	15	10	30	32	90	34	17	18	8.0	2.2
9	36	14	15	10	46	33	78	32	17	18	7.8	2.0
10	35	14	15	10	60	180	57	30	16	18	7.2	1.7
11	32	13	15	11	80	220	34	28	16	19	6.4	1.6
12	30	12	15	12	120	270	43	26	16	19	6.2	1.4
13	29	11	15	12	160	250	47	24	16	20	5.9	1.4
14	29	10	15	11	220	140	50	22	15	20	5.9	1.5
15	29	11	15	10	200	90	56	20	15	23	5.9	1.4
16	28	11	14	9.5	180	85	62	18	14	25	5.4	1.3
17	27	12	14	9.5	130	85	68	17	17	25	5.0	1.2
18	26	12	14	9.0	100	80	65	20	19	24	4.5	1.2
19	25	13	14	9.0	85	70	65	22	20	23	6.3	.97
20	24	13	14	8.5	70	110	64	20	18	21	8.8	.84
21	24	13	14	8.0	60	3500	61	25	17	20	8.8	.74
22	24	13	13	8.0	50	4000	59	35	16	19	7.7	.77
23	23	14	13	8.0	40	6300	55	40	15	26	6.8	.73
24	23	14	13	7.5	35	5220	53	38	14	33	6.0	.73
25	23	14	13	7.5	30	4100	52	30	14	31	5.6	.73
26	22	14	13	7.0	26	1640	52	26	13	31	5.5	.73
27	20	14	12	7.0	24	522	51	28	13	28	6.0	.69
28	21	15	12	7.0	22	230	50	29	13	25	6.4	.63
29	20	15	12	7.0	---	92	50	28	13	32	6.2	.64
30	19	15	12	7.0	---	81	49	26	13	32	5.0	.65
31	19	---	11	7.0	---	101	---	24	---	28	3.8	---
TOTAL	884	431	433	293.5	1857.0	27610	4422	936	492	715	245.3	41.55
MEAN	28.5	14.4	14.0	9.47	66.3	891	147	30.2	16.4	23.1	7.91	1.38
MAX	42	19	15	12	220	6300	820	48	22	33	22	3.2
MIN	19	10	11	7.0	8.0	20	34	17	13	16	3.8	.63
AC-FT	1750	855	859	582	3680	54760	8770	1860	976	1420	487	82

CAL YR 1986 TOTAL 20047.66 MEAN 54.9 MAX 700 MIN 1.0 AC-FT 39760
WTR YR 1987 TOTAL 38360.20 MEAN 105 MAX 6300 MIN .63 AC-FT 76090

BEAVER CREEK BASIN

06354500 BEAVER CREEK AT LINTON, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
OCT											
27...	1230	19	1160	--	19.0	15.0	--	--	--	--	--
DEC											
11...	1200	15	1780	--	--	0.0	--	--	--	--	--
JAN											
29...	1200	6.9	1070	--	--	--	--	--	--	--	--
FEB											
25...	1330	29	--	--	-2.0	0.0	--	--	--	--	--
MAR											
05...	1135	27	970	--	3.0	1.0	--	--	--	--	--
21...	1730	3520	140	7.85	3.0	5.0	40	0	9.5	4.0	11
22...	1245	7180	152	--	3.0	1.0	--	--	--	--	--
24...	1210	3920	170	--	1.5	1.0	--	--	--	--	--
MAY											
01...	1045	48	720	--	25.0	19.0	--	--	--	--	--
JUN											
10...	1115	17	1060	--	18.0	19.0	--	--	--	--	--
JUL											
22...	1230	19	1170	--	30.0	26.0	--	--	--	--	--
SEP											
02...	1400	2.3	970	7.40	28.0	21.0	310	0	66	34	110

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
MAR											
21...	33	0.8	5.9	50	20	4.3	0.10	5.8	72	90	0.10
SEP											
02...	43	3	14	350	200	9.0	0.30	17	666	660	0.91

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
MAR										
21...	1	20	160	<1	12	90	0.3	<1	<1	110
SEP										
02...	7	380	30	<1	160	50	0.1	1	1	450

06354988 BOWMAN-HALEY LAKE NEAR HALEY, ND

LOCATION.--Lat 45°59'06", long 103°14'43", in NE¼ sec.24, T.129 N., R.101 W., Bowman County, Hydrologic Unit 10130301, at dam on North Fork Grand River, and 6 mi west of Haley.

DRAINAGE AREA.--446 mi^2, approximately.

RESERVOIR-ELEVATION AND CONTENTS RECORDS

PERIOD OF RECORD.--August 1966 to current year.

GAGE.--Water-stage recorder. Datum of gage is at National Geodetic Vertical Datum of 1929.

REMARKS.--Reservoir is formed by a rolled earth-fill dam; storage began Aug. 22, 1966; dam completed April 1967. Total capacity is 93,000 acre-ft at maximum pool, elevation, 2,777.0 ft. Dead storage is 4,280 acre-ft below lowest point of outlet, elevation, 2,740.0 ft. Normal operating storage is 20,100 acre-ft at elevation 2,755.0 ft, crest of spillway. Figures given herein represent total contents. Controlled releases are through a 30-inch or 8-inch gate valve. The spillway is uncontrolled "glory hole" type and discharges through a conduit 9 ft in diameter. The reservoir is for flood control, water supply, and recreation.

COOPERATION.--Records of elevations and contents furnished by U.S. Army Corps of Engineers. Elevations affected by wind.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 37,540 acre-ft, Mar. 28, 1978, elevation, 2,762.66 ft; minimum since first reaching spillway level, 12,660 acre-ft, Sept. 16-20, 1982, elevation, 2,749.93 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 23,220 acre-ft, Apr. 5, elevation, 2,757.17 ft; minimum, 16,990 acre-ft, Sept. 30, elevation, 2,753.73 ft (estimated).

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	2,755.00	19,100	--
Oct. 31	2,755.03	19,160	+60
Nov. 30	*2,755.07	19,230	+70
Dec. 31	*2,755.10	19,280	+50
CAL YR 1986	--	--	+4,570
Jan. 31	*2,755.07	19,230	-50
Feb. 28	2,755.22	19,500	+270
Mar. 31	2,755.41	19,850	+350
Apr. 30	2,755.62	20,240	+390
May 31	2,755.65	20,290	+50
June 30	2,755.30	19,650	-640
July 31	2,755.29	19,640	-10
Aug. 31	2,753.99	17,400	-2,240
Sept. 30	2,753.73	16,990	-410
WTR YR 1987	--	--	-1,200

* - Estimated

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^2.

WATER-DISCHARGE RECORDS

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: Nov. 8-13, Dec. 4 to Feb. 12, Feb. 15 to Mar. 2, 21-24, 29, 30, June 4-5, 20-22. Records good except those for periods of estimated daily discharge, which are fair. Flow regulated since August 1966 by Bowman-Haley Lake (station 06354988) 8 mi upstream.

AVERAGE DISCHARGE.--51 years (water years 1908-17, 1946-87), 27.3 ft^3/s, 19,800 acre-ft/yr; median of yearly mean discharges, 21 ft^3/s, 15,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14,100 ft^3/s, Apr. 7, 1952, gage height, 17.03 ft, from rating curve extended above 4,500 ft^3/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, 637 ft^3/s, Apr. 6, gage height, 9.25 ft; minimum daily discharge, 1.0 ft^3/s, Aug. 7, 8, Sept. 1-4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.0	8.4	7.9	5.0	6.5	5.5	16	16	9.0	1.5	1.5	1.0
2	4.1	3.7	8.4	6.5	6.0	7.0	20	15	9.4	1.5	1.5	1.0
3	4.2	4.8	7.0	6.5	5.7	10	24	16	9.9	1.5	1.5	1.0
4	4.6	5.0	5.2	6.5	5.3	11	45	19	9.0	1.3	1.5	1.0
5	4.8	3.9	5.0	5.0	5.5	9.5	250	19	4.6	1.3	1.3	1.1
6	5.3	3.8	5.0	5.0	5.7	9.0	597	19	3.5	1.3	1.2	1.4
7	5.9	2.9	4.5	3.0	5.7	9.3	598	19	2.9	1.3	1.0	1.7
8	5.8	2.0	5.0	3.5	5.2	8.7	504	19	3.0	1.4	1.0	1.8
9	6.2	2.5	4.0	5.0	4.9	13	414	18	3.2	1.5	1.1	1.8
10	7.3	2.0	3.5	5.0	4.9	11	343	17	3.2	1.5	1.2	1.7
11	10	2.5	4.0	8.0	5.4	11	262	17	3.0	1.5	1.3	1.6
12	8.3	3.0	5.0	9.0	6.1	10	214	16	3.7	1.6	1.3	1.6
13	5.0	4.0	6.0	7.0	5.7	9.7	176	14	3.7	1.6	1.3	1.6
14	4.2	5.0	5.5	5.0	5.9	9.5	147	13	3.7	1.8	1.3	1.8
15	5.8	4.5	7.0	4.5	6.5	9.9	124	11	3.1	1.8	1.4	2.2
16	4.4	3.2	7.5	4.5	6.5	9.3	106	9.3	2.9	1.8	1.5	1.7
17	4.1	2.9	7.0	5.0	6.0	9.7	91	8.1	2.7	1.6	1.5	1.6
18	3.5	2.9	7.5	5.0	6.0	11	80	6.4	2.7	1.6	1.5	1.6
19	3.6	2.4	11	7.0	6.0	11	73	5.2	2.4	1.5	1.5	1.6
20	3.7	2.3	9.5	8.0	6.5	11	67	7.7	2.2	1.5	1.5	1.6
21	3.7	2.3	11	9.0	6.5	10	52	11	2.0	1.5	1.5	1.6
22	3.4	2.5	13	9.0	6.0	15	43	9.4	1.8	1.5	1.5	1.6
23	3.5	3.4	15	9.0	6.0	20	38	7.7	1.6	1.5	1.5	1.6
24	3.4	4.3	12	9.0	5.5	15	33	7.4	2.8	1.6	1.5	1.6
25	3.4	4.6	8.5	9.5	5.5	17	30	7.7	3.2	1.3	1.5	1.5
26	3.6	4.5	8.5	8.5	5.0	17	27	7.9	2.2	1.3	1.5	1.5
27	4.9	4.7	8.5	10	5.0	17	24	8.1	2.2	1.3	1.5	1.5
28	4.2	5.2	7.5	11	5.5	18	22	8.3	2.2	1.3	1.7	1.5
29	6.5	6.0	7.5	8.5	---	16	20	8.6	2.1	1.4	1.4	1.5
30	4.0	6.8	7.5	7.5	---	15	18	8.7	1.6	1.5	1.2	1.5
31	3.8	---	8.5	7.0	---	14	---	9.0	---	1.5	1.1	---
TOTAL	149.2	116.0	233.0	212.0	161.0	370.1	4458	378.5	109.5	46.1	42.8	45.8
MEAN	4.81	3.87	7.52	6.84	5.75	11.9	149	12.2	3.65	1.49	1.38	1.53
MAX	10	8.4	15	11	6.5	20	598	19	9.9	1.8	1.7	2.2
MIN	3.4	2.0	3.5	3.0	4.9	5.5	16	5.2	1.6	1.3	1.0	1.0
AC-FT	296	230	462	421	319	734	8840	751	217	91	85	91

CAL YR 1986 TOTAL 13142.3 MEAN 36.0 MAX 700 MIN .90 AC-FT 26070
WTR YR 1987 TOTAL 6322.0 MEAN 17.3 MAX 598 MIN 1.0 AC-FT 12540

06355000 NORTH FORK GRAND RIVER AT HALEY, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1951, 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
OCT 09...	1120	6.3	2250	--	13.0	9.5	--	--	--	--	--
NOV 26...	1430	4.4	2550	--	9.5	0.5	--	--	--	--	--
JAN 08...	1300	3.4	2490	--	-3.0	0.0	--	--	--	--	--
FEB 20...	1305	7.2	2170	8.70	7.0	0.0	340	10	55	49	390
APR 07...	1650	588	2110	--	21.0	9.0	--	--	--	--	--
MAY 19...	1550	5.4	2170	--	17.5	16.5	--	--	--	--	--
JUN 11...	1055	3.2	2290	--	25.5	21.0	--	--	--	--	--
JUL 23...	1350	1.6	2580	8.60	22.5	25.0	300	0	49	43	490
AUG 28...	1125	1.6	2760	--	23.0	18.0	--	--	--	--	--

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
FEB 20...	71	9	11	330	860	9.6	0.30	3.3	1610	1600	2.2
JUL 23...	77	13	11	430	950	8.8	0.60	9.5	1870	1800	2.5

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
FEB 20...	1	560	30	<1	38	80	0.4	4	3	700
JUL 23...	2	1400	20	2	55	<10	0.1	5	2	760

06355310 BUFFALO CREEK TRIBUTARY NEAR GASCOYNE, ND

LOCATION.--Lat 46°06'40", long 103°02'20", in SE¼NE¼ sec.3, T.130 N., R.99 W., Bowman County, Hydrologic Unit 10130301, on left bank 46 ft downstream from Chicago, Milwaukee, St. Paul, Pacific Railway bridge, and 1.8 mi east of Gascoyne.

DRAINAGE AREA.--15.7 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1974 to September 1987 (discontinued).

REVISED RECORDS.--WDR ND-76-1: 1975.

GAGE.--Water-stage recorder. Elevation of gage is 2,725 ft, from topographic map.

REMARKS.--Estimated daily discharges, Nov. 7 to Mar. 31. Records fair except those for period of ice effect, Nov. 7 to Mar. 31, which are poor. Some regulation by strip mine upstream from station.

AVERAGE DISCHARGE.--13 years, 1.12 ft^3/s, 811 acre-ft/yr; median of yearly mean discharges, .9 ft^3/s, 650 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 100 ft^3/s, May 9, 1975, gage height, 8.41 ft; no flow at times most years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 99 ft^3/s, Apr. 3, gage height, 7.78 ft; no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.1	.93	.28	.02	.42	.04	33	.35	2.1	1.4	.09	.51
2	1.8	.96	.28	.02	2.2	.03	33	.10	2.0	1.1	.18	.54
3	1.6	.98	.28	.02	2.8	.03	49	.19	1.9	.85	.20	.57
4	1.6	.96	.21	.02	2.5	.64	40	.10	1.7	.71	.20	.48
5	1.5	.84	.18	.02	2.0	1.3	21	.08	1.8	.62	.15	.61
6	1.4	.45	.18	.02	2.0	1.9	7.7	.19	1.5	.44	.08	.85
7	1.4	.32	.18	.02	2.0	1.4	3.6	.31	1.4	.27	.06	.85
8	1.2	.25	.18	.02	2.3	1.6	2.9	.28	1.2	.21	.14	.76
9	1.2	.15	.12	.02	2.1	1.1	2.1	.26	1.2	.20	.28	.58
10	1.1	.15	.04	.03	1.2	.34	1.6	.24	1.3	.19	.38	.46
11	1.1	.12	.02	.03	.96	.17	1.5	.15	1.5	.47	.41	.36
12	.85	.11	.02	.04	.78	.08	1.5	.11	1.4	1.7	.47	.28
13	.70	.10	.02	.04	.67	2.7	1.5	.07	1.3	2.2	.54	.18
14	.67	.10	.02	.04	.43	3.6	1.3	.04	1.1	2.2	.61	.15
15	.53	.10	.02	.04	.20	3.1	1.2	.03	.80	1.3	.45	.13
16	.48	.10	.02	.04	.13	1.8	.51	.02	.58	.08	.40	.10
17	.48	.13	.02	.04	.09	1.4	.63	.00	.45	.01	.39	.06
18	.48	.13	.01	.04	.08	1.3	.82	.00	.32	.00	.31	.03
19	.45	.13	.01	.04	.08	.63	.76	.00	.26	.00	.21	.03
20	.46	.15	.01	.03	.08	1.2	.47	.54	2.1	.00	.19	.03
21	.46	.16	.00	.02	.08	.50	.58	1.7	3.5	.00	.16	.02
22	.46	.16	.00	.01	.08	.35	.58	1.8	3.5	.04	.07	.02
23	.42	.54	.00	.01	.08	.57	.52	1.3	3.0	.05	.05	.01
24	.37	.94	.00	.01	.08	.43	.34	1.3	3.5	.03	.18	.01
25	.30	.90	.00	.01	.08	.30	.34	1.3	4.0	.03	.55	.01
26	.26	.51	.01	.00	.07	.18	.33	1.5	3.5	.04	.71	.00
27	.24	.46	.01	.00	.05	.84	.59	3.5	2.9	.04	.96	.00
28	.24	.37	.02	.00	.05	3.5	.96	3.7	2.4	.09	1.0	.00
29	.77	.29	.02	.00	---	2.2	.45	2.7	1.8	.10	.80	.00
30	.96	.28	.02	.00	---	2.0	.64	2.3	1.5	.07	.63	.00
31	.93	---	.02	.00	---	8.2	---	2.1	---	.05	.51	---
TOTAL	26.51	11.77	2.20	.65	23.59	43.43	209.42	26.26	55.51	14.49	11.36	7.63
MEAN	.86	.39	.07	.02	.84	1.40	6.98	.85	1.85	.47	.37	.25
MAX	2.1	.98	.28	.04	2.8	8.2	49	3.7	4.0	2.2	1.0	.85
MIN	.24	.10	.00	.00	.05	.03	.33	.00	.26	.00	.05	.00

CAL YR 1986 TOTAL 350.12 MEAN .96 MAX 30 MIN .00
WTR YR 1987 TOTAL 432.81 MEAN 1.19 MAX 49 MIN .00

06355310 BUFFALO CREEK TRIBUTARY NEAR GASCOYNE, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1974 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)
OCT 07...	1540	1.3	3400	8.50	17.0	15.5	10.8	121	--	--	--
NOV 21...	1120	0.16	5100	7.90	8.0	1.0	5.7	46	970	280	140
JAN 06...	1410	0.01	6500	--	-5.0	0.0	--	--	--	--	--
FEB 18...	1505	0.08	4250	8.20	-2.0	1.0	11.6	92	880	390	140
APR 06...	1550	6.7	1800	8.10	17.0	9.5	10.1	98	420	210	72
JUN 11...	1550	1.8	5910	9.00	29.0	24.5	12.7	173	1200	790	110
JUL 23...	1740	0.04	5920	8.90	24.0	25.5	11.3	156	--	--	--
AUG 28...	1620	1.0	4190	8.30	27.0	20.5	9.5	118	880	500	140

DATE	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2) (00405)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)
NOV 21...	150	1100	71	16	10	683	17	2700	17	1.2	10
FEB 18...	130	780	65	12	11	491	6.0	2200	15	0.80	7.8
APR 06...	59	260	57	6	9.8	210	3.2	770	6.1	0.30	8.3
JUN 11...	230	1300	70	16	11	428	0.8	3500	16	0.90	1.0
AUG 28...	130	760	65	11	12	383	3.7	1400	14	0.70	3.9

DATE	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS-PHORUS, TOTAL (MG/L AS P) (00665)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P) (00666)	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)
NOV 21...	4530	4500	6.2	2.0	<0.100	0.180	1.6	0.030	0.020	--	--
FEB 18...	3670	3600	5.0	0.79	<0.100	0.120	1.7	0.050	0.020	--	--
APR 06...	1350	1300	1.8	25	0.290	0.120	2.8	0.170	0.070	3	2
JUN 11...	5550	5400	7.5	27	<0.100	0.090	3.2	0.080	0.030	--	--
JUL 23...	--	--	--	--	--	--	--	--	--	4	3
AUG 28...	3550	2700	4.8	10	<0.100	0.040	1.7	0.040	0.020	--	--

06355310 BUFFALO CREEK TRIBUTARY NEAR GASCOYNE, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE) (01012)	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)	BORON, DISSOLVED (UG/L AS B) (01020)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD) (01027)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR) (01034)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, TOTAL RECOVERABLE (UG/L AS PB) (01051)	LEAD, DISSOLVED (UG/L AS PB) (01049)
NOV 21...	--	--	3400	--	--	--	--	--	210	--	--
FEB 18...	--	--	2100	--	--	--	--	--	80	--	--
APR 06...	<10	<0.5	890	<1	<1	<10	<10	2	80	<5	<5
JUN 11...	--	--	4800	--	--	--	--	--	80	--	--
JUL 23...	<10	<10	--	<1	<1	<10	<10	<1	--	<5	<5
AUG 28...	--	--	2800	--	--	--	--	--	60	--	--

DATE	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY TOTAL RECOVERABLE (UG/L AS HG) (71900)	MERCURY DISSOLVED (UG/L AS HG) (71890)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI) (01067)	NICKEL, DISSOLVED (UG/L AS NI) (01065)	SELENIUM, TOTAL (UG/L AS SE) (01147)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN) (01092)	ZINC, DISSOLVED (UG/L AS ZN) (01090)	CARBON, ORGANIC DISSOLVED (MG/L AS C) (00681)
NOV 21...	320	--	--	--	--	--	--	--	--	50
FEB 18...	430	--	--	--	--	--	--	--	--	24
APR 06...	58	<0.10	<0.1	5	3	<1	<1	10	14	18
JUN 11...	30	--	--	--	--	--	--	--	--	55
JUL 23...	--	0.80	0.1	7	5	1	<1	<10	20	--
AUG 28...	30	--	--	--	--	--	--	--	--	38

DATE	CYANIDE TOTAL (MG/L AS CN) (00720)	PHENOLS TOTAL (UG/L) (32730)	GROSS ALPHA, DISSOLVED (UG/L AS U-NAT) (80030)	GROSS ALPHA, SUSP. TOTAL (UG/L AS U-NAT) (80040)	GROSS BETA, DISSOLVED (PCI/L AS CS-137) (03515)	GROSS BETA, SUSP. TOTAL (PCI/L AS CS-137) (03516)	GROSS BETA, DISSOLVED (PCI/L AS SR/YT-90) (80050)	GROSS BETA, SUSP. TOTAL (PCI/L AS SR/YT-90) (80060)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)
NOV 21...	--	--	--	--	--	--	--	--	119	0.05
FEB 18...	--	--	--	--	--	--	--	--	41	0.01
APR 06...	<0.010	4	--	--	--	--	--	--	55	1.0
JUN 11...	--	--	--	--	--	--	--	--	17	0.08
JUL 23...	<0.010	6	4.9	<0.4	29	0.5	19	0.5	--	--
AUG 28...	--	--	--	--	--	--	--	--	32	0.09

06439980 LAKE OAHE NEAR PIERRE, SD

LOCATION.--Lat 44°27'30", long 100°23'29", in NE¼ 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^2, 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^3/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, 22,764,000 acre-ft, May 14, 1986, affected by wind; minimum since initial filling, 14,815,000 acre-ft, Sept. 25, 1981.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 21,542,000 acre-ft, Apr. 19; minimum contents, 18,041,000 acre-ft, Jan. 30.

MONTHEND ELEVATION AND CONTENTS AT 2400 HOURS, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	1,610.77	20,087,000	-
Oct. 31	1,609.62	19,684,000	-403,000
Nov. 30	1,608.74	19,415,000	-269,000
Dec. 31	1,605.69	18,485,000	-930,000
CAL YR 1986	-	-	+1,942,000
Jan. 31	1,604.21	18,056,000	-429,000
Feb. 28	1,606.07	18,597,000	+541,000
Mar. 31	1,612.13	20,535,000	+1,938,000
Apr. 30	1,614.60	21,384,000	+849,000
May 31	1,613.70	21,119,000	-265,000
June 30	1,613.29	21,018,000	-101,000
July 31	1,611.58	20,248,000	-770,000
Aug. 31	1,610.11	19,893,000	-355,000
Sept. 30	1,607.77	19,154,000	-739,000
WTR YR 1987	-	-	-933,000

06467600 JAMES RIVER NEAR MANFRED, ND

LOCATION.--Lat 47°38'40", long 99°49'40", near midpoint of north line sec.15, T.148 N., R.72 W., Wells County, Hydrologic Unit 10160001, on right upstream wingwall of bridge on county highway, and 5 mi southwest of Manfred.

DRAINAGE AREA.--253 mi^2, of which about 197 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1954 to August 1957 (annual maximum only), September 1957 to current year (seasonal records only from 1982 to 1985).

GAGE.--Water-stage recorder. Datum of gage is 1,605.73 ft above National Geodetic Vertical Datum of 1929. Prior to Sept. 16, 1957, crest-stage gage only on downstream side of bridge at same datum.

REMARKS.--Estimated daily discharges: Oct. 9 to Apr. 5. Records good except those for periods of estimated daily discharges, which are fair.

AVERAGE DISCHARGE.--27 years (water years 1958-82, 1986 to current year), 4.02 ft^3/s, 2,910 acre-ft/yr; median of yearly mean discharges, 3.6 ft^3/s, 2,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 2,000 ft^3/s, Apr. 18 or 19, 1979, gage height, 9.2 ft, from highwater mark, backwater from snow; no flow for long periods each year.

EXTREMES FOR CURRENT YEAR.--Peaks greater than a base of 30 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 6	----	75	ice jam	June 23	1600	63	3.53
Mar. 21	1900	*300	*[a]6.39	July 23	0500	248	4.86
Apr. 3	----	90	ice jam				

No flow for several months.
a - ice jam

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	70	1.4	.57	.55	68	1.1
2	.00	.00	.00	.00	.00	.00	80	1.0	.46	.69	60	.79
3	.00	.00	.00	.00	.00	1.0	90	.81	.34	1.0	50	.65
4	.00	.00	.00	.00	.00	10	80	.82	.22	2.0	39	.56
5	.00	.00	.00	.00	.00	50	74	.69	.14	4.2	32	.43
6	.00	.00	.00	.00	.00	75	68	.49	.07	4.0	26	.32
7	.00	.00	.00	.00	.00	66	59	.40	.0	3.6	21	.25
8	.00	.00	.00	.00	.00	60	50	.30	.0	2.3	18	.18
9	.00	.00	.00	.00	.00	55	43	.28	.0	1.3	14	.22
10	.00	.00	.00	.00	.00	50	35	.22	.0	2.1	12	.18
11	.00	.00	.00	.00	.00	45	30	.18	.0	3.6	10	.22
12	.00	.00	.00	.00	.00	42	25	.16	.0	5.9	8.6	.25
13	.00	.00	.00	.00	.00	39	22	.12	.0	5.9	7.3	.22
14	.00	.00	.00	.00	.00	37	19	.11	.0	5.2	6.3	.16
15	.00	.00	.00	.00	.00	35	16	.10	.0	4.1	7.3	.16
16	.00	.00	.00	.00	.00	33	15	.07	.0	2.5	5.7	.18
17	.00	.00	.00	.00	.00	32	13	.03	.0	1.8	4.8	.65
18	.00	.00	.00	.00	.00	31	12	.10	.0	1.6	4.5	.46
19	.00	.00	.00	.00	.00	30	11	.10	.0	5.9	4.1	.37
20	.00	.00	.00	.00	.00	50	8.8	.16	.0	5.2	3.2	1.1
21	.00	.00	.00	.00	.00	250	7.9	.43	.0	27	2.3	.54
22	.00	.00	.00	.00	.00	220	6.8	.38	.0	128	1.9	.43
23	.00	.00	.00	.00	.00	190	5.6	.90	36	208	1.1	.37
24	.00	.00	.00	.00	.00	170	5.0	1.6	32	176	1.0	.25
25	.00	.00	.00	.00	.00	140	4.2	1.5	13	149	1.5	.18
26	.00	.00	.00	.00	.00	120	2.6	1.6	4.8	128	3.3	.18
27	.00	.00	.00	.00	.00	100	2.1	1.9	1.4	115	3.0	.16
28	.00	.00	.00	.00	.00	85	2.4	1.8	.73	105	3.5	.22
29	.00	.00	.00	.00	---	70	1.9	1.5	.74	97	3.3	.25
30	.00	.00	.00	.00	---	64	1.7	1.3	.65	86	2.1	.18
31	.00	---	.00	.00	---	60	---	.88	---	76	1.5	---
TOTAL	.00	.00	.00	.00	.00	2210.00	861.0	21.33	91.12	1358.44	426.3	11.21
MEAN	.00	.00	.00	.00	.00	71.3	28.7	.69	3.04	43.8	13.8	.37
MAX	.00	.00	.00	.00	.00	250	90	1.9	36	208	68	1.1
MIN	.00	.00	.00	.00	.00	.00	1.7	.03	.00	.55	1.0	.16
AC-FT	.0	.0	.0	.0	.0	4380	1710	42	181	2690	846	22

CAL YR 1986 TOTAL 2449.47 MEAN 6.71 MAX 150 MIN .00 AC-FT 4860
WTR YR 1987 TOTAL 4979.37 MEAN 13.6 MAX 250 MIN .00 AC-FT 9880

06467600 JAMES RIVER NEAR MANFRED, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1959-60, 1962-64, 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)
MAR												
09...	1120	55	370	--	-15.0	0.5	--	--	--	--	--	--
24...	0930	172	160	--	0.0	0.5	--	--	--	--	--	--
30...	1150	64	450	--	-2.0	0.5	--	--	--	--	--	--
APR												
06...	1145	68	450	7.90	14.0	6.0	1.5	10.4	82	150	0	29
MAY												
11...	1000	0.20	1040	8.05	12.0	14.5	0.80	8.6	84	310	0	61
JUL												
06...	1130	3.8	850	7.70	25.0	22.0	0.80	3.8	43	250	0	49
AUG												
24...	1100	0.99	980	7.77	10.0	16.0	1.1	5.9	59	320	0	64
SEP												
30...	1245	0.15	1060	8.15	15.0	12.0	1.6	10.0	92	300	0	66

DATE	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2) (00405)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)
APR												
06...	19	33	31	1	9.5	159	3.9	81	5.2	17	307	290
MAY												
11...	38	120	45	3	9.4	439	7.5	150	13	9.0	677	660
JUL												
06...	31	110	48	3	10	353	14	120	9.1	25	509	570
AUG												
24...	38	110	42	3	14	436	14	120	12	--	662	--
SEP												
30...	33	140	49	4	13	412	5.6	150	14	--	711	--

DATE	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	SOLIDS, RESIDUE AT 105 DEG. C, SUS-PENDED (MG/L) (00530)	NITRO-GEN, NITRITE TOTAL (MG/L AS N) (00615)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOS-PHORUS, TOTAL (MG/L AS P) (00665)
APR												
06...	0.42	56	1	<0.010	<0.010	<0.100	<0.100	--	--	--	--	0.250
MAY												
11...	0.92	0.37	<1	0.020	0.030	<0.100	<0.100	--	--	--	--	0.140
JUL												
06...	0.69	5.2	<1	--	<0.010	--	<0.100	--	--	--	--	--
AUG												
24...	--	--	<1	<0.010	<0.010	<0.100	<0.100	0.030	0.090	1.3	1.3	0.410
SEP												
30...	--	--	4	--	<0.010	--	<0.100	--	0.040	--	1.0	--

DATE	PHOS-PHORUS, DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P) (70507)	PHOS-PHORUS, ORTHO, DIS-SOLVED (MG/L AS P) (00671)	ANTI-MONY, TOTAL (UG/L AS SB) (01097)	ANTI-MONY, DIS-SOLVED (UG/L AS SB) (01095)	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA) (01007)	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)	BERYL-LIUM, TOTAL RECOV-ERABLE (UG/L AS BE) (01012)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE) (01010)	BORON, TOTAL RECOV-ERABLE (UG/L AS B) (01022)
APR												
06...	0.190	0.170	0.159	<1	<1	3	2	100	48	<10	<0.5	200
MAY												
11...	0.110	0.103	0.091	--	<1	--	3	100	69	<10	<0.5	280
JUL												
06...	0.330	--	0.310	--	<1	--	5	--	79	--	<0.5	--
AUG												
24...	0.360	0.380	0.310	--	--	5	5	--	--	--	--	--
SEP												
30...	0.100	--	0.116	--	--	--	2	--	--	--	--	--

06467600 JAMES RIVER NEAR MANFRED, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	BORON, DIS-SOLVED (UG/L AS B) (01020)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD) (01027)	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, TOTAL RECOV-ERABLE (UG/L AS FE) (01045)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN) (01055)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)
APR 06...	100	<1	<1	<1	<3	<1	--	69	<5	--	41	0.3
MAY 11...	350	--	<1	<1	<3	<1	--	20	5	--	37	0.7
JUL 06...	430	--	<1	1	<3	3	--	86	<5	--	76	0.9
AUG 24...	310	<1	<1	--	--	<1	180	81	<5	60	55	--
SEP 30...	390	--	<1	--	--	<1	--	26	<5	--	65	0.2

DATE	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, TOTAL (UG/L AS SE) (01147)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG) (01077)	SILVER, DIS-SOLVED (UG/L AS AG) (01075)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)	CYANIDE TOTAL (MG/L AS CN) (00720)	CYANIDE DIS-SOLVED (MG/L AS CN) (00723)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
APR 06...	4	1	<1	<1	<1	<1	16	<0.010	<0.01	5	0.89	100
MAY 11...	--	1	--	<1	--	<1	10	--	<0.01	16	0.01	44
JUL 06...	--	<1	--	<1	--	<1	7	--	<0.01	3	0.03	100
AUG 24...	--	--	<1	<1	--	--	4	<0.010	<0.01	7	0.02	29
SEP 30...	--	--	--	<1	--	--	3	--	<0.01	22	0.01	42

06468170 JAMES RIVER NEAR GRACE CITY, ND

LOCATION.--Lat 47°33'29", long 98°51'45", in NW¼NW¼NW¼ sec.17, T.147 N., R.64 W., Foster County, Hydrologic Unit 10160001, on left bank on downstream side of county highway bridge, and 2.5 mi northwest of Grace City.

DRAINAGE AREA.--1,060 mi^2, approximately, of which about 650 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1968 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,457.60 ft, above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Nov. 8 to Apr. 5, Apr. 11-20, June 26 to July 6, and Aug. 28 to Sept. 30. Records fair except for periods of estimated discharge, which are poor.

AVERAGE DISCHARGE.--19 years, 32.8 ft^3/s, 23,760 acre-ft/yr; median of yearly mean discharges, 33 ft^3/s, 23,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,100 ft^3/s, Apr. 13, 1969, gage height, 12.00 ft; no flow at times most years.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 28	0700	*1300	a*12.20	No other peak greater than base discharge.			

No flow for many days.
a - Backwater from ice

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	1.2	.92	.35	1.4	950	42	9.7	.20	6.5	17
2	.00	.00	1.2	.92	.40	1.4	900	38	7.6	.10	6.1	15
3	.00	.00	1.2	.92	.40	1.4	800	36	6.9	.05	5.2	14
4	.00	.00	1.2	.92	.40	1.5	700	33	7.2	.02	4.9	13
5	.00	.00	1.1	.92	.45	1.5	630	30	7.3	.00	4.2	12
6	.00	.00	1.1	.90	.45	1.5	571	28	6.2	.00	2.4	10
7	.00	.00	1.1	.90	.45	1.5	504	26	5.8	.00	2.0	9.0
8	.00	.10	1.1	.90	.50	1.5	445	25	5.9	.00	2.1	8.2
9	.00	.50	1.0	.90	.50	1.6	384	22	7.4	.10	2.0	7.4
10	.00	.50	1.0	.90	.54	1.6	342	23	7.6	.30	2.6	6.8
11	.00	.60	1.0	.90	.58	1.6	300	21	5.9	.63	1.9	6.0
12	.00	.70	1.0	.90	.62	1.7	270	21	5.1	.30	1.2	5.6
13	.00	.80	1.0	.85	.66	1.7	240	17	4.8	.24	3.5	5.4
14	.00	.90	1.0	.80	.70	1.8	215	15	4.5	.27	9.6	5.4
15	.00	1.2	1.0	.75	.74	2.0	190	15	4.5	.40	16	6.0
16	.00	1.4	1.0	.70	.80	3.0	170	11	4.7	.27	20	6.0
17	.00	1.5	.98	.60	.84	4.0	150	9.1	3.5	.16	25	6.0
18	.00	1.5	.98	.55	.90	5.5	135	8.9	3.1	.36	26	6.0
19	.00	1.4	.98	.50	.95	8.0	120	7.6	3.2	.87	28	5.8
20	.00	1.3	.96	.45	1.0	10	100	7.5	2.3	.91	30	5.6
21	.00	1.3	.96	.40	1.1	20	90	15	1.6	1.3	28	5.2
22	.00	1.3	.96	.35	1.1	50	85	17	1.9	1.2	26	5.0
23	.00	1.2	.94	.30	1.2	100	79	14	4.9	.81	26	4.6
24	.00	1.2	.94	.25	1.2	370	74	13	3.8	1.2	25	4.4
25	.00	1.1	.94	.25	1.2	800	66	14	2.0	14	26	4.3
26	.00	1.1	.94	.25	1.3	1000	59	15	1.0	23	28	4.1
27	.00	1.1	.92	.30	1.3	1250	56	15	.80	22	27	4.0
28	.00	1.2	.92	.30	1.3	1200	52	13	.65	17	24	3.8
29	.00	1.2	.92	.30	---	1150	49	12	.40	14	22	3.6
30	.00	1.2	.92	.35	---	1140	47	12	.30	12	20	3.4
31	.00	---	.92	.35	---	1000	---	12	---	8.8	19	---
TOTAL	.00	24.30	31.38	19.50	21.93	8134.2	8773	588.1	130.55	120.49	470.2	212.6
MEAN	.00	.81	1.01	.63	.78	262	292	19.0	4.35	3.89	15.2	7.09
MAX	.00	1.5	1.2	.92	1.3	1250	950	42	9.7	23	30	17
MIN	.00	.00	.92	.25	.35	1.4	47	7.5	.30	.00	1.2	3.4
AC-FT	.0	48	62	39	43	16130	17400	1170	259	239	933	422

CAL YR 1986 TOTAL 12007.26 MEAN 32.9 MAX 800 MIN .00 AC-FT 23820
WTR YR 1987 TOTAL 18526.10 MEAN 50.8 MAX 1250 MIN .00 AC-FT 36750

06468170 JAMES RIVER NEAR GRACE CITY, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L) (00310)	HARD-NESS (MG/L AS CACO3) (00900)
DEC											
01...	1500	1.2	1600	7.72	0.5	1.0	2.4	--	--	--	300
JAN											
12...	1400	0.90	1770	7.58	6.0	0.0	1.4	1.0	7	--	430
MAR											
30...	1430	1140	270	--	1.0	0.5	--	--	--	--	--
APR											
06...	1515	571	310	7.70	18.0	7.0	3.8	10.7	86	--	110
MAY											
11...	1700	22	700	8.45	20.0	20.0	1.9	11.1	120	--	260
AUG											
24...	1530	26	840	8.44	21.0	19.0	2.7	10.0	106	2.8	320
SEP											
29...	1200	3.6	850	8.47	14.0	11.0	3.1	9.6	85	--	270

DATE	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2) (00405)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)
DEC											
01...	0	53	41	260	64	7	14	--	0	230	76
JAN											
12...	0	82	55	250	55	5	16	--	0	310	76
APR											
06...	0	23	13	16	21	0.7	14	111	4.3	49	4.2
MAY											
11...	0	50	33	55	30	2	12	267	1.8	120	12
AUG											
24...	0	54	44	74	32	2	15	334	2.3	130	12
SEP											
29...	0	47	38	85	38	2	20	342	2.2	100	18

DATE	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	SOLIDS, RESIDUE AT 105 DEG. C, SUS-PENDED (MG/L) (00530)	NITRO-GEN, NITRITE TOTAL (MG/L AS N) (00615)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)
DEC											
01...	17	1020	--	1.4	3.3	12	--	<0.010	--	<0.100	--
JAN											
12...	31	1200	--	1.6	2.9	3	--	<0.010	--	<0.100	--
APR											
06...	11	203	200	0.28	313	5	0.030	0.020	0.400	0.370	--
MAY											
11...	13	469	460	0.64	28	<1	0.020	0.030	<0.100	<0.100	--
AUG											
24...	--	554	--	--	--	31	<0.010	<0.010	<0.100	<0.100	0.040
SEP											
29...	--	552	--	--	--	8	--	<0.010	--	<0.100	--

DATE	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN,AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOS-PHORUS, TOTAL (MG/L AS P) (00665)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P) (70507)	PHOS-PHORUS, ORTHO, DIS-SOLVED (MG/L AS P) (00671)	ANTI-MONY, TOTAL (UG/L AS SB) (01097)	ANTI-MONY, DIS-SOLVED (UG/L AS SB) (01095)	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)
DEC											
01...	--	--	--	--	0.210	--	0.192	--	<1	--	4
JAN											
12...	--	--	--	--	0.690	--	0.660	--	<1	--	4
APR											
06...	--	--	--	0.190	0.130	0.117	0.105	<1	<1	2	2
MAY											
11...	--	--	--	0.190	0.150	0.141	0.131	--	<1	--	4
AUG											
24...	0.030	2.3	1.8	0.140	0.120	0.110	0.092	--	--	6	5
SEP											
29...	0.050	--	1.9	--	0.180	--	0.069	--	--	--	3

06468170 JAMES RIVER NEAR GRACE CITY, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA) (01007)	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)	BERYL-LIUM, TOTAL RECOV-ERABLE (UG/L AS BE) (01012)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE) (01010)	BORON, TOTAL RECOV-ERABLE (UG/L AS B) (01022)	BORON, DIS-SOLVED (UG/L AS B) (01020)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD) (01027)	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)
DEC 01...	--	78	--	<0.5	--	310	--	<1	<1	<3
JAN 12...	--	120	--	0.9	--	310	--	<1	<1	<3
APR 06...	100	38	<10	<0.5	110	40	<1	<1	<1	<3
MAY 11...	100	64	<10	<0.5	70	100	--	1	<1	<3
AUG 24...	--	--	--	--	--	140	<1	<1	--	--
SEP 29...	--	--	--	--	--	150	--	<1	--	--

DATE	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE) (01045)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN) (01055)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, TOTAL (UG/L AS SE) (01147)
DEC 01...	1	--	170	<5	--	1400	0.2	--	3	--
JAN 12...	1	--	39	<5	--	1600	0.4	--	1	--
APR 06...	<1	--	85	<5	--	35	0.3	2	1	<1
MAY 11...	2	--	32	<5	--	44	0.6	--	<1	--
AUG 24...	<1	1700	15	<5	160	11	0.4	--	--	<1
SEP 29...	<1	--	15	<5	--	35	0.5	--	--	--

DATE	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG) (01077)	SILVER, DIS-SOLVED (UG/L AS AG) (01075)	THAL-LIUM, DIS-SOLVED (UG/L AS TL) (01057)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)	CYANIDE TOTAL (MG/L AS CN) (00720)	CYANIDE DIS-SOLVED (MG/L AS CN) (00723)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
DEC 01...	<1	--	<1	<1	3	--	0.02	125	0.40	68
JAN 12...	<1	--	<1	<1	7	--	0.01	96	0.23	82
APR 06...	<1	<1	<1	--	6	<0.010	<0.01	10	16	82
MAY 11...	<1	--	<1	--	7	--	<0.01	3	0.15	100
AUG 24...	<1	--	--	--	4	<0.010	<0.01	76	5.2	99
SEP 29...	<1	--	--	--	<3	--	<0.01	13	0.13	100

06468190 JUANITA LAKE TRIBUTARY NEAR GRACE CITY, ND

LOCATION.--Lat 47°32'54", long 98°45'31", in SW¼NE¼SE¼ sec.13, T.147 N., R.64 W., Foster County, Hydrologic Unit 10160001, on left bank 1,000 ft upstream from Lake Juanita, 2 mi east of Grace City.

DRAINAGE AREA.--94 mi^2, approximately, of which about 54 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1986 to current year. Seasonal records only.

GAGE.--Water-stage recorder. Datum of gage is 1,460.00 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Estimated daily discharges: Mar. 20 to Apr. 1, and Sept. 30. Records fair.

EXTREMES FOR CURRENT PERIOD.--Peak discharges greater than base of 30 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage Height (ft)	Date	Time	Discharge (ft^3/s)	Gage Height (ft)
Mar. 22	----	40	----	Apr. 2	0615	*204	*20.82

No flow for several months.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						.00	50	.00	1.6	.01	.31	.60
2						.00	170	.00	1.3	.01	.25	.36
3						.00	165	.00	1.1	.01	.23	.21
4						.00	164	.00	.86	.00	.14	.11
5						.00	140	.00	.65	.01	.12	.08
6						.00	124	.01	.52	.01	.09	.07
7						.00	101	.00	.49	.00	.06	.06
8						.00	57	.00	.29	.00	.05	.05
9						.00	41	.01	.24	.00	.03	.04
10						.00	35	.00	.17	.00	.03	.03
11						.00	32	.00	.16	.04	.02	.04
12						.00	27	.00	.13	.05	.00	.09
13						.00	23	.00	.11	.05	.00	.11
14						.00	17	.00	.06	.05	.00	.11
15						.00	14	.00	.01	.04	.02	.12
16						.00	8.5	.00	.00	.04	.02	.03
17						.00	4.9	.00	.00	.04	.03	.03
18						.00	2.8	.00	.00	.09	.05	.03
19						.00	1.4	.00	.00	.27	.03	.08
20						1.0	.80	.02	.00	1.6	.03	.05
21						10	.45	1.9	.00	2.1	.02	.08
22						20	.45	5.5	.00	1.7	.02	.04
23						17	.28	3.6	.04	1.7	.01	.03
24						20	.11	3.4	.07	1.4	.00	.02
25						30	.36	2.9	.09	1.1	.02	.01
26						20	.34	2.8	.05	1.1	.02	.01
27						10	.12	2.6	.03	.97	.65	.01
28						10	.06	2.6	.02	.76	1.6	.01
29						15	.02	2.4	.02	.50	1.6	.01
30						18	.01	2.1	.02	.39	1.3	.01
31						20	---	2.0	---	.34	.73	---
TOTAL						191.00	1180.60	31.84	8.03	14.38	7.48	2.53
MEAN						6.16	39.4	1.03	.27	.46	.24	.08
MAX						30	170	5.5	1.6	2.1	1.6	.60
MIN						.00	.01	.00	.00	.00	.00	.01
AC-FT						379	2340	63	16	29	15	5.0

06468190 JUANITA LAKE TRIBUTARY NEAR GRACE CITY, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--March 1986 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)
APR 06...	1700	123	300	7.60	18.0	11.0	2.0	9.2	82	100	0
DATE	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2) (00405)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)
APR 06...	21	12	19	27	0.8	7.5	121	5.9	34	6.1	13
DATE	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	SOLIDS, RESIDUE AT 105 DEG. C, SUS-PENDED (MG/L) (00530)	NITRO-GEN, NITRITE TOTAL (MG/L AS N) (00615)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	PHOS-PHORUS, TOTAL (MG/L AS P) (00665)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P) (00666)
APR 06...	192	190	0.26	64	6	0.010	<0.010	<0.100	<0.100	0.090	0.060
DATE	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P) (70507)	PHOS-PHORUS, ORTHO, DIS-SOLVED (MG/L AS P) (00671)	ANTI-MONY, TOTAL (UG/L AS SB) (01097)	ANTI-MONY, DIS-SOLVED (UG/L AS SB) (01095)	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA) (01007)	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)	BERYL-LIUM, TOTAL RECOV-ERABLE (UG/L AS BE) (01012)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE) (01010)	BORON, TOTAL RECOV-ERABLE (UG/L AS B) (01022)
APR 06...	0.042	0.031	<1	<1	1	<1	<100	34	<10	<0.5	20
DATE	BORON, DIS-SOLVED (UG/L AS B) (01020)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD) (01027)	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)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)
APR 06...	40	<1	<1	<1	<3	<1	89	<5	17	0.2	1
DATE	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, TOTAL (UG/L AS SE) (01147)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG) (01077)	SILVER, DIS-SOLVED (UG/L AS AG) (01075)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)	CYANIDE TOTAL (MG/L AS CN) (00720)	CYANIDE DIS-SOLVED (MG/L AS CN) (00723)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
APR 06...	<1	<1	<1	<1	<1	8	<0.010	<0.01	10	3.2	82

06468250 JAMES RIVER ABOVE ARROWWOOD LAKE NEAR KENSAL, ND

LOCATION.--Lat 47°23'59", long 98°47'50", in SW¼SW¼SW¼ sec.2, T.145 N., R.64 W., Foster County, Hydrologic Unit 10160003, on right bank 30 ft upstream from bridge on county road 8 mi northwest of Kensal.

DRAINAGE AREA.--1,200 mi^2, approximately, of which about 750 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1985 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,440.00 ft above National Geodetic Vertical Datum of 1929, from topographc map.

REMARKS.--Estimated daily discharges: Nov. 7-9, Jan. 15-19, Feb. 24 to June 9. Records good except those for periods of estimated daily discharges, which are fair.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,500 ft^3/s, Mar. 28, 1987, gage height 11.48 ft, backwater from ice; no flow at times most years.

EXTREMES FOR CURRENT PERIOD.--Peak discharges greater than base of 200 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage Height (ft)	Date	Time	Discharge (ft^3/s)	Gage Height (ft)
Mar. 28	0715	*1500	*[a]11.48	No other peak greater than peak discharge.			

a - Backwater from ice
Minimum daily discharge, 0.08 ft^3/s, July 17.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.7	1.6	2.8	1.8	1.2	2.0	1040	56	10	3.4	17	29
2	2.1	1.5	2.6	1.8	1.2	2.0	1070	53	9.8	2.7	17	27
3	2.4	1.5	2.6	1.8	1.2	2.0	1020	50	9.4	1.5	17	24
4	2.3	1.4	2.4	1.8	1.2	2.2	920	45	9.5	.75	16	21
5	2.3	1.4	2.3	1.8	1.2	2.4	860	40	9.0	1.6	13	19
6	1.9	1.4	2.3	1.8	1.2	2.4	800	35	8.5	1.7	9.6	19
7	1.9	1.3	2.3	1.8	1.9	2.2	770	30	8.0	1.9	6.6	16
8	1.7	1.2	2.3	1.8	2.2	2.0	680	30	10	1.3	5.4	15
9	1.4	1.2	2.3	1.7	2.0	2.0	610	25	14	.92	4.2	15
10	1.8	1.5	1.9	1.7	2.0	2.0	540	20	13	.64	2.9	15
11	1.9	2.0	1.8	1.7	2.3	2.1	480	15	13	1.1	1.7	15
12	1.4	2.2	1.8	1.7	2.9	2.1	420	20	11	1.6	.55	16
13	1.4	1.7	1.8	1.7	2.8	2.2	370	16	10	1.7	1.6	16
14	1.4	1.9	1.9	1.7	2.3	2.3	330	14	8.8	.79	2.2	15
15	1.4	2.5	2.1	1.7	2.1	2.5	290	13	7.4	.74	1.8	13
16	1.4	3.0	2.1	1.6	2.0	2.6	260	12	6.0	.92	2.0	12
17	1.3	3.0	2.1	1.6	2.0	2.9	230	10	4.9	.08	3.7	13
18	1.0	2.9	2.1	1.6	2.0	4.0	210	9.0	4.2	.32	8.5	13
19	1.0	2.9	2.1	1.5	2.0	6.0	185	8.5	3.4	3.9	12	13
20	1.0	2.8	2.1	1.5	2.0	10	160	8.0	3.4	4.9	17	13
21	1.0	2.8	2.0	1.5	2.0	30	145	15	3.1	4.5	22	13
22	.95	2.8	2.0	1.4	2.0	50	130	20	2.4	12	24	13
23	.94	2.8	2.0	1.1	2.0	100	110	17	6.8	9.2	25	14
24	.96	2.8	2.0	1.1	2.0	185	100	15	6.6	6.9	26	14
25	1.1	2.8	2.0	1.1	2.0	300	95	13	5.8	5.8	26	15
26	1.1	2.8	1.8	1.1	2.0	600	87	16	5.1	4.6	27	15
27	.94	2.8	1.8	1.1	2.0	1000	80	15	4.2	3.2	32	11
28	.92	2.8	1.8	1.1	2.0	1400	70	14	3.6	3.2	34	6.8
29	1.2	2.8	1.8	1.1	---	1200	65	13	3.4	8.2	33	6.9
30	1.4	2.8	1.8	1.1	---	1050	60	12	3.5	13	32	7.0
31	1.7	---	1.8	1.1	---	1000	---	11	---	16	30	---
TOTAL	44.91	66.9	64.5	46.9	53.7	6972.9	12187	670.5	217.8	119.06	470.75	454.7
MEAN	1.45	2.23	2.08	1.51	1.92	225	406	21.6	7.26	3.84	15.2	15.2
MAX	2.4	3.0	2.8	1.8	2.9	1400	1070	56	14	16	34	29
MIN	.92	1.2	1.8	1.1	1.2	2.0	60	8.0	2.4	.08	.55	6.8
AC-FT	89	133	128	93	107	13830	24170	1330	432	236	934	902

CAL YR 1986 TOTAL 13358.56 MEAN 36.6 MAX 681 MIN .13 AC-FT 26500
WTR YR 1987 TOTAL 21369.51 MEAN 58.5 MAX 1400 MIN .08 AC-FT 42390

06468250 JAMES RIVER ABOVE ARROWWOOD LAKE NEAR KENSAL, ND

WATER-QUALITY RECORDS

PERIOD OF RECORD.--June 1985 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L) (00310)	HARD-NESS (MG/L AS CACO3) (00900)
[a]OCT											
09...	0930	1.4	830	7.65	0.0	7.0	--	3.5	5.6	45	220
DEC											
01...	1600	2.7	1170	7.58	0.5	1.0	--	6.4	--	--	350
JAN											
12...	1530	1.8	1720	7.66	5.0	0.0	--	4.6	3.0	20	510
MAR											
09...	1515	2.0	1040	--	-10.0	0.0	--	--	--	--	--
31...	1015	1180	260	--	2.0	0.5	--	--	--	--	--
APR											
07...	1000	773	322	7.80	15.0	1.0	--	--	11.4	79	--
[a]MAY											
13...	1300	17	720	8.14	22.0	19.0	--	2.3	7.0	75	270
[a]JUL											
07...	1000	1.6	650	8.94	21.0	23.0	--	13	6.0	69	180
[a]AUG											
25...	1030	27	880	8.30	12.0	16.5	--	15	6.2	63	260
SEP											
29...	1500	7.1	900	8.25	15.0	13.5	--	14	10.6	100	320

DATE	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2) (00405)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)
OCT											
09...	0	40	29	82	43	2	11	292	13	120	20
DEC											
01...	0	60	49	130	43	3	14	--	0	200	32
JAN											
12...	0	96	66	200	45	4	16	--	0	270	59
MAY											
13...	0	54	33	56	30	2	12	286	4.0	110	14
JUL											
07...	0	24	30	64	42	2	10	210	0.4	110	15
AUG											
25...	0	41	39	100	43	3	16	326	3.1	140	22
SEP											
29...	0	57	44	77	33	2	19	357	3.9	120	15

DATE	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	SOLIDS, RESIDUE AT 105 DEG. C, SUS-PENDED (MG/L) (00530)	NITRO-GEN, NITRITE TOTAL (MG/L AS N) (00615)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)
OCT												
09...	29	520	510	0.71	2.0	7	--	0.050	--	0.120	--	--
DEC												
01...	28	752	--	1.0	5.4	17	--	<0.010	--	<0.100	--	--
JAN												
12...	32	1140	--	1.6	5.4	10	--	0.010	--	<0.100	--	--
APR												
07...	--	--	--	--	--	--	0.020	--	0.400	--	--	--
MAY												
13...	19	478	470	0.65	21	2	0.030	0.030	<0.100	<0.100	--	--
JUL												
07...	14	424	390	0.58	1.9	29	--	<0.010	--	<0.100	--	--
AUG												
25...	--	573	--	--	--	36	<0.010	<0.010	<0.100	<0.100	0.040	0.030
SEP												
29...	--	594	--	--	--	31	--	<0.010	--	<0.100	--	0.040

a - Laboratory analyses incomplete prior to report publication

06468250 JAMES RIVER ABOVE ARROWWOOD LAKE NEAR KENSAL, ND

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	PHOSPHORUS, DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P) (70507)	PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P) (00671)	ANTIMONY, TOTAL (UG/L AS SB) (01097)	ANTIMONY, DISSOLVED (UG/L AS SB) (01095)	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA) (01007)
OCT 09...	--	--	--	0.090	--	0.059	--	<1	--	2	--
DEC 01...	--	--	--	0.080	--	0.064	--	<1	--	2	--
JAN 12...	--	--	--	0.180	--	0.156	--	<1	--	3	--
APR 07...	--	--	0.170	--	0.092	--	<1	--	2	--	<100
MAY 13...	--	--	0.180	0.090	0.089	0.078	--	<1	--	3	100
JUL 07...	--	--	--	0.050	--	0.010	--	<1	--	7	--
AUG 25...	2.9	1.6	0.090	0.030	0.022	<0.003	--	--	4	3	--
SEP 29...	--	2.0	--	0.020	--	0.006	--	--	--	2	--

DATE	BARIUM, DISSOLVED (UG/L AS BA) (01005)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE) (01012)	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)	BORON, TOTAL RECOVERABLE (UG/L AS B) (01022)	BORON, DISSOLVED (UG/L AS B) (01020)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD) (01027)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COBALT, DISSOLVED (UG/L AS CO) (01035)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, TOTAL RECOVERABLE (UG/L AS FE) (01045)	IRON, DISSOLVED (UG/L AS FE) (01046)
OCT 09...	74	--	<0.5	--	180	--	<1	<1	<3	<1	--	17
DEC 01...	79	--	<0.5	--	210	--	<1	<1	<3	<1	--	31
JAN 12...	120	--	<0.5	--	290	--	<1	<1	<3	3	--	48
APR 07...	--	<10	--	10	--	<1	--	--	--	--	--	--
MAY 13...	74	<10	<0.5	110	140	--	<1	<1	<3	<1	--	18
JUL 07...	46	--	<0.5	--	160	--	<1	<1	<3	2	--	19
AUG 25...	--	--	--	--	200	<1	1	--	--	<1	680	9
SEP 29...	--	--	--	--	180	--	<1	--	--	<1	--	9

DATE	LEAD, DISSOLVED (UG/L AS PB) (01049)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN) (01055)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY DISSOLVED (UG/L AS HG) (71890)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI) (01067)	NICKEL, DISSOLVED (UG/L AS NI) (01065)	SELENIUM, TOTAL (UG/L AS SE) (01147)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	SILVER, TOTAL RECOVERABLE (UG/L AS AG) (01077)	SILVER, DISSOLVED (UG/L AS AG) (01075)
OCT 09...	<5	--	87	0.5	--	3	--	<1	--	<1
DEC 01...	<5	--	380	--	--	2	--	<1	--	<1
JAN 12...	<5	--	1300	0.2	--	1	--	<1	--	<1
APR 07...	--	--	--	--	2	--	<1	--	1	--
MAY 13...	<5	--	150	0.3	--	<1	--	<1	--	<1
JUL 07...	<5	--	13	0.7	--	<1	--	<1	--	<1
AUG 25...	<5	300	8	0.2	--	--	<1	<1	--	--
SEP 29...	<5	--	18	0.3	--	--	--	<1	--	--

06468250 JAMES RIVER ABOVE ARROWWOOD LAKE NEAR KENSAL, ND

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	THALLIUM, DISSOLVED (UG/L AS TL) (01057)	ZINC, DISSOLVED (UG/L AS ZN) (01090)	CYANIDE TOTAL (MG/L AS CN) (00720)	CYANIDE DISSOLVED (MG/L AS CN) (00723)	SEDIMENT, SUSPENDED (MG/L) (80154)	SED. MENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT 09...	<1	<3	--	<0.01	111	0.43	63
DEC 01...	<1	6	--	<0.01	81	0.59	94
JAN 12...	<1	7	--	<0.01	122	0.58	53
APR 07...	--	--	<0.010	--	10	21	96
MAY 13...	--	<3	<0.010	<0.01	11	0.49	97
JUL 07...	--	8	--	<0.01	28	0.12	97
AUG 25...	--	4	<0.010	<0.01	37	2.7	95
SEP 29...	--	<3	--	<0.01	65	1.2	86

DATE	ALDRIN, DISSOLVED (UG/L) (39331)	ALDRIN, TOTAL (UG/L) (39330)	AMETRYNE TOTAL (82184)	ATRAZINE, TOTAL (UG/L) (39630)	SEVIN, TOTAL (UG/L) (39750)	CHLORDANE, DISSOLVED (UG/L) (39352)	CHLORDANE, TOTAL (UG/L) (39350)	CYANAZINE TOTAL (UG/L) (81757)	DDD, DISSOLVED (UG/L) (39361)
OCT 09...	<0.01	<0.010	<0.10	<0.10	--	<0.1	<0.1	<0.10	<0.01
MAY 13...	--	<0.010	<0.10	<0.10	<2.0	--	<0.1	<0.10	--
JUL 07...	<0.01	<0.010	<0.10	<0.10	<2.0	<0.1	<0.1	<0.10	<0.01
AUG 25...	<0.01	<0.010	<0.10	<0.10	--	<0.1	<0.1	<0.10	<0.01

DATE	DDD, TOTAL (UG/L) (39360)	DDE, DISSOLVED (UG/L) (39366)	DDE, TOTAL (UG/L) (39365)	DDT, DISSOLVED (UG/L) (39371)	DDT, TOTAL (UG/L) (39370)	DIAZINON, DISSOLVED (UG/L) (39572)	DIAZINON, TOTAL (UG/L) (39570)	DIELDRIN DISSOLVED (UG/L) (39381)	DIELDRIN TOTAL (UG/L) (39380)	ENDOSULFAN DISSOLV (UG/L) (82354)	ENDOSULFAN, TOTAL (UG/L) (39388)
OCT 09...	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01	<0.01	<0.01	<0.010	<0.01	<0.010
MAY 13...	<0.010	--	<0.010	--	<0.010	<0.01	<0.01	--	<0.010	--	<0.010
JUL 07...	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01	<0.01	<0.01	<0.010	<0.01	<0.010
AUG 25...	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01	<0.01	<0.01	<0.010	<0.01	<0.010

DATE	ENDRIN, DISSOLVED (UG/L) (39391)	ETHION DISSOLV (UG/L) (82346)	ENDRIN, TOTAL (UG/L) (39390)	ETHION, TOTAL (UG/L) (39398)	HEPTACHLOR, DISSOLVED (UG/L) (39411)	HEPTACHLOR, TOTAL (UG/L) (39410)	HEPTACHLOR EPOXIDE DISSOLVED (UG/L) (39421)	HEPTACHLOR EPOXIDE TOTAL (UG/L) (39420)	LINDANE DISSOLVED (UG/L) (39341)	LINDANE TOTAL (UG/L) (39340)	MALATHION, DISSOLVED (UG/L) (39532)
OCT 09...	<0.01	<0.01	<0.010	<0.01	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01
MAY 13...	--	<0.01	<0.010	<0.01	--	<0.010	--	<0.010	--	<0.010	<0.01
JUL 07...	<0.01	<0.01	<0.010	<0.01	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01
AUG 25...	<0.01	<0.01	<0.010	<0.01	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01

06468250 JAMES RIVER ABOVE ARROWWOOD LAKE NEAR KENSAL, ND

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	MALA-THION, TOTAL (UG/L) (39530)	METHO-MYL TOTAL (UG/L) (39051)	METH-OXY-CHLOR DISSOLV (UG/L) (82350)	METH-OXY-CHLOR, TOTAL (UG/L) (39480)	METHYL PARA-THION, DIS-SOLVED (UG/L) (39602)	METHYL PARA-THION, TOTAL (UG/L) (39600)	MIREX, DIS-SOLVED (UG/L) (39756)	MIREX, TOTAL (UG/L) (39755)	METHYL TRI-THION, TOTAL (UG/L) (39790)	METHYL-TRI-THION DISSOLV (UG/L) (82344)	NAPH-THA-LENES, POLY-CHLOR. TOTAL (UG/L) (39250)
OCT 09...	<0.01	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.10
MAY 13...	<0.01	<2.0	--	<0.01	<0.01	<0.01	--	<0.01	<0.01	<0.01	<0.10
JUL 07...	<0.01	<2.0	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.10
AUG 25...	<0.01	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.10

DATE	PARA-THION, DIS-SOLVED (UG/L) (39542)	PARA-THION, TOTAL (UG/L) (39540)	PCB, DIS-SOLVED (UG/L) (39517)	PCB, TOTAL (UG/L) (39516)	PCN DISSOLV (UG/L) (82360)	PER-THANE DISSOLV (UG/L) (82348)	PER-THANE TOTAL (UG/L) (39034)	PROME-TONE TOTAL (UG/L) (39056)	PROME-TRYNE TOTAL (UG/L) (39057)	PROPHAM TOTAL (UG/L) (39052)	PRO-PAZINE TOTAL (UG/L) (39024)
OCT 09...	<0.01	<0.01	<0.1	<0.1	<0.10	<0.10	<0.1	<0.1	<0.1	--	<0.10
MAY 13...	<0.01	<0.01	--	<0.1	--	--	<0.1	<0.1	<0.1	<2.0	<0.10
JUL 07...	<0.01	<0.01	<0.1	<0.1	<0.10	<0.10	<0.1	<0.1	<0.1	<2.0	<0.10
AUG 25...	<0.01	<0.01	<0.1	<0.1	<0.10	<0.10	<0.1	<0.1	<0.1	--	<0.10

DATE	SIMA-ZINE TOTAL (UG/L) (39055)	SIME-TRYNE TOTAL (UG/L) (39054)	2,4-D, TOTAL (UG/L) (39730)	2, 4-DP TOTAL (UG/L) (82183)	2,4,5-T TOTAL (UG/L) (39740)	SILVEX, TOTAL (UG/L) (39760)	TOX-APHENE, DIS-SOLVED (UG/L) (39401)	TOX-APHENE, TOTAL (UG/L) (39400)	TRI-FLURA-LIN TOTAL RECOVER (UG/L) (39030)	TRI-THION DISSOLV (UG/L) (82342)	TOTAL TRI-THION (UG/L) (39786)
OCT 09...	<0.10	<0.1	<0.01	<0.01	<0.01	<0.01	<1.0	<1	<0.10	<0.01	<0.01
MAY 13...	<0.10	<0.1	0.04	<0.01	<0.01	<0.01	--	<1	<0.10	<0.01	<0.01
JUL 07...	<0.10	<0.1	0.03	<0.01	<0.01	<0.01	<1.0	<1	<0.10	<0.01	<0.01
AUG 25...	<0.10	<0.1	--	<0.01	<0.01	<0.01	<1.0	<1	<0.10	<0.01	<0.01

06468300 KELLY CREEK BELOW NICCUM RESERVOIR NEAR BORDULAC, ND

LOCATION.--Lat 47°24'01", long 98°49'43", in SW¼SW¼SE¼ sec.4, T.145 N., R.64 W., Foster County, Hydrologic Unit 10160001, on right bank 300 ft upstream from culvert on county road 6.5 mi east of Bordulac.

DRAINAGE AREA.--188 mi^2, approximately, of which about 77 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1985 to current year, seasonal records only.

GAGE.--Water-stage recorder. Elevation of gage is 1,460.00 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Estimated daily discharges: Feb. 6 to Apr. 2, July 2-6, and Sept. 30. Records good except those for periods of estimated daily discharges, which are fair. Slight amount of regulation by Niccum Reservoir.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 350 ft^3/s, Apr. 1, 1987, gage height, 4.52 ft, backwater from ice; no flow at times most years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 350 ft^3/s, Apr. 1, gage height, 4.52 ft, backwater from ice; no flow, Feb. 1-5.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1					.00	.70	320	6.8	8.4	.10	14	.41
2					.00	.68	260	5.9	7.1	.09	13	.23
3					.00	.65	253	4.7	5.3	.08	12	.15
4					.00	.60	249	4.4	3.6	.10	11	.15
5					.00	.55	215	4.1	2.6	.20	9.1	.15
6					.10	.70	205	3.6	2.2	.25	8.3	.15
7					.20	1.5	180	3.0	2.0	.22	7.1	.15
8					.30	2.5	149	2.4	1.6	.14	6.0	.12
9					.40	2.2	117	2.2	1.2	.09	4.8	.12
10					.50	2.3	92	1.8	.80	.09	3.2	.13
11					.52	2.1	76	1.6	1.0	.19	2.6	.15
12					.54	1.9	61	.96	1.0	.23	2.2	.16
13					.50	1.6	49	1.1	.75	.22	1.6	.16
14					.35	1.3	40	.82	.53	.21	1.3	.15
15					.20	1.0	33	.68	.35	.14	1.7	.15
16					.25	1.0	29	.82	.24	.09	1.3	.15
17					.30	1.0	26	.61	.22	.11	.83	.14
18					.35	1.0	23	.61	.26	.21	.79	.20
19					.40	1.5	21	.52	.18	1.5	.61	.48
20					.50	10	20	1.3	.13	1.7	.61	.51
21					.54	50	17	7.2	.10	3.0	.55	.38
22					.56	100	16	9.1	.07	4.8	.38	.32
23					.58	160	14	8.7	.84	6.0	.27	.31
24					.58	140	13	7.3	.70	6.1	.24	.22
25					.58	100	13	6.7	.42	4.9	.47	.19
26					.60	80	12	6.6	.23	3.1	1.2	.18
27					.62	180	9.7	6.3	.26	4.2	1.3	.18
28					.70	150	8.9	6.8	.09	13	1.2	.19
29					---	120	8.2	8.8	.07	17	.98	.18
30					---	150	7.0	10	.09	16	.68	.17
31					---	170	---	9.2	---	15	.45	---
TOTAL					10.17	1434.78	2536.8	134.62	42.33	99.06	109.76	6.33
MEAN					.36	46.3	84.6	4.34	1.41	3.20	3.54	.21
MAX					.70	180	320	10	8.4	17	14	.51
MIN					.00	.55	7.0	.52	.07	.08	.24	.12
AC-FT					20	2850	5030	267	84	196	218	13

06468300 KELLY CREEK BELOW NICCUM RESERVOIR NEAR BORDULAC, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--March 1986 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L) (00310)	HARD-NESS (MG/L AS CACO3) (00900)
MAR											
09...	1615	2.2	890	--	-8.0	0.5	--	--	--	--	--
31...	1110	147	260	--	5.0	0.5	--	--	--	--	--
[a]APR											
07...	0800	185	280	7.80	12.0	3.5	--	9.5	70	--	--
MAY											
13...	1410	1.1	580	8.53	22.0	18.5	3.3	9.5	101	--	250
JUL											
07...	0830	0.22	550	9.43	20.0	21.5	2.5	8.6	97	--	190
AUG											
25...	0830	0.35	760	8.40	10.0	17.0	3.1	6.4	65	5.6	280

DATE	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2) (00405)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)
MAY											
13...	0	55	28	32	21	0.9	13	264	1.5	71	12
JUL											
07...	0	28	30	48	33	2	12	219	0.1	76	9.9
AUG											
25...	11	56	34	57	29	2	16	269	2.0	130	17

DATE	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	SOLIDS, RESIDUE AT 105 DEG. C, SUS-PENDED (MG/L) (00530)	NITRO-GEN, NITRITE TOTAL (MG/L AS N) (00615)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)
APR											
07...	--	--	--	--	--	--	0.020	--	0.300	--	--
MAY											
13...	12	382	380	0.52	1.1	<1	0.020	0.030	<0.100	<0.100	--
JUL											
07...	4.6	362	340	0.49	0.22	80	--	<0.010	--	<0.100	--
AUG											
25...	--	529	--	--	--	7	<0.010	<0.010	<0.100	<0.100	0.020

DATE	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOS-PHORUS, TOTAL (MG/L AS P) (00665)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P) (70507)	PHOS-PHORUS, ORTHO, DIS-SOLVED (MG/L AS P) (00671)	ANTI-MONY, TOTAL (UG/L AS SB) (01097)	ANTI-MONY, DIS-SOLVED (UG/L AS SB) (01095)	ARSENIC TOTAL (UG/L AS AS) (01002)
APR										
07...	--	--	--	0.200	--	0.124	--	<1	--	2
MAY										
13...	--	--	--	0.110	0.040	0.029	0.019	--	<1	--
JUL										
07...	--	--	--	--	0.100	--	0.064	--	1	--
AUG										
25...	0.010	2.4	1.6	0.480	0.410	0.043	0.350	--	--	7

a - Laboratory analysis incomplete prior to report publication.

06468300 KELLY CREEK BELOW NICCUM RESERVOIR NEAR BORDULAC, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA) (01007)	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)	BERYL-LIUM, TOTAL RECOV-ERABLE (UG/L AS BE) (01012)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE) (01010)	BORON, TOTAL RECOV-ERABLE (UG/L AS B) (01022)	BORON, DIS-SOLVED (UG/L AS B) (01020)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD) (01027)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)
APR 07...	--	<100	--	<10	--	50	--	<1	--	--
MAY 13...	3	100	97	<10	<0.5	20	80	--	<1	<1
JUL 07...	8	--	57	--	<0.5	--	80	--	<1	1
AUG 25...	7	--	--	--	--	--	110	<1	1	--

DATE	COBALT, DIS-SOLVED (UG/L AS CO) (01035)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE) (01045)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN) (01055)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)
APR 07...	--	--	--	--	--	--	--	--	2	--
MAY 13...	<3	<1	--	11	<5	--	11	0.3	--	1
JUL 07...	<3	2	--	17	<5	--	7	0.5	--	<1
AUG 25...	--	<1	180	11	<5	230	10	0.5	--	--

DATE	SELE-NIUM, TOTAL (UG/L AS SE) (01147)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG) (01077)	SILVER, DIS-SOLVED (UG/L AS AG) (01075)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)	CYANIDE TOTAL (MG/L AS CN) (00720)	CYANIDE DIS-SOLVED (MG/L AS CN) (00723)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
APR 07...	<1	--	<1	--	--	<0.010	--	4	1.8	95
MAY 13...	--	<1	--	<1	<3	<0.010	<0.01	24	0.07	73
JUL 07...	--	<1	--	<1	9	--	<0.01	11	0.01	51
AUG 25...	<1	<1	--	--	4	<0.010	<0.01	6	0.01	95

06468500 JAMES RIVER NEAR PINGREE, ND

LOCATION.--Lat 47°08'30", long 98°47'00", in SW¼SW¼ sec.3, T.142 N., R.64 W., Stutsman County, Hydrologic Unit 10160001, on right bank 500 ft upstream from dam at outlet of DePuy Marsh, 6.5 mi southeast of Pingree, and 6.25 mi northeast of Buchanan.

DRAINAGE AREA.--1,670 mi^2, approximately, of which about 900 mi^2 is probably noncontributing.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1965, 1979 to current year.

REMARKS.--Current sampling site is located at bridge 2 mi upstream from former stream-gaging station.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	COLOR (PLAT-INUM-COBALT UNITS) (00080)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L) (00310)	HARD-NESS (MG/L AS CACO3) (00900)
OCT 09...	1100	1.5	760	8.60	0.0	9.0	13	5.5	10.5	89	--	260
DEC 02...	0900	2.5	860	7.79	0.0	2.5	27	2.4	--	--	--	310
JAN 13...	0830	2.0	960	7.65	2.0	2.0	9	1.2	--	--	--	350
APR 07...	1200	770	345	7.40	17.0	3.0	--	2.5	8.0	58	--	110
MAY 12...	0930	20	370	7.95	18.0	15.5	34	7.0	8.2	81	--	140
JUL 07...	1130	1.5	530	8.91	25.0	22.0	26	13	12.0	136	--	200
AUG 25...	1200	25	600	8.95	13.0	17.5	18	25	8.8	90	6.5	230

DATE	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2) (00405)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)
OCT 09...	9	49	34	54	29	1	15	253	1.2	140	13	0.30
DEC 02...	19	58	41	69	31	2	18	295	9.2	170	12	0.20
JAN 13...	13	65	45	74	30	2	18	335	14	170	15	0.20
APR 07...	0	24	13	23	28	1	10	116	8.9	48	6.1	--
MAY 12...	0	29	16	24	26	0.9	11	148	3.2	48	5.8	0.10
JUL 07...	0	41	23	37	27	1	14	223	0.5	71	9.0	0.20
AUG 25...	0	43	29	45	28	1	15	245	0.5	77	9.9	0.20

DATE	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	SOLIDS, RESIDUE AT 105 DEG. C, SUS-PENDED (MG/L) (00530)	NITRO-GEN, NITRITE TOTAL (MG/L AS N) (00615)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)
OCT 09...	16	513	470	0.70	2.1	10	--	<0.010	--	<0.100	--	--
DEC 02...	24	572	570	0.78	3.9	5	--	<0.010	--	<0.100	--	--
JAN 13...	28	637	620	0.87	3.4	5	--	<0.010	--	<0.100	--	--
APR 07...	10	220	200	0.30	457	1	0.040	0.030	0.600	0.540	--	--
MAY 12...	19	237	240	0.32	13	21	0.020	0.020	<0.100	<0.100	--	--
JUL 07...	0.4	344	330	0.47	1.4	36	--	<0.010	--	<0.100	--	--
AUG 25...	--	389	--	--	--	62	<0.010	<0.010	<0.100	<0.100	0.020	0.010

06468500 JAMES RIVER NEAR PINGREE, ND

DATE	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	PHOSPHORUS, DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P) (70507)	PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P) (00671)	ALUMINUM, DISSOLVED (UG/L AS AL) (01106)	ANTIMONY, TOTAL (UG/L AS SB) (01097)	ANTIMONY, DISSOLVED (UG/L AS SB) (01095)	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA) (01007)
OCT 09...	--	--	--	0.030	--	0.010	--	--	<1	--	3	--
DEC 02...	--	--	--	0.040	--	0.025	--	--	<1	--	2	--
JAN 13...	--	--	--	0.060	--	0.045	--	--	<1	--	2	--
APR 07...	--	--	0.270	0.200	0.185	0.170	40	<1	<1	2	2	<100
MAY 12...	--	--	0.150	0.060	0.056	0.039	--	<1	<1	1	2	<100
JUL 07...	--	--	--	0.050	--	0.015	--	--	<1	--	4	--
AUG 25...	2.9	1.2	0.160	0.040	0.064	0.016	10	--	--	6	5	--

DATE	BARIUM, DISSOLVED (UG/L AS BA) (01005)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE) (01012)	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)	BORON, TOTAL RECOVERABLE (UG/L AS B) (01022)	BORON, DISSOLVED (UG/L AS B) (01020)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD) (01027)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COBALT, DISSOLVED (UG/L AS CO) (01035)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, TOTAL RECOVERABLE (UG/L AS FE) (01045)
OCT 09...	69	--	<0.5	--	140	--	<1	<1	<3	1	--
DEC 02...	67	--	<0.5	--	140	--	<1	<1	<3	<1	--
JAN 13...	81	--	<0.5	--	140	--	<1	<1	<3	2	--
APR 07...	<36	<10	<0.5	30	50	<1	<1	<1	<3	<1	--
MAY 12...	74	<10	<0.5	50	70	<1	<1	<1	<3	1	--
JUL 07...	57	--	<0.5	--	110	--	<1	1	<3	<1	--
AUG 25...	<100	--	--	--	130	1	2	--	<1	<1	850

DATE	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, DISSOLVED (UG/L AS PB) (01049)	LITHIUM DISSOLVED (UG/L AS LI) (01130)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN) (01055)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY DISSOLVED (UG/L AS HG) (71890)	MOLYBDENUM, DISSOLVED (UG/L AS MO) (01060)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI) (01067)	NICKEL, DISSOLVED (UG/L AS NI) (01065)	SELENIUM, TOTAL (UG/L AS SE) (01147)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)
OCT 09...	11	<5	--	--	4	0.2	--	--	3	--	<1
DEC 02...	<3	<5	--	--	120	0.1	--	--	2	--	<1
JAN 13...	6	<5	--	--	970	0.1	--	--	2	--	<1
APR 07...	84	<5	20	--	170	0.2	<1	2	<1	<1	<1
MAY 12...	25	<5	--	--	150	0.6	--	3	<1	<1	<1
JUL 07...	6	<5	--	--	37	0.4	--	--	<1	--	<1
AUG 25...	7	<5	60	410	49	0.2	<1	--	--	<1	<1

DATE	SILVER, TOTAL RECOVERABLE (UG/L AS AG) (01077)	SILVER, DISSOLVED (UG/L AS AG) (01075)	STRONTIUM, DISSOLVED (UG/L AS SR) (01080)	THALLIUM, DISSOLVED (UG/L AS TL) (01057)	VANADIUM, DISSOLVED (UG/L AS V) (01085)	ZINC, DISSOLVED (UG/L AS ZN) (01090)	CYANIDE TOTAL (MG/L AS CN) (00720)	CYANIDE DISSOLVED (MG/L AS CN) (00723)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT 09...	--	<1	--	<1	--	<3	--	<0.01	86	0.35	62
DEC 02...	--	<1	--	<1	--	4	--	0.02	38	0.26	40
JAN 13...	--	<1	--	<1	--	8	--	<0.01	38	0.21	90
APR 07...	<1	<1	90	--	2	8	<0.010	<0.01	6	12	88
MAY 12...	<1	<1	--	--	--	<3	<0.010	<0.01	22	1.2	98
JUL 07...	--	<1	--	--	--	4	--	0.01	29	0.12	94
AUG 25...	--	--	300	--	--	4	<0.010	<0.01	78	5.3	99

06469000 JAMESTOWN RESERVOIR NEAR JAMESTOWN, ND

LOCATION.--Lat 46°55'50", long 98°42'23", in SE¼NW¼ sec.24, T.140 N., R.64 W., Stutsman County, Hydrologic Unit 10160001, on left bank in control house below Jamestown Dam on James River, 1.7 mi north of Jamestown Post Office, and 3.3 mi upstream from Pipestem Creek.

DRAINAGE AREA.--1,760 mi^2, approximately, of which about 1,010 mi^2 is probably noncontributing.

RESERVOIR-ELEVATION AND CONTENTS RECORDS

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

GAGE.--Water-stage recorder. Datum of gage is 1,400.00 ft above National Geodetic Vertical Datum of 1929; gage readings have been reduced to elevations NGVD. June 22, 1959, to June 3, 1971 at site 0.2 mi upstream at same datum. Prior to June 22, 1959, nonrecording gages at different locations.

REMARKS.--Reservoir is formed by earth-fill dam, completed Oct. 1, 1953. Closure made May 7, 1953, and filling of dead storage started. Gates initially closed Feb. 8, 1954. Usable capacity, 229,470 acre-ft between elevations 1,400 ft, sill of outlet and 1,454 ft, crest of spillway. Dead storage below elevation 1,400 ft, 820 acre-ft. Maximum design pool, 389,000 acre-ft, elevation, 1,464.6 ft. Figures given herein represent total contents based on capacity table dated Oct. 1, 1965. Reservoir is used for flood control and municipal supply. Elevations are adjusted for wind effect.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 103,100 acre-ft, May 1, 1969, elevation, 1,443.60 ft; minimum since initial filling of reservoir, 18,220 acre-ft, Mar. 4, 5, 1965, elevation, 1,423.66 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 90,150 acre-ft, Apr. 20, elevation, 1,442.20 ft; minimum 29,090 acre-ft, Dec. 23, 24, elevation, 1,429.89 ft.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	1,431.93	33,690	--
Oct. 31	1,430.97	31,440	-2,250
Nov. 30	*1,430.40	30,200	-1,240
Dec. 31	1,429.99	29,300	-900
CAL YR 1986	--	--	+620
Jan. 31	*1,430.28	29,930	+630
Feb. 28	1,430.92	31,340	+1,410
Mar. 31	1,435.70	44,280	+12,940
Apr. 30	1,440.99	79,530	+35,250
May 31	1,438.82	62,240	-17,290
June 30	*1,436.45	46,780	-15,460
July 31	1,434.71	41,200	-5,580
Aug. 31	1,434.11	39,430	-1,770
Sept. 30	1,432.92	36,170	-3,260
WTR YR 1987	--	--	+2,480

* - Gage readings obtained from U.S.B.R.

06469000 JAMESTOWN RESERVOIR NEAR JAMESTOWN, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1960 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	SAMPLING DEPTH (FEET) (00003)	RESERVOIR DEPTH (FEET) (72025)	TEMPERATURE AIR (DEG C) (00020)	CLOUD COVER (PERCENT) (00032)	WIND DIRECTION (DEG. FROM TRUE NORTH) (00036)	WIND SPEED (MILES PER HOUR) (00035)	BAROMETRIC PRESSURE (MM OF HG) (00025)	ICE THICKNESS (FEET) (82130)	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH (STANDARD UNITS) (00400)	TEMPERATURE WATER (DEG C) (00010)
JAN												
27...	1130	0.0	--	--	--	--	--	--	--	758	8.20	1.5
27...	1132	1.60	--	--	--	--	--	--	--	759	8.20	3.5
27...	1134	3.30	38.6	-2.0	100	300	5.0	769	1.70	761	8.20	3.5
27...	1136	6.60	--	--	--	--	--	--	--	762	8.30	3.5
27...	1138	13.2	--	--	--	--	--	--	--	765	8.20	3.5
27...	1140	19.8	--	--	--	--	--	--	--	787	7.80	4.0
27...	1142	26.4	--	--	--	--	--	--	--	818	7.50	4.0
27...	1144	33.0	--	--	--	--	--	--	--	867	7.40	4.5
APR												
28...	1200	0.0	--	--	--	--	--	--	--	571	8.00	11.5
28...	1202	1.60	--	--	--	--	--	--	--	571	8.00	11.5
28...	1204	3.30	50.0	22.5	30	220	5.0	769	--	571	8.00	11.0
28...	1206	6.60	--	--	--	--	--	--	--	575	8.00	11.0
28...	1208	13.2	--	--	--	--	--	--	--	576	7.90	11.0
28...	1210	19.8	--	--	--	--	--	--	--	574	7.90	10.5
28...	1212	26.4	--	--	--	--	--	--	--	573	7.90	10.5
28...	1214	33.0	--	--	--	--	--	--	--	570	8.00	10.5
28...	1216	39.6	--	--	--	--	--	--	--	570	8.00	10.5
28...	1218	46.2	--	--	--	--	--	--	--	570	8.00	10.5
JUL												
22...	1156	0.0	--	--	--	--	--	--	--	465	7.90	25.0
22...	1158	1.60	--	--	--	--	--	--	--	465	7.90	24.0
22...	1200	3.30	43.7	25.5	20	180	5.0	766	--	465	7.90	23.5
22...	1202	6.60	--	--	--	--	--	--	--	466	7.80	23.5
22...	1204	13.2	--	--	--	--	--	--	--	466	7.80	23.5
22...	1206	19.8	--	--	--	--	--	--	--	466	7.80	23.0
22...	1208	26.4	--	--	--	--	--	--	--	466	7.70	22.5
22...	1210	33.0	--	--	--	--	--	--	--	466	7.60	22.0
22...	1212	39.6	--	--	--	--	--	--	--	468	7.40	21.5
22...	1214	46.2	--	--	--	--	--	--	--	470	7.40	21.5

DATE	COLOR (PLATINUM-COBALT UNITS) (00080)	TRANSPARENCY (SECCHI DISK) (IN) (00077)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)	HARDNESS (MG/L AS CACO3) (00900)	HARDNESS NONCARBONATE (MG/L AS CACO3) (95902)	CALCIUM DISSOLVED (MG/L AS CA) (00915)	MAGNESIUM, DISSOLVED (MG/L AS MG) (00925)	SODIUM, DISSOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM ADSORPTION RATIO (00931)	POTASSIUM, DISSOLVED (MG/L AS K) (00935)
JAN												
27...	--	--	18.0	--	--	--	--	--	--	--	--	--
27...	--	--	17.5	--	--	--	--	--	--	--	--	--
27...	28	30.0	17.3	129	260	0	51	33	68	34	2	15
27...	--	--	17.5	--	--	--	--	--	--	--	--	--
27...	--	--	15.8	--	--	--	--	--	--	--	--	--
27...	--	--	8.8	--	--	--	--	--	--	--	--	--
27...	--	--	3.3	--	--	--	--	--	--	--	--	--
27...	--	--	1.0	--	--	--	--	--	--	--	--	--
APR												
28...	--	--	11.4	--	--	--	--	--	--	--	--	--
28...	--	--	11.4	--	--	--	--	--	--	--	--	--
28...	28	48.0	11.3	102	190	0	37	23	46	33	2	12
28...	--	--	10.8	--	--	--	--	--	--	--	--	--
28...	--	--	10.7	--	--	--	--	--	--	--	--	--
28...	--	--	11.0	--	--	--	--	--	--	--	--	--
28...	--	--	11.1	--	--	--	--	--	--	--	--	--
28...	--	--	11.2	--	--	--	--	--	--	--	--	--
28...	--	--	11.0	--	--	--	--	--	--	--	--	--
28...	--	--	10.9	--	--	--	--	--	--	--	--	--
JUL												
22...	--	--	8.8	--	--	--	--	--	--	--	--	--
22...	--	--	8.7	--	--	--	--	--	--	--	--	--
22...	28	32.4	8.3	97	160	0	33	19	35	30	1	12
22...	--	--	8.0	--	--	--	--	--	--	--	--	--
22...	--	--	7.9	--	--	--	--	--	--	--	--	--
22...	--	--	7.4	--	--	--	--	--	--	--	--	--
22...	--	--	7.0	--	--	--	--	--	--	--	--	--
22...	--	--	5.4	--	--	--	--	--	--	--	--	--
22...	--	--	3.4	--	--	--	--	--	--	--	--	--
22...	--	--	2.4	--	--	--	--	--	--	--	--	--

06469000 JAMESTOWN RESERVOIR NR JAMESTOWN, ND

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	ALKALINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLORIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUORIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTITUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITROPHOSPHORUS, DIS-SOLVED (MG/L AS P) (00666)	BORON, DIS-SOLVED (UG/L AS B) (01020)
JAN 27...	--	140	15	0.20	20	514	--	0.70	<0.100	0.080	130
APR 28...	198	100	10	0.20	14	356	360	0.48	0.280	0.110	90
JUL 22...	176	69	13	0.20	14	303	300	0.41	0.320	0.140	80

06469400 PIPESTEM CREEK NEAR PINGREE, ND

LOCATION.--Lat 47°10'03", long 98°58'07", in NE¼NE¼NW¼ sec.31, T.143 N., R.65 W., Stutsman County, Hydrologic Unit 10160002, on right bank on downstream side of State Highway 36 bridge, and 3 mi west of Pingree.

DRAINAGE AREA.--700 mi^2, of which about 440 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1973 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,500.63 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Nov. 7 to Apr. 3 and Apr. 15-20. Records fair except for periods of estimated record which are poor.

AVERAGE DISCHARGE.--14 years, 27.3 ft^3/s, 19,780 acre-ft/yr; median of yearly mean discharges, 20 ft^3/s, 14,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,520 ft^3/s, Apr. 20, 1979, gage height, 11.60 ft, backwater from ice; no flow at times.

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

Date	Time	Discharge (ft^3/s)	Gage Height (ft)	Date	Time	Discharge (ft^3/s)	Gage Height (ft)
Mar. 10	----	ice jam	*[bc]11.45	Apr. 1	0745	*750	[b]9.49
Mar. 21	----	[a]340	unknown				

Minimum daily discharge, .38 ft^3/s, Jan. 24-26.
a - About
b - Backwater from ice
c - Observed

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.2	.86	1.5	.54	.44	2.0	650	31	43	5.0	73	21
2	2.5	.76	1.5	.54	.46	2.0	550	30	40	4.8	71	19
3	2.5	.86	1.5	.54	.46	2.0	500	28	38	4.0	64	16
4	2.2	1.0	1.4	.52	.48	8.0	549	27	35	3.6	57	16
5	2.4	.87	1.3	.52	.48	25	497	27	32	3.6	51	17
6	2.4	1.1	1.2	.50	.50	35	441	26	31	3.6	48	16
7	2.5	1.1	1.1	.50	.50	70	390	23	29	3.6	42	15
8	2.4	1.1	1.1	.50	.50	60	355	22	27	3.6	37	15
9	2.1	1.1	1.0	.50	.50	54	300	22	25	3.6	34	14
10	1.9	1.2	.90	.50	.70	50	259	21	24	3.6	28	15
11	1.8	1.2	.80	.50	1.5	30	227	16	24	3.4	25	14
12	1.7	1.2	.76	.50	1.8	18	199	10	21	3.5	25	15
13	1.7	1.3	.72	.50	2.0	19	174	9.1	18	3.6	23	13
14	1.5	1.3	.72	.50	2.4	20	156	9.8	15	3.5	23	12
15	1.5	1.4	.70	.50	2.5	22	140	9.1	13	3.1	27	11
16	1.3	1.6	.70	.46	2.5	23	120	8.5	11	2.4	27	11
17	1.3	1.6	.70	.44	2.5	23	100	8.5	10	2.4	27	10
18	1.1	1.6	.70	.42	2.4	30	90	8.3	10	2.8	27	11
19	1.0	1.6	.68	.40	2.4	70	80	7.9	10	8.7	27	11
20	1.1	1.6	.66	.40	2.3	200	70	8.7	9.4	21	27	12
21	1.0	1.6	.64	.40	2.3	340	65	26	8.5	45	27	13
22	1.0	1.6	.62	.39	2.2	330	64	45	8.2	80	24	12
23	1.0	1.5	.60	.39	2.2	325	61	54	7.4	92	24	12
24	1.0	1.6	.58	.38	2.2	320	56	45	7.4	89	23	12
25	1.0	1.6	.58	.38	2.2	310	52	43	7.4	76	23	11
26	1.0	1.7	.56	.38	2.1	300	49	43	7.4	66	23	9.8
27	1.0	1.7	.56	.40	2.1	310	45	43	6.4	61	24	7.7
28	1.0	1.7	.56	.40	2.0	320	42	46	6.4	58	26	6.9
29	1.0	1.6	.56	.40	---	350	39	46	6.4	57	24	6.9
30	1.0	1.6	.54	.40	---	400	33	46	5.6	62	24	7.1
31	1.0	---	.54	.42	---	450	---	44	---	71	21	---
TOTAL	48.1	40.55	25.98	14.12	44.62	4518.0	6353	833.9	536.5	850.4	1026	382.4
MEAN	1.55	1.35	.84	.46	1.59	146	212	26.9	17.9	27.4	33.1	12.7
MAX	2.5	1.7	1.5	.54	2.5	450	650	54	43	92	73	21
MIN	1.0	.76	.54	.38	.44	2.0	33	7.9	5.6	2.4	21	6.9
AC-FT	95	80	52	28	89	8960	12600	1650	1060	1690	2040	758

CAL YR 1986 TOTAL 6989.38 MEAN 19.1 MAX 320 MIN .00 AC-FT 13860
WTR YR 1987 TOTAL 14673.53 MEAN 40.2 MAX 650 MIN .38 AC-FT 29100

06469400 PIPESTEM CREEK NEAR PINGREE, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1974 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
JAN 13...	0930	0.50	1500	--	3.0	0.0	--	--	--	--	--
MAR 31...	1400	431	360	--	6.0	1.0	--	--	--	--	--
APR 07...	1400	365	430	7.90	7.0	10.5	160	18	32	19	25
MAY 12...	0850	12	910	--	17.0	14.0	--	--	--	--	--
JUL 07...	1305	3.6	1270	--	25.0	23.0	--	--	--	--	--
AUG 25...	1445	24	910	8.20	14.0	17.0	320	0	60	41	75

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR 07...	24	0.9	10	140	66	5.0	0.10	16	263	260	0.36
AUG 25...	33	2	15	340	150	12	0.20	32	624	590	0.85

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR 07...	2	50	60	<1	22	40	0.6	<1	<1	150
AUG 25...	4	140	30	<1	29	160	1.4	1	1	270

06470000 JAMES RIVER AT JAMESTOWN, ND

LOCATION.--Lat 46°53'22", long 98°40'58", in NW¼NE¼ sec.6, T.139 N., R.63 W., Stutsman County, Hydrologic Unit 10160003, on left bank 200 ft upstream from Interstate 94 bridge at southeast corner of Jamestown, and 3 mi downstream from Pipestem Creek.

DRAINAGE AREA.--2,820 mi^2, approximately, of which about 1,650 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1928 to September 1933, March to May 1935, August 1937 to September 1939, April 1943 to current year. Monthly discharge only for some periods, published in WSP 1309.

REVISED RECORDS.--WSP 1239: 1938(M). WSP 1917: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,373.27 ft above National Geodetic Vertical Datum of 1929. Oct. 1, 1949 to Sept. 30, 1965, at former bridge 0.5 mi upstream at datum 2.00 ft higher. See WSP 1729 or 1917 for history of changes prior to Oct. 1, 1949.

REMARKS.--Estimated daily discharges: Nov. 7-16, Dec. 3-8, and Jan. 17-30. Records good, except those for estimated daily discharges, which are fair. Flow regulated by Arrowwood, Jim, and Pipestem Lakes, and Jamestown Reservoir, combined capacity, 393,000 acre-ft. Regulation by Jamestown Reservoir (station 06469000) 6 mi since 1953 and by Pipestem Lake, capacity 147,000 acre-ft, since 1973.

AVERAGE DISCHARGE.--51 years (water years 1929-33, 1938-39, 1944-87), 66.3 ft^3/s, 48,030 acre-ft/yr; median of yearly mean discharges, 36 ft^3/s, 26,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,390 ft^3/s, May 13, 1950, gage height, 15.82 ft, site and datum then in use; no flow at times in 1933.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 653 ft^3/s, Mar. 20, gage height, 7.67 ft; minimum daily, 4.0 ft^3/s, Jan. 26, 27.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	45	54	55	4.5	4.5	16	167	526	355	252	237	246
2	45	54	56	4.7	4.5	16	145	523	353	247	234	246
3	42	55	56	5.0	4.2	15	140	523	352	248	232	245
4	42	55	56	4.8	4.5	15	140	526	351	252	214	243
5	42	55	56	4.8	5.2	18	137	532	351	253	189	245
6	41	56	56	4.8	6.6	28	174	532	352	254	202	245
7	41	56	56	4.7	8.1	56	301	533	352	256	199	245
8	41	56	56	4.7	14	73	437	528	351	247	199	250
9	40	56	47	4.8	9.8	53	532	527	351	247	199	246
10	40	57	46	4.8	9.0	27	517	530	362	246	199	231
11	41	58	46	4.8	9.0	22	518	526	358	248	197	126
12	41	60	46	5.0	9.3	23	521	524	352	250	199	191
13	41	62	49	4.9	8.9	22	520	526	352	245	197	240
14	41	65	49	4.5	9.2	22	516	524	350	242	197	242
15	52	68	48	5.3	9.8	22	516	525	350	242	197	243
16	55	72	48	5.5	12	22	517	524	350	241	197	244
17	55	76	47	5.5	13	22	516	535	354	252	197	249
18	55	80	45	5.4	14	26	524	532	352	287	196	256
19	55	81	45	5.3	13	49	526	528	351	259	195	256
20	54	81	44	5.2	13	354	527	537	352	244	194	251
21	54	81	43	5.2	12	535	524	530	355	240	194	233
22	55	78	42	5.0	12	404	522	374	331	242	194	67
23	55	73	38	4.6	11	288	526	362	289	267	193	17
24	54	70	16	4.3	11	201	527	362	254	242	194	23
25	55	62	8.5	4.1	11	157	531	368	239	239	199	93
26	55	56	6.7	4.0	12	147	532	371	251	239	104	208
27	53	56	5.9	4.0	19	176	533	361	251	238	194	242
28	55	56	5.4	4.1	17	150	531	360	251	238	245	251
29	53	56	5.1	4.2	---	165	529	358	254	237	245	250
30	53	56	4.8	4.3	---	157	529	356	249	235	247	249
31	56	---	4.7	4.4	---	144	---	355	---	234	245	---
TOTAL	1507	1901	1187.1	147.2	286.6	3425	13175	14718	9775	7663	6324	6373
MEAN	48.6	63.4	38.3	4.75	10.2	110	439	475	326	247	204	212
MAX	56	81	56	5.5	19	535	533	537	362	287	247	256
MIN	40	54	4.7	4.0	4.2	15	137	355	239	234	104	17
AC-FT	2990	3770	2350	292	568	6790	26130	29190	19390	15200	12540	12640

CAL YR 1986 TOTAL 25412.6 MEAN 69.6 MAX 309 MIN 1.8 AC-FT 50410
WTR YR 1987 TOTAL 66481.9 MEAN 182 MAX 537 MIN 4.0 AC-FT 131900

06470000 JAMES RIVER AT JAMESTOWN, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1950-51, 1958 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L) (00310)	HARD-NESS (MG/L AS CACO3) (00900)
OCT											
09...	1500	39	750	8.10	5.0	11.0	10	10.0	88	--	250
DEC											
02...	1400	57	775	8.20	0.0	1.5	2.8	--	--	--	260
JAN											
13...	1200	4.9	1100	7.80	3.0	0.0	4.1	14.5	99	--	420
FEB											
24...	1130	11	689	--	-5.0	0.5	--	--	--	--	--
MAR											
26...	1625	141	370	--	3.0	1.0	--	--	--	--	--
31...	1520	142	400	--	6.0	1.5	--	--	--	--	--
APR											
07...	1630	301	610	8.00	21.0	6.0	3.0	15.4	122	--	210
MAY											
14...	0900	524	500	8.10	15.0	15.0	5.5	8.7	85	--	170
JUL											
07...	1600	232	490	8.11	30.0	23.0	14	8.1	93	--	170
AUG											
25...	1545	210	510	8.00	13.0	17.5	15	7.8	80	2.9	190

DATE	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2) (00405)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)
OCT											
09...	4	51	29	61	34	2	13	243	3.7	140	17
DEC											
02...	0	54	31	66	34	2	15	--	0	140	14
JAN											
13...	0	97	42	86	30	2	12	--	0	240	48
APR											
07...	6	42	25	47	31	1	16	202	3.9	110	11
MAY											
14...	1	35	20	37	30	1	12	169	2.6	88	9.4
JUL											
07...	2	37	20	34	28	1	11	173	2.6	78	8.6
AUG											
25...	8	42	21	33	26	1	12	183	3.5	80	8.0

DATE	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	SOLIDS, RESIDUE AT 105 DEG. C, SUS-PENDED (MG/L) (00530)	NITRO-GEN, NITRITE TOTAL (MG/L AS N) (00615)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)
OCT											
09...	18	515	480	0.70	54	18	--	0.010	--	0.220	--
DEC											
02...	18	502	--	0.68	77	6	--	<0.010	--	0.280	--
JAN											
13...	17	744	--	1.0	9.9	7	--	<0.010	--	0.220	--
APR											
07...	15	392	390	0.53	319	21	0.030	0.020	0.500	0.460	--
MAY											
14...	9.9	316	310	0.43	447	11	0.050	0.060	0.300	0.290	--
JUL											
07...	11	312	300	0.42	195	40	--	<0.010	--	0.310	--
AUG											
25...	--	319	--	--	--	32	0.020	0.020	0.200	0.160	0.070

06470000 JAMES RIVER AT JAMESTOWN, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	PHOSPHORUS, DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P) (70507)	PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P) (00671)	ANTIMONY, TOTAL (UG/L AS SB) (01097)	ANTIMONY, DISSOLVED (UG/L AS SB) (01095)	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DISSOLVED (UG/L AS AS) (01000)
OCT 09...	--	--	--	--	0.090	--	0.086	--	<1	--	3
DEC 02...	--	--	--	--	0.120	--	0.118	--	<1	--	3
JAN 13...	--	--	--	--	0.030	--	0.025	--	<1	--	2
APR 07...	--	--	--	0.270	0.200	0.186	0.180	<1	<1	3	2
MAY 14...	--	--	--	0.200	0.140	0.141	0.112	--	<1	--	2
JUL 07...	--	--	--	--	0.100	--	0.090	--	<1	--	2
AUG 25...	0.060	1.0	1.4	0.120	0.100	0.109	0.085	--	--	4	3

DATE	BARIUM, TOTAL RECOVERABLE (UG/L AS BA) (01007)	BARIUM, DISSOLVED (UG/L AS BA) (01005)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE) (01012)	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)	BORON, TOTAL RECOVERABLE (UG/L AS B) (01022)	BORON, DISSOLVED (UG/L AS B) (01020)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD) (01027)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COBALT, DISSOLVED (UG/L AS CO) (01035)
OCT 09...	--	74	--	<0.5	--	150	--	<1	<1	<3
DEC 02...	--	54	--	<0.5	--	150	--	<1	<1	<3
JAN 13...	--	71	--	<0.5	--	290	--	<1	<1	<3
APR 07...	100	51	<10	<0.5	30	90	<1	<1	<1	<3
MAY 14...	100	42	<10	<0.5	30	70	--	<1	<1	<3
JUL 07...	--	43	--	<0.5	--	80	--	<1	<1	<3
AUG 25...	--	--	--	--	--	80	<1	<1	--	--

DATE	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, TOTAL RECOVERABLE (UG/L AS FE) (01045)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, DISSOLVED (UG/L AS PB) (01049)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN) (01055)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY DISSOLVED (UG/L AS HG) (71890)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI) (01067)	NICKEL, DISSOLVED (UG/L AS NI) (01065)	SELENIUM, TOTAL (UG/L AS SE) (01147)
OCT 09...	2	--	5	5	--	180	--	--	5	--
DEC 02...	2	--	10	<5	--	110	0.1	--	3	--
JAN 13...	1	--	41	<5	--	630	0.1	--	2	--
APR 07...	<1	--	46	<5	--	460	0.2	4	<1	<1
MAY 14...	<1	--	25	<5	--	140	0.5	--	1	--
JUL 07...	<1	--	6	<5	--	31	0.3	--	6	--
AUG 25...	<1	920	18	<5	360	130	0.3	--	--	2

DATE	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	SILVER, TOTAL RECOVERABLE (UG/L AS AG) (01077)	SILVER, DISSOLVED (UG/L AS AG) (01075)	THALLIUM, DISSOLVED (UG/L AS TL) (01057)	ZINC, DISSOLVED (UG/L AS ZN) (01090)	CYANIDE TOTAL (MG/L AS CN) (00720)	CYANIDE DISSOLVED (MG/L AS CN) (00723)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT 09...	<1	--	<1	<1	4	--	<0.01	65	6.8	70
DEC 02...	<1	--	<1	<1	<3	--	<0.01	8	1.2	--
JAN 13...	<1	--	<1	<1	10	--	<0.01	60	0.79	29
APR 07...	<1	1	<1	--	8	<0.010	<0.01	34	28	83
MAY 14...	<1	--	<1	--	5	--	<0.01	21	30	98
JUL 07...	<1	--	<1	--	5	--	<0.01	41	26	97
AUG 25...	1	--	--	--	5	<0.010	<0.01	38	22	95

06470500 JAMES RIVER AT LA MOURE, ND

LOCATION.--Lat 46°21'20", long 98°18'15", in NE¼NE¼ sec.11, T.133 N., R.61 W., LaMoure County, Hydrologic Unit 10160003, on left bank 80 ft downstream from bridge on State Highway 13, 0.5 mi west of LaMoure, and 12 mi upstream from Cottonwood Creek.

DRAINAGE AREA.--4,390 mi^2, approximately, of which about 2,600 mi^2 is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April to July 1903 (gage-height record only), April 1950 to current year. Gage-height records for 1902-11 are contained in reports of the National Oceanic and Atmospheric Administration.

REVISED RECORDS.--WSP 1917: Drainage area.

GAGE.--Water-stage recorder and rubble-masonry control. Datum of gage is 1,290.00 ft above National Geodetic Vertical Datum of 1929. See WSP 1729 or 1917 for history of changes prior to Apr. 19, 1950.

REMARKS.--Periods of estimated record include Oct. 19 to Nov. 8, Dec. 8-15, Jan. 22-26, Mar. 10-30, and Sept. 1-25. Records fair. Flow regulated by Arrowwood, Jim, and Pipestem Lakes and Jamestown Reservoir, combined capacity, 393,000 acre-ft. Regulation by Jamestown Reservoir (station 06469000) 85 mi upstream since 1953 and by Pipestem Lake, capacity 147,000 acre-ft, since 1973.

AVERAGE DISCHARGE.--37 years (water years 1951-87), 103 ft^3/s, 74,620 acre-ft/yr; median of yearly mean discharges, 74 ft^3/s, 53,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,800 ft^3/s, Apr. 14, 1969, gage height, 16.17 ft; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Prior to flood of Apr. 14, 1969, a long-time resident said that the flood of May 16, 1950, was the highest since 1881, with stage in either 1942 or 1943 being almost as high owing to large ice jam.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,500 ft^3/s, Mar. 25, gage height, 13.00 ft, backwater from ice; minimum daily, 17.0 ft^3/s, Jan. 23-25, 27-28.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	172	68	87	26	20	36	591	554	472	255	250	170
2	167	66	89	25	21	35	627	554	460	255	250	190
3	147	66	88	24	21	37	738	554	440	252	250	230
4	133	66	84	24	22	38	752	554	426	250	250	235
5	130	60	79	24	22	40	729	551	416	250	249	240
6	118	55	71	24	24	69	686	552	411	250	243	245
7	118	50	61	24	28	174	621	555	406	250	230	245
8	118	55	58	24	29	384	550	549	395	253	215	250
9	114	60	54	24	32	493	540	557	385	254	215	250
10	114	60	50	22	37	600	562	554	389	260	215	250
11	102	68	48	23	44	750	621	554	397	253	212	240
12	93	77	46	23	52	750	651	542	391	253	210	240
13	91	81	45	24	61	700	652	567	393	246	210	240
14	95	74	45	23	63	550	650	551	378	252	210	240
15	81	69	45	25	59	340	636	538	365	242	210	220
16	84	67	44	25	57	250	624	532	363	238	210	200
17	81	70	45	22	53	200	623	538	377	260	210	190
18	81	72	45	20	48	220	606	545	368	262	210	200
19	80	79	45	20	45	340	618	550	362	308	210	210
20	80	76	44	20	44	600	609	561	362	336	210	220
21	78	75	43	19	45	900	578	591	362	332	208	230
22	78	75	43	18	43	1500	572	588	361	290	206	230
23	76	76	43	17	43	1900	567	608	356	276	206	240
24	76	76	43	17	40	2300	560	551	356	255	206	240
25	74	78	43	17	40	2470	564	512	354	255	206	160
26	74	78	42	18	40	2400	554	514	285	255	206	89
27	72	80	39	17	40	1800	554	510	255	255	204	67
28	72	82	35	17	38	1300	554	503	255	255	201	68
29	70	84	31	19	---	1000	554	500	255	255	177	87
30	70	86	28	19	---	760	554	480	255	255	157	115
31	68	---	27	19	---	680	---	467	---	252	159	---
TOTAL	3007	2129	1590	663	1111	23616	18297	16836	11050	8114	6605	6031
MEAN	97.0	71.0	51.3	21.4	39.7	762	610	543	368	262	213	201
MAX	172	86	89	26	63	2470	752	608	472	336	250	250
MIN	68	50	27	17	20	35	540	467	255	238	157	67
AC-FT	5960	4220	3150	1320	2200	46840	36290	33390	21920	16090	13100	11960

CAL YR 1986 TOTAL 45085 MEAN 124 MAX 641 MIN 7.6 AC-FT 89430
WTR YR 1987 TOTAL 99049 MEAN 271 MAX 2470 MIN 17 AC-FT 196500

06470500 JAMES RIVER AT LAMOURE, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1957 to current year.

PERIOD OF DAILY RECORDS.--
WATER TEMPERATURE: June 1953 to September 1975, October 1976 to current year.
SPECIFIC CONDUCTANCE: October 1976 to current year.

INSTRUMENTATION.--Temperature recorder from June 1953 to September 1978. Water-quality monitor since October 1982.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Maximum, 33.0°C July 12, 13, 1957; July 23, 1977; minimum, 0.0°C on many days during winter months.
SPECIFIC CONDUCTANCE: Maximum daily, 1,880 microsiemens, Jan. 31, 1979; minimum daily, 200 microsiemens, Mar. 24-26, 1978.
EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: Maximum, 29.9°C, July 31; minimum, 0.0°C on many days during winter months.
SPECIFIC CONDUCTANCE: Maximum recorded, 1,200 microsiemens, Feb. 1; minimum, 210 microsiemens, Mar. 24, 25.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	COLOR (PLAT-INUM-COBALT UNITS) (00080)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L) (00310)
OCT 14...	1230	95	900	8.19	2.0	5.0	27	6.0	15.2	117	--
DEC 03...	1030	24	960	7.83	-5.5	1.0	22	4.7	--	--	--
JAN 13...	1430	26	1060	7.76	4.0	1.0	9	2.7	19.5	136	--
MAR 25...	1055	2470	210	--	0.0	0.5	--	--	--	--	--
APR 01...	0945	563	410	--	--	0.5	--	--	--	--	--
08...	0900	556	440	7.90	5.0	9.0	--	14	10.0	85	--
MAY 18...	1330	544	540	7.82	10.5	14.5	40	24	8.0	77	--
JUL 08...	0930	257	550	8.30	20.0	24.0	32	29	8.3	97	--
AUG 26...	1030	218	570	8.05	10.0	16.0	48	22	7.5	74	4.2

DATE	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2) (00405)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)
OCT 14...	330	49	73	37	75	32	2	13	286	3.5	160
DEC 03...	330	34	71	37	86	35	2	13	296	8.5	180
JAN 13...	390	41	90	41	88	32	2	12	353	12	190
APR 08...	170	24	37	18	25	23	0.9	11	143	3.5	66
MAY 18...	180	5	39	21	40	31	1	11	179	5.2	90
JUL 08...	200	2	44	21	37	28	1	11	194	1.9	89
AUG 26...	210	15	48	23	42	28	1	12	200	3.4	95

Note: No analysis of suspended sediment nor bed-material particle size were made during current year.

06470500 JAMES RIVER AT LAMOURE, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301)	SOLIDS, DISSOLVED (TONS PER AC-FT) (70303)	SOLIDS, DISSOLVED (TONS PER DAY) (70302)	SOLIDS, RESIDUE AT 105 DEG. C, SUSPENDED (MG/L) (00530)	NITROGEN, NITRITE TOTAL (MG/L AS N) (00615)	NITROGEN, NITRITE DISSOLVED (MG/L AS N) (00613)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N) (00630)
OCT 14...	29	0.30	21	680	580	0.92	174	11	--	0.010	--
DEC 03...	32	0.30	18	638	620	0.87	41	9	--	<0.010	--
JAN 13...	38	0.20	20	700	690	0.95	48	5	--	<0.010	--
APR 08...	9.7	--	14	280	270	0.38	420	56	0.030	0.030	0.600
MAY 18...	12	0.10	11	330	330	0.45	485	52	0.070	0.060	0.500
JUL 08...	11	0.10	12	361	340	0.49	250	24	--	<0.010	--
AUG 26...	12	0.20	--	361	--	--	--	55	<0.010	<0.010	<0.100

DATE	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	PHOSPHORUS, DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P) (70507)	PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P) (00671)	ANTIMONY, TOTAL (UG/L AS SB) (01097)	ANTIMONY, DISSOLVED (UG/L AS SB) (01095)
OCT 14...	<0.100	--	--	--	--	--	0.200	--	0.184	--	<1
DEC 03...	0.560	--	--	--	--	--	0.170	--	0.170	--	<1
JAN 13...	0.480	--	--	--	--	--	0.050	--	0.048	--	<1
APR 08...	0.600	--	--	--	--	0.330	0.180	0.183	0.148	<1	<1
MAY 18...	0.500	--	--	--	--	0.360	0.190	0.190	0.170	<1	<1
JUL 08...	0.190	--	--	--	--	--	0.090	--	0.085	--	<1
AUG 26...	<0.100	0.020	<0.010	1.4	0.60	0.130	0.090	0.109	0.061	--	--

DATE	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA) (01007)	BARIUM, DISSOLVED (UG/L AS BA) (01005)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE) (01012)	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)	BORON, TOTAL RECOVERABLE (UG/L AS B) (01022)	BORON, DISSOLVED (UG/L AS B) (01020)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD) (01027)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)
OCT 14...	--	3	--	74	--	<0.5	--	180	--	<1	<1
DEC 03...	--	3	--	56	--	<0.5	--	210	--	<1	<1
JAN 13...	--	2	--	63	--	<0.5	--	230	--	<1	<1
APR 08...	3	2	100	50	<10	<0.5	120	60	<1	<1	<1
MAY 18...	4	3	200	48	<10	<0.5	1200	90	<1	<1	<1
JUL 08...	--	3	--	53	--	<0.5	--	100	--	1	1
AUG 26...	4	2	--	--	--	--	--	110	<1	1	--

06470500 JAMES RIVER AT LAMOURE, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	COBALT, DIS-SOLVED (UG/L AS CO) (01035)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE) (01045)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN) (01055)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, TOTAL (UG/L AS SE) (01147)
OCT 14...	<3	1	--	7	<5	--	110	0.2	--	<1	--
DEC 03...	<3	1	--	9	<5	--	210	<0.1	--	3	--
JAN 13...	<3	2	--	10	<5	--	480	0.1	--	2	--
APR 08...	<3	<1	--	120	<5	--	220	0.3	6	1	<1
MAY 18...	<3	7	--	25	<5	--	130	0.4	9	3	<1
JUL 08...	<3	2	--	7	<5	--	99	0.4	--	<1	--
AUG 26...	--	<1	1300	9	<5	370	85	0.1	--	--	<1

DATE	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG) (01077)	SILVER, DIS-SOLVED (UG/L AS AG) (01075)	THAL-LIUM, DIS-SOLVED (UG/L AS TL) (01057)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)	CYANIDE TOTAL (MG/L AS CN) (00720)	CYANIDE DIS-SOLVED (MG/L AS CN) (00723)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT 14...	<1	--	<1	<1	8	--	<0.01	81	21	45
DEC 03...	<1	--	<1	<1	<3	--	0.02	86	5.6	59
JAN 13...	<1	--	<1	<1	17	--	<0.01	93	6.4	19
APR 08...	<1	<1	<1	--	6	<0.010	<0.01	67	101	100
MAY 18...	<1	<1	<1	--	25	<0.010	<0.01	93	137	99
JUL 08...	<1	--	<1	--	<3	--	<0.01	84	58	99
AUG 26...	<1	--	--	--	5	<0.010	0.02	55	32	99

DATE	TIME	SAMPLE LOC-ATION, CROSS SECTION (FT FM L BANK) (00009)	DEPTH TO TOP OF SAMPLE INTER-VAL (FT) (72015)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
AUG 26...	1101	10	3.0	16.0	570
26...	1102	20	3.0	16.0	570
26...	1103	30	3.0	16.0	575
26...	1104	40	3.0	16.0	575
26...	1105	50	3.0	16.0	575
26...	1106	60	3.0	16.0	570
26...	1107	70	3.0	16.0	570
26...	1108	80	3.0	16.0	570
26...	1109	90	3.0	16.0	570
26...	1110	100	3.0	16.0	570
26...	1112	110	3.0	16.0	570
26...	1115	120	3.0	16.0	570

06470500 JAMES RIVER AT LAMOURE, ND--CONTINUED

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1				---	---	---	0.7	0.5	0.6	0.6	0.5	0.6
2				---	---	---	.6	.5	.6	.6	.5	.6
3				---	---	---	.6	.5	.6	.7	.5	.6
4				---	---	---	.7	.5	.6	.7	.6	.7
5				5.0	3.0	4.0	.7	.5	.6	.8	.6	.7
6				4.7	4.0	4.5	.7	.5	.6	.8	.7	.8
7				3.9	2.4	2.9	.6	.5	.6	.8	.7	.8
8				2.6	.3	1.0	.7	.5	.6	.8	.7	.8
9				.8	.4	.6	.6	.4	.5	.7	.5	.7
10				.7	.5	.7	.6	.5	.6	.6	.5	.6
11				.7	.4	.6	.6	.5	.6	.7	.5	.6
12				.5	.4	.5	.7	.5	.6	1.0	.6	.8
13				.6	.4	.5	.5	.4	.5	1.0	.8	.9
14				.7	.5	.6	.7	.5	.6	1.0	.8	.9
15				.7	.5	.6	.6	.5	.6	.9	.5	.7
16				.7	.6	.7	.7	.5	.6	.8	.5	.6
17				.6	.5	.6	.6	.5	.6	.5	.5	.5
18				.6	.4	.5	.7	.5	.6	.7	.0	.5
19				.6	.5	.6	.7	.5	.6	.5	.4	.5
20				.6	.5	.6	.7	.5	.6	.7	.5	.6
21				.6	.5	.6	.7	.5	.6	.7	.4	.6
22				.6	.5	.6	.7	.5	.6	.5	.0	.4
23				.6	.5	.6	.7	.5	.6	.3	.0	.1
24				.6	.5	.6	.7	.5	.6	.2	.0	.0
25				.7	.5	.6	.7	.5	.6	.3	.0	.1
26				.8	.5	.6	.6	.5	.6	.4	.0	.3
27				.7	.6	.7	.7	.5	.6	.3	.1	.3
28				.8	.5	.7	.6	.5	.6	.4	.1	.3
29				.8	.5	.7	.6	.5	.6	.3	.0	.2
30				.6	.5	.6	.6	.5	.6	.4	.0	.1
31				---	---	---	.6	.5	.6	.1	.0	.1
MONTH				---	---	---	.7	.4	.59	1.0	.0	.52

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	0.5	0.0	0.3	0.2	0.0	0.1	1.7	0.8	1.3	16.0	13.4	14.6
2	.6	.4	.5	.2	.0	.0	2.9	.4	1.5	15.6	14.0	15.0
3	.8	.5	.6	.2	.0	.1	3.9	.0	2.4	16.3	14.2	15.2
4	.5	.5	.5	.2	.0	.2	5.3	2.0	3.6	17.2	15.2	16.1
5	.5	.4	.5	.3	.0	.2	6.4	3.5	4.9	18.2	15.5	16.7
6	.5	.5	.5	.5	.0	.3	7.7	4.5	6.1	18.2	16.0	17.1
7	.7	.5	.5	.5	.0	.3	9.7	6.7	8.1	18.0	15.5	17.0
8	.7	.5	.6	.2	.0	.1	11.5	8.5	9.9	18.7	16.0	17.3
9	.7	.4	.5	.3	.0	.1	10.8	9.9	10.4	18.7	17.0	17.9
10	.5	.3	.4	.2	.0	.1	10.0	8.4	9.3	19.5	17.0	18.2
11	.5	.2	.4	.2	.0	.2	9.7	7.4	8.5	18.5	16.5	17.7
12	.4	.0	.1	.2	.0	.2	9.0	7.5	8.4	17.9	16.4	17.3
13	.4	.0	.1	.2	.0	.1	8.5	7.5	8.1	18.9	16.4	17.5
14	.3	.0	.2	.2	.0	.0	9.7	6.8	8.2	19.2	16.4	17.7
15	.3	.2	.2	.2	.0	.1	11.0	8.2	9.5	20.4	17.2	18.6
16	.2	.2	.2	.2	.0	.0	11.8	9.5	10.7	21.7	19.3	20.3
17	.2	.0	.2	.2	.0	.0	13.4	10.5	11.9	20.3	15.5	17.7
18	.2	.0	.2	.2	.0	.1	15.8	12.0	13.8	15.3	14.4	14.7
19	.2	.0	.2	.3	.0	.1	15.9	13.8	14.9	15.2	14.0	14.5
20	.3	.0	.2	.0	.0	.0	15.0	12.4	13.4	15.0	14.2	14.6
21	.3	.2	.2	.0	.0	.0	13.9	11.2	12.4	14.0	9.0	11.5
22	.2	.0	.1	.0	.0	.0	14.0	11.5	12.8	11.8	9.0	10.3
23	.2	.0	.2	.0	.0	.0	13.2	11.5	12.3	13.2	11.0	12.0
24	.2	.0	.1	.2	.0	.0	12.5	11.0	11.7	13.0	12.3	12.6
25	.2	.0	.1	.1	.0	.0	14.5	11.5	12.9	12.7	12.5	12.6
26	.2	.2	.2	.5	.0	.1	15.2	12.9	14.0	15.4	12.5	13.6
27	.2	.2	.2	.2	.0	.0	14.5	12.4	13.6	18.7	15.3	16.6
28	.2	.0	.2	.0	.0	.0	15.8	12.8	14.3	19.8	15.5	18.1
29	---	---	---	.4	.0	.1	15.5	13.5	14.6	21.0	18.4	19.6
30	---	---	---	.7	.0	.3	14.7	13.3	14.0	21.9	19.5	20.7
31	---	---	---	1.8	.0	.7	---	---	---	22.9	20.5	21.6
MONTH	.8	.0	.29	1.8	.0	.11	15.9	.0	9.92	22.9	9.0	16.3

06470500 JAMES RIVER AT LAMOURE, ND--CONTINUED

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1988 TO SEPTEMBER 1987

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	22.0	19.9	20.7	22.4	20.0	21.3	29.7	27.5	28.6	18.9	16.5	17.7
2	19.9	18.4	19.1	21.0	20.0	20.4	28.8	26.9	27.9	18.9	16.5	17.6
3	19.0	16.9	18.0	22.0	19.4	20.3	27.8	25.0	26.2	19.7	16.5	18.1
4	20.5	17.5	19.0	22.0	20.0	20.8	25.5	23.0	24.4	19.9	18.0	19.1
5	21.5	18.5	19.8	24.0	20.0	21.4	25.0	22.9	23.8	19.0	18.0	18.5
6	22.9	20.0	21.3	25.0	22.0	23.2	23.8	21.5	22.9	19.9	17.4	18.6
7	22.5	21.0	21.9	25.5	20.5	23.7	22.9	21.5	22.1	19.0	17.0	18.1
8	21.9	19.5	20.8	24.5	20.0	22.2	22.7	21.0	21.6	18.0	15.7	16.9
9	21.0	19.5	20.3	24.0	20.0	21.3	23.0	20.5	21.8	18.8	16.1	17.4
10	20.5	19.0	19.5	24.5	20.0	21.8	23.5	21.4	22.4	17.9	16.1	16.9
11	22.4	18.8	20.4	24.0	20.5	22.4	24.5	21.0	22.6	16.0	15.0	15.5
12	23.4	20.5	21.8	22.4	19.5	20.4	23.5	21.5	22.7	15.4	14.5	15.1
13	24.5	22.0	23.1	22.0	19.5	20.2	22.5	20.5	21.6	16.2	13.5	14.7
14	25.0	22.5	23.7	20.5	20.0	20.2	22.3	20.5	21.3	17.3	14.2	15.4
15	24.5	23.0	23.7	23.0	20.0	21.3	21.9	21.0	21.4	18.2	16.0	16.9
16	25.0	22.5	23.8	23.5	20.5	22.0	21.5	19.9	20.6	18.7	17.0	17.7
17	25.9	21.5	24.2	24.5	22.5	23.4	21.9	19.5	20.5	18.0	16.9	17.5
18	26.5	24.0	25.1	23.5	22.5	22.8	20.9	19.0	19.8	16.5	14.9	15.8
19	25.5	24.2	24.8	24.0	21.0	22.5	21.0	18.5	19.5	15.4	14.2	14.7
20	25.9	23.5	24.6	25.0	22.5	23.7	21.0	18.5	19.7	15.0	13.5	14.4
21	27.0	24.0	25.4	25.5	23.9	24.5	21.5	20.0	20.6	15.0	13.5	14.3
22	27.5	25.0	26.4	28.9	24.0	25.8	20.0	18.5	19.2	16.2	13.4	14.6
23	26.0	24.0	25.2	28.5	25.0	25.9	20.0	17.0	18.6	16.5	14.0	15.2
24	24.9	23.4	23.9	26.5	24.3	25.4	19.0	18.0	18.6	15.6	14.0	14.9
25	23.4	20.0	22.3	26.5	24.6	25.7	18.0	16.0	17.0	16.0	13.5	14.7
26	21.8	20.0	20.9	26.0	24.5	25.3	16.0	15.5	15.8	16.5	14.0	15.1
27	22.9	19.9	21.2	27.9	24.9	26.1	17.3	15.0	15.9	17.0	15.5	16.2
28	22.5	21.0	21.6	28.4	26.0	27.0	18.5	15.5	16.8	15.9	13.9	14.8
29	22.0	20.0	20.7	27.5	26.4	26.9	19.9	16.5	17.9	14.4	12.4	13.4
30	22.5	20.0	21.4	28.5	26.0	27.1	18.5	16.5	17.5	15.0	13.0	13.9
31	---	---	---	29.9	27.0	28.3	18.5	15.5	17.0	---	---	---
MONTH	27.5	16.9	22.2	29.9	19.4	23.3	29.7	15.0	20.8	19.9	12.4	16.1

SPECIFIC CONDUCTANCE MICROSIEMENS/CM AT 25 DEG C, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1				---	---	---	910	900	910	980	970	980
2				---	---	---	920	900	910	990	980	980
3				---	---	---	930	900	920	990	980	990
4				---	---	---	950	920	940	990	980	980
5				880	870	870	960	950	950	990	980	980
6				880	870	870	980	960	970	990	980	980
7				880	870	880	990	970	980	990	970	980
8				870	860	860	1010	990	1000	990	980	980
9				880	860	870	1030	1000	1010	1000	980	990
10				900	880	890	1050	1020	1040	1010	1000	1000
11				920	900	910	1060	1040	1050	1020	1000	1010
12				930	900	920	1070	1060	1070	1030	1010	1020
13				930	900	920	1080	1060	1070	1030	1000	1010
14				930	900	910	1080	1050	1070	1030	998	1010
15				940	910	920	1070	1050	1060	1020	997	1000
16				940	930	940	1050	1030	1040	1010	996	1000
17				940	910	940	1030	1010	1020	1010	995	1000
18				930	900	920	1020	1010	1010	1050	995	1020
19				940	910	930	1010	1000	1010	1070	1050	1070
20				930	910	920	1010	990	1000	1100	1070	1090
21				940	910	930	1000	990	1000	1110	1090	1100
22				950	910	940	1010	1000	1000	1130	1090	1110
23				940	910	930	1010	1000	1000	1130	1090	1100
24				930	900	920	1010	990	1000	1150	1090	1110
25				910	890	900	1000	990	1000	1170	1100	1130
26				890	880	880	1000	990	990	1170	1160	1160
27				890	890	890	1000	980	990	1180	1160	1180
28				900	890	900	990	980	980	1190	1180	1190
29				910	900	900	990	980	980	1190	1180	1180
30				910	900	900	990	980	980	1180	1180	1180
31				---	---	---	980	970	980	1180	1180	1180
MONTH				---	---	---	1080	900	998	1190	970	1055

06470500 JAMES RIVER AT LAMOURE, ND--CONTINUED

SPECIFIC CONDUCTANCE MICROSIEMENS/CM AT 25 DEG C, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	1200	1190	1190	830	800	820	410	370	390	620	580	600
2	1190	1180	1190	840	820	830	470	420	430	620	580	600
3	1180	1180	1180	850	840	840	440	410	420	630	560	590
4	1180	1160	1170	850	840	850	460	410	440	640	580	610
5	1160	1140	1150	840	810	830	430	380	410	600	580	590
6	1140	1110	1130	820	710	760	480	410	440	620	560	600
7	1100	1060	1090	720	610	670	480	400	430	610	580	600
8	1060	1040	1050	630	460	580	510	440	460	620	570	590
9	1040	1020	1030	450	370	400	530	450	480	640	580	610
10	1020	1010	1020	400	350	380	550	490	510	610	590	600
11	1020	1000	1010	350	320	360	600	520	540	610	590	600
12	1000	990	1000	340	310	320	640	590	610	600	580	590
13	1000	920	960	340	310	320	660	590	610	590	580	590
14	910	850	880	330	310	320	640	590	600	590	570	580
15	850	760	810	350	330	340	660	610	620	620	480	550
16	760	730	740	370	350	360	660	600	620	650	540	600
17	790	740	770	390	360	370	680	610	620	600	550	580
18	780	760	780	440	340	360	670	600	620	560	520	540
19	770	720	740	390	310	360	650	560	610	590	560	570
20	710	690	700	320	290	310	640	600	610	610	590	600
21	720	700	700	290	230	260	650	580	620	630	620	630
22	730	710	720	240	230	240	660	560	620	630	610	620
23	760	730	740	230	210	220	650	610	630	620	600	610
24	790	760	770	220	210	210	660	590	620	620	610	610
25	790	780	780	220	210	210	630	590	610	630	620	620
26	780	770	780	240	220	230	640	590	610	630	620	630
27	780	760	770	270	240	250	620	550	600	640	620	630
28	800	780	790	280	270	270	650	570	620	650	630	630
29	---	---	---	320	290	300	620	550	610	630	600	610
30	---	---	---	340	310	330	640	580	610	640	610	630
31	---	---	---	370	340	360	---	---	---	660	630	650
MONTH	1200	690	916	850	210	428	680	370	554	660	480	602

SPECIFIC CONDUCTANCE MICROSIEMENS/CM AT 25 DEG C, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	670	660	660	640	630	640	650	640	640	570	560	560
2	680	660	660	640	630	630	670	640	650	580	560	570
3	690	670	680	640	620	630	670	580	640	570	550	560
4	700	670	680	620	560	590	570	540	550	560	550	560
5	700	680	690	560	540	550	550	520	540	550	540	550
6	710	690	700	560	540	550	540	520	540	550	530	540
7	720	690	700	550	540	550	540	530	530	530	520	530
8	730	710	720	560	550	550	550	530	540	540	520	530
9	730	710	720	570	550	560	550	530	540	540	530	530
10	740	720	720	570	550	560	560	540	540	540	530	530
11	740	720	730	570	550	560	550	540	550	540	530	530
12	730	720	720	550	520	540	530	530	530	530	520	530
13	730	710	720	550	520	540	550	520	530	540	520	530
14	720	690	710	540	530	530	550	520	530	540	520	530
15	720	710	720	540	520	530	560	540	550	540	530	530
16	710	700	710	540	530	540	550	540	540	550	530	540
17	710	600	630	550	540	540	540	530	540	540	530	540
18	610	570	590	560	550	560	540	520	530	550	540	540
19	570	510	550	580	550	560	550	520	530	550	540	540
20	530	480	510	580	550	560	560	530	530	550	540	540
21	470	420	450	590	570	580	560	540	550	550	540	550
22	430	360	410	590	580	590	580	550	560	550	540	540
23	390	340	370	590	570	590	590	570	580	550	540	550
24	350	270	330	590	570	580	580	570	580	560	550	550
25	280	260	270	600	570	580	580	570	580	560	540	550
26	590	260	440	620	600	610	570	570	570	560	540	550
27	610	600	600	640	620	630	580	570	570	560	550	560
28	610	590	600	650	630	640	580	570	570	560	550	560
29	610	590	600	650	630	640	580	560	570	570	550	560
30	610	600	600	650	620	640	570	560	560	600	570	580
31	---	---	---	650	640	640	570	560	560	---	---	---
MONTH	740	260	606	650	520	580	670	520	559	600	520	545

06470800 BEAR CREEK NEAR OAKES, ND

LOCATION.--Lat 46°13'31", long 98°04'17", in NE¼NE¼ sec.28, T.132 N., R.59 W., Dickey County, Hydrologic Unit 10160003, on right bank 80 ft downstream from bridge on ND Highway 13, 6 mi north, and 1 mi east of Oakes.

DRAINAGE AREA.--357 mi^2, of which about 255 mi^2 is noncontributing, revised.

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder. Datum of gage is 1,291.30 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Oct. 1 to Mar. 30, Apr. 29 to May 5, and May 24 to Sept. 30. Records poor.

AVERAGE DISCHARGE.--11 years, 9.42 ft^3/s, 6,820 acre-ft/yr; median of yearly mean discharges, 7.6 ft^3/s, 5,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,170 ft^3/s, Apr. 15, 1979, gage height, 11.47 ft; no flow for long periods each year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of July 1, 1975, reached a stage of 15.00 ft present datum, from floodmark, discharge 4,590 ft^3/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 50 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 7	----	60	ice backwater	Mar. 21	1945	*500	a*10.01

No flow for several months.
a - Backwater from ice

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.10	.25	.50	.00	.05	1.0	137	10	4.4	.66	.05	.00
2	.10	.24	.50	.00	.10	2.0	115	9.0	4.3	.60	.05	.00
3	.10	.23	.50	.00	.12	5.0	106	8.0	3.8	.50	.10	.00
4	.10	.22	.50	.00	.13	10	91	7.0	3.3	.40	.05	.00
5	.10	.21	.50	.00	.14	20	86	6.9	2.9	.35	.02	.00
6	.10	.20	.49	.00	.15	45	74	6.2	2.8	.30	.20	.00
7	.10	.35	.48	.00	.17	50	66	5.9	3.8	.20	.15	.00
8	.10	.50	.47	.00	.18	30	59	5.6	5.1	.10	.10	.00
9	.10	.65	.46	.00	.19	20	52	5.3	5.6	.02	.02	.00
10	.10	.80	.45	.00	.20	30	47	5.0	5.7	.02	.00	.00
11	.10	.76	.40	.00	.22	35	43	4.4	6.0	.30	.00	.00
12	.10	.72	.36	.00	.23	40	40	3.8	5.7	.70	.00	.00
13	.10	.70	.33	.00	.24	45	38	3.7	5.2	.60	.00	.00
14	.10	.65	.28	.00	.25	50	36	3.4	4.7	.60	.00	.00
15	.10	.60	.25	.00	.27	60	34	3.1	4.2	.70	.00	.00
16	.12	.58	.23	.00	.28	70	31	3.0	3.8	.75	.00	.00
17	.14	.56	.20	.00	.30	80	29	2.8	3.3	.70	.00	.00
18	.18	.54	.18	.00	.32	100	28	2.7	2.9	.60	.00	.00
19	.22	.52	.16	.00	.33	200	25	2.7	2.7	.65	.00	.00
20	.26	.52	.14	.00	.35	320	23	2.8	2.4	.70	.00	.00
21	.30	.50	.13	.00	.36	450	22	4.3	2.3	.70	.00	.00
22	.30	.50	.10	.00	.38	400	20	4.8	2.1	.55	.00	.00
23	.30	.50	.08	.00	.39	420	19	5.2	1.9	.50	.00	.00
24	.30	.50	.06	.00	.40	440	17	5.5	1.7	.40	.00	.00
25	.30	.50	.05	.00	.45	280	17	6.0	1.4	.40	.00	.00
26	.29	.50	.04	.00	.50	250	15	5.7	1.2	.40	.00	.00
27	.28	.50	.03	.00	.60	230	14	5.4	1.2	.30	.00	.00
28	.27	.50	.02	.00	.80	210	13	5.1	1.1	.20	.00	.00
29	.26	.50	.02	.00	---	190	12	4.8	1.0	.10	.00	.00
30	.25	.50	.01	.00	---	165	11	4.5	.78	.05	.00	.00
31	.25	---	.01	.00	---	156	---	4.7	---	.00	.00	---
TOTAL	5.52	14.80	7.93	.00	8.10	4404.0	1320	157.3	97.28	13.05	.74	.00
MEAN	.18	.49	.26	.00	.29	142	44.0	5.07	3.24	.42	.02	.00
MAX	.30	.80	.50	.00	.80	450	137	10	6.0	.75	.20	.00
MIN	.10	.20	.01	.00	.05	1.0	11	2.7	.78	.00	.00	.00
AC-FT	11	29	16	.0	16	8740	2620	312	193	26	1.5	.0

CAL YR 1986 TOTAL 4897.89 MEAN 13.4 MAX 361 MIN .00 AC-FT 9710
WTR YR 1987 TOTAL 6028.68 MEAN 16.5 MAX 450 MIN .00 AC-FT 11960

06470800 BEAR CREEK NEAR OAKES, ND--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
MAR 25...	1315	275	320	--	0.0	0.5	--	--	--	--	--
APR 01...	1115	137	410	7.70	0.0	1.0	140	24	31	16	23
MAY 18...	1520	2.7	1000	--	12.0	13.0	--	--	--	--	--

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
APR 01...	24	0.9	14	120	65	21	0.0	15	253	260	0.34

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
APR 01...	1	140	130	<1	20	30	0.7	<1	1	230

06470830 JAMES RIVER AT OAKES, ND

LOCATION.--Lat 46°08'14", long 98°08'09", in NW¼NE¼NE¼ sec.30, T.131 N., R.59 W., Dickey County Hydrologic Unit 10160003, on left bank 300 ft downstream from bridge 1.0 mi west of Oakes.

DRAINAGE AREA.--5,320 mi^2, of which about 3,300 mi^2 is probably noncontributing.

GAGE-HEIGHT RECORDS

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

GAGE.--Water-stage recorder. Datum of gage is 1,280.00 ft above National Vertical Datum of 1929. Flow regulated by Jamestown Reservoir (station 06469000).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily gage height, 95.20 ft, Dec. 20, 1984; minimum, 88.67 ft, July 30, 1984.

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	91.59	91.40	90.62	90.52	90.25
2	---	---	---	---	---	---	---	91.50	91.34	90.46	90.49	90.40
3	---	---	---	---	---	---	---	91.53	91.16	90.43	90.45	90.85
4	---	---	---	---	---	---	---	91.56	91.17	90.50	90.43	90.55
5	---	---	---	---	---	---	---	91.57	91.09	90.47	90.61	90.51
6	---	---	---	---	---	---	---	91.50	91.12	90.49	90.52	90.54
7	---	---	---	---	---	---	---	91.44	91.00	90.46	90.49	90.50
8	---	---	---	---	---	---	---	91.55	90.93	90.44	90.46	90.54
9	---	---	---	---	---	---	93.05	91.47	90.93	90.52	90.44	90.52
10	---	---	---	---	---	---	92.91	91.47	91.02	90.54	90.55	90.46
11	---	---	---	---	---	---	92.71	91.32	91.06	90.48	90.80	90.43
12	---	---	---	---	---	---	92.66	91.71	90.99	90.33	90.41	90.47
13	---	---	---	---	---	---	92.58	91.74	90.96	90.42	90.43	90.51
14	---	---	---	---	---	---	92.53	91.49	90.84	90.44	90.50	90.51
15	---	---	---	---	---	---	92.53	91.75	90.87	90.54	90.40	90.44
16	---	---	---	---	---	---	92.48	91.76	90.93	90.95	90.36	90.35
17	---	---	---	---	---	---	92.43	91.30	90.95	90.61	90.39	90.30
18	---	---	---	---	---	---	92.62	91.28	90.84	90.58	90.37	90.32
19	---	---	---	---	---	---	92.59	91.29	90.79	90.67	90.35	90.28
20	---	---	---	---	---	---	92.24	91.31	90.78	90.63	90.46	90.27
21	---	---	---	---	---	---	92.11	91.06	90.77	90.73	90.32	90.32
22	---	---	---	---	---	---	92.10	91.27	90.77	90.94	90.27	90.45
23	---	---	---	---	---	---	91.93	91.44	90.77	90.77	90.32	90.47
24	---	---	---	---	---	---	91.88	91.50	90.73	90.67	90.38	90.42
25	---	---	---	---	---	---	91.85	91.52	90.68	90.61	90.38	90.45
26	---	---	---	---	---	---	91.80	91.51	90.59	90.51	90.35	90.40
27	---	---	---	---	---	---	91.69	91.58	90.62	90.52	90.37	90.28
28	---	---	---	---	---	---	91.76	91.72	90.51	90.52	90.47	90.20
29	---	---	---	---	---	---	91.57	91.53	90.38	90.47	90.53	90.10
30	---	---	---	---	---	---	91.69	91.47	90.42	90.50	90.33	90.13
31	---	---	---	---	---	---	---	91.46	---	90.51	90.32	---
MEAN	---	---	---	---	---	---	---	91.5	90.9	90.6	90.4	90.4
MAX	---	---	---	---	---	---	---	91.76	91.40	90.95	90.80	90.85
MIN	---	---	---	---	---	---	---	91.06	90.38	90.33	90.27	90.10

06470830 JAMES RIVER AT OAKES, ND

LOCATION.--Lat 46°08'14", long 98°08'09", in NW¼NE¼NE¼ sec.30, T.131 N., R.59 W., Dickey County Hydrologic Unit 10160003, on left bank 300 ft downstream from bridge 1.0 mi west of Oakes.

DRAINAGE AREA.--5,320 mi^2, of which about 3,300 mi^2 is probably noncontributing.

WATER-QUALITY RECORDS

GAGE.--Water-stage recorder. Datum of gage is 1,280.00 ft above National Vertical Datum of 1929. Flow regulated by Jamestown Reservoir (station 06469000).

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

PERIOD OF DAILY RECORDS.--
SPECIFIC CONDUCTANCE: March 1982 to current year.
WATER TEMPERATURE: March 1982 to current year.

INSTRUMENTATION.--Water quality monitor since October 1982.

REMARKS.--Long periods of missing record are the result of the monitor probes being frozen in ice or equipment failure. Because of the large percentage of missing or faulty record only daily mean values are presented and all extremes are qualified as observed or recorded.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum observed, 2,250 microsiemens, Jan. 7, 1986; minimum recorded, 290 microsiemens, Apr. 1, 1984.
WATER TEMPERATURE: Maximum, 31.0°C, July 31 1987; minimum 0.0°C on many days during the winter months.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: Maximum recorded, 31.0°C July 31; minimum, 0.0°C on many days during winter months.
SPECIFIC CONDUCTANCE: Maximum recorded, 1,180 microsiemens, Dec. 24, 25, 28; minimum recorded, 438 microsiemens, Apr. 10.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L) (00310)	HARD-NESS (MG/L AS CACO3) (00900)
OCT 15...	1500	80	880	8.53	10.0	6.0	6.5	13.0	102	--	330
DEC 04...	0900	90	1020	7.95	-10.0	0.5	4.6	--	--	--	340
JAN 20...	1600	30	1120	8.66	-1.0	0.0	1.4	--	--	15	410
APR 08...	1430	618	400	7.90	70.0	12.0	15	9.0	82	--	150
MAY 18...	1700	517	560	8.00	12.0	13.5	22	8.6	81	--	190
JUL 08...	1200	230	570	8.25	25.0	23.5	41	6.8	79	--	200
AUG 26...	1330	212	600	8.00	12.0	16.0	36	7.3	72	3.4	210

DATE	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION TATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2) (00405)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)
OCT 15...	55	72	37	71	31	2	11	277	1.6	160	32
DEC 04...	41	73	39	89	35	2	13	302	6.5	190	35
JAN 20...	59	90	46	96	33	2	13	355	1.5	210	48
APR 08...	18	35	16	23	23	0.8	13	135	3.3	61	11
MAY 18...	0	40	22	43	31	1	11	191	3.7	84	12
JUL 08...	9	45	22	40	29	1	12	194	2.1	91	12
AUG 26...	12	48	23	43	29	1	12	203	3.9	97	12

06470830 JAMES RIVER AT OAKES, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301)	SOLIDS, DISSOLVED (TONS PER AC-FT) (70303)	SOLIDS, DISSOLVED (TONS PER DAY) (70302)	SOLIDS, RESIDUE AT 105 DEG. C, SUSPENDED (MG/L) (00530)	NITROGEN, NITRITE TOTAL (MG/L AS N) (00615)	NITROGEN, NITRITE DISSOLVED (MG/L AS N) (00613)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)
OCT 15...	0.30	21	680	570	0.92	147	21	--	<0.010	--	<0.100
DEC 04...	0.30	17	653	640	0.89	159	13	--	<0.010	--	0.480
JAN 20...	0.30	9.4	712	730	0.97	58	3	--	<0.010	--	<0.100
MAR 20...	--	--	--	--	--	--	16	--	--	--	--
27...	--	--	--	--	--	--	57	--	--	--	--
APR 08...	0.10	13	261	250	0.35	436	42	0.030	0.020	0.600	0.620
MAY 18...	0.10	9.7	348	340	0.47	486	69	0.050	0.040	0.400	0.400
JUL 08...	0.10	6.9	345	350	0.47	214	43	--	<0.010	--	<0.100
AUG 26...	0.40	--	373	--	--	--	65	<0.010	<0.010	<0.100	<0.100
27...	--	--	--	--	--	--	57	--	--	--	--

DATE	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	PHOSPHORUS, DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P) (70507)	PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P) (00671)	ANTIMONY, TOTAL (UG/L AS SB) (01097)	ANTIMONY, DISSOLVED (UG/L AS SB) (01095)	ARSENIC TOTAL (UG/L AS AS) (01002)
OCT 15...	--	0.020	--	--	--	<0.200	--	0.142	--	<1	--
DEC 04...	--	0.090	--	--	--	0.130	--	0.132	--	<1	--
JAN 20...	--	0.020	--	--	--	0.040	--	0.022	--	<1	--
APR 08...	--	0.240	--	--	0.330	0.210	0.206	0.171	<1	<1	2
MAY 18...	--	0.110	--	--	0.330	0.180	0.190	0.168	1	<1	4
JUL 08...	--	0.060	--	--	--	0.060	--	0.041	--	<1	--
AUG 26...	0.080	0.060	1.4	1.4	0.120	0.070	0.093	0.056	--	--	4

DATE	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA) (01007)	BARIUM, DISSOLVED (UG/L AS BA) (01005)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE) (01012)	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)	BORON, TOTAL RECOVERABLE (UG/L AS B) (01022)	BORON, DISSOLVED (UG/L AS B) (01020)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD) (01027)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COBALT, DISSOLVED (UG/L AS CO) (01035)
OCT 15...	4	--	66	--	<0.5	--	170	--	<1	<1	<3
DEC 04...	3	--	59	--	<0.5	--	210	--	<1	<1	<3
JAN 20...	2	--	63	--	<0.5	--	260	--	<1	<1	<3
APR 08...	2	100	43	<10	<0.5	80	60	<1	<1	<1	<3
MAY 18...	3	<100	48	<10	<0.5	90	90	1	<1	<1	<3
JUL 08...	2	--	61	--	0.5	--	110	--	3	1	<3
AUG 26...	2	--	--	--	--	--	120	<1	<1	--	--

06470830 JAMES RIVER AT OAKES, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE) (01045)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN) (01055)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, TOTAL (UG/L AS SE) (01147)
OCT										
15...	1	--	6	<5	--	27	0.1	--	3	--
DEC										
04...	2	--	8	<5	--	100	0.1	--	3	--
JAN										
20...	2	--	4	<5	--	18	0.3	--	5	--
APR										
08...	<1	--	130	<5	--	<10	0.3	4	2	<1
MAY										
18...	2	--	27	<5	--	42	<0.1	6	<1	<1
JUL										
08...	1	--	10	<5	--	110	0.4	--	<1	--
AUG										
26...	<1	1500	6	<5	390	36	0.1	--	--	<1

DATE	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG) (01077)	SILVER, DIS-SOLVED (UG/L AS AG) (01075)	THAL-LIUM, DIS-SOLVED (UG/L AS TL) (01057)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)	CYANIDE TOTAL (MG/L AS CN) (00720)	CYANIDE DIS-SOLVED (MG/L AS CN) (00723)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT										
15...	<1	--	<1	<1	9	--	<0.01	94	20	63
DEC										
04...	<1	--	<1	<1	<3	--	<0.01	66	16	59
JAN										
20...	<1	--	<1	<1	10	--	<0.01	23	1.9	46
APR										
08...	<1	<1	<1	--	14	<0.010	<0.01	59	98	95
MAY										
18...	<1	<1	<1	--	12	<0.010	<0.01	89	124	97
JUL										
08...	<1	--	<1	--	14	--	<0.01	132	82	99
AUG										
26...	<1	--	--	--	5	<0.010	<0.01	69	39	99

Note: No analyses of suspended-sediment nor bed-material partical size were made during the water year.

DATE	TIME	SAMPLE LOC-ATION, CROSS SECTION (FT FM L BANK) (00009)	DEPTH TO TOP OF SAMPLE INTER-VAL (FT) (72015)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
AUG					
26...	1332	20	3.0	16.0	600
26...	1334	40	3.0	16.5	600
26...	1336	60	3.0	16.0	595
26...	1338	80	3.0	16.0	595
26...	1340	100	3.0	16.0	600
26...	1342	120	3.0	16.0	600
26...	1345	140	3.0	16.0	600

06470830 JAMES RIVER AT OAKES, ND

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	14.4	13.3	13.7	3.7	2.1	3.0	0.1	0.0	0.0	0.0	0.0	0.0
2	13.8	12.8	13.4	3.0	1.5	2.3	.0	.0	.0	.0	.0	.0
3	12.7	10.5	11.3	2.9	2.0	2.8	.1	.0	.0	.0	.0	.0
4	11.4	9.0	10.2	2.5	.7	1.7	.1	.0	.0	.0	.0	.0
5	11.9	10.1	11.0	4.6	2.1	3.2	.0	.0	.0	.0	.0	.0
6	12.0	9.3	10.5	4.6	3.4	4.2	.0	.0	.0	.0	.0	.0
7	13.9	11.0	12.0	3.3	1.3	2.0	.0	.0	.0	.0	.0	.0
8	12.7	9.8	10.9	2.1	.0	.7	.0	.0	.0	.0	.0	.0
9	10.2	8.3	9.3	.5	.1	.4	.1	.0	.0	.0	.0	.0
10	9.4	8.1	8.8	.4	.3	.4	.0	.0	.0	.0	.0	.0
11	8.0	5.6	6.7	.3	.1	.3	.0	.0	.0	.0	.0	.0
12	5.4	3.4	4.3	.2	.1	.2	.1	.0	.0	.1	.0	.0
13	5.7	3.1	4.2	.1	.0	.1	.0	.0	.0	.1	.0	.0
14	6.5	3.5	4.8	.1	.0	.1	.0	.0	.0	.0	.0	.0
15	7.4	4.8	5.9	.0	.0	.0	.0	.0	.0	.2	.0	.1
16	9.8	6.5	7.9	.1	.0	.0	.0	.0	.0	.2	.0	.1
17	10.6	7.8	9.3	.1	.0	.1	.0	.0	.0	.0	.0	.0
18	12.0	9.2	10.5	.0	.0	.0	.0	.0	.0	.1	.0	.0
19	12.6	10.0	11.3	.0	.0	.0	.0	.0	.0	.0	.0	.0
20	13.1	10.7	11.9	.1	.0	.0	.1	.0	.0	---	---	---
21	13.2	10.6	12.0	.0	.0	.0	.0	.0	.0	---	---	---
22	13.4	11.9	12.6	.0	.0	.0	.1	.0	.0	---	---	---
23	13.1	8.9	10.6	.0	.0	.0	.1	.0	.0	---	---	---
24	8.8	7.9	8.3	.1	.0	.0	.1	.0	.0	---	---	---
25	9.6	7.7	8.5	.1	.0	.0	.0	.0	.0	---	---	---
26	8.9	6.8	8.0	.1	.0	.1	.0	.0	.0	---	---	---
27	9.8	7.3	8.5	.1	.0	.0	.0	.0	.0	---	---	---
28	10.0	8.8	9.3	.1	.0	.1	.0	.0	.0	---	---	---
29	8.5	6.8	7.7	.1	.0	.1	.0	.0	.0	---	---	---
30	7.8	6.1	7.1	.0	.0	.0	.0	.0	.0	---	---	---
31	7.9	3.9	6.3	---	---	---	.0	.0	.0	---	---	---
MONTH	14.4	3.1	9.25	4.6	.0	.73	.1	.0	.00	---	---	---

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1							---	---	---	17.3	14.2	15.6
2							---	---	---	16.5	14.6	15.7
3							---	---	---	16.6	14.3	15.5
4							---	---	---	17.7	15.1	16.3
5							---	---	---	18.5	15.8	17.0
6							---	---	---	19.4	16.2	17.7
7							---	---	---	19.5	16.2	17.9
8							---	---	---	19.9	16.9	18.4
9							11.7	10.1	10.7	20.1	17.8	19.0
10							10.4	8.1	9.0	20.1	17.7	19.0
11							9.6	6.8	8.(	19.4	16.6	18.2
12							10.0	8.3	9.:	18.4	16.1	17.2
13							9.9	9.0	9.4	19.0	15.9	17.3
14							10.7	7.7	9.1	19.8	16.1	17.9
15							12.4	9.3	10.6	20.6	17.1	18.8
16							13.2	10.8	12.0	22.3	19.2	20.6
17							14.7	11.7	13.1	20.7	15.0	17.7
18							16.7	13.3	14.8	14.8	13.1	13.8
19							17.2	14.9	16.0	14.4	12.5	13.4
20							16.6	12.7	14.2	15.4	13.7	14.4
21							13.5	10.7	12.1	15.1	8.9	10.8
22							14.5	11.4	12.8	10.7	8.2	9.5
23							13.9	12.2	13.2	12.7	9.9	11.1
24							13.1	11.9	12.6	13.0	11.9	12.4
25							15.1	11.5	13.1	13.0	12.6	12.8
26							16.3	13.4	14.7	15.4	12.7	13.7
27							15.6	12.9	14.3	19.4	15.3	17.0
28							16.8	13.2	14.9	20.6	17.8	19.2
29							16.3	14.2	15.3	21.9	18.8	20.3
30							15.6	13.5	14.6	22.1	19.6	20.9
31							---	---	---	23.3	19.9	21.6
MONTH							---	---	---	23.3	8.2	16.5

JAMES RIVER BASIN

06470830 JAMES RIVER AT OAKES, ND

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1988 TO SEPTEMBER 1987

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	22.5	19.9	21.2	22.4	20.0	21.2	30.3	25.5	28.4	19.4	15.8	17.6
2	19.8	17.7	18.6	21.4	19.2	20.4	29.5	26.6	28.2	19.5	16.0	17.8
3	18.3	15.8	17.1	23.5	18.7	20.9	28.0	24.3	25.9	20.1	16.6	18.3
4	20.6	16.3	18.3	22.5	20.6	21.6	26.0	22.1	24.0	20.4	18.3	19.4
5	22.1	18.2	20.0	24.8	20.8	22.5	24.9	22.2	23.6	19.9	17.9	19.0
6	24.1	20.4	22.0	25.7	22.0	23.9	24.2	21.3	22.9	20.8	17.4	19.1
7	23.8	22.2	22.9	26.2	22.7	24.5	23.1	21.3	22.2	19.6	17.3	18.1
8	22.5	20.2	21.4	25.0	22.8	23.6	23.3	20.7	22.0	18.4	15.1	16.8
9	21.8	19.0	20.5	24.9	21.8	23.2	24.9	20.4	22.5	18.8	15.5	17.2
10	21.0	19.1	19.8	25.6	21.5	23.4	24.7	21.8	23.3	18.0	16.0	16.9
11	23.2	19.2	21.0	24.1	22.3	23.2	24.6	21.2	22.8	16.1	14.9	15.5
12	24.6	20.8	22.7	22.4	19.0	20.6	23.6	20.5	22.3	15.1	14.1	14.7
13	25.6	22.4	24.0	22.4	18.1	20.1	23.0	20.1	21.7	16.5	12.7	14.5
14	25.6	22.8	24.3	22.6	19.6	21.0	23.0	20.6	21.8	17.8	13.8	15.7
15	25.3	22.7	24.1	24.0	20.0	21.9	24.0	21.6	22.6	18.9	16.0	17.3
16	25.9	22.7	24.3	23.9	20.6	22.3	22.6	20.3	21.5	19.4	17.2	18.3
17	26.3	22.9	24.5	26.0	22.5	24.1	22.4	19.0	20.6	18.9	17.0	18.0
18	27.0	23.2	25.1	24.7	22.6	23.3	20.9	17.5	19.3	16.7	14.7	15.6
19	26.4	23.7	25.2	25.4	20.9	22.9	21.8	17.4	19.5	15.4	13.7	14.5
20	27.2	23.6	25.3	26.6	21.6	24.2	22.2	18.6	20.5	14.9	12.5	14.0
21	28.1	24.1	26.0	27.6	24.3	25.8	21.9	19.8	20.9	15.4	13.2	14.4
22	28.7	25.0	26.8	27.4	24.6	26.0	20.1	17.3	18.7	16.6	12.8	14.6
23	27.2	23.7	25.3	27.4	23.3	25.8	20.8	16.4	18.6	17.3	13.4	15.3
24	24.8	22.3	23.3	26.6	23.6	25.2	19.5	17.9	18.4	16.6	13.9	15.4
25	22.6	20.6	21.7	27.4	24.1	25.8	17.9	16.2	17.0	17.0	13.4	15.1
26	21.2	18.5	19.9	27.4	24.2	25.7	16.2	15.5	15.9	17.8	14.7	16.2
27	22.5	18.0	20.1	28.3	24.9	26.6	16.9	14.8	15.7	18.0	16.1	16.9
28	22.5	20.2	21.3	29.0	25.9	27.5	18.7	14.8	16.7	16.2	13.3	14.5
29	22.4	19.5	21.1	28.5	26.6	27.4	20.0	16.2	17.9	15.1	10.8	12.9
30	23.3	19.2	21.2	29.4	26.1	27.7	18.5	15.6	17.2	15.5	12.1	13.8
31	---	---	---	31.0	26.8	28.7	18.8	14.8	16.8	---	---	---
MONTH	28.7	15.8	22.3	31.0	18.1	23.9	30.3	14.8	20.9	20.8	10.8	16.2

SPECIFIC CONDUCTANCE MICROSIEMENS/CM AT 25 DEG C, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	620	600	611	977	967	968	1030	1020	1030	1150	1140	1140
2	650	620	634	967	957	963	1030	1020	1020	1150	1140	1140
3	640	630	632	958	948	955	1030	1020	1020	1140	1130	1140
4	660	640	649	958	948	953	1030	1010	1020	1140	1130	1140
5	680	650	662	958	938	948	1020	1010	1020	1140	1130	1140
6	710	680	694	949	929	943	1030	1010	1020	1140	1120	1130
7	740	710	726	939	939	939	1030	1020	1020	1130	1110	1120
8	760	740	753	940	930	936	1040	1020	1030	1120	1110	1110
9	770	760	767	940	920	930	1040	1030	1040	1120	1110	1120
10	780	770	773	931	920	929	1040	1030	1040	1130	1110	1120
11	780	770	778	941	921	934	1060	1040	1050	1130	1120	1120
12	800	780	793	951	931	941	1070	1050	1060	1120	1100	1110
13	810	800	804	972	951	957	1080	1070	1080	1100	1080	1090
14	820	810	814	982	962	973	1090	1080	1090	1080	1070	1070
15	830	820	825	993	982	985	1110	1090	1100	1080	1060	1060
16	851	830	842	1000	983	994	1120	1100	1110	1080	1060	1070
17	871	851	858	1010	993	1010	1120	1110	1120	1080	1070	1080
18	871	861	870	1020	1000	1010	1130	1110	1120	1100	1080	1090
19	882	871	877	1020	1010	1020	1140	1120	1130	1110	1100	1100
20	902	882	891	1030	1020	1030	1150	1130	1140	---	---	---
21	913	902	905	1030	1020	1030	1150	1140	1150	---	---	---
22	913	903	912	1030	1020	1030	1160	1150	1160	---	---	---
23	933	913	920	1040	1020	1030	1170	1150	1160	---	---	---
24	934	923	926	1040	1030	1030	1180	1170	1170	---	---	---
25	934	924	928	1040	1030	1030	1180	1170	1170	---	---	---
26	935	924	927	1040	1030	1030	1170	1160	1170	---	---	---
27	945	925	935	1040	1030	1030	1170	1160	1170	---	---	---
28	945	935	943	1040	1030	1030	1180	1160	1170	---	---	---
29	956	945	951	1040	1030	1030	1170	1160	1160	---	---	---
30	966	956	959	1040	1030	1030	1160	1150	1150	---	---	---
31	977	957	968	---	---	---	1150	1140	1150	---	---	---
MONTH	977	600	823	1040	920	987	1180	1010	1098	---	---	---

06470830 JAMES RIVER AT OAKES, ND

SPECIFIC CONDUCTANCE MICROSIEMENS/CM AT 25 DEG C, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1							---	---	---	607	587	600
2							---	---	---	607	596	598
3							---	---	---	606	595	597
4							---	---	---	614	594	606
5							---	---	---	633	603	616
6							---	---	---	623	582	610
7							---	---	---	601	571	589
8							---	---	---	620	590	602
9							---	---	---	619	599	608
10							479	438	461	609	578	602
11							497	457	476	588	557	570
12							496	467	485	576	556	562
13							515	475	492	575	545	563
14							525	504	517	565	544	558
15							553	514	535	573	553	558
16							572	543	556	582	552	562
17							571	551	558	572	561	566
18							570	550	556	571	560	566
19							569	549	562	570	550	560
20							688	558	594	559	549	554
21							678	587	645	559	529	547
22							597	566	585	539	528	533
23							585	565	572	528	518	527
24							595	584	589	528	518	525
25							613	593	599	537	517	530
26							612	582	599	537	527	536
27							611	592	603	556	537	544
28							611	590	602	566	546	558
29							609	589	597	586	556	568
30							608	588	599	625	575	602
31							---	---	---	655	625	641
MONTH							---	---	---	655	517	573

SPECIFIC CONDUCTANCE MICROSIEMENS/CM AT 25 DEG C, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	664	645	653	563	543	557	621	561	591	594	584	590
2	664	654	660	572	553	565	590	570	579	593	582	591
3	674	664	667	572	542	568	590	569	578	601	582	594
4	683	663	674	582	571	575	589	569	575	600	590	594
5	693	663	676	591	571	576	619	569	577	609	598	602
6	693	673	684	581	561	573	599	568	582	608	587	604
7	682	672	680	580	560	570	578	558	567	587	566	580
8	672	652	665	580	570	574	578	558	569	576	564	569
9	652	641	647	589	560	576	577	567	571	574	553	564
10	681	621	639	589	509	577	587	567	573	563	552	557
11	671	630	647	589	539	570	586	566	575	562	551	558
12	640	610	628	589	578	579	576	566	572	561	549	556
13	630	610	618	588	568	580	586	565	576	559	548	555
14	629	599	612	587	567	575	585	565	578	558	547	553
15	619	599	609	587	567	575	595	575	581	557	546	550
16	619	599	612	587	567	576	585	574	581	555	544	548
17	618	598	612	587	566	579	604	584	595	554	543	546
18	628	608	615	596	566	578	604	593	603	553	542	548
19	627	597	612	586	566	575	613	593	605	552	541	549
20	617	597	606	565	525	547	613	593	603	560	549	552
21	607	587	595	575	545	561	603	592	598	559	549	556
22	606	576	591	574	554	563	612	592	601	578	557	567
23	596	576	588	574	554	562	602	591	596	567	546	560
24	595	515	578	564	544	557	601	591	595	556	545	554
25	585	565	578	573	553	560	601	591	598	564	543	554
26	585	565	576	583	553	567	611	600	602	562	542	552
27	584	544	566	582	562	571	610	599	601	552	541	546
28	564	554	556	592	562	575	609	588	598	560	540	550
29	554	534	546	602	581	594	607	587	596	559	538	550
30	563	523	544	611	591	600	597	586	591	558	547	551
31	---	---	---	611	591	604	595	584	591	---	---	---
MONTH	693	515	618	611	509	573	621	558	587	609	538	563

06470875 JAMES RIVER AT DAKOTA LAKE DAM NR LUDDEN, ND

LOCATION.--Lat 45°56'52", long 98°10'29", in SE¼NE¼NE¼ sec.34, T.129 N., R.60 W., Dickey County, Hydrologic Unit 10160003, on left bank, 10 ft upstream from dam, 4.5 mi southwest of Ludden and .8 mi upstream from North Dakota-South Dakota state line.

DR INAGE AREA.--5,480 mi^2, of which about 3,300 mi^2 are noncontributing.

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder and concrete dam control. Datum of gage is 1,280.00 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Oct. 2-15. Records good except those for period of no gage height record, Oct. 2-15, and period of variable backwater conditions, Mar. 19 to May 11, which are fair. Flow regulated by upstream reservoirs, Jamestown Reservoir (station 06469000), Pipestem Lake, capacity 147,000 acre-ft, and Lake LaMoure.

AVERAGE DISCHARGE.--6 years, 177 ft^3/s, 128,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 2,300 ft^3/s, Mar. 28, 1987, gage height, 13.76 ft, no flow at times during some years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, about 2,300 ft^3/s, Mar. 28, gage height, 13.76 ft; minimum daily discharge, 32 ft^3/s, Jan. 26 to Feb. 1, 4-5.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	178	104	92	64	32	71	1530	610	538	173	235	206
2	200	76	92	64	35	68	1410	600	531	250	229	145
3	220	137	92	64	33	65	1340	595	522	227	243	50
4	200	66	96	58	32	67	1300	590	468	209	227	219
5	190	81	93	57	32	71	1290	580	457	236	153	237
6	180	180	92	56	33	96	1280	580	426	227	213	214
7	170	133	92	54	36	135	1260	580	442	237	220	218
8	160	95	89	51	40	168	1250	550	430	229	220	217
9	150	83	88	51	40	175	1230	560	389	188	211	248
10	140	64	80	51	40	198	1170	550	350	209	138	245
11	130	60	75	49	42	246	1150	560	386	255	96	241
12	120	60	74	49	48	339	1070	438	397	266	233	216
13	110	62	68	51	48	439	1040	492	388	220	197	218
14	90	67	64	51	48	471	990	591	395	218	157	222
15	78	67	64	51	49	534	930	513	349	176	203	216
16	113	70	63	45	54	587	905	513	324	60	191	215
17	103	71	60	45	56	646	874	667	359	234	164	214
18	54	75	58	45	59	741	731	614	375	233	182	214
19	75	75	57	41	62	840	780	536	363	247	161	240
20	127	75	59	40	65	980	900	545	332	268	145	244
21	116	75	60	37	68	1060	823	693	329	240	204	232
22	116	75	60	37	71	1120	740	641	319	207	188	216
23	154	75	60	37	71	1250	720	584	315	302	169	238
24	115	79	60	37	71	1490	700	582	308	271	154	251
25	100	83	60	35	69	1710	690	620	319	266	168	228
26	82	80	60	32	69	1810	670	635	312	256	185	228
27	101	81	60	32	71	2000	660	603	272	233	185	218
28	144	86	64	32	71	2210	630	547	278	238	165	181
29	124	92	64	32	---	1900	640	602	274	236	174	168
30	67	92	64	32	---	1700	620	605	236	214	217	112
31	124	---	64	32	---	1600	---	569	---	212	181	---
TOTAL	4031	2519	2224	1412	1445	24787	29323	17945	11183	7037	5808	6311
MEAN	130	84.0	71.7	45.5	51.6	800	977	579	373	227	187	210
MAX	220	180	96	64	71	2210	1530	693	538	302	243	251
MIN	54	60	57	32	32	65	620	438	236	60	96	50
AC-FT	8000	5000	4410	2800	2870	49170	58160	35590	22180	13960	11520	12520

CAL YR 1986 TOTAL 58894 MEAN 161 MAX 880 MIN 3.1 AC-FT 116800
WTR YR 1987 TOTAL 114025 MEAN 312 MAX 2210 MIN 32 AC-FT 226200

06470875 JAMES RIVER AT DAKOTA LAKE DAM NEAR LUDDEN, ND--CONTINUED

WATER-QUALITY RECORDS

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

PERIOD OF DAILY RECORDS.--
WATER TEMPERATURE: October 1982 to current year.
SPECIFIC CONDUCTANCE: October 1982 to current year.
DISSOLVED OXYGEN: October 1982 to current year.
PH: June 1983 to current year.

INSTRUMENTATION.--Water quality monitor since October 1982.

REMARKS.--Unpublished records of daily dissolved oxygen and pH are available in files at the District office.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Maximum, 31.0°C, July 31, 1987; minimum, 0.0°C, several days during winter months each year.
SPECIFIC CONDUCTANCE: Maximum recorded, 2,620 microsiemens, Feb. 28, 1986; minimum recorded, 217 microsiemens, July 13, 1983.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: Maximum, 31.0°C, July 31; minimum, 0.0°C, several days during winter months.
SPECIFIC CONDUCTANCE: Maximum recorded, 1,190 microsiemens, Jan. 12; minimum recorded, 340 microsiemens, April 1.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	SOLVED (PER-CENT SATUR-ATION) (00301)	OXYGEN, DIS-BIO-CHEM-ICAL, 5 DAY (MG/L) (00310)	OXYGEN DEMAND, HARD-NESS (MG/L AS CACO3) (00900)
[a]OCT 15...	1200	77	720	8.65	5.0	5.0	5.0	12.8	98	--	270
DEC 04...	1200	99	1040	8.60	-8.0	1.0	3.4	25.6	175	--	380
JAN 20...	1400	40	1120	8.47	-1.0	1.5	2.6	30.2	213	15.5	410
FEB 25...	1030	70	990	--	0.5	1.0	--	--	--	--	--
MAR 10...	1545	210	680	--	-5.0	1.0	--	--	--	--	--
26...	1230	1800	315	--	0.0	0.5	--	--	--	--	--
APR 02...	0950	1410	689	--	-2.0	1.0	--	--	--	--	--
09...	0915	1220	425	7.90	5.0	11.0	15	9.6	86	--	150
[a]MAY 19...	1400	535	600	8.55	15.0	14.0	25	9.6	92	--	210
[a]JUL 09...	1230	194	580	8.40	30.0	23.0	28	6.8	78	--	210
[a]AUG 27...	1000	186	620	8.20	15.0	15.0	27	7.2	70	5.0	220

DATE	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2) (00405)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)
OCT 15...	37	60	29	53	29	1	13	232	1	120	21	0.20
DEC 04...	41	81	43	89	33	2	14	338	1.6	210	37	0.30
20...	50	86	47	94	32	2	14	358	2.3	220	43	0.30
APR 09...	11	35	16	25	24	0.9	13	142	3.4	64	12	0.10
MAY 19...	3	44	24	46	31	1	12	206	1.1	97	13	0.10
JUL 09...	7	46	23	41	28	1	12	203	1.5	96	13	0.10
AUG 27...	17	49	24	45	29	1	14	204	2.5	110	13	0.20

Note: No analyses of suspended-sediment or bed-material particle size were made during current year.
a - Laboratory analysis incomplete prior to report publication.

06470875 JAMES RIVER AT DAKOTA LAKE DAM NEAR LUDDEN, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	SOLIDS, RESIDUE AT 105 DEG. C, SUS-PENDED (MG/L) (00530)	NITRO-GEN, NITRITE TOTAL (MG/L AS N) (00615)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)
OCT 15...	19	533	450	0.72	111	10	--	<0.010	--	<0.100	--	0.020
DEC 04...	14	675	690	0.92	180	9	--	<0.010	--	<0.100	--	0.030
JAN 20...	71	727	790	0.99	79	3	--	<0.010	--	<0.100	--	0.040
APR 09...	13	282	260	0.38	929	42	0.030	0.030	0.600	0.620	--	0.160
MAY 19...	9.7	378	370	0.51	546	55	0.030	0.020	0.200	0.180	--	0.100
JUL 09...	9.4	369	360	0.50	193	48	--	<0.010	--	<0.100	--	0.120
AUG 27...	--	393	--	--	--	45	<0.010	<0.010	<0.100	<0.100	0.110	0.120

DATE	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOS-PHORUS, TOTAL (MG/L AS P) (00665)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS, ORTHO, TOTAL (MG/L AS P) (70507)	PHOS-PHORUS, ORTHO, DIS-SOLVED (MG/L AS P) (00671)	ANTI-MONY, TOTAL (UG/L AS SB) (01097)	ANTI-MONY, DIS-SOLVED (UG/L AS SB) (01095)	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA) (01007)
OCT 15...	--	--	--	<0.200	--	0.051	--	<1	--	3	--
DEC 04...	--	--	--	0.060	--	0.050	--	<1	--	3	--
JAN 20...	--	--	--	0.040	--	0.025	--	<1	--	<1	--
APR 09...	--	--	0.310	0.210	0.172	0.149	<1	<1	3	2	100
MAY 19...	--	--	0.190	0.060	0.065	0.044	1	<1	3	3	100
JUL 09...	--	--	--	0.110	--	0.099	--	<1	--	4	--
AUG 27...	2.3	1.2	0.110	0.050	0.072	0.031	--	--	3	2	--

DATE	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)	BERYL-LIUM, TOTAL RECOV-ERABLE (UG/L AS BE) (01012)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE) (01010)	BORON, TOTAL RECOV-ERABLE (UG/L AS B) (01022)	BORON, DIS-SOLVED (UG/L AS B) (01020)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD) (01027)	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, TOTAL RECOV-ERABLE (UG/L AS FE) (01045)	IRON, DIS-SOLVED (UG/L AS FE) (01046)
OCT 15...	63	--	<0.5	--	130	--	<1	<1	<3	1	--	3
DEC 04...	68	--	<0.5	--	200	--	<1	<1	<3	1	--	<3
JAN 20...	73	--	<0.5	--	220	--	1	<1	<3	1	--	5
APR 09...	40	<10	<0.5	40	60	<1	<1	<1	<3	3	--	81
MAY 19...	52	<10	<0.5	720	4200	<1	<1	<1	<3	1	--	7
JUL 09...	59	--	<0.5	--	110	--	<1	<1	<3	<1	--	11
AUG 27...	--	--	--	--	120	<1	<1	--	--	<1	1000	7

06470875 JAMES RIVER AT DAKOTA LAKE DAM NEAR LUDDEN, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN) (01055)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, TOTAL (UG/L AS SE) (01147)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG) (01077)	SILVER, DIS-SOLVED (UG/L AS AG) (01075)
OCT 15...	<5	--	6	0.2	--	3	--	<1	--	<1
DEC 04...	<5	--	92	0.2	--	2	--	<1	--	<1
JAN 20...	<5	--	37	0.2	--	4	--	<1	--	<1
APR 09...	<5	--	67	0.2	4	2	<1	<1	<1	<1
MAY 19...	<5	--	14	0.3	7	<1	<1	<1	<1	<1
JUL 09...	<5	--	65	0.2	--	<1	--	<1	--	<1
AUG 27...	<5	580	9	0.1	--	--	<1	<1	--	--

DATE	THAL-LIUM, DIS-SOLVED (UG/L AS TL) (01057)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)	CYANIDE TOTAL (MG/L AS CN) (00720)	CYANIDE DIS-SOLVED (MG/L AS CN) (00723)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT 15...	<1	5	--	<0.01	58	12	72
DEC 04...	<1	<3	--	<0.01	31	8.3	28
JAN 20...	<1	13	--	<0.01	100	11	39
APR 09...	--	8	<0.010	<0.01	44	145	97
MAY 19...	--	4	<0.010	<0.01	74	107	99
JUL 09...	--	13	--	<0.01	55	29	99
AUG 27...	--	3	<0.010	<0.01	61	31	100

DATE	ALDRIN, DIS-SOLVED (UG/L) (39331)	ALDRIN, TOTAL (UG/L) (39330)	AME-TRYNE TOTAL (82184)	ATRA-ZINE, TOTAL (UG/L) (39630)	SEVIN, TOTAL (UG/L) (39750)	CHLOR-DANE, DIS-SOLVED (UG/L) (39352)	CHLOR-DANE, TOTAL (UG/L) (39350)	CYAN-AZINE TOTAL (UG/L) (81757)	DDD, DIS-SOLVED (UG/L) (39361)
OCT 15...	<0.01	<0.010	<0.10	<0.10	<2.0	<0.1	<0.1	<0.10	<0.01
MAY 19...	<0.01	<0.010	<0.10	<0.10	<2.0	<0.1	<0.1	<0.10	<0.01
JUL 09...	<0.01	<0.010	<0.10	0.10	<2.0	<0.1	<0.1	<0.10	<0.01
AUG 27...	<0.01	<0.010	<0.10	<0.10	--	<0.1	<0.1	<0.10	<0.01

DATE	DDD, TOTAL (UG/L) (39360)	DDE, DIS-SOLVED (UG/L) (39366)	DDE, TOTAL (UG/L) (39365)	DDT, DIS-SOLVED (UG/L) (39371)	DDT, TOTAL (UG/L) (39370)	DI-AZINON, DIS-SOLVED (UG/L) (39572)	DI-AZINON, TOTAL (UG/L) (39570)	DI-ELDRIN DIS-SOLVED (UG/L) (39381)	DI-ELDRIN TOTAL (UG/L) (39380)	ENDO-SULFAN DISSOLV (UG/L) (82354)	ENDO-SULFAN, TOTAL (UG/L) (39388)
OCT 15...	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01	<0.01	<0.01	<0.010	<0.01	<0.010
MAY 19...	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01	<0.01	<0.01	<0.010	<0.01	<0.010
JUL 09...	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01	<0.01	<0.01	<0.010	<0.01	<0.010
AUG 27...	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01	<0.01	<0.01	<0.010	<0.01	<0.010

06470875 JAMES RIVER AT DAKOTA LAKE DAM NEAR LUDDEN, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	ENDRIN, DIS-SOLVED (UG/L) (39391)	ETHION DISSOLV (UG/L) (82346)	ENDRIN, TOTAL (UG/L) (39390)	ETHION, TOTAL (UG/L) (39398)	HEPTA-CHLOR, DIS-SOLVED (UG/L) (39411)	HEPTA-CHLOR, TOTAL (UG/L) (39410)	HEPTA-CHLOR EPOXIDE DIS-SOLVED (UG/L) (39421)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L) (39420)	LINDANE DIS-SOLVED (UG/L) (39341)	LINDANE TOTAL (UG/L) (39340)	MALA-THION, DIS-SOLVED (UG/L) (39532)
OCT 15...	<0.01	<0.01	<0.010	<0.01	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01
MAY 19...	<0.01	<0.01	<0.010	<0.01	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01
JUL 09...	<0.01	<0.01	<0.010	<0.01	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01
AUG 27...	<0.01	<0.01	<0.010	<0.01	<0.01	<0.010	<0.01	<0.010	<0.01	<0.010	<0.01

DATE	MALA-THION, TOTAL (UG/L) (39530)	METHO-MYL TOTAL (UG/L) (39051)	METH-OXY-CHLOR DISSOLV (UG/L) (82350)	METH-OXY-CHLOR, TOTAL (UG/L) (39480)	METHYL PARA-THION, DIS-SOLVED (UG/L) (39602)	METHYL PARA-THION, TOTAL (UG/L) (39600)	MIREX, DIS-SOLVED (UG/L) (39756)	MIREX, TOTAL (UG/L) (39755)	METHYL TRI-THION, TOTAL (UG/L) (39790)	METHYL-TRI-THION DISSOLV (UG/L) (82344)	NAPH-THA-LENES, POLY-CHLOR. TOTAL (UG/L) (39250)
OCT 15...	<0.01	<2.0	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.10
MAY 19...	<0.01	<2.0	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.10
JUL 09...	<0.01	<2.0	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.10
AUG 27...	<0.01	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.10

DATE	PARA-THION, DIS-SOLVED (UG/L) (39542)	PARA-THION, TOTAL (UG/L) (39540)	PCB, DIS-SOLVED (UG/L) (39517)	PCB, TOTAL (UG/L) (39516)	PCN DISSOLV (UG/L) (82360)	PER-THANE DISSOLV (UG/L) (82348)	PER-THANE TOTAL (UG/L) (39034)	PROME-TONE TOTAL (UG/L) (39056)	PROME-TRYNE TOTAL (UG/L) (39057)	PROPHAM TOTAL (UG/L) (39052)	PRO-PAZINE TOTAL (UG/L) (39024)
OCT 15...	<0.01	<0.01	<0.1	<0.1	<0.10	<0.10	<0.1	<0.1	<0.1	<2.0	<0.10
MAY 19...	<0.01	<0.01	<0.1	<0.1	<0.10	<0.10	<0.1	<0.1	<0.1	<2.0	<0.10
JUL 09...	<0.01	<0.01	<0.1	<0.1	<0.10	<0.10	<0.1	<0.1	<0.1	<2.0	<0.10
AUG 27...	<0.01	<0.01	<0.1	<0.1	<0.10	<0.10	<0.1	<0.1	<0.1	--	<0.10

DATE	SIMA-ZINE TOTAL (UG/L) (39055)	SIME-TRYNE TOTAL (UG/L) (39054)	2,4-D, TOTAL (UG/L) (39730)	2, 4-DP TOTAL (UG/L) (82183)	2,4,5-T TOTAL (UG/L) (39740)	SILVEX, TOTAL (UG/L) (39760)	TOX-APHENE, DIS-SOLVED (UG/L) (39401)	TOX-APHENE, TOTAL (UG/L) (39400)	TRI-FLURA-LIN TOTAL RECOVER (UG/L) (39030)	TRI-THION DISSOLV (UG/L) (82342)	TOTAL TRI-THION (UG/L) (39786)
OCT 15...	<0.10	<0.1	0.05	<0.01	<0.01	<0.01	<1.0	<1	<0.10	<0.01	<0.01
MAY 19...	<0.10	<0.1	0.04	<0.01	<0.01	<0.01	<1.0	<1	<0.10	<0.01	<0.01
JUL 09...	<0.10	<0.1	0.15	<0.01	<0.01	<0.01	<1.0	<1	<0.10	<0.01	<0.01
AUG 27...	<0.10	<0.1	--	<0.01	<0.01	<0.01	<1.0	<1	<0.10	<0.01	<0.01

DATE	TIME	SAMPLE LOC-ATION, CROSS SECTION (FT FM L BANK) (00009)	DEPTH TO TOP OF SAMPLE INTER-VAL (FT) (72015)	TEMPER-ATURE WATER (DEG C) (00010)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
AUG 27...	1005	20	0.50	15.0	620
27...	1010	40	0.50	15.0	620
27...	1015	60	0.50	15.0	620
27...	1020	80	0.50	15.0	620
27...	1025	100	0.50	15.0	620

06470875 JAMES RIVER AT DAKOTA LAKE DAM NEAR LUDDEN, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

TEMPERATURE, WATER, DEGREES CENTIGRADE, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	15.4	14.0	14.5	4.7	3.0	3.9	2.7	1.3	2.2	1.9	1.0	1.5
2	14.5	13.1	13.7	4.0	2.6	3.3	2.8	1.0	1.9	1.7	1.2	1.4
3	13.1	10.7	11.6	3.9	2.5	3.5	1.5	.8	1.2	1.9	1.0	1.5
4	11.6	9.7	10.7	3.7	2.3	2.9	1.6	.6	1.4	1.9	1.5	1.7
5	11.9	10.6	11.2	4.6	2.8	3.6	---	---	---	2.1	1.2	1.7
6	11.7	9.8	10.8	4.5	3.6	4.2	2.0	.9	1.7	1.7	1.0	1.4
7	13.9	11.0	12.2	3.6	2.0	2.5	1.9	1.5	1.8	2.2	1.0	1.4
8	12.6	10.1	11.0	2.8	.2	.7	1.9	1.1	1.6	2.0	1.3	1.5
9	10.5	9.1	9.8	.5	.2	.3	1.7	.9	1.3	1.9	1.0	1.3
10	---	---	---	1.2	.4	.8	1.9	1.3	1.7	1.9	1.1	1.4
11	---	---	---	1.4	1.1	1.2	1.8	1.2	1.6	2.1	1.4	1.5
12	---	---	---	1.6	1.3	1.4	1.8	1.4	1.6	2.2	1.6	1.8
13	---	---	---	1.8	1.2	1.4	1.8	1.4	1.5	2.3	1.9	1.9
14	---	---	---	1.8	1.3	1.6	1.6	1.2	1.4	2.1	1.7	1.8
15	---	---	---	2.0	1.5	1.7	1.8	1.4	1.6	2.2	1.4	1.6
16	9.1	6.2	7.5	2.2	1.8	2.0	---	---	---	2.2	1.8	1.8
17	9.6	7.3	8.4	2.3	1.8	2.1	---	---	---	2.1	1.7	1.7
18	11.5	8.8	10.0	2.3	1.6	2.0	---	---	---	2.4	1.8	1.9
19	12.0	10.1	11.0	2.3	1.5	2.1	---	---	---	2.3	1.5	1.7
20	13.8	11.0	12.2	2.2	1.3	1.8	---	---	---	2.4	1.6	1.9
21	12.9	11.2	12.1	2.2	2.0	2.1	---	---	---	2.4	1.7	1.8
22	13.0	12.2	12.5	2.2	1.2	1.6	---	---	---	2.4	1.8	2.0
23	12.7	9.5	10.8	2.4	1.0	1.7	---	---	---	2.5	1.9	2.0
24	9.6	8.6	9.0	2.3	2.0	2.2	2.0	1.3	1.7	2.5	1.8	1.9
25	9.7	8.3	8.9	2.1	1.0	1.7	2.0	1.3	1.6	2.7	1.9	2.2
26	9.0	8.0	8.5	2.5	1.1	2.1	1.9	1.6	1.7	2.7	2.0	2.2
27	9.4	7.8	8.6	2.6	1.8	2.3	1.9	1.4	1.7	2.7	2.0	2.2
28	9.8	8.7	9.2	2.6	1.4	2.3	1.9	1.4	1.6	2.6	2.0	2.1
29	8.7	7.5	8.1	2.1	1.2	1.6	1.9	1.2	1.5	2.6	1.8	2.0
30	8.5	6.7	7.6	2.5	1.4	1.7	1.9	1.3	1.6	2.8	2.0	2.2
31	8.4	4.6	6.8	---	---	---	1.7	1.0	1.4	2.8	2.4	2.4
MONTH	---	---	---	4.7	.2	2.08	---	---	---	2.8	1.0	1.79

TEMPERATURE, WATER, DEGREES CENTIGRADE, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	2.8	2.3	2.5	1.7	.6	1.1	1.8	.9	1.4	17.7	14.8	16.0
2	2.9	2.2	2.4	1.4	1.0	1.1	2.8	1.2	1.9	16.9	15.3	16.0
3	2.6	2.2	2.3	1.4	1.1	1.1	3.8	1.9	2.8	16.9	15.1	15.9
4	2.6	2.2	2.3	1.6	1.1	1.2	5.3	3.1	4.1	17.7	15.4	16.3
5	2.7	2.3	2.5	1.8	1.1	1.4	7.2	4.9	6.0	18.5	16.1	17.2
6	3.0	2.4	2.5	2.0	1.4	1.6	9.2	6.8	7.9	19.2	16.8	18.0
7	2.8	1.9	2.4	2.1	1.4	1.7	11.7	8.5	9.7	19.4	17.4	18.1
8	3.0	2.4	2.6	1.4	.5	1.0	12.2	10.2	11.1	19.8	17.6	18.6
9	3.1	2.6	2.7	1.0	.3	.6	11.9	11.3	11.5	20.6	18.4	19.4
10	2.9	2.6	2.7	.7	.3	.4	11.2	9.9	10.5	21.3	18.8	19.9
11	2.9	2.4	2.6	.4	.1	.2	10.4	9.0	9.6	19.8	18.0	18.8
12	3.0	2.6	2.7	.2	.0	.0	10.8	9.2	9.9	18.7	18.0	18.2
13	3.1	2.5	2.7	.3	.0	.1	10.0	9.4	9.6	19.4	17.1	17.8
14	2.8	2.6	2.6	.1	.0	.0	10.6	8.6	9.6	22.0	16.5	18.7
15	2.8	2.4	2.6	.0	.0	.0	12.1	9.6	10.7	20.5	16.7	18.7
16	2.5	2.2	2.3	.0	.0	.0	13.7	11.4	12.5	22.3	19.3	20.6
17	2.5	2.2	2.3	.0	.0	.0	16.2	12.8	13.8	20.5	15.7	17.8
18	2.5	2.0	2.2	.0	.0	.0	17.4	13.8	15.4	15.4	13.7	14.2
19	2.1	1.8	1.9	.2	.0	.0	17.6	15.5	16.4	16.6	13.1	13.8
20	2.1	1.7	1.8	.4	.0	.1	16.6	13.7	14.8	15.3	13.7	14.4
21	1.7	1.1	1.3	.2	.0	.1	13.7	12.2	12.9	15.0	9.8	12.1
22	1.6	1.1	1.3	.5	.0	.1	14.6	12.1	13.0	11.1	8.8	9.9
23	1.5	1.1	1.2	.3	.0	.1	14.1	12.8	13.4	12.2	10.2	11.0
24	1.4	1.0	1.1	.0	.0	.0	14.2	12.4	13.2	13.0	11.6	12.1
25	1.4	1.1	1.1	.2	.0	.0	16.4	12.6	14.0	13.0	12.7	12.8
26	1.2	.7	.9	2.0	.0	.2	16.5	13.7	14.9	15.2	12.9	13.7
27	1.2	.7	.8	.7	.1	.3	15.8	13.9	14.8	18.9	14.8	16.6
28	1.5	.8	1.0	1.2	.3	.8	17.1	14.2	15.4	20.6	17.8	19.0
29	---	---	---	.7	.3	.4	16.3	14.8	15.5	21.9	19.3	20.3
30	---	---	---	.8	.3	.5	16.0	14.5	15.2	23.3	19.7	20.9
31	---	---	---	1.3	.3	.8	---	---	---	22.9	20.3	21.4
MONTH	3.1	.7	2.05	2.1	.0	.48	17.6	.9	11.0	23.3	8.8	16.7

06470875 JAMES RIVER AT DAKOTA LAKE DAM NEAR LUDDEN, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

TEMPERATURE, WATER, DEGREES CENTIGRADE, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	22.1	20.7	21.2	22.7	19.5	20.5	30.5	27.2	28.4	19.1	16.7	17.8
2	20.2	18.7	19.2	21.5	19.6	20.4	29.9	27.4	28.4	19.2	16.8	17.9
3	18.5	16.7	17.7	22.5	20.0	20.8	28.4	25.3	26.3	20.4	17.2	18.7
4	20.9	17.0	18.5	22.3	20.5	21.1	25.6	23.3	24.4	20.9	18.8	19.8
5	22.4	18.5	19.9	25.6	21.0	22.6	25.1	22.7	23.9	20.5	18.6	19.5
6	24.2	20.2	21.5	25.3	22.9	23.9	24.4	22.5	23.5	20.7	18.7	19.6
7	24.2	22.8	23.1	26.0	23.6	24.6	23.6	22.2	22.6	20.5	18.4	19.0
8	22.5	20.8	21.6	25.1	23.6	24.0	22.8	21.6	22.1	18.9	16.7	17.8
9	---	---	---	25.2	22.7	23.7	25.0	21.0	22.7	19.5	17.2	18.3
10	---	---	---	25.8	22.9	23.9	24.5	22.3	23.2	18.9	17.3	17.8
11	---	---	---	24.6	22.6	23.5	25.3	21.8	23.2	17.0	15.9	16.2
12	---	---	---	23.1	20.2	21.2	24.4	21.6	22.7	15.9	15.0	15.4
13	---	---	---	22.9	19.4	20.4	23.3	21.3	22.2	16.9	14.2	15.2
14	25.9	25.9	---	---	---	---	23.6	21.6	22.5	18.0	15.0	16.1
15	25.6	23.6	24.3	23.2	20.4	21.5	25.0	22.6	23.4	19.4	16.5	17.7
16	26.2	23.4	24.6	24.5	19.7	24.0	23.5	21.7	22.4	19.1	17.6	18.3
17	26.9	24.0	25.3	25.8	23.2	24.3	22.4	20.3	21.1	18.7	17.6	17.9
18	27.3	24.7	25.8	25.0	23.8	24.2	20.7	18.9	19.8	17.2	15.5	16.1
19	27.0	24.5	25.6	27.6	22.3	24.3	19.8	18.2	18.8	15.4	14.2	14.8
20	26.7	24.6	25.3	28.3	23.6	25.3	21.2	18.8	19.9	14.9	13.4	14.3
21	28.4	24.6	25.9	27.5	24.9	26.0	21.9	20.3	20.8	15.0	13.6	14.3
22	28.7	25.7	27.0	27.4	25.0	26.1	20.3	18.2	19.2	16.0	14.0	14.7
23	27.5	24.8	25.8	27.5	25.3	26.3	19.9	17.4	18.5	17.6	14.1	15.6
24	25.8	23.8	24.5	27.3	24.7	25.6	19.4	17.8	18.3	16.2	14.7	15.5
25	24.2	22.0	22.8	27.8	24.8	26.1	17.6	16.5	16.9	16.5	14.2	15.2
26	21.5	19.8	20.5	27.9	25.2	26.4	16.4	16.0	16.2	18.1	15.4	16.5
27	22.3	19.0	20.4	---	---	---	16.7	15.3	15.9	17.8	16.6	17.1
28	22.4	20.9	21.5	---	---	---	17.9	15.5	16.5	16.7	14.2	15.2
29	22.0	20.2	21.1	28.8	27.7	28.1	19.7	16.6	17.8	14.9	12.4	13.6
30	22.5	19.9	21.0	29.4	27.1	28.0	18.5	16.5	17.4	14.7	13.2	13.9
31	---	---	---	31.0	27.4	28.5	18.6	15.6	17.0	---	---	---
MONTH	---	---	---	---	---	---	30.5	15.3	21.2	20.9	12.4	16.7

SPECIFIC CONDUCTANCE MICROSIEMENS/CM AT 25 DEG C, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	890	840	860	880	870	880	1090	1070	1070	1150	1140	1140
2	850	790	820	880	870	880	1080	1060	1060	1150	1140	1140
3	800	740	760	880	870	880	1070	1060	1060	1160	1150	1150
4	760	730	750	890	870	880	---	1060	1060	1160	1140	1150
5	750	710	740	890	870	870	---	---	---	1170	1160	1170
6	730	710	720	880	860	870	1050	1040	1040	1170	1160	1160
7	720	670	700	890	860	870	1050	1040	1040	1170	1160	1170
8	700	680	700	890	870	870	1050	1040	1040	1170	1150	1160
9	720	690	700	890	870	870	1050	1030	1030	1180	1160	1170
10	---	---	---	910	890	890	1050	1030	1040	1180	1160	1170
11	---	---	---	920	880	900	1050	1020	1040	1180	1160	1170
12	---	---	---	930	910	920	1050	1020	1040	1190	1160	1170
13	---	---	---	970	920	940	1040	1020	1030	1170	1140	1160
14	---	---	---	980	960	960	1060	1040	1050	1160	1140	1150
15	---	---	---	1000	980	980	1070	1040	1050	1150	1130	1140
16	770	740	760	1000	980	990	---	---	---	1150	1130	1140
17	790	770	780	1000	980	990	---	---	---	1150	1130	1140
18	810	790	800	1020	1000	1010	---	---	---	1150	1130	1140
19	820	810	810	1030	1010	1020	---	---	---	1160	1140	1150
20	840	820	830	1050	1020	1030	---	---	---	1160	1140	1150
21	830	820	820	1050	1030	1050	---	---	---	1150	1130	1140
22	840	820	830	1070	1050	1060	---	---	---	1140	1130	1140
23	850	830	840	1080	1060	1070	---	---	---	1130	1110	1120
24	850	840	850	1080	1060	1070	1100	1080	1090	1120	1100	1110
25	860	840	850	1090	1070	1080	1100	1090	1090	1120	1110	1120
26	860	840	850	1100	1080	1080	1110	1100	1110	1130	1110	1120
27	870	840	860	1090	1080	1080	1120	1100	1110	1130	1110	1120
28	880	840	860	1090	1080	1090	1120	1100	1110	1130	1110	1120
29	880	860	870	1090	1080	1090	1130	1120	1130	1130	1110	1120
30	880	870	870	1090	1080	1080	1140	1120	1130	1130	1110	1120
31	890	880	880	---	---	---	1130	1130	1130	1130	1110	1120
MONTH	---	---	---	1100	860	975	---	---	---	1190	1100	1143

06470875 JAMES RIVER AT DAKOTA LAKE DAM NEAR LUDDEN, ND--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

SPECIFIC CONDUCTANCE MICROSIEMENS/CM AT 25 DEG C, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	1130	1110	1120	970	950	960	360	340	350	610	600	600
2	1130	1110	1120	980	970	970	370	350	360	600	590	590
3	1130	1110	1120	990	960	970	370	360	370	590	570	580
4	1120	1110	1120	990	970	980	370	370	370	580	560	570
5	1120	1100	1110	990	960	970	390	370	380	580	560	570
6	1130	1100	1110	960	940	950	400	380	390	590	570	580
7	1120	1100	1110	960	950	950	420	400	410	580	560	570
8	1110	1100	1100	960	930	950	430	410	420	570	560	560
9	1110	1100	1100	930	900	910	440	430	440	580	560	570
10	1100	1090	1100	910	870	890	440	430	440	580	560	570
11	1110	1090	1100	870	770	820	430	410	420	560	550	560
12	1100	1060	1080	790	780	790	440	420	430	560	550	560
13	1060	1050	1060	790	770	780	460	430	440	560	550	560
14	1050	1030	1040	770	760	770	470	440	450	570	550	560
15	1040	1030	1040	760	720	740	480	460	470	580	560	570
16	1040	1020	1030	710	660	690	480	460	470	590	570	580
17	1030	1020	1020	660	610	640	520	480	500	580	570	570
18	1020	1000	1010	610	580	600	540	520	530	590	570	580
19	1000	960	990	590	580	580	560	540	550	630	590	620
20	1000	980	1000	580	560	570	570	550	560	620	610	620
21	1010	970	990	570	550	560	560	550	560	630	510	570
22	980	970	970	560	550	550	560	550	550	510	480	490
23	980	950	960	560	540	550	570	560	560	520	480	500
24	950	940	950	550	530	540	570	560	560	500	480	490
25	970	950	960	530	520	530	570	540	550	500	480	490
26	970	960	960	510	500	510	580	550	560	490	480	490
27	980	960	970	500	460	480	610	580	590	500	480	490
28	970	960	970	480	430	450	620	590	600	520	510	510
29	---	---	---	430	380	390	600	580	590	540	510	530
30	---	---	---	380	360	370	610	600	600	560	530	540
31	---	---	---	380	360	370	---	---	---	570	550	560
MONTH	1130	940	1043	990	360	703	620	340	482	630	480	555

SPECIFIC CONDUCTANCE MICROSIEMENS/CM AT 25 DEG C, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	590	570	580	---	600	600	540	500	520	660	620	640
2	610	580	590	620	580	600	550	520	530	670	640	660
3	620	---	---	590	570	580	540	510	530	680	640	670
4	---	---	---	580	550	560	550	530	540	680	660	670
5	---	---	---	560	550	560	560	540	550	670	650	660
6	---	---	---	570	550	560	580	540	560	670	650	670
7	---	---	---	570	560	570	590	560	580	670	650	660
8	---	---	---	570	560	560	590	550	570	650	640	650
9	---	---	---	570	560	560	580	560	570	640	630	640
10	---	---	---	570	550	560	600	530	570	640	620	630
11	---	---	---	570	550	560	580	550	570	640	630	630
12	---	---	---	560	540	550	610	470	570	640	630	630
13	---	---	---	560	540	550	620	470	560	650	630	640
14	---	---	---	---	---	---	590	510	550	650	630	640
15	---	---	---	560	540	540	570	500	550	640	630	640
16	---	---	---	560	550	560	610	490	550	650	630	640
17	---	---	---	570	540	560	590	510	550	640	600	620
18	---	---	---	570	540	560	610	470	560	610	590	600
19	---	---	---	560	550	550	630	500	570	590	590	590
20	---	---	---	560	540	550	620	480	570	600	590	590
21	---	---	---	560	510	550	610	500	580	620	600	610
22	---	---	---	560	510	550	620	520	580	620	600	610
23	---	---	---	560	520	550	620	490	590	620	600	610
24	---	620	---	550	530	550	640	490	600	620	600	610
25	630	600	620	550	540	540	640	520	610	620	600	610
26	620	600	610	530	520	530	660	540	610	630	610	620
27	630	580	600	---	---	---	650	550	620	640	630	630
28	630	590	610	---	---	---	690	570	620	650	630	640
29	620	590	600	530	530	530	690	570	630	650	630	640
30	600	---	590	540	520	530	660	600	630	650	630	640
31	---	---	---	550	520	540	650	590	630	---	---	---
MONTH	---	---	---	---	---	---	690	470	575	680	590	633

JAMES RIVER BASIN

06470878 JAMES RIVER AT ND-SD STATE LINE

LOCATION.--Lat 45°56'10", long 98°10'26", in SE¼SE¼ sec. 34, T.129 N., R.60 W., Dickey County, Hydrologic Unit 10160003, at bridge on North Dakota-South Dakota state line road 6.5 mi south, and 1 mi west from Ludden.

DRAINAGE AREA.--5,480 mi^2, approximately, revised, of which about 3,300 mi^2 is probably noncontributing.

GAGE HEIGHT RECORDS

PERIOD OF RECORD.--October 1981 to current year (gage heights only).

GAGE.--Water-stage recorder. Datum of gage is 1,200 ft above National Geodetic Vertical Datum of 1929.

EXTREMES FOR PERIOD OF RECORD.--Maximum observed 93.60 ft, Mar. 28, 1987; minimum 87.40 ft, Sept. 3, 1985.

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	89.21	88.50	88.87	88.75	88.40	88.76	93.07	90.69	90.36	89.12	89.09	89.01
2	89.23	88.55	88.89	88.74	88.39	88.72	92.93	90.68	90.34	89.15	89.11	88.99
3	89.24	88.48	88.90	88.74	88.38	88.73	92.69	90.59	90.33	89.15	89.13	89.10
4	89.14	88.50	88.93	88.73	88.37	88.74	92.50	90.55	90.19	89.09	89.10	89.05
5	89.12	88.57	88.92	88.72	88.39	88.75	92.48	90.52	90.12	89.11	89.09	89.17
6	89.10	88.53	88.91	88.72	88.40	88.85	92.43	90.53	90.02	89.12	89.08	89.17
7	89.08	88.56	88.91	88.71	88.47	88.93	92.35	90.51	90.02	89.12	89.10	89.18
8	89.04	88.59	88.91	88.70	88.45	89.09	92.24	90.40	89.99	89.13	89.10	89.18
9	89.00	88.69	88.90	88.69	88.50	89.32	92.20	90.43	89.89	89.13	89.08	89.18
10	89.05	88.60	88.90	88.69	88.49	89.33	92.09	90.42	89.80	89.11	89.08	89.19
11	88.97	88.54	88.89	88.68	88.48	89.56	92.05	90.46	89.85	89.27	89.08	89.21
12	88.92	88.51	88.87	88.67	88.47	89.87	91.91	90.15	89.88	89.33	89.05	89.19
13	88.88	88.50	88.86	88.66	88.46	90.20	91.87	90.22	89.86	89.21	89.04	89.17
14	88.88	88.50	88.86	88.66	88.47	90.26	91.79	90.49	89.84	89.15	89.02	89.16
15	88.89	88.49	88.85	88.61	88.48	90.43	91.68	90.27	89.72	89.13	89.01	89.15
16	88.84	88.50	88.84	88.60	88.56	90.56	91.64	90.27	89.61	89.14	89.03	89.11
17	88.80	88.48	88.83	88.54	88.60	90.67	91.58	90.64	89.59	89.13	88.99	89.07
18	88.90	88.54	88.83	88.53	---	90.83	91.30	90.49	89.66	89.29	88.98	89.05
19	88.82	88.61	88.82	88.52	88.64	91.01	91.41	90.33	89.63	89.34	88.95	89.08
20	88.71	88.58	88.81	88.51	88.65	91.13	91.66	90.36	89.57	89.49	88.91	89.07
21	88.71	88.57	88.80	88.50	---	91.41	91.50	90.71	89.53	89.45	88.98	89.03
22	88.69	88.70	88.79	88.51	---	91.53	91.31	90.55	89.51	89.36	88.99	89.02
23	88.68	88.70	88.79	88.47	88.70	91.70	91.27	90.43	89.48	89.51	88.94	89.03
24	88.66	88.73	88.78	88.45	88.73	92.08	91.13	90.45	89.48	89.50	88.93	89.07
25	88.61	88.77	88.75	88.44	88.75	92.54	91.04	90.51	89.50	89.38	88.97	89.04
26	88.65	88.78	88.70	88.43	88.80	92.72	90.99	90.54	89.49	89.30	89.00	89.03
27	88.59	88.81	88.76	88.45	88.83	92.92	90.94	90.46	89.38	89.19	89.01	88.98
28	88.58	88.82	88.76	88.43	88.80	93.60	90.81	90.35	89.33	89.15	89.02	88.89
29	88.52	88.83	88.74	88.41	---	93.34	90.86	90.48	89.30	89.12	89.02	88.79
30	88.63	88.83	88.75	88.40	---	93.30	90.68	90.48	89.19	89.05	89.07	88.69
31	88.56	---	88.75	88.41	---	93.17	---	90.41	---	88.99	89.02	---
MEAN	88.9	88.6	88.8	88.6	---	90.7	91.7	90.5	89.7	89.2	89.0	89.1
MAX	89.24	88.83	88.93	88.75	---	93.60	93.07	90.71	90.36	89.51	89.13	89.21
MIN	88.52	88.48	88.70	88.40	---	88.72	90.68	90.15	89.19	88.99	88.91	88.69

06470878 JAMES RIVER AT ND-SD STATE LINE--CONTINUED

WATER-QUALITY RECORDS

PERIOD OF RECORD.--September 1973 to December 1987 (discontinued).

PERIOD OF DAILY RECORDS.--
WATER TEMPERATURE: October 1974 to December 1987 (discontinued).
SPECIFIC CONDUCTANCE: October 1979 to December 1987 (discontinued).

REMARKS.--Water temperatures and specific conductances are measured daily in field by local observer.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Maximum daily, 28.5°C, Aug 5, 6, 1983, June 12, 1976, July 13, 1984; minimum 0.0°C for several days during winter months each year.
SPECIFIC CONDUCTANCE: Maximum, 4,000 microsiemens, Mar. 15, 1979; minimum, 240 microsiemens, Apr. 3, 1984.

EXTREMES FOR CURRENT PERIOD.--
WATER TEMPERATURE: Maximum, 29.0°C, July 31; minimum 1.0°C Dec. 13, Jan. 15-16.
SPECIFIC CONDUCTANCE: Maximum, 1,180 microsiemens, Dec. 29-31; minimum, 280 microsiemens, Mar. 30 to Apr. 1.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
ONCE DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15.5	5.0	3.5	2.5	2.5	2.0	3.0	17.0	22.0	22.0	28.5	18.0
2	15.0	4.0	2.5	2.5	2.5	2.0	3.5	16.5	20.0	21.0	27.0	18.5
3	13.0	5.5	2.0	2.5	2.0	2.0	5.0	17.0	18.0	21.5	26.5	18.5
4	11.5	3.5	1.5	2.5	2.5	3.0	5.5	17.0	22.0	22.0	24.5	20.0
5	12.0	5.5	3.5	3.0	3.0	4.0	6.0	18.0	20.0	23.0	24.0	19.5
6	11.5	5.5	3.0	2.0	4.0	5.0	8.5	18.0	22.0	25.0	24.0	19.5
7	13.0	3.5	3.0	2.5	4.0	5.0	11.5	18.5	25.0	25.0	24.0	19.5
8	12.0	1.5	3.0	2.0	3.5	2.5	14.0	19.0	22.0	25.0	23.0	20.0
9	10.5	1.5	1.5	2.0	4.0	2.0	12.0	20.0	20.5	26.0	22.5	20.5
10	10.0	1.5	1.5	2.0	3.5	2.0	11.0	21.0	21.5	25.0	23.5	18.5
11	9.0	1.5	1.5	2.5	4.5	4.0	10.0	19.0	22.0	24.5	23.0	16.0
12	8.0	1.5	2.0	3.5	3.5	2.0	11.5	17.5	25.5	21.0	22.0	16.5
13	7.0	1.5	1.0	4.0	3.5	3.0	10.5	18.5	25.5	21.5	22.0	18.0
14	8.0	1.5	2.5	3.5	3.0	2.0	10.0	19.0	26.5	21.5	23.0	17.5
15	8.0	2.0	3.0	1.0	3.0	2.0	11.0	19.0	24.0	22.5	24.5	18.0
16	12.0	2.0	3.0	1.0	3.0	2.0	12.0	21.0	27.0	22.5	22.5	20.0
17	10.0	2.0	2.5	2.5	4.0	1.5	14.0	16.0	25.5	25.0	22.0	18.5
18	11.0	2.0	2.5	2.0	---	2.0	18.0	15.0	26.0	25.0	21.5	17.5
19	11.5	2.0	4.0	1.5	3.5	2.0	16.5	15.0	25.5	25.0	20.0	15.5
20	12.5	2.5	3.0	2.0	3.5	2.5	15.0	16.0	25.0	25.0	20.5	17.0
21	13.0	2.5	2.5	2.0	---	2.5	13.0	12.0	25.5	26.5	21.0	15.5
22	14.0	3.5	2.5	1.5	---	3.0	14.0	11.0	27.0	26.5	19.0	15.5
23	13.5	2.0	4.0	1.5	3.0	3.5	14.0	12.0	25.5	26.0	21.5	16.0
24	12.5	3.0	4.0	1.5	2.0	2.0	---	13.5	24.5	26.0	19.0	16.5
25	10.0	3.5	3.5	1.5	3.0	1.5	---	15.0	23.0	26.5	18.0	15.5
26	9.5	4.0	4.0	1.5	3.0	2.0	15.0	14.5	21.0	27.5	17.0	17.0
27	10.5	4.5	4.0	2.5	2.0	2.0	15.0	17.0	21.0	28.0	16.5	18.0
28	10.0	4.5	3.0	2.5	2.0	2.0	15.5	20.0	22.0	28.5	17.5	16.0
29	9.0	3.0	2.5	2.5	---	1.5	16.0	21.0	21.5	28.5	17.5	15.0
30	8.5	3.0	2.5	2.5	---	2.5	16.0	21.5	21.5	28.5	19.0	15.0
31	7.0	---	2.5	2.5	---	3.0	---	21.5	---	29.0	17.5	---
MEAN	10.9	2.97	2.74	2.23	---	2.52	---	17.3	23.3	24.9	21.7	17.6
MAX	15.5	5.5	4.0	4.0	---	5.0	---	21.5	27.0	29.0	28.5	20.5
MIN	7.0	1.5	1.0	1.0	---	1.5	---	11.0	18.0	21.0	16.5	15.0

06470878 JAMES RIVER AT ND-SD STATE LINE--CONTINUED

SPECIFIC CONDUCTANCE MICROSIEMENS/CM AT 25 DEG C, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	790	760	980	1140	1010	900	280	610	560	590	550	600
2	780	800	980	1130	1000	940	300	600	580	600	540	600
3	770	750	980	1140	990	970	320	600	590	580	510	600
4	760	880	980	1150	1000	900	320	600	690	570	520	610
5	700	870	980	1150	1020	860	340	590	670	560	540	590
6	690	870	980	1150	1040	860	360	580	680	550	560	580
7	680	860	980	1140	1050	860	380	580	680	530	570	560
8	670	870	960	1060	1090	820	390	620	690	550	580	600
9	640	870	980	1090	1090	780	400	600	690	540	590	600
10	630	870	980	1030	1050	760	420	610	690	510	590	600
11	610	870	1000	1030	1060	730	410	600	680	500	570	610
12	610	890	1020	1030	1040	690	410	600	670	530	560	610
13	680	910	1020	1030	1030	660	410	600	670	540	580	590
14	680	970	1040	1020	1020	680	420	600	650	540	580	585
15	690	970	1040	1000	1010	600	460	580	640	560	570	575
16	690	950	1060	970	1000	570	470	600	640	550	570	560
17	700	950	1060	960	960	560	520	580	630	540	580	560
18	710	950	1080	980	---	560	520	550	630	580	580	550
19	740	950	1080	990	900	500	560	570	610	560	580	560
20	750	960	1090	1010	910	480	580	580	600	520	570	560
21	750	970	1100	1020	---	470	580	570	600	560	560	560
22	760	970	1110	1030	---	430	580	550	600	580	560	560
23	760	970	1130	1000	910	380	590	540	600	570	580	560
24	770	960	1130	990	910	400	---	580	590	560	580	560
25	780	950	1140	1000	900	370	---	580	580	570	570	560
26	790	960	1150	1010	900	320	620	600	570	570	580	570
27	790	960	1160	1010	900	310	620	600	560	580	600	580
28	800	950	1170	1020	880	300	630	600	550	580	580	570
29	810	960	1180	1010	---	290	630	590	560	570	570	580
30	780	960	1180	1000	---	280	640	580	570	570	600	580
31	760	---	1180	1010	---	280	---	550	---	560	600	---
MEAN	726	913	1061	1042	---	597	---	587	624	557	570	579
MAX	810	970	1180	1150	---	970	---	620	690	600	600	610
MIN	610	750	960	960	---	280	---	540	550	500	510	550

06470980 JAMES RIVER NEAR HECLA, SD

LOCATION.--Lat 45°53'34", long 98°10'13", in SW¼SE¼SE¼ sec. 16, T.128 N., R.61 W., Brown County, SD, Hydrologic Unit 10160003, on left bank 30 ft upstream from bridge on county road 1.0 mi northwest of Hecla, South Dakota and 3.0 mi downstream from the North Dakota - South Dakota border.

DRAINAGE AREA.--5,520 mi^2 approximately, of which about 3,300 mi^2 is probably noncontributing.

GAGE HEIGHT RECORDS

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

GAGE.--Water-stage recorder. Datum of gage is 1200.00 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records of stream velocity and discharge are also collected at this location. These records which have been used to supplement the discharge record for station 06740875, James River at Dakota Lake Dam near Ludden, ND are available in the files of the District office.

EXTREMES FOR PERIOD OF RECORD.--Maximum, 92.72 ft, Apr. 1, 1987; minimum, 87.34 ft, Aug. 28, 1985.

GAGE HEIGHT (FEET ABOVE DATUM), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	88.98	88.34	88.70	88.54	88.24	88.61	92.68	90.33	90.01	---	88.85	88.84
2	89.01	88.36	88.72	88.53	88.24	88.59	92.53	90.31	90.01	---	88.87	88.80
3	89.04	88.33	88.72	88.52	88.24	88.57	92.31	90.23	90.01	---	88.91	88.86
4	88.95	88.35	88.73	88.51	88.24	88.56	92.11	90.19	89.87	---	88.90	88.83
5	88.94	88.32	88.74	88.50	88.24	88.57	92.03	90.16	89.80	---	88.87	88.93
6	88.90	88.32	88.74	88.49	88.24	88.64	91.99	90.17	89.70	---	88.88	88.95
7	88.89	88.30	88.74	88.47	88.25	88.73	91.92	90.15	89.71	---	88.88	88.96
8	88.85	88.53	88.73	88.47	88.26	88.76	91.81	90.04	89.68	---	88.88	88.97
9	88.80	88.48	88.72	88.47	88.27	88.94	91.77	90.06	89.58	---	88.88	88.96
10	88.85	88.34	88.71	88.45	88.27	89.09	91.69	90.05	---	---	88.86	88.98
11	88.79	88.27	88.70	88.45	88.27	89.24	91.65	90.09	---	---	88.85	88.99
12	88.75	88.24	88.68	88.44	88.28	89.48	91.52	89.79	---	---	88.85	88.98
13	88.70	88.23	88.67	88.43	88.29	89.75	91.47	89.84	---	---	88.84	88.96
14	88.69	88.23	88.65	88.43	88.30	89.86	91.40	90.09	---	---	88.81	88.95
15	88.69	88.23	88.64	88.42	88.32	89.98	91.29	89.89	---	---	88.81	88.94
16	88.64	88.23	88.62	88.41	88.38	90.11	91.25	89.87	---	---	88.84	88.90
17	88.60	88.22	88.61	88.40	88.40	90.21	91.19	90.22	---	---	88.81	88.89
18	88.64	88.28	88.59	88.39	88.42	90.38	90.92	90.12	---	---	88.81	88.87
19	88.57	88.34	88.58	88.38	88.44	90.54	90.99	89.97	---	---	88.78	88.89
20	88.52	88.39	88.57	88.36	88.46	90.69	91.27	90.00	---	---	88.74	88.87
21	88.52	88.43	88.57	88.35	88.48	90.80	91.11	90.37	---	---	88.79	88.83
22	88.50	88.47	88.56	88.34	88.49	90.91	90.93	90.21	---	---	88.81	88.81
23	88.49	88.51	88.56	88.33	88.52	91.19	90.89	90.06	---	---	88.77	88.82
24	88.45	88.54	88.55	88.32	88.54	91.58	90.76	90.07	---	---	88.76	88.83
25	88.43	88.57	88.54	88.30	88.55	91.85	90.68	90.13	---	---	88.83	88.81
26	88.43	88.60	88.54	88.29	88.59	91.98	90.63	90.16	---	---	88.85	88.80
27	88.41	88.62	88.54	88.28	88.61	92.29	90.59	90.08	---	---	88.84	88.78
28	88.41	88.64	88.55	88.27	88.62	92.34	90.47	89.98	---	---	88.84	88.72
29	88.39	88.66	88.55	88.26	---	92.40	90.50	90.10	---	---	88.85	88.62
30	88.42	88.68	88.55	88.25	---	92.46	90.33	90.11	---	---	88.89	88.52
31	88.42	---	88.55	88.25	---	92.60	---	90.04	---	---	88.85	---
MEAN	88.7	88.4	88.6	88.4	88.4	90.2	91.4	90.1	---	---	88.8	88.9
MAX	89.04	88.68	88.74	88.54	88.62	92.60	92.68	90.37	---	---	88.91	88.99
MIN	88.39	88.22	88.54	88.25	88.24	88.56	90.33	89.79	---	---	88.74	88.52

06470980 JAMES RIVER NEAR HECLA, SD--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L) (00310)	HARD-NESS (MG/L AS CACO3) (00900)
OCT											
15...	1000	102	710	8.58	0.0	5.5	4.0	12.4	96	--	260
DEC											
03...	1330	100	1060	8.70	-4.0	1.0	4.5	--	--	--	390
JAN											
20...	1200	40	1130	8.55	-3.0	0.0	1.3	--	--	--	410
APR											
08...	1200	1200	410	7.90	18.0	11.0	12	10.1	90	--	140
MAY											
19...	1000	550	610	8.35	10.0	13.0	26	8.2	77	--	210
JUL											
09...	1000	231	590	8.25	25.0	23.0	20	6.6	76	--	210
AUG											
27...	1200	197	620	8.08	16.0	15.0	22	7.5	72	5.0	230

DATE	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2) (00405)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)
OCT											
15...	34	58	28	51	29	1	12	226	1.1	120	20
DEC											
03...	49	82	44	92	33	2	14	337	1.3	210	41
JAN											
20...	51	83	49	99	33	2	15	358	1.9	240	45
APR											
08...	8	33	15	22	23	0.8	13	136	3.3	57	11
MAY											
19...	0	44	24	48	32	1	12	209	1.8	100	14
JUL											
09...	4	45	23	42	29	1	12	203	2.2	95	11
AUG											
27...	20	49	25	44	28	1	13	205	3.3	110	13

DATE	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS-SOLVED (TONS PER DAY) (70302)	SOLIDS, RESIDUE AT 105 DEG. C, SUS-PENDED (MG/L) (00530)	NITRO-GEN, NITRITE TOTAL (MG/L AS N) (00615)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)
OCT											
15...	19	480	440	0.65	132	13	--	<0.010	--	<0.100	--
DEC											
03...	12	669	700	0.91	181	16	--	<0.010	--	<0.100	--
JAN											
20...	9.2	714	760	0.97	77	2	--	<0.010	--	<0.100	--
APR											
08...	13	270	250	0.37	875	40	0.030	0.030	0.700	0.730	--
MAY											
19...	10	374	380	0.51	555	56	0.030	0.020	0.100	0.120	--
JUL											
09...	11	365	360	0.50	228	50	--	<0.010	--	<0.100	--
AUG											
27...	--	394	--	--	--	51	0.010	<0.010	<0.100	<0.100	0.130

06470980 JAMES RIVER NEAR HECLA, SD--CONTINUED

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	PHOSPHORUS, DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P) (70507)	PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P) (00671)	ANTIMONY, TOTAL (UG/L AS SB) (01097)	ANTIMONY, DISSOLVED (UG/L AS SB) (01095)	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DISSOLVED (UG/L AS AS) (01000)
OCT 15...	--	--	--	--	<0.200	--	0.039	--	<1	--	3
DEC 03...	--	--	--	--	0.070	--	0.065	--	<1	--	3
JAN 20...	--	--	--	--	0.030	--	0.011	--	<1	--	2
APR 08...	--	--	--	<0.010	0.210	0.196	0.172	<1	<1	2	2
MAY 19...	--	--	--	0.200	0.070	0.060	0.044	1	<1	3	2
JUL 09...	--	--	--	--	0.110	--	0.098	--	<1	--	3
AUG 27...	0.140	1.7	1.0	0.100	0.050	0.064	0.031	--	--	3	2

DATE	BARIUM, TOTAL RECOVERABLE (UG/L AS BA) (01007)	BARIUM, DISSOLVED (UG/L AS BA) (01005)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE) (01012)	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)	BORON, TOTAL RECOVERABLE (UG/L AS B) (01022)	BORON, DISSOLVED (UG/L AS B) (01020)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD) (01027)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COBALT, DISSOLVED (UG/L AS CO) (01035)
OCT 15...	--	68	--	<0.5	--	130	--	<1	<1	<3
DEC 03...	--	66	--	<0.5	--	210	--	<1	<1	<3
JAN 20...	--	69	--	2	--	230	--	1	<1	<3
APR 08...	100	37	<10	<0.5	40	60	<1	<1	<1	<3
MAY 19...	100	53	<10	<0.5	160	110	<1	<1	<1	<3
JUL 09...	--	56	--	<0.5	--	110	--	<1	<1	<3
AUG 27...	--	--	--	--	--	120	<1	<1	--	--

DATE	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, TOTAL RECOVERABLE (UG/L AS FE) (01045)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, DISSOLVED (UG/L AS PB) (01049)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN) (01055)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY DISSOLVED (UG/L AS HG) (71890)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI) (01067)	NICKEL, DISSOLVED (UG/L AS NI) (01065)	SELENIUM, TOTAL (UG/L AS SE) (01147)
OCT 15...	1	--	7	<5	--	8	0.2	--	3	--
DEC 03...	2	--	3	<5	--	77	0.1	--	4	--
JAN 20...	1	--	5	<5	--	11	0.3	--	5	--
APR 08...	3	--	66	<5	--	54	0.3	3	2	<1
MAY 19...	1	--	7	<5	--	42	0.3	4	<1	<1
JUL 09...	<1	--	4	<5	--	5	0.5	--	2	--
AUG 27...	<1	1200	4	<5	580	15	<0.1	--	--	<1

DATE	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	SILVER, TOTAL RECOVERABLE (UG/L AS AG) (01077)	SILVER, DISSOLVED (UG/L AS AG) (01075)	THALLIUM, DISSOLVED (UG/L AS TL) (01057)	ZINC, DISSOLVED (UG/L AS ZN) (01090)	CYANIDE TOTAL (MG/L AS CN) (00720)	CYANIDE DISSOLVED (MG/L AS CN) (00723)	SEDIMENT, SUSPENDED (MG/L) (80154)	MENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT 15...	<1	--	<1	<1	15	--	<0.01	69	19	--
DEC 03...	<1	--	<1	<1	<3	--	<0.01	9	2.4	--
JAN 20...	<1	--	<1	<1	15	--	<0.01	33	3.6	--
APR 08...	<1	<1	<1	--	10	<0.010	<0.01	23	74	--
MAY 19...	<1	<1	<1	--	<3	<0.010	<0.01	63	93	--
JUL 09...	<1	--	<1	--	6	--	<0.01	129	80	100
AUG 27...	<1	--	--	--	<3	<0.010	<0.01	59	31	98

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.--716 mi^2, of which about 332 mi^2 is probably noncontributing.

PERIOD OF RECORD.--June 1956 to current year.

REVISED RECORDS.--WDR SD-86-1: Drainage area.

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.--31 years, 21.0 ft^3/s, 15,210 acre-ft/yr; median of yearly mean discharges, 14 ft^3/s, 10,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,930 ft^3/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^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 10	--	1,060	ice jam	Apr. 4	2215	255	6.04
Mar. 23	1700	*1,690	*10.32	May 29	1245	96	5.04
Mar. 28	1000	401	6.76				

No flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	8.0	5.8	1.5	.89	3.3	193	16	58	.43	.00	.00
2	16	7.2	6.2	1.5	.94	3.3	159	15	48	.39	.00	.00
3	21	6.7	6.5	1.5	.89	3.3	169	13	42	.29	.00	.00
4	30	5.7	6.0	1.5	.89	4.2	236	13	38	.20	.00	.00
5	37	4.8	5.8	1.5	.93	10	247	12	33	.17	.00	.00
6	38	4.7	5.5	1.5	1.2	20	208	12	27	.09	.00	.00
7	37	4.8	6.2	1.5	1.5	25	180	12	27	.05	.00	.00
8	32	5.7	6.8	1.4	1.6	50	162	11	23	.02	.00	.00
9	27	4.7	7.1	1.4	1.5	400	150	10	19	.00	.00	.00
10	26	7.5	6.9	1.4	1.4	1000	132	10	17	.01	.00	.00
11	25	8.1	6.5	1.3	1.5	908	117	9.7	16	.10	.00	.00
12	23	8.2	5.5	1.4	1.5	795	102	8.2	15	.11	.00	.00
13	21	7.6	4.5	1.5	1.5	765	92	8.8	13	.07	.00	.00
14	20	7.3	4.5	1.5	1.3	537	81	8.5	12	.04	.00	.00
15	18	7.2	4.0	1.4	1.4	355	73	7.7	9.7	.01	.00	.00
16	17	7.2	3.6	1.2	1.4	233	66	7.3	7.2	.00	.00	.00
17	16	7.0	3.2	1.2	1.4	175	60	6.6	6.1	.00	.00	.00
18	14	6.8	3.1	1.1	1.4	185	50	4.9	5.1	.26	.00	.00
19	14	6.6	3.2	1.1	1.4	230	49	3.9	4.1	.67	.00	.00
20	13	6.7	3.1	1.1	1.4	334	47	6.1	3.3	.46	.00	.00
21	13	6.3	2.9	1.0	1.5	537	41	11	2.8	.30	.00	.00
22	12	6.2	2.9	1.0	1.6	1030	37	10	2.0	.17	.00	.00
23	11	5.5	2.5	.85	1.6	1600	37	11	1.3	.23	.00	.00
24	10	5.1	2.6	.84	1.7	1250	38	12	.71	.14	.00	.00
25	10	5.9	2.4	.71	1.8	628	33	12	.92	.11	.00	.00
26	9.4	6.2	2.2	.70	3.3	404	29	13	1.0	.07	.00	.00
27	9.3	5.5	2.2	.70	3.3	319	25	12	.86	.04	.00	.00
28	9.3	5.8	1.9	.66	3.1	360	21	28	.67	.01	.00	.00
29	8.8	6.2	1.9	.64	---	281	20	90	.62	.00	.00	.00
30	8.5	5.8	1.7	.67	---	267	18	85	.56	.00	.00	.00
31	8.7	---	1.7	.75	---	231	---	71	---	.00	.00	---
TOTAL	568.0	191.0	128.9	36.02	43.84	12943.1	2872	550.7	434.94	4.44	.00	.00
MEAN	18.3	6.37	4.16	1.16	1.57	418	95.7	17.8	14.5	.14	.00	.00
MAX	38	8.2	7.1	1.5	3.3	1600	247	90	58	.67	.00	.00
MIN	8.5	4.7	1.7	.64	.89	3.3	18	3.9	.56	.00	.00	.00
AC-FT	1130	379	256	71	87	25670	5700	1090	863	8.8	.00	.00

CAL YR 1986	TOTAL	10993.59	MEAN	30.1	MAX	599	MIN	.00	AC-FT	21810
WTR YR 1987	TOTAL	17772.94	MEAN	48.7	MAX	1600	MIN	.00	AC-FT	35250

As the number of streams on which streamflow information is likely to be desired far exceeds the number of stream-gaging stations feasible to operate at one time, the Geological Survey collects limited streamflow data at sites other than stream-gaging stations. When limited streamflow data are collected on a systematic basis over a period of years for use in hydrologic analyses, the site at which the data are collected is called a partial-record station. Data collected at these partial-record stations are usable in low-flow or floodflow analyses, depending on the type of data collected. In addition, discharge measurements are made at other sites not included in the partial-record program. These measurements are generally made in times of drought or flood to give better areal coverage to those events. Those measurements and others collected for some special reason are called measurements at miscellaneous sites.

Records collected at partial-record stations are presented in a table of annual maximum stage and discharge at crest-stage stations. Discharge measurements made at miscellaneous sites for both low flow and high flow are given in a second table.

Crest-stage partial-record stations

The following table contains annual maximum discharge for crest-stage stations. A crest-stage gage is a device which will register the peak stage occurring between inspections of the gage. A stage-discharge relation for each gage is developed from discharge measurements made by indirect measurements of peak flow or by current meter. The date of the maximum discharge is not always certain, but it is usually determined by comparison with nearby continuous-record stations, weather records, or local inquiry. Only the maximum discharge for each water year is given. Information on some lower floods may have been obtained, but is not published herein. The years given in the period of record represent water years for which the annual maximum has been determined.

Annual maximum discharge at crest-stage partial-record stations

Station No.	Station Name	Location	Drainage area (mi2)	Period of record	Annual Maximum Date	Annual Maximum Gage height (ft)	Annual Maximum Discharge (ft3/s)
		RED RIVER OF THE NORTH BASIN					
05052100	Richland County Drain #65 nr Great Bend, ND	Lat 46°05'41", long 96°47'01", in NE1/4 NE1/4 NE1/4 sec.11, T.130 N., R.49 W., Richland County, Hydrologic Unit 09020105, at bridge on county road 4 mi south and 1 mi east of Great Bend.	38	#1981-85, 1986-87	3-18-87	b3.56	a10
05056225	Webster Coulee at Webster,ND	Lat 48°16'55", long 98°53'45", in SW1/4 SW1/4 SW1/4 sec.33, T.156 N., R.64 W., Ramsey County, Hydrologic Unit 09020201, 3/4 mi west of Webster.	670	1980-87	4-16-87	Undetermined	a1,150
05056244	St. Joe Coulee nr Webster, ND	Lat 48°19'23", long 99°00'19", in NE1/4 NE1/4 sec.21, T.156 N., R.65 W., Ramsey County, Hydrologic Unit 09020201, on bridge crossing 2.75 mi north and 6 mi west of Webster.	---	1986-87	4-08-87	48.17	320
05060510	Cass County Drain #52 nr Amenia, ND.	Lat 46°58'41", long 97°11'52", in SE1/4 SE1/4 SE1/4 sec.36, T.141 N., R.52 W., Cass County, Hydrologic Unit 09020204, on left bank 40 ft upstream on county road, 0.7 mi south, and 1 mi east of Amenia.	13.5	#1981-85, 1986-87	3-17-87	ab1.30	a2.0
050605550	Rush River nr Prosper, ND.	Lat 46°57'59", long 97°03'04", in NE1/4 SE1/4 SE1/4 sec.1, T.140 N., R.51 W., Cass County, Hydrologic Unit 09020204, on right bank 30 ft upstream on county road, 1.5 mi west, and 0.2 mi north of Prosper.	170	#1981-85, 1986-87	3-22-87	7.26	a340
05060570	Lower Branch Rush River nr Prosper, ND.	Lat 46°56'30", long 96°59'18", in NE1/4 NE1/4 SE1/4 sec.16, T.140 N., R.50 W., Cass County, Hydrologic Unit 09202004, on right bank 60 ft upstream on county road, 1.5 mi east, and 1.5 mi south of Prosper.	35.8	#1981-85, 1986-87	3-25-87	b4.77	a63
05062200	Elm River n Kelso, ND	Lat 47°17'30", long 97°06'50", in sec.23, T.144 N., R.51 W., Traill County, Hydrologic Unit 09020107, on left bank 50 ft upstream from county road, 4.0 mi south, and 3.4 mi west of Kelso.	199	#1955-63, d1965-73, #1980-87	3-22-87	b11.22	a550
05065500	Goose River nr Portland, ND	Lat 47°32'20", long 97°27'20", in SE1/4 NE1/4 sec.19, T.147 N., R.53 W., Traill County, Hydrologic Unit 09020101, on left bank 75 ft upstream from bridge on State Highway 18, 1.2 mi upstream from unnamed tributary , 4 mi downstream from Beaver Creek, and 5 mi northwest of Portland.	517	1939-75, 1980-87	4-08-87	17.58	2,500

See footnotes at end of table.

Annual maximum discharge at crest-stage partial-record stations--continued

Station No.	Station Name	Location	Drainage area (mi^2)	Period of record	Date	Annual Maximum Gage height (ft)	Annual Maximum Discharge (ft^3/s)
		RED RIVER OF THE NORTH--CONTINUED					
	Red River at Grand Forks,	Lat 47°56'34", long 97°03'10", in SW¼ NE¼ sec.33, T.152 N., R.50 W., Grand Forks County, Hydrologic Unit 09020301, on left bank 2.3 mi downstream from Red Lake River. (Previous site of Red River at Grand Forks).	30,100	1882-1983 1987	3-29-87	33.82	17,500
05083000	Turtle River at Manvel, ND	Lat 48°04'43", long 97°11'03", in SE¼ sec.10, T.153 N., R.51 W., Grand Forks County, Hydrologic Unit 09020307, on left bank 10 ft downstream from bridge on State Highway No. 33, 0.3 mi west of Manvel, and 10 mi upstream from mouth.	613	#1945-70, 1972-73, 1980-87	3-29-87	b16.42	a1,210
05083500	Red River of the North at Oslo, MN	Lat 48°11'40", long 97°08'30", in SW¼SW¼ sec.36, T.155 N., R.51 W., Walsh County, Hydrologic Unit 09020306, on bridge crossing the Red River 0.5 mi west of Oslo, MN.	31,200	#1936-37, #1941-43, #1945-60, 1985-87	3-30-87	31.76	a18,500
05102490	Red River of the North at Pembina, ND	Lat 48°58'17", long 97°14'16", in NE¼ sec.4, T.163 N., R.51 W., Pembina County, Hydrologic Unit 09020311, on bridge crossing the Red River 0.2 mi north of Pembina.	40,200	1985-87	4-09-87	774.15	c37,000
		SOURIS RIVER BASIN					
05119410	Bonnes Coulee at Velva, ND	Lat 48°03'30", long 100°57'00", in NE¼SW¼ sec. 21, T.153 N., R.80 W., McHenry County, at culvert on U.S. Highway 52, 0.5 mi west of Velva.	53.0	1962, 1965, 1971-73, 1976-77	7-19-87	5.09	a450
		KNIFE RIVER BASIN					
06339490	Elm Creek near Golden Valley, ND	Lat 47°06'25", long 102°03'05", in SE¼ NW¼ sec. 23, T.142 N., R.90 W., Mercer County, Hydrologic Unit 10130201, at bridge on county road, 13.5 mi south of Golden Valley.	82.0	#1967-81 1982-87	3-22-87	13.64	1,300
06340200	West Branch Otter Creek near Beulah, ND	Lat 47°08'05", long 101°39'35", in NW¼ NW¼ SW¼ sec.12, T.142 N., R.87 W., Oliver County, Hydrologic Unit 10130201, on right bank 10 mi northeast of Beulah.	26.5	#1965-83, 1984	3-05-86	b7.47	420
		HEART RIVER BASIN					
06343000	Heart River near South Heart, ND	Lat 46°51'56", long 102°56'53", in NE¼ SE¼ SW¼ sec.8, T.139 N., R.97 W., Stark County, Hydrologic Unit 10130202, on left bank 1.7 mi downstream from North Creek, 2 mi east of South Heart and 5.5 mi upstream from Edward Arthur Patterson Lake.	311	#1965-84, 1985	4-02-87	16.15	2,520
06348300	Heart River at Starck Bridge near Judson, ND	Lat 46°42'11", long 101°12'45", in SE¼ SW¼ SW¼ sec.6, T.137 N., R.83 W., Morton County, Hydrologic Unit 10130203, at Starck bridge, 9.5 mi southeast of Judson.	---	1986-87	3-23-87	36.12	9,500

- Operated as a continuous-record gaging station
a - Estimate
b - Backwater from ice
c - Discharge determined using record from station 2 mi downstream
d - Annual maximum only

Miscellaneous discharge measurement sites

Measurements of streamflow at points other than gaging stations are given in the following table.

Discharge measurements made at miscellaneous sites during water year 1986

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements	
					Date	Discharge (ft^3/s)
		RED RIVER OF THE NORTH BASIN				
Sheyenne River	Red River of the North	Lat 47°50'00, long 99°12'30", in SE¼ SW¼ SW¼, sec.2, T.150 N., R.67 W., Eddy County, Hydrologic Unit 09020202, at bridge on county highway 4 mi west of Sheyenne.	---	---	10-10-86	0.99
Sheyenne River at Sheyenne, ND 05055500	Red River of the North	Lat 47°50'20", long 99°07'35", in NE¼ NE¼ SE¼ sec.5, T.150 N., R.66 W., Eddy County, Hydrologic Unit 09020202, at recreational pool dam 1 mi north of Sheyenne.	1,830	1929-33, 1939-50, 1986	10-15-86 10-16-86 10-16-86	7.90 0.40 3.50
Unnamed tributary	Sheyenne River	Lat 47°50'22", long 99°07'25", in NW¼ NW¼ SW¼, sec.4, T.150 N., R.66 W., Eddy County, Hydrologic Unit 09020202, at mouth of tributary entering Sheyenne River on right bank about 300 ft below U.S. Highway 281, 1.0 mi north of Sheyenne.	---	---	10-16-86	.14
Sheyenne River	Red River of the North	Lat 47°51'48, long 99°57'54", in SW¼ NW¼ SE¼, sec.27, T.151 N., R.65 W., Benson County, Hydrologic Unit 09020202, 300 ft downstream from Bourette Dam, 7.4 mi northeast of Sheyenne.	---	---	10-15-86 10-16-86 10-16-86	11.10 9.51 9.55
Big Coulee near Fort Totten 05055520	Sheyenne River	Lat 47°53'02", long 98°58'00", in NW¼ NE¼ SW¼, sec.22, T.151 N., R.65 W., Benson County, Hydrologic Unit 09020202, on right bank 30 ft upstream from culvert in county highway, 7 mi south of Fort Totten.	---	1966-70	10-15-86	2.14
Sheyenne River	Red River of the North	Lat 47°50'01", long 98°55'30", in SW¼ SE¼ SE¼, sec.2, T.150, N., R.65 W., Eddy County, Hydrologic Unit 09020203, 500 ft downstream from bridge on county highway, 8.8 mi east of Sheyenne.	---	---	10-16-86 10-16-86	9.70 11.4
Sheyenne River	Red River of the North	Lat 47°47'55", long 98°53'23", in NW¼ SW¼ NE¼, sec.19, T.150 N., R.64 W., Eddy County, Hydrologic Unit 09020203, 300 ft downstream from river crossing, 11.3 mi southeast of Sheyenne.	---	---	10-15-86 10-16-86 10-86-86	10.9 11.4 11.3
Robinson Coulee	Sheyenne River	Lat 47°43'57", long 98°50'10", in SW¼ SW¼ SE¼, sec.10, T.149 N., R.64 W., Eddy County, Hydrologic Unit 09020203, at culvert on county road 1.5 mi upstream from Sheyenne River, 9 mi northeast of Brantford.	---	---	10-15-86	1.38
Unnamed tributary	Sheyenne River	Lat 47°48'20", long 98°42'55", in NE¼ SW¼ SW¼, sec.15, T.150 N., R.63 W., Eddy County, Hydrologic Unit 09020203, near mouth of tributary entering Sheyenne River on left bank near gaging station 05056000 Sheyenne River near Warwick, 3.3 mi south of Warwick.	---	---	10-16-86	1.19
Sheyenne River near Hamar	Red River of the North	Lat 47°47'40", long 98°35'15", in SE¼ NE¼ SE¼, sec.21, T.150 N., R.62 W., Eddy County, Hydrologic Unit 09020203, 100 ft downstream from culvert crossing on county highway, 3.5 mi south of Hamar.	---	---	10-10-86	29.0

Discharge measurements made at miscellaneous sites during water year 1986

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements	
					Date	Discharge (ft^3/s)
		RED RIVER OF THE NORTH BASIN--CONTINUED				
Sheyenne River	Red River of the North	Lat 47°46'24", long 98°33'18", on section line between sec.6 and sec.35, T.150 N., R.62 W., Eddy County, Hydrologic Unit 09020203, 300 ft below road at site, 4.8 mi south of Hamar.	---	---	10-15-86 10-16-86 10-17-86	18.0 19.1 17.7
Colvin Creek	Sheyenne	Lat 47°45'34", long 98°33'32", in SE¼ SE¼ SW¼, sec.35, T.150 N., R.62 W., Eddy County, Hydrologic Unit 09020203, 100 ft downstream from culvert on county road, 1.0 mi upstream from mouth, 5.8 mi south of Hamar	---	---	10-16-86	.25
Mauvais Coulee Tributary No. 3 near Cando, ND 05056060	Mauvais Coulee	Lat 48°27'28", long 99°14'06", in NW¼ NW¼, sec.6, Towner County at bridge 2.1 mi south of Cando.	60.2	1955-71	4-03-87 4-07-87 4-09-87 4-15-87 5-05-87 6-10-87 7-30-87	21.1 639. 349. 47.5 2.68 .04 0.0
Sheyenne River	Red River of the North	Lat 46°22'02", long 97°33'47", in NW¼ NW¼ NE¼, sec.2, T.133 N., R.55 W., Ransom County, Hydrologic Unit 09020204, 150 ft upstream from bridge on county road, 7.4 mi southeast of Lisbon at river mi 148.	---	1963	10-21-86 10-22-86 10-22-86	32.1 30.6 30.4
Sheyenne River	Red River of the North	Lat 46°25'40", long 97°29'34", on section line between sec.8 and sec.17, T.134 N., R.54 W., Ransom County, Hydrologic Unit 09020204, at river fiord, 1 mi upstream from State Highway 27 bridge, 9.1 mi east of Lisbon at river mile 135.	---	1963	10-21-86 10-22-86 10-22-86	36.4 35.1 35.3
Sheyenne River	Red River of the North	Lat 46°28'18", long 97°30'03", on section line between sec.29 and sec.32, T.135 N., R.54 W., Ransom County, Hydrologic Unit 09020204, 300 ft downstream from abandoned bridge, 9.4 mi northeast of Lisbon at river mi 132.	---	1963	10-21-86 10-22-86 10-22-86	45.9 40.2 39.9
Sheyenne River	Red River of the North	Lat 46°30'54", long 97°29'23", in SE¼ SE¼ SE¼, sec.8, T.135 N., R.54 W., Ransom County, Hydrologic Unit 09020204, 30 ft upstream from county highway bridge, 5 mi south of Sheldon at river mi 114.	---	1963	10-21-86 10-22-86 10-22-86	39.8 38.6 39.5
Sheyenne River	Red River of the North	Lat 46°30'53", long 97°23'40", in SW¼ SW¼ SE¼, sec.7, T.135 N., R.53 W., Ransom County, Hydrologic Unit 09020203, 30 ft below county highway bridge, 6.7 mi southeast of Sheldon at river mi 114.	---	1963	10-21-86 10-22-86 10-22-86	45.4 47.7 46.9
Unnamed tributary	Sheyenne River	Lat 46°30'52", long 97°20'58", in NE¼ NW¼ NE¼, sec.16, T.135 N., R.52 W., Ransom County, Hydrologic Unit 09020204, at mouth of tributary, 9.4 mi northeast of McLeod.	---	---	10-22-86	.63
Sheyenne River	Red River of the North	Lat 46°31'29", long 97°18'47", in SE¼ NE¼NE¼, sec.11, T.135 N., R.53 W., Ransom County, Hydrologic Unit 09020203, 30 ft upstream from bridge, 9.2 mi southeast of Sheldon at river mi 104.	---	1963	10-21-86 10-22-86 10-22-86	52.8 51.7 54.2
Sheyenne River	Red River of the North	Lat 46°31'50", long 97°15'40", in NE¼ SE¼ SE¼, sec.6, T.135 N., R.52 W., Richland County, Hydrologic Unit 09020203, 500 ft upstream from bridge, 9.2 mi northeast of McLeod at river mi 97.	---	1963	10-21-86	2.43

Discharge measurements made at miscellaneous sites during water year 1986

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements	
					Date	Discharge (ft^3/s)
		RED RIVER OF THE NORTH BASIN--CONTINUED				
Unnamed tributary	Sheyenne River	Lat 46°31'28", long 97°15'25", in NE1/4 SE1/4 NW1/4, sec.8, T.135 N., R.52 W., Richland County Hydrologic Unit 09020203, about 1/4 mi downstream from county highway bridge, 9.3 mi northeast of McLeod.	---	1963	10-21-86	2.43
Sheyenne River	Red River of the North	Lat 46°32'21", long 97°13'06", in NE1/4 SE1/4 NE1/4, sec.4, T.135 N., R.52 W., Richland County, Hydrologic Unit 09020204, at bridge on county road, 13.5 mi west of Walcott at river mi 92.	---	1963	10-21-86 10-22-86 10-22-86	61.9 63.3 64.4
Sheyenne River	Red River of the North	Lat 46°33'25", long 97°08'14", in NE1/4 NE1/4 NE1/4, sec.31, T.136, N., R.51 W., Richland County, Hydrologic Unit 09020204, 100 ft downstream from bridge on State Highway 18, 9.5 mi west of Walcott at river mi 88.	---	1963	10-21-86 10-22-86 10-22-86	68.4 67.9 68.0
Sheyenne River	Red River of the North	Lat 46°34'53", long 97°04'28", in SE1/4 SE1/4 NE1/4, sec.22, T.136, N., R.51 W., Richland County, Hydrologic Unit 09020204, 50 ft downstream from bridge on county road, 6.2 mi northwest of Walcott at river mi 77.	---	1963	10-21-86 10-22-86 10-22-86	78.0 74.4 75.6
Sheyenne River	Red River of the North	Lat 46°36'10", long 97°01'52", in SE1/4 SW1/4 SW1/4, sec.7, T.136, N., R.50 W., Richland County, Hydrologic Unit 09020204, 100 ft downstream from bridge on county highway, 6.0 mi northwest of Walcott at river mi 74.	---	1963	10-21-86 10-22-86 10-22-86	75.4 74.4 74.0
		MISSOURI RIVER BASIN				
Missouri River at Washburn, ND 06341000	Missouri River Mainstem	Lat 47°17'20", long 101°02'15", in SE1/4 SW1/4, sec.14, T.144 N., R.82 W., McLean County, Hydrologic Unit 10130101 at mi 1,355.	184,000	---	9-21-88 9-21-88	[a]18,900 18,300
Missouri River	Missouri River Mainstem	Lat 46°57'19", long 100°54'20", in NE1/4 NE1/4 SW1/4, sec.16, T.140 W., R.81 W., Burleigh County Hydrologic Unit 10130101, 1 mi upstream of Double Ditch Indian Village, 10 mi northwest of Bismarck at mi 1,313.	185,900	---	9-21-87	[a]16,400
Missouri River	Missouri River Mainstem	Lat 46°49'42", long 100°50'30", in NE1/4 NW1/4 SE1/4, sec.25, T.139 W., R.81 W., Morton County Hydrologic Unit, 10130101, .5 mi upstream of U.S. Interstate 94 bridge crossing, 2 mi west of Bismarck at mi 1,306.	186,300	---	9-22-87 9-24-87	[a]18,400 [a]17,900
		JAMES RIVER BASIN				
Pipestem Creek below Pipestem Dam near Jamestown, ND 06469425	James River	Lat 46°57'00", long 98°45'26", on south line sec.9, T.140 N., R.64 W., Stutsman County, below Pipestem Reservoir embankment on county highway, 3 mi northwest of Jamestown.	1,010	1974-76, 1978-79, 1983-84, 1986	5-13-87 8-04-87 8-04-87	134 62.3 130

a - Discharge measurement using moving boat method.

Water-quality partial-record stations are particular sites where chemical-quality, biological and/or sediment data are collected systematically over a period of years for use in hydrologic analyses. These data are collected usually less than quarterly. Samples collected at sites other than gaging stations and partial-record stations to give better areal coverage in a river basin are referred to as miscellaneous sites.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
RED RIVER OF THE NORTH BASIN											
05055500 SHEYENNE RIVER AT SHEYENNE, ND (LAT 47 50 20N LONG 099 07 35W)											
OCT 1986											
15...	1350	7.90	750	8.80	15.5	7.5	--	--	--	--	--
16...	0955	.40	740	8.82	10.5	7.0	--	--	--	--	--
16...	1355	3.50	740	8.81	15.0	7.5	--	--	--	--	--
4751480995754 SHEYENNE RIVER - SITE 4											
OCT 1986											
15...	1540	11.1	715	8.63	15.5	7.0	--	--	--	--	--
16...	1140	9.51	720	8.70	14.0	7.0	--	--	--	--	--
16...	1545	9.55	715	8.62	18.0	8.0	--	--	--	--	--
4750010985530 SHEYENNE RIVER - SITE 4A											
OCT 1986											
16...	0930	11.4	710	8.74	7.0	7.0	--	--	--	--	--
16...	1530	9.70	720	8.75	16.0	8.5	--	--	--	--	--
4747550985323 SHEYENNE RIVER - SITE 5											
OCT 1986											
15...	1705	10.9	720	8.60	16.5	7.0	--	--	--	--	--
16...	1115	11.4	720	8.65	14.0	7.0	--	--	--	--	--
16...	1530	11.3	705	8.66	18.0	8.5	--	--	--	--	--
4746240983318 SHEYENNE RIVER - SITE 9											
OCT 1986											
15...	1615	18.0	702	--	15.0	6.5	--	--	--	--	--
16...	1105	19.1	688	8.21	13.0	7.5	--	--	--	--	--
16...	1530	17.7	682	8.15	13.0	8.0	--	--	--	--	--
05056060 MAUVAIS COULEE TRIB NO. 3 NR CANDO, N. DAK. (LAT 48 27 20N LONG 099 12 40W)											
APR 1987											
03...	1040	21	282	--	6.0	0.5	--	--	--	--	--
07...	1400	640	390	7.22	20.0	10.0	140	30	33	14	8.5
09...	1330	349	358	--	--	11.5	--	--	--	--	--
15...	1445	48	510	--	22.5	13.0	--	--	--	--	--
MAY											
05...	1420	--	--	--	26.0	18.0	--	--	--	--	--
JUN											
10...	1030	0.04	1200	7.85	16.0	17.5	490	240	110	52	55
05056244 ST. JOE COULEE NR WEBSTER, ND (LAT 48 19 23N LONG 099 00 19Z)											
APR 1987											
03...	1530	61	380	--	8.5	1.5	--	--	--	--	--
08...	1355	316	390	8.00	21.0	13.0	150	51	39	13	15
4622020973347 SHEYENNE RIVER - SITE A											
OCT 1986											
21...	1310	32.1	1300	--	--	11.0	--	--	--	--	--
22...	0935	30.6	1030	--	--	11.0	--	--	--	--	--
22...	1230	30.4	1140	--	--	12.0	--	--	--	--	--
4625400972934 SHEYENNE RIVER - SITE C											
OCT 1986											
21...	1425	36.4	1170	--	--	13.0	--	--	--	--	--
22...	1045	35.1	1100	--	--	11.5	--	--	--	--	--
22...	1330	35.3	1120	--	--	13.0	--	--	--	--	--
4728180973003 SHEYENNE RIVER - SITE D											
OCT 1986											
21...	1530	45.9	1070	--	--	13.5	--	--	--	--	--
22...	1125	40.2	1090	--	--	12.0	--	--	--	--	--
22...	1430	39.9	1100	--	--	14.5	--	--	--	--	--

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
RED RIVER OF THE NORTH BASIN											
4630540972923 SHEYENNE RIVER - SITE E											
OCT 1986											
21...	1420	39.8	1030	--	22.0	11.5	--	--	--	--	--
22...	0920	38.6	1030	8.45	13.5	11.0	--	--	--	--	--
22...	1325	39.5	1020	8.46	18.0	12.0	--	--	--	--	--
4630530972340 SHEYENNE RIVER - SITE F											
OCT 1986											
21...	1600	45.4	1000	--	21.0	11.5	--	--	--	--	--
22...	1100	47.7	1010	8.45	15.5	11.0	--	--	--	--	--
22...	1515	46.9	1000	8.57	17.5	12.5	--	--	--	--	--
4630520972058 UNNAMED TRIBUTARY TO SHEYENNE RIVER											
OCT 1986											
22	1550	0.63	500	--	--	14.0	--	--	--	--	--
4631290971847 SHEYENNE RIVER - SITE G											
OCT 1986											
21...	1320	52.8	970	--	19.0	10.5	--	--	--	--	--
22...	0915	51.7	980	8.45	13.0	10.0	--	--	--	--	--
22...	1250	54.2	980	8.51	18.0	11.5	--	--	--	--	--
4631500971540 SHEYENNE RIVER - SITE H											
OCT 1986											
21...	1455	54.5	950	--	21.0	11.0	--	--	--	--	--
22...	1100	55.7	960	8.49	--	--	--	--	--	--	--
22...	1430	55.2	970	8.53	18.5	12.0	--	--	--	--	--
4631280971525 UNNAMED TRIBUTARY TO SHEYENNE RIVER											
OCT 1986											
21...	1615	2.43	600	--	23.0	12.0	--	--	--	--	--
4632210971306 SHEYENNE RIVER - SITE I											
OCT 1986											
21...	1405	61.9	880	7.60	17.0	14.0	--	--	--	--	--
22...	0905	63.3	1120	7.66	10.0	11.0	--	--	--	--	--
22...	1640	64.4	910	7.35	13.0	11.0	--	--	--	--	--
4633250970814 SHEYENNE RIVER - SITE J											
OCT 1986											
21...	1230	68.4	865	7.65	14.0	14.0	--	--	--	--	--
22...	1155	67.9	890	7.90	10.0	11.0	--	--	--	--	--
22...	1445	68.0	890	7.95	11.0	11.0	--	--	--	--	--
4634530970428 SHEYENNE RIVER - SITE L											
OCT 1986											
21...	1350	78.0	900	--	19.0	9.5	--	--	--	--	--
22...	0905	74.4	905	8.02	12.5	9.5	--	--	--	--	--
22...	1315	75.6	900	8.40	18.0	11.0	--	--	--	--	--
05056244 ST. JOE COULEE NR WEBSTER, ND (LAT 48 19 23N LONG 099 00 192)											
APR 1987											
03...	1530	61	380	--	8.5	1.5	--	--	--	--	--
08...	1355	316	390	8.00	21.0	13.0	150	51	39	13	15
05060510 CASS COUNTY DRAIN #52 NEAR AMENIA, ND (LAT 46 58 41N LONG 097 11 52W)											
MAR 1987											
17...	1050	1.7	310	7.10	0.5	0.5	120	25	30	12	9.5
05060550 RUSH RIVER NEAR PROSPER, ND (LAT 46 57 59N LONG 097 03 04W)											
MAR 1987											
26...	1715	288	447	7.80	5.5	1.0	190	68	47	17	11
05060570 LOWER BRANCH RUSH RIVER NEAR PROSPER, ND (LAT 46 56 30N LONG 096 59 18W)											
MAR 1987											
27...	1230	48	492	6.60	0.0	0.5	190	69	46	18	12

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
				RED RIVER OF THE NORTH BASIN--CONTINUED							
		05062200 ELM RIVER NEAR KELSO, N. DAK. (LAT 47 17 30N LONG 97 06 50W)									
MAR 1987 23...	1615	293	392	6.50	5.0	0.5	150	48	36	14	13
		05065500 GOOSE RIVER NEAR PORTLAND, ND (LAT 47 32 20N LONG 97 27 20W)									
NOV 1987 03...	1005	0.24	410	--	-0.5	0.5	--	--	--	--	--
MAR 23...	1335	720	390	8.10	7.0	1.0	160	59	39	15	13
		05083000 TURTLE RIVER AT MANVEL, ND (LAT 48 04 43N LONG 097 11 03W)									
MAR 1987 30...	1635	1140	1030	[a]7.44	6.0	0.5	270	160	68	25	100
		05083500 RED RIVER OF THE NORTH AT OSLO, MN (LAT 48 11 35N LONG 097 08 25W)									
APR 1987 06...	1200	14400	613	8.18	18.0	4.0	260	94	61	27	24
				SOURIS RIVER BASIN							
		05119410 BONNES COULEE NEAR VELVA, ND (LAT 48 03 30N LONG 100 57 00)									
APR 1987 08...	0935	8.0	1430	8.12	14.5	9.0	370	57	79	41	190

DATE	ALDRIN, TOTAL (UG/L) (39330)	CHLOR-DANE, TOTAL (UG/L) (39350)	DDD, TOTAL (UG/L) (39360)	DDE, TOTAL (UG/L) (39365)	DDT, TOTAL (UG/L) (39370)	DI-AZINON, TOTAL (UG/L) (39570)	DICAMBA (MED-IBEN) (BAN-VEL D) TOTAL (UG/L) (82052)	DI-ELDRIN TOTAL (UG/L) (39380)	ENDO-SULFAN, TOTAL (UG/L) (39388)	ENDRIN, TOTAL (UG/L) (39390)
	481229101171900 PUPPY DOG CREEK AT MINOT, ND (LAT 48 12 29N LONG 101 17 19W)									
AUG 1987 05...	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01	0.20	<0.010	<0.010	<0.010

DATE	ETHION, TOTAL (UG/L) (39398)	HEPTA-CHLOR, TOTAL (UG/L) (39410)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L) (39420)	LINDANE TOTAL (UG/L) (39340)	MALA-THION, TOTAL (UG/L) (39530)	METH-OXY-CHLOR, TOTAL (UG/L) (39480)	METHYL PARA-THION, TOTAL (UG/L) (39600)	MIREX, TOTAL (UG/L) (39755)	METHYL TRI-THION, TOTAL (UG/L) (39790)	NAPH-THA-LENES, POLY-CHLOR. TOTAL (UG/L) (39250)
	481229101171900 PUPPY DOG CREEK AT MINOT, ND (LAT 48 12 29N LONG 101 17 19W)									
AUG 1987 05...	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01	<0.01	<0.10

DATE	PARA-THION, TOTAL (UG/L) (39540)	PCB, TOTAL (UG/L) (39516)	PER-THANE TOTAL (UG/L) (39034)	PICLO-RAM (TOR-DON) (AMDON) TOTAL (UG/L) (39720)	2,4-D, TOTAL (UG/L) (39730)	2, 4-DP TOTAL (UG/L) (82183)	2,4,5-T TOTAL (UG/L) (39740)	SILVEX, TOTAL (UG/L) (39760)	TOX-APHENE, TOTAL (UG/L) (39400)	TOTAL TRI-THION (UG/L) (39786)
	481229101171900 PUPPY DOG CREEK AT MINOT, ND (LAT 48 12 29N LONG 101 17 19W)									
AUG 1987 05...	<0.01	<0.1	<0.1	<0.01	0.07	<0.01	<0.01	<0.01	<1	<0.01

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	PERCENT SODIUM (00932)	SODIUM ADSORPTION RATIO (00931)	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	ALKALINITY LAB (MG/L AS CACO3) (90410)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301)	SOLIDS, DISSOLVED (TONS PER AC-FT) (70303)
RED RIVER OF THE NORTH BASIN											
05056060 MAUVAIS COULEE TRIB NO. 3 NR CANDO, N. DAK. (LAT 48 27 20N LONG 099 12 40W)											
APR 1987											
03...	--	--	--	--	--	--	--	--	--	--	--
07...	11	0.3	8.0	110	62	10	0.10	15	189	210	0.26
09...	--	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--	--
MAY											
05...	--	--	--	--	--	--	--	--	--	--	--
JUN											
10...	19	1	15	250	330	29	0.20	6.1	780	750	1.1
05056244 ST. JOE COULEE NR WEBSTER, ND (LAT 48 19 23N LONG 099 00 192)											
APR 1987											
08...	17	0.5	9.5	100	91	11	0.10	20	234	260	0.32
05060510 CASS COUNTY DRAIN #52 NEAR AMENIA, ND (LAT 46 58 41N LONG 097 11 52W)											
MAR 1987											
17...	13	0.4	11	100	29	11	0.10	17	190	180	0.26
05060550 RUSH RIVER NEAR PROSPER, ND (LAT 46 57 59N LONG 097 03 04W)											
MAR 1987											
26...	11	0.4	12	120	90	13	0.20	18	312	280	0.42
05060570 LOWER BRANCH RUSH RIVER NEAR PROSPER, ND (LAT 46 56 30N LONG 096 59 18W)											
MAR 1987											
27...	11	0.4	11	120	63	11	0.10	22	276	260	0.38
05062200 ELM RIVER NEAR KELSO, N. DAK. (LAT 47 17 30N LONG 97 06 50W)											
MAR 1987											
23...	15	0.5	12	100	70	11	0.10	16	231	230	0.31
05065500 GOOSE RIVER NEAR PORTLAND, N. DAK. (LAT 47 32 20N LONG 97 27 20W)											
MAR 1987											
23...	14	0.5	9.2	100	85	10	0.10	13	233	240	0.32
05083000 TURTLE RIVER AT MANVEL, N. DAK. (LAT 48 04 43N LONG 097 11 03W)											
MAR 1987											
30...	43	3	10	110	180	140	0.20	16	606	610	0.82
05083500 RED RIVER OF THE NORTH AT OSLO, MN (LAT 48 11 35N LONG 097 08 25W)											
APR											
06...	16	0.7	8.0	170	120	19	0.20	16	407	380	0.55
SOURIS RIVER BASIN											
05119410 BONNES COULEE NEAR VELVA, N. DAK. (LAT 48 03 30N LONG 100 57 00)											
APR											
08...	52	4	11	310	480	12	0.10	15	1010	1000	1.4

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
RED RIVER OF THE NORTH BASIN										
05056060 MAUVAIS COULEE TRIB NO. 3 NR CANDO, N. DAK. (LAT 48 27 20N LONG 099 12 40W)										
APR 1987 07...	2	100	50	0	14	10	0.3	0	0	210
JUN 10...	6	70	30	0	59	10	--	0	0	580
05056244 ST. JOE COULEE NR WEBSTER, ND (LAT 48 19 23N LONG 099 00 192)										
APR 1987 08...	5	100	40	<1	16	10	0.3	<1	<1	110
05060510 CASS COUNTY DRAIN #52 NEAR AMENIA, ND (LAT 46 58 41N LONG 097 11 52W)										
MAR 1987 17...	5	30	60	<1	13	20	0.2	1	<1	160
05060550 RUSH RIVER NEAR PROSPER, ND (LAT 46 57 59N LONG 097 03 04W)										
MAR 1987 26...	4	60	130	<1	23	120	0.4	1	1	270
05060570 LOWER BRANCH RUSH RIVER NEAR PROSPER, ND (LAT 46 56 30N LONG 096 59 18W)										
MAR 1987 27...	7	20	50	<1	24	10	0.6	1	<1	210
05062200 ELM RIVER NEAR KELSO, ND (LAT 47 17 30N LONG 97 06 50W)										
MAR 1987 23...	3	30	150	<1	21	150	0.3	1	<1	210
05065500 GOOSE RIVER NEAR PORTLAND, N. DAK. (LAT 47 32 20N LONG 97 27 20W)										
MAR 1987 23...	2	50	140	<1	17	270	0.5	<1	1	220
05083000 TURTLE RIVER AT MANVEL, N. DAK. (LAT 48 04 43N LONG 097 11 03W)										
MAR 1987 30...	3	120	80	1	51	100	0.3	<1	<1	610
05083500 RED RIVER OF THE NORTH AT OSLO, MN (LAT 48 11 35N LONG 097 08 25W)										
APR 06...	3	50	30	<1	28	10	<1	<1	<1	240
SOURIS RIVER BASIN										
05119410 BONNES COULEE NEAR VELVA, N. DAK. (LAT 48 03 30N LONG 100 57 00)										
APR 08...	1	2700	340	<1	85	110	0.4	1	1	710

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
KNIFE RIVER BASIN											
06339490 ELM CREEK NR GOLDEN VALLEY, ND (LAT 47 06 25N LONG 102 03 05W)											
MAR 1987											
05...	1320	159	910	7.56	15.0	1.0	130	14	22	19	130
06340200 WEST BRANCH OTTER CREEK NR BEULAH, ND (LAT 47 08 05N LONG 101 39 35W)											
FEB 1987											
12...	1111	13	970	--	0.0	0.0	--	--	--	--	--
MAR											
05...	0941	38	1500	8.11	10.0	0.0	360	97	62	49	210
HEART RIVER BASIN											
06343000 HEART RIVER NR SOUTH HEART, ND (LAT 46 51 56N LONG 102 56 53W)											
MAR 1987											
05...	1115	24	2380	8.00	20.0	0.5	460	120	76	66	410
APR											
04...	1550	1270	415	--	14.0	6.0	--	--	--	--	--

DATE	PERCENT SODIUM (00932)	SODIUM AD-SORP-TION RATIO (00931)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER AC-FT) (70303)
KNIFE RIVER BASIN											
06339490 ELM CREEK NR GOLDEN VALLEY, ND (LAT 47 06 25N LONG 102 03 05W)											
MAR											
05...	66	5	11	120	310	4.4	0.10	5.1	570	570	0.78
06340200 WEST BRANCH OTTER CREEK NR BEULAH, ND (LAT 47 08 05N LONG 101 39 35W)											
MAR											
05...	55	5	11	260	520	6.9	0.10	12	1060	1000	1.4
HEART RIVER BASIN											
06343000 HEART RIVER NR SOUTH HEART, ND (LAT 46 51 56N LONG 102 56 53W)											
MAR											
05...	65	8	11	340	970	14	0.30	10	1810	1800	2.5

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
KNIFE RIVER BASIN										
06339490 ELM CREEK NR GOLDEN VALLEY, ND (LAT 47 06 25N LONG 102 03 05W)										
MAR										
05...	<1	90	210	<1	15	200	0.1	<1	<1	340
06340200 WEST BRANCH OTTER CREEK NR BEULAH, ND (LAT 47 08 05N LONG 101 39 35W)										
MAR										
05...	0	150	160	0	37	350	0.2	0	1	800
HEART RIVER BASIN										
06343000 HEART RIVER NR SOUTH HEART, ND (LAT 46 51 56N LONG 102 56 53W)										
MAR										
05...	1	350	50	<1	35	390	0.2	<1	2	850

GROUND-WATER LEVELS

BENSON COUNTY

480228098482501. Local number, 153-063-30CBC.
LOCATION.--Lat 48°02'28", long 098°48'25", Hydrologic Unit 09020201.
Owner: North Dakota State Water Commission.
AQUIFER.--Spiritwood.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 200 ft, cased to 137 ft, plastic pipe, No. 18 slot screen set 137 to 143 ft below land-surface datum.
INSTRUMENTATION.--Measured quarterly using a steel tape.
DATUM.--Altitude of land-surface datum is 1,445 ft. Measuring point: Top of casing 2.00 ft above land-surface datum.
PERIOD OF RECORD.--June 1970 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 13.32 ft below land-surface datum, June 15, 1987; lowest measured, 22.30 ft below land-surface datum, Mar. 3, 1971.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 2	14.29	MAY 7	13.34	JUNE 15	13.32	SEPT 8	13.63

BENSON COUNTY

480958099154801. Local number, 154-067-15BBB.
LOCATION.--Lat 48°09'58", long 099°15'48", Hydrologic Unit 09020201.
Owner: North Dakota State Water Commission.
AQUIFER.--Spiritwood.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 180 ft, cased to 147 ft, plastic pipe, No. 18 slot screen set 147 to 153 ft below land-surface datum.
INSTRUMENTATION.--Measured quarterly using a steel tape.
DATUM.--Altitude of land-surface datum is 1,475 ft. Measuring point: Top of casing 2.00 ft above land-surface datum.
PERIOD OF RECORD.--June 1970 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 30.19 ft below land-surface datum, May 26, 1983; lowest measured, 33.80 ft below land-surface datum, Mar. 15, 1978.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 19	30.69	MAY 11	30.20	JUNE 16	30.24	AUG 12	30.52

BENSON COUNTY

481041099442701. Local number, 154-071-11AAD1.
LOCATION.--Lat 48°10'41", long 099°44'27", Hydrologic Unit 09020202.
Owner: North Dakota State Water Commission.
AQUIFER.--Fox Hills Sandstone.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 100 ft, cased to 42 ft, plastic pipe, No. 12 slot screen set 42 to 45 ft below land-surface datum.
INSTRUMENTATION.--Measured quarterly using a steel tape.
DATUM.--Altitude of land-surface datum is 1,590 ft. Measuring point: Top of casing 2.0 ft (0.61 m) above land-surface datum.
PERIOD OF RECORD.--August 1968 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.41 ft below land-surface datum, July 12, 1982; lowest measured, 9.05 ft below land-surface datum, Mar. 13, 1978.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 19	8.59	MAY 12	7.29	JUNE 16	7.52	AUG 12	7.20

BOWMAN COUNTY

461534103491701. Local number, 132-105-16BDB.
LOCATION.--Lat 46°15'34", long 103°49'17", Hydrologic Unit 10110203.
Owner: North Dakota State Water Commission.
AQUIFER.--Hell Creek-Fox Hills Sandstone.
WELL CHARACTERISTICS.--Drilled observation well, diameter 2 in, depth 475 ft, cased to 441 ft, steel pipe, No. 12 slot screen set 441 to 459 ft below land-surface datum.
INSTRUMENTATION.--Measured annually, during late November or early December, using a steel tape.
DATUM.--Altitude of land-surface datum is 3,010 ft. Measuring point: Top of casing 3.40 ft above land-surface datum.
PERIOD OF RECORD.--September 1971 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 270.15 ft below land-surface datum, Feb. 25, 1973; lowest measured, 272.07 ft below land-surface datum, Sept. 11, 1985.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL
NOV 25	271.88

BURLEIGH COUNTY

464943100305801. Local number, 139-078-27CBB.
LOCATION.--Lat 46°49'43", long 100°30'58", Hydrologic Unit 10130103.
Owner: North Dakota State Water Commission.
AQUIFER.--McKenzie.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 255 ft, cased to 200 ft, plastic pipe, slotted 200 to 220 ft below land-surface datum, gravel packed.
INSTRUMENTATION.--Measured on a six-week schedule, except during the winter, using a steel tape.
DATUM.--Altitude of land-surface datum is 1,713. Measuring point: Top of casing 1.90 ft above land-surface datum.
PERIOD OF RECORD.--August 1962 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 21.73 ft below land-surface datum, June 5, 1987; lowest measured, 32.44 ft below land-surface datum, Aug. 26, 1977.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 16	23.23	MAR 6	22.84	JUNE 5	21.73	AUG 3	22.33
NOV 6	23.20	APR 3	22.01	JULY 2	22.31	SEPT 4	22.65
DEC 4	23.09	MAY 6	22.03				

CASS COUNTY

464359096541301. Local number, 138-049-29CCC.
LOCATION.--Lat 46°43'59", long 096°54'13", Hydrologic Unit 09020105.
Owner: North Dakota State Water Commission.
AQUIFER.--West Fargo.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 317 ft, cased to 278 ft, plastic pipe, screens set at 278 to 280 ft below land-surface datum.
INSTRUMENTATION.--Measured monthly using a steel tape.
COOPERATION.--Record provided by the North Dakota State Water Commission since 1983.
DATUM.--Altitude of land-surface datum is 912 ft. Measuring point: Top of casing 1.80 ft above land-surface datum.
PERIOD OF RECORD.--August 1964 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 33.90 ft below land-surface datum, Oct. 1, 1964, lowest measured, 58.00 ft below land-surface datum, Aug. 30, 1986.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	58.14	APR 25	58.45	JUNE 27	58.97	AUG 29	68.46
NOV 30	58.25	MAY 30	59.40	JULY 31	59.55	SEPT 26	60.97
DEC 6	60.00						

DIVIDE COUNTY

485649103155701. Local number, 163-097-15BCC.
LOCATION.--Lat 48°56'49", long 103°15'57", Hydrologic Unit 09010001.
Owner: North Dakota State Water Commission.
AQUIFER.--Yellowstone.
WELL CHARACTERISTICS.--Drilled observation well, diameter 2 in, depth 575 ft, cased to 546 ft, steel pipe, No. 12 slot screen set 546 to 558 ft below land-surface datum.
INSTRUMENTATION.--Measured quarterly using a steel tape.
DATUM.--Altitude of land-surface datum is 1,915 ft. Measuring point: Top of casing 1.50 ft above land-surface datum.
PERIOD OF RECORD.--January 1973 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 10.31 ft below land-surface datum, June 5, 1979; lowest measured, 14.04 ft below land-surface datum, Aug. 19, 1987.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 20	13.75	FEB 11	13.39	JULY 14	13.93	AUG 19	14.04
NOV 18	13.57	MAY 5	13.74				

DUNN COUNTY

471323102290101. Local number, 143-093-09BCB.
LOCATION.--Lat 47°13'23", long 102°29'01", Hydrologic Unit 10130201.
Owner: North Dakota State Water Commission.
AQUIFER.--Sentinel Butte.
WELL CHARACTERISTICS.--Drilled observation well, diameter 2 in, depth 965 ft, cased to 378 ft, steel pipe, No. 12 slot screen set 378 to 396 ft below land-surface datum.
INSTRUMENTATION.--Measured quarterly using a steel tape.
DATUM.--Altitude of land-surface datum is 2,133 ft. Measuring point: Top of casing 2.10 ft above land-surface datum.
PERIOD OF RECORD.--February 1974 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 92.12 ft below land-surface datum, June 7, 1984; lowest measured, 93.79 ft below land-surface datum, June 22, 1981.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 14	93.04	MAY 14	93.07	AUG 19	93.02	AUG 27	93.27
FEB 17	92.96						

EDDY COUNTY

473720098592401. Local number, 148-065-19DAA.
LOCATION.--Lat 47°37'20", long 098°59'24", Hydrologic Unit 10160001.
Owner: North Dakota State Water Commission.
AQUIFER.--New Rockford.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 242 ft, cased to 220 ft, plastic pipe, slotted from 210 to 220 ft below land-surface datum.
INSTRUMENTATION.--Measured on a six-week schedule, except during the winter, using a steel tape.
DATUM.--Altitude of land-surface datum is 1,526 ft. Measuring point: Top of casing 1.90 ft above land-surface datum.
PERIOD OF RECORD.--September 1964 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 43.40 ft below land-surface datum, Sept. 6, 1983; lowest measured, 50.49 ft below land-surface datum, Sept. 6, 1978.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 8	45.48	MAY 11	44.09	AUG 24	45.14	SEPT 30	44.95
DEC 2	45.80	JULY 6	44.97				

EMMONS COUNTY

463632100171901. Local number, 136-076-07CBC.
LOCATION.--Lat 46°36'32", long 100°17'19", Hydrologic Unit 10130103.
Owner: North Dakota State Water Commission.
AQUIFER.--Long Lake.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 150 ft, cased to 117 ft, plastic pipe, No. 12 slot screen set at 117 to 123 ft below land-surface datum.
INSTRUMENTATION.--Measured quarterly using a steel tape.
DATUM.--Altitude of land-surface datum is 1,735 ft. Measuring point: Top of casing 2.00 ft above land-surface datum.
PERIOD OF RECORD.--November 1972 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.40 ft below land-surface datum, Dec. 10, 1986; lowest measured, 8.32 ft below land-surface datum, Sept. 1, 1977.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 10	0.40	APR 17	0.87	JULY 13	0.94	SEPT 15	2.29

GRAND FORKS COUNTY

474957097343501. Local number, 150-054-04CCD.
LOCATION.--Lat 47°49'57", long 097°34'35", Hydrologic Unit 09020307.
Owner: North Dakota State Water Commission.
AQUIFER.--Elk Valley.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 126 ft, cased to 40 ft, plastic pipe, No. 12 slot screen set 40 to 43 ft below land-surface datum.
INSTRUMENTATION.--Measured quarterly using a steel tape.
DATUM.--Altitude of land-surface datum is 1,127 ft. Measuring point: Top of casing 1.80 ft, above land-surface datum.
PERIOD OF RECORD.--September 1965 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.97 ft below land-surface datum, July 23, 1987; lowest measured, 7.96 ft below land-surface datum, Mar. 7, 1977.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 3	4.65	MAY 11	2.48	JULY 23	0.97	AUG 31	1.95
NOV 14	4.55						

GRIGGS COUNTY

471612098113101. Local number, 144-059-20CCC.
LOCATION.--Lat 47°16'12", long 098°11'31", Hydrologic Unit 09020203.
Owner: North Dakota State Water Commission.
AQUIFER.--Spiritwood.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 240 ft, cased to 158 ft, plastic pipe, No. 25 slot screen set 158 to 161 ft below land-surface datum.
INSTRUMENTATION.--Measured quarterly using a steel tape.
COOPERATION.--Record provided by the North Dakota State Water Commission since 1975.
DATUM.--Altitude of land-surface datum is 1,430 ft. Measuring point: Top of casing 2.0 ft above land-surface datum.
PERIOD OF RECORD.--September 1971 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 45.84 ft below land-surface datum, Apr. 5, 1977; lowest measured, 86.99 ft below land-surface datum, Aug. 10, 1976.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 9	51.38	APR 29	50.13	JULY 8	65.06	SEPT 9	65.12

GRIGGS COUNTY

473425098232901. Local number, 147-061-01CCC.
LOCATION.--Lat 47°34'25", long 098°23'29", Hydrologic Unit 09020203.
Owner: North Dakota State Water Commission.
AQUIFER.--Spiritwood.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 340 ft, cased to 237 ft, plastic pipe, No. 25 slot screen set 237 to 240 ft below land-surface datum.
INSTRUMENTATION.--Measured monthly except during the winter, using a steel tape.
COOPERATION.--Record provided by the North Dakota State Water Commission since 1977.
DATUM.--Altitude of land-surface datum is 1,525 ft. Measuring point: Top of casing 2.00 ft above land-surface datum.
PERIOD OF RECORD.--September 1971 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 26.17 ft below land-surface datum, Apr 29, 1987; lowest measured, 96.10 ft below land-surface datum, Aug. 12, 1975.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 10	26.93	APR 29	26.17	JULY 8	39.66	SEPT 9	27.53

GRIGGS COUNTY

473600098065901. Local number, 148-059-36AAB.
LOCATION.--Lat 47°36'00", long 098°06'59", Hydrologic Unit 09020203.
Owner: North Dakota State Water Commission.
AQUIFER.--McVille.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 180 ft, cased to 137 ft, plastic pipe, No. 12 slot screen set 137 to 143 ft below land-surface datum.
INSTRUMENTATION.--Measured quarterly using a steel tape.
COOPERATION.--Record provided by the North Dakota State Water Commission since 1984.
DATUM.--Altitude of land-surface datum is 1,320 ft. Measuring point: Top of casing 2.00 ft above land-surface datum.
PERIOD OF RECORD.--October 1971 to December 1982, April 1985 to present.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, +0.77 ft above land-surface datum, Sept. 11, 1986; lowest 12.09 ft below land-surface datum, Aug. 9, 1978.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 9	1.83	APR 30	1.22	JULY 8	0.08	SEPT 9	0.88

HETTINGER COUNTY

463153102521001. Local number, 135-097-04DCA.
LOCATION.--Lat 46°31'53", long 102°52'10", Hydrologic Unit 10130204.
Owner: North Dakota State Water Commission.
AQUIFER.--Fox Hills Sandstone.
WELL CHARACTERISTICS.--Drilled observation well, diameter 4 in, depth 1,790 ft, cased to 1,320 ft, steel pipe, open hole.
INSTRUMENTATION.--Measured quarterly using a steel tape. Water-level recorder prior to May 1974.
DATUM.--Altitude of land-surface datum is 2,567 ft. Measuring point: Top of casing 0.70 ft above land-surface datum.
PERIOD OF RECORD.--September 1968 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 142.02 ft below land-surface datum, Dec. 19, 1968; lowest measured, 145.91 ft below land-surface datum, Sept. 19, 1968 (first measurement on well may be as much as 1.5 ft low due to slow recovery of well.)

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 24	143.04	MAR 10	143.21	JUNE 12	143.23	SEPT 4	143.35

KIDDER COUNTY

470638099324301. Local number, 142-070-16DDD.
LOCATION.--Lat 47°06'38", long 099°32'43", Hydrologic Unit 10130103.
Owner: North Dakota State Water Commission.
AQUIFER.--Long Lake.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 84 ft, cased to 70 ft, plastic pipe, No. 18 slot screen set 70 to 73 ft below land-surface datum.
INSTRUMENTATION.--Measured monthly, except during the winter, using a steel tape.
COOPERATION.--Record provided by the North Dakota State Water Commission since 1979.
DATUM.--Altitude of land-surface datum is 1,810 ft. Measuring point: Top of casing 1.90 ft above land-surface datum.
PERIOD OF RECORD.--November 1965 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 19.94 ft below land-surface datum, Dec. 4, 1976; lowest measured, 26.03 ft below land-surface datum, Aug. 27, 1982.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 15	21.71	APR 15	20.12	JUNE 12	19.96	AUG 17	20.69
NOV 28	21.42	MAY 14	20.08	JULY 16	20.09	SEPT 19	20.17

MC LEAN COUNTY

473752101055301. Local number, 148-082-23BBB.
LOCATION.--Lat 47°37'52", long 101°05'53", Hydrologic Unit 10130101.
Owner: North Dakota State Water Commission.
AQUIFER.--Lake Nettie.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 300 ft, cased to 198 ft, plastic pipe, No. 24 slot screen set 198 to 204 ft below land-surface datum.
INSTRUMENTATION.--Measured monthly, except during the winter, using a steel tape.
COOPERATION.--Record provided by the North Dakota State Water Commission since December 1984.
DATUM.--Altitude of land-surface datum is 1,880 ft. Measuring point: Top of casing 2.30 ft above land-surface datum.
PERIOD OF RECORD.--December 1969 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 36.21 ft below land-surface datum, July 31, 1987, and June 27, 1984; lowest measured, 42.30 ft below land-surface datum, Dec. 2, 1970.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	36.84	JULY 10	36.46	AUG 10	36.30	SEPT 9	36.41
21	36.74	13	36.42	12	36.36	11	36.43
DEC 3	36.67	15	36.41	19	36.30	14	36.44
APR 15	36.57	17	36.42	21	36.33	16	36.45
MAY 19	36.32	20	36.31	26	36.30	18	36.48
JUNE 26	37.37	24	36.23	28	36.30	21	36.54
JULY 1	36.38	27	36.24	31	36.34	23	36.53
3	36.44	31	36.21	SEPT 2	36.34	25	36.69
6	36.45	AUG 5	36.23	4	36.38	29	36.74
8	36.51	7	36.31	7	36.41		

OLIVER COUNTY

470642101162701. Local number, 142-084-24BBA.
LOCATION.--Lat 47°06'42", long 101°16'27", Hydrologic Unit 10130101.
Owner: North Dakota State Water Commission.
AQUIFER.--Fox Hills Sandstone.
WELL CHARACTERISTICS.--Drilled observation well, diameter 4 in, depth 1,295 ft, cased to 966 ft, steel pipe, open ended.
INSTRUMENTATION.--Measured quarterly using a steel tape.
DATUM.--Altitude of land-surface datum is 2,006 ft. Measuring point: Top of casing 2.00 ft above land-surface datum.
PERIOD OF RECORD.--January 1968 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 197.04 ft below land-surface datum, Dec. 8, 1972; lowest measured, 201.85 ft below land-surface datum, Aug. 6, 1987.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 24	199.00	MAY 7	200.02	AUG 6	201.85

PEMBINA COUNTY

485239097501702. Local number, 162-056-01CCC2.
LOCATION.--Lat 48°52'39", long 097°50'17", Hydrologic Unit 09020313.
Owner: North Dakota State Water Commission.
AQUIFER.--Icelandic.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 40 ft, cased to 37 ft, plastic pipe, No. 12 slot screen set 37 to 40 ft below land-surface datum.
INSTRUMENTATION.--Measured quarterly using a steel tape.
DATUM.--Altitude of land-surface datum is 988 ft. Measuring point: Top of casing 1.8 ft above land-surface datum.
PERIOD OF RECORD.--October 1969 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.65 ft below land-surface datum, May 21, 1970; lowest measured, 8.10 ft below land-surface datum, Mar. 8, 1985.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 8	6.43	MAR 25	5.79	AUG 5	6.97	SEPT 1	7.51
NOV 19	6.47	MAR 27	5.49				

PIERCE COUNTY

475323100092101. Local number, 151-074-20AAA.
LOCATION.--Lat 47°53'23", long 100°09'21", Hydrologic Unit 09020202.
Owner: North Dakota State Water Commission.
AQUIFER.--New Rockford.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 320 ft, cased to 256 ft, plastic pipe, No. 18 slot screen set 256 to 259 ft below land-surface datum.
INSTRUMENTATION.-- Measured quarterly using a steel tape.
DATUM.--Altitude of land-surface datum is 1,605 ft. Measuring point: Top of casing 2.00 ft above land-surface datum.
PERIOD OF RECORD.--November 1968 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 28.08 ft below land-surface datum, Nov. 29, 1976; lowest measured, 31.87 ft below land-surface datum, Aug. 24, 1987.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 20	31.06	MAY 11	31.04	AUG 24	31.87	SEPT 30	31.85

RICHLAND COUNTY

462633097163402. Local number, 134-052-06CCD2.
LOCATION.--Lat 46°26'33", long 097°16'34", Hydrologic Unit 09020204.
Owner: North Dakota State Water Commission.
AQUIFER.--Sheyenne Delta.
WELL CHARACTERISTICS.--Drilled observation well, diameter 4 in, depth 40 ft, cased to 30 ft, plastic pipe, slotted 30 to 40 ft below land-surface datum.
INSTRUMENTATION.--Water level recorder October 1965 to current year. Prior to February 1972 only 5-day low and EOM water levels are available.
DATUM.--Altitude of land-surface datum is 1,067 ft. Measuring point: Top of casing 0.65 ft above land-surface datum.
REMARKS.--Key well reported in monthly Water Resources Review.
PERIOD OF RECORD.--September 1963 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest recorded water level, 0.78 ft below land-surface datum, May 13, 1972; lowest recorded, 8.73 ft below land-surface datum, Feb. 8, 1977. May have been lower during period of missing record, Jan. 17 to Feb. 7, 1977.

DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MAXIMUM VALUES (DAILY-LOW WATER-LEVEL)

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	4.63	5.06	5.09	6.04	6.41	6.05	3.94	5.14	5.63	6.93	7.58	8.16
10	4.76	4.78	5.42	6.09	6.31	5.41	3.62	5.50	5.94	7.12	7.71	8.21
15	4.91	5.00	5.74	6.15	6.24	5.27	3.57	5.83	6.33	7.10	7.82	8.23
20	4.99	5.13	5.81	6.34	6.33	5.02	4.11	5.53	6.48	7.23	7.93	8.23
25	5.04	4.95	5.89	6.51	6.26	4.37	4.42	4.77	6.72	7.31	8.01	8.27
EOM	5.15	4.66	5.98	6.48	6.15	4.01	4.75	5.00	6.91	7.51	8.08	8.27

WATER YEAR 1987 HIGHEST WATER LEVEL 3.41 APRIL 13 LOWEST WATER LEVEL 8.29 SEPTEMBER 27

STARK COUNTY

465755102410701. Local number, 140-095-08AAA.
LOCATION.--Lat 46°57'55", long 102°41'07", Hydrologic Unit 10130204.
Owner: North Dakota State Water Commission.
AQUIFER.--Sentinel Butte.
WELL CHARACTERISTICS.--Drilled observation well, diameter 4 in, depth 160 ft, cased to 80 ft, plastic pipe, open ended.
INSTRUMENTATION.--Measured monthly using a steel tape.
DATUM.--Altitude of land-surface datum is 2,419 ft. Measuring point: Top of casing 1.70 ft above land-surface datum.
REMARKS.--Key well reported in monthly Water Resources Review.
PERIOD OF RECORD.--December 1968 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 15.61 ft below land-surface datum, June 19, 1970; lowest measured, 20.41 ft below land-surface datum, Mar. 21, 1969. During well construction a measurement of 27.23 ft below land-surface datum was made (12-10-68), but was not considered to be the result of natural conditions.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 20	16.66	FEB 17	16.65	MAY 21	16.91	AUG 21	17.64
NOV 21	16.55	MAR 19	16.65	JUNE 19	17.26	SEPT 18	17.82
DEC 19	16.61	APR 20	16.32	JULY 20	17.76	SEPT 24	17.83
JAN 20	16.86						

STEELE COUNTY

471601097371001. Local number, 144-055-26BBB.
LOCATION.--Lat 47°16'01", long 097°37'10", Hydrologic Unit 09020109.
Owner: North Dakota State Water Commission.
AQUIFER.--Galesburg.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 300 ft, cased to 53 ft, plastic pipe, slotted 53 to 68 ft below land-surface datum.
INSTRUMENTATION.--Measured monthly, except during the winter, using a steel tape.
COOPERATION.--Record provided by the North Dakota State Water Commission since 1982.
DATUM.--Altitude of land-surface datum is 1,160 ft. Measuring point: Top of casing 2.00 ft above land-surface datum.
PERIOD OF RECORD.--June 1970 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 16.20 ft below land-surface datum, Apr. 23, 1984; lowest measured, 24.33 ft below land-surface datum, Aug. 6, 1980.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 26	19.92	APR 18	19.31	JUNE 13	18.96	AUG 9	19.95
NOV 23	20.03	MAY 17	20.89	JULY 12	21.44	SEPT 5	19.76

STUTSMAN COUNTY

463846098274101. Local number, 137-062-26DDD.
LOCATION.--Lat 46°38'46", long 098°27'41", Hydrologic Unit 10160003.
Owner: North Dakota State Water Commission.
AQUIFER.--Spiritwood.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 240 ft, cased to 157 ft, plastic pipe, No. 12 slot screen set 157 to 163 ft below land-surface datum.
INSTRUMENTATION.--Measured monthly, except during the winter, using a steel tape.
COOPERATION.--Record provided by the North Dakota State Water Commission since 1982.
DATUM.--Altitude of land-surface datum is 1,455 ft. Measuring point: Top of casing 1.80 ft above land-surface datum.
PERIOD OF RECORD.--September 1970 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 15.20 ft below land-surface datum, Sept. 6, 1979; lowest measured, 20.67 ft below land-surface datum, May 28, 1973.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 2	17.77	APR 23	16.90	JULY 1	15.81	AUG 5	15.76
NOV 6	17.45	MAY 28	15.97	JULY 23	15.75	SEPT 3	15.63
DEC 4	17.49						

TRAILL COUNTY

473228097051501. Local number, 147-051-22BBB.
LOCATION.--Lat 47°32'28", long 097°05'15", Hydrologic Unit 09020301.
Owner: North Dakota State Water Commission.
AQUIFER.--Hillsboro.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 103 ft, cased to 97 ft, plastic pipe, No. 18 slot screen set 97 to 100 ft below land-surface datum.
INSTRUMENTATION.--Measured quarterly using a steel tape.
DATUM.--Altitude of land-surface datum is 925 ft. Measuring point: Top of casing 2.40 ft above land-surface datum.
PERIOD OF RECORD.--August 1965 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, +1.90 ft above land-surface datum, July 4, 1979; lowest measured, 7.27 ft below land-surface datum, Aug. 17, 1965.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 24	0.14	JULY 10	0.15	SEPT 15	1.36

WALSH COUNTY

481657097473601. Local number, 156-056-36CCC1.
LOCATION.--Lat 48°16'57", long 097°47'36", Hydrologic Unit 09020308.
Owner: North Dakota State Water Commission.
AQUIFER.--Fordville.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 280 ft, cased to 27 ft, plastic pipe, No. 18 slot screen set 27 to 30 ft below land-surface datum.
INSTRUMENTATION.--Measured quarterly using a steel tape.
DATUM.--Altitude of land-surface datum is 1,145 ft. Measuring point: Top of casing 1.85 ft above land-surface datum.
PERIOD OF RECORD.--May 1968 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.98 ft below land-surface datum, June 3, 1987; lowest measured, 6.98 ft below land-surface datum, Mar. 11, 1985.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 3	6.04	JUNE 3	4.98	AUG 6	5.71	SEPT 1	5.60
NOV 14	6.01						

WALSH COUNTY

482408097443201. Local number, 157-055-21DBC.
LOCATION.--Lat 48°24'08", long 097°44'32", Hydrologic Unit 09020301.
Owner: North Dakota State Water Commission.
AQUIFER.--Dakota Formation.
WELL CHARACTERISTICS.--Drilled observation well, diameter 4 in, depth 496 ft, cased to 491 ft, steel pipe, screen set 491 to 496 ft below land-surface datum.
INSTRUMENTATION.--Measured quarterly using a steel tape.
DATUM.--Altitude of land-surface datum is 975 ft. Measuring point: Top of casing at land-surface datum.
PERIOD OF RECORD.--May 1968 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 88.84 ft below land-surface datum, Mar. 9, 1982; lowest measured, 92.75 ft below land-surface datum, Sept. 17, 1974.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 9	90.96	MAR 25	90.65	JUNE 1	90.73	SEPT 1	91.08
NOV 20	90.78						

WALSH COUNTY

482449098095801. Local number, 157-058-18DDD.
LOCATION.--Lat 48°24'49", long 098°09'58", Hydrologic Unit 09020308.
Owner: North Dakota State Water Commission.
AQUIFER.--Pierre Shale.
WELL CHARACTERISTICS.--Drilled observation well, diameter 4 in, depth 140 ft, cased to 80 ft, plastic pipe, slotted screen set 80 to 100 ft below land-surface datum.
INSTRUMENTATION.--Measured quarterly using a steel tape.
DATUM.--Altitude of land-surface datum is 1,580 ft. Measuring point: Top of casing 1.00 ft above land-surface datum.
PERIOD OF RECORD.--June 1968 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, +0.89 ft above land-surface datum, Dec. 5, 1972; lowest measured, 9.15 ft below land-surface datum, Mar. 14, 1977.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 6	1.52	MAR 25	0.06	JUNE 1	1.63	SEPT 1	3.42
NOV 17	2.43						

WARD COUNTY

480912101090301. Local number, 154-082-24ABA.
LOCATION.--Lat 48°09'12", long 101°09'03", Hydrologic Unit 09010001.
Owner: North Dakota State Water Commission.
AQUIFER.--Lower Souris.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 115 ft, cased to 10 ft, plastic pipe, slotted screen set 10 to 40 ft below land-surface datum.
INSTRUMENTATION.--Measured quarterly using a steel tape.
DATUM.--Altitude of land-surface datum is 1,850 ft. Measuring point: Top of casing 1.70 ft above land-surface datum.
PERIOD OF RECORD.--January 1964 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 10.84 ft below land-surface datum (corrected), June 17, 1965; lowest measured, 14.77 ft below land-surface datum, Sept. 27, 1987.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 20	14.40	APR 19	11.91	JUNE 20	13.77	SEPT 27	14.77

WELLS COUNTY

474419099371201. Local number, 149-070-09DAA1.
LOCATION.--Lat 47°44'19", long 099°37'12", Hydrologic Unit 10160001.
Owner: North Dakota State Water Commission.
AQUIFER.--New Rockford.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 283 ft, cased to 177 ft, plastic pipe, slotted 177 to 197 ft below land-surface datum.
INSTRUMENTATION.--Measured quarterly using a steel tape.
DATUM.--Altitude of land-surface datum is 1,610 ft. Measuring point: Top of casing 1.80 ft above land-surface datum.
PERIOD OF RECORD.--May 1966 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 64.02 ft below land-surface datum, Dec. 10, 1986; lowest measured, 66.65 ft below land-surface datum, Mar. 15, 1967.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 1	64.48	DEC 10	64.02	MAR 26	64.24	JULY 13	64.65
OCT 22	64.49	JAN 8	64.55	MAY 6	64.85	AUG 24	64.66
NOV 21	64.95	JAN 28	64.31	MAY 11	64.45	SEPT 30	64.59
DEC 3	64.46	FEB 10	64.55	MAY 28	64.08		

WILLIAMS COUNTY

483048103373101. Local number, 158-100-17ADA.
LOCATION.--Lat 48°30'48", long 103°37'31", Hydrologic Unit 10110102.
Owner: North Dakota State Water Commission.
AQUIFER.--Little Muddy.
WELL CHARACTERISTICS.--Drilled observation well, diameter 1.25 in, depth 52 ft, cased to 35 ft, plastic pipe, slotted 35 to 43 ft below land-surface datum.
INSTRUMENTATION.--Measured quarterly using a steel tape.
DATUM.--Altitude of land-surface datum is 1,987 ft. Measuring point: Top of casing 2.00 ft above land-surface datum.
PERIOD OF RECORD.--August 1966 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 18.02 ft below land-surface datum, June 5, 1979; lowest measured, 21.91 ft below land-surface datum, Aug. 28, 1985.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 18	21.59	MAY 5	19.81	JULY 29	20.79	AUG 19	21.29
FEB 10	21.44						

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

STATION NUMBER	LOCAL IDENTIFIER	COUNTY	GEO-LOGIC UNIT	DEPTH OF WELL, TOTAL (FEET) (72008)	DATE	TIME	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET) (72019)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)
			BOWMAN COUNTY						
461202103005001	130-099-01BBB	011	125TRVL	60.00	09-21-87	1335	25.96	2400	8.30
[a]460645103021801	130-099-03ADD	011	125TRVL	64.00	09-11-87	1155	3.30	6300	8.30
460705103025601	130-099-03BAA	011	125TRVL	70.00	09-11-87	1030	19.19	6050	8.60
460645103033302	130-099-04ADD2	011	125TRVL	50.00	09-22-87	1305	15.75	6500	6.70
460705103041101	130-099-04BAA	011	125TRVL	47.00	09-22-87	1525	11.13	3850	7.00
		[b]011	125TRVL	47.00	09-22-87	1526	11.13	3850	7.00
461355103055701	131-099-19DDD	011	125TRVL	74.00	09-21-87	1545	10.90	3110	8.10
460902103043601	131-099-21CCB1	011	125HRMN	80.00	09-17-87	1355	55.52	1790	7.20
[a]461355103043303	131-099-21CCC3	011	125TRVL	152.00	09-17-87	1700	69.37	1690	8.80
460856103024401	131-099-22DCC1	011	125HRMN	76.00	09-16-87	1800	42.47	4080	7.20
		[b]011	125TRVL	76.00	09-16-87	1801	42.47	4080	7.20
460856103020701	131-099-23CCC1	011	125TRVL	170.00	09-16-87	1325	72.87	1330	8.80
460856103020702	131-099-23CCC2	011	125TRVL	100.00	09-16-87	1505	73.18	2550	8.30
460804103010101	131-099-26DDC1	011	125HRMN	76.00	09-15-87	1445	45.18	1400	8.50
460843103032001	131-099-27BBC1	011	120TRTR	86.00	09-02-87	1805	52.13	4610	7.60
460843103032003	131-099-27BBC3	011	125TRVL	160.00	09-02-87	1650	56.80	1590	8.90
460823103030301	131-099-27CAB	011	125TGRVL	38.00	09-11-87	1405	17.44	3840	7.00
460816103032702	131-099-27CBC2	011	125TRVL	60.00	09-10-87	1410	52.55	2600	7.60
460830103044504	131-099-29ADD4	011	125HRMN	80.00	09-18-87	1310	55.32	1840	8.00
460834103055501	131-099-29BCC	011	125TGRVL	53.00	09-03-87	1625	10.68	1690	9.30
460804103052301	131-099-29CDD	011	125HRMN	32.00	09-03-87	1355	13.25	8000	6.70
460725103051301	131-099-32DBC1	011	125TRVL	30.00	09-22-87	1105	9.71	2810	7.50
460747103032902	131-099-33ADA2	011	120TRTR	38.00	09-09-87	1405	3.70	2640	8.40
460747103032903	131-099-33ADA3	011	125TRVL	76.00	09-09-87	1530	3.93	2390	8.80
460757103021601	131-099-34AAA	011	125TGRVL	41.00	09-11-87	1515	20.39	7990	10.30
460744103014801	131-099-35BDB1	011	125TRVL	78.00	09-10-87	1645	34.79	1300	8.90
			BURLEIGH COUNTY						
464239100462401	137-080-03CBC	015	112BMCK	42.00	09-25-87	0940	9.62	1200	8.60
464540100222101	138-077-22AAD	015	112GCDF	126.00	09-15-87	0830	9.67	3000	6.10
464554100482401	138-080-17CDD1	015	112BMCK	57.00	09-25-87	0835	13.80	1400	8.20
			DIVIDE COUNTY						
484746104015901	161-103-02CCB	023	112SKJL	96.00	09-22-87	1315	24.90	860	9.00
			GRAND FORKS COUNTY						
475646097372201	152-054-31BBB	035	112ELKV	60.00	10-22-86	1605	24.28	690	7.60
480908097450001	154-055-17CCC	035	112ELKV	50.00	10-22-86	1505	11.13	610	7.40
			GRIGGS COUNTY						
472412098261201	145-061-04DAD1	039	112SPRD	107.00	10-21-86	1405	13.82	[c]8150	7.70
472555098013501	146-058-26CBC	039	112MCVL	143.00	10-21-86	1240	8.71	1150	8.10
			LA MOURE COUNTY						
461958098132901	133-060-16DAA	045	112LMUR	63.00	09-16-87	1220	21.35	320	7.30
462447098432602	134-064-22BBB2	045	112EDGL	32.00	09-16-87	1110	13.10	1600	7.00
			LOGAN COUNTY						
463517099282502	136-070-15CCC2	047	112STRR	52.00	09-15-87	1250	14.02	625	7.10
463417099271002	136-070-26BBB2	047	112STRR	43.00	09-15-87	1135	20.03	675	6.70
			MCHENRY COUNTY						
480913100372501	154-077-18CCC	049	112NRKF	178.00	09-21-87	1415	55.56	600	8.20
			MCLEAN COUNTY						
474026100583201	148-081-03AAB	055	112BGFV	40.00	09-21-87	1035	9.19	890	7.80
474444101064902	149-082-12BAB2	055	112SKCK	56.00	09-21-87	1120	1.26	100	8.10
			MOUNTRAIL COUNTY						
475840102295001	152-092-19AAB	061	112BDVL	158.00	09-23-87	0920	51.51	900	8.00

a - Laboratory analysis not available prior to report publication
b - Split sample analysis for quality assurance.
c - Laboratory value.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

STATION NUMBER	DATE	TEMPERATURE AIR (DEG C) (00020)	TEMPERATURE WATER (DEG C) (00010)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)	HARDNESS (MG/L AS CACO3) (00900)	HARDNESS NONCARBONATE (MG/L AS CACO3) (95902)	CALCIUM DISSOLVED (MG/L AS CA) (00915)	MAGNESIUM, DISSOLVED (MG/L AS MG) (00925)	SODIUM, DISSOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)
					BOWMAN COUNTY						
461202103005001	09-21-87	22.0	7.5	1.6	15	180	0	29	25	520	86
460645103021801	09-11-87	15.0	12.5	2.8	29	--	--	--	--	--	--
460705103025601	09-11-87	11.0	7.0	1.9	18	140	0	16	24	1400	95
460645103033302	09-22-87	25.0	7.5	2.1	20	1700	1500	190	300	1200	60
460705103041101	09-22-87	--	9.5	--	--	720	170	130	95	760	69
	09-22-87	28.0	9.5	0.9	9	510	92	56	90	760	76
461355103055701	09-21-87	22.0	9.5	0.8	8	240	0	26	42	660	85
460902103043601	09-17-87	16.0	7.5	--	--	980	690	210	110	62	12
461355103043303	09-17-87	14.0	7.5	3.4	32	--	--	--	--	--	--
460856103024401	09-16-87	16.0	7.5	1.9	18	1700	1200	300	220	500	39
	09-16-87	--	7.5	--	--	1800	1300	320	230	490	38
460856103020701	09-16-87	23.0	7.5	5.9	55	28	0	6.0	3.2	340	96
460856103020702	09-16-87	18.0	7.5	--	--	58	0	11	7.2	590	95
460804103010101	09-15-87	27.0	7.5	--	--	16	0	3.4	1.7	320	97
460843103032001	09-02-87	32.0	6.5	1.6	15	460	0	66	70	1100	83
460843103032003	09-02-87	32.0	6.5	11.4	104	27	0	7.7	1.7	400	97
460823103030301	09-11-87	14.0	6.0	2.4	22	1800	1600	310	250	340	29
460816103032702	09-10-87	17.0	8.5	--	--	300	0	55	40	510	78
460830103044504	09-18-87	16.0	7.5	--	--	140	0	26	17	390	85
460834103055501	09-03-87	25.0	8.0	3.5	33	21	0	5.7	1.5	410	97
460804103052301	09-03-87	25.0	7.0	--	--	590	0	230	2.5	1900	87
460725103051301	09-22-87	23.0	9.5	0	0	530	130	79	81	470	65
460747103032902	09-09-87	24.0	11.0	--	--	110	0	22	14	590	91
460747103032903	09-09-87	24.0	11.5	1.6	16	27	0	6.3	2.7	590	98
460757103021601	09-11-87	14.0	7.0	3.9	36	1600	1600	84	340	1900	72
460744103014801	09-10-87	16.0	8.0	3.0	28	27	0	6.7	2.4	340	96
					BURLEIGH COUNTY						
464239100462401	09-25-87	--	11.0	--	--	220	0	26	37	220	68
464540100222101	09-15-87	--	15.5	--	--	1000	970	170	140	290	38
464554100482401	09-25-87	--	7.5	--	--	440	160	110	41	140	40
					DIVIDE COUNTY						
484746104015901	09-22-87	--	10.0	--	--	100	0	7.0	21	160	76
					GRAND FORKS COUNTY						
475646097372201	10-22-86	--	8.5	--	--	380	87	90	37	4.	2
480908097450001	10-22-86	--	8.0	--	--	270	14	80	18	28	18
					GRIGGS COUNTY						
472412098261201	10-21-86	--	10.0	--	--	5200	4700	430	1000	660	22
472555098013501	10-21-86	--	9.0	--	--	100	0	28	7.5	220	81
					LA MOURE COUNTY						
461958098132901	09-16-87	--	10.5	--	--	160	0	39	16	2.	3
462447098432602	09-16-87	--	12.0	--	--	770	470	180	77	61	15
					LOGAN COUNTY						
463517099282502	09-15-87	--	12.0	--	--	270	120	63	27	28	18
463417099271002	09-15-87	--	13.0	--	--	270	0	62	29	34	21
					MCHENRY COUNTY						
480913100372501	09-21-87	--	9.5	--	--	230	0	64	17	41	27
					MCLEAN COUNTY						
474026100583201	09-21-87	--	8.5	--	--	490	100	120	46	11	5
474444101064902	09-21-87	--	11.0	--	--	560	240	150	46	33	11
					MOUNTRAIL COUNTY						
475840102295001	09-23-87	--	9.5	--	--	1000	740	270	81	52	10

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

STATION NUMBER	DATE	SODIUM ADSORPTION RATIO (00931)	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	ALKALINITY LAB (MG/L AS CACO3) (90410)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301)	SOLIDS, DISSOLVED (TONS PER AC-FT) (70303)
				BOWMAN COUNTY							
461202103005001	09-21-87	17	6.4	538	800	7.1	1.3	9.1	1730	1700	2.4
460645103021801	09-11-87	--	--	--	--	--	--	--	--	--	--
460705103025601	09-11-87	52	9.5	332	3100	12	0.70	11	5120	4800	7.0
460645103033302	09-22-87	13	8.9	251	4500	9.5	0.50	9.1	6640	6400	9.0
460705103041101	09-22-87	13	17	550	2000	8.2	0.10	12	3340	3400	4.5
	09-22-87	15	13	423	1900	7.6	0.20	14	3370	5000	4.6
461355103055701	09-21-87	19	9.0	492	1200	9.8	1.2	7.9	2310	2300	3.1
460902103043601	09-17-87	0.9	9.1	293	780	15	0.30	11	1520	1400	2.1
461355103043303	09-17-87	--	--	--	--	--	--	--	--	--	--
460856103024401	09-16-87	5	14	486	2200	40	0.40	5.8	3730	3600	5.1
	09-16-87	5	16	460	2300	38	0.30	5.6	3770	3700	5.1
460856103020701	09-16-87	29	2.1	656	350	27	3.0	7.8	1060	1100	1.4
460856103020702	09-16-87	35	5.1	460	900	5.0	2.0	5.8	1780	1800	2.4
460804103010101	09-15-87	36	2.6	434	290	5.1	2.3	7.4	897	890	1.2
460843103032001	09-02-87	23	40	700	2400	12	1.0	19	4220	4100	5.7
460843103032003	09-02-87	35	2.3	729	480	34	3.6	8.3	1320	1400	1.8
460823103030301	09-11-87	4	8.8	167	2200	16	0.30	13	3880	3200	5.3
460816103032702	09-10-87	13	8.5	462	1000	6.9	0.80	6.4	1920	1900	2.6
460830103044504	09-18-87	15	12	493	470	5.7	0.40	9.0	1250	1200	1.7
460834103055501	09-03-87	41	3.1	609	330	5.8	1.3	9.8	1140	1100	1.6
460804103052301	09-03-87	36	14	725	5100	8.9	0.30	9.5	8510	7700	11.6
460725103051301	09-22-87	9	13	408	1200	2.2	0.20	11	2220	2100	3.0
460747103032902	09-09-87	25	6.4	577	810	6.2	1.3	7.5	1860	1800	2.5
460747103032903	09-09-87	51	3.1	579	720	7.1	2.1	6.4	1650	1700	2.2
460757103021601	09-11-87	21	27	44	5600	35	0.40	5.0	8520	8000	11.6
460744103014801	09-10-87	30	2.2	576	440	29	2.8	8.3	1080	1200	1.5
				BURLEIGH COUNTY							
464239100462401	09-25-87	7	8.3	220	110	9.3	0.10	7.9	769	770	1.0
464540100222101	09-15-87	4	12	29	1200	310	0.10	0.2	2320	2100	3.2
464554100482401	09-25-87	3	7.1	280	210	13	0.20	17	604	740	0.82
				DIVIDE COUNTY							
484746104015901	09-22-87	7	6.8	360	84	20	0.30	4.5	513	550	0.70
				GRAND FORKS COUNTY							
475646097372201	10-22-86	0.1	3.2	290	82	5.5	0.30	26	427	420	0.58
480908097450001	10-22-86	0.8	9.2	260	75	2.8	0.10	22	413	400	0.56
				GRIGGS COUNTY							
472412098261201	10-21-86	4	24	540	5700	150	0.50	27	8970	8300	12.2
472555098013501	10-21-86	10	9.9	340	190	48	0.50	24	749	740	1.0
				LA MOURE COUNTY							
461958098132901	09-16-87	0.1	1.9	180	2.9	1.6	0.20	11	180	180	0.24
462447098432602	09-16-87	1	6.0	300	470	89	0.10	20	1080	1100	1.5
				LOGAN COUNTY							
463517099282502	09-15-87	0.8	5.7	150	89	3.6	0.10	21	376	330	0.51
463417099271002	09-15-87	0.9	6.3	430	110	6.0	0.10	25	331	400	0.45
				MCHENRY COUNTY							
480913100372501	09-21-87	1	6.3	310	11	2.9	0.0	28	344	360	0.47
				MCLEAN COUNTY							
474026100583201	09-21-87	0.2	5.3	390	81	1.9	0.0	23	547	530	0.74
474444101064902	09-21-87	0.6	5.7	320	240	2.1	0.0	25	722	700	0.98
				MOUNTRAIL COUNTY							
475840102295001	09-23-87	0.7	9.3	270	730	17	0.10	24	1360	1300	1.8

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

STATION NUMBER	DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BORON, DIS-SOLVED (UG/L AS B) (01020)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	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)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
					BOWMAN COUNTY						
461202103005001	09-21-87	--	1500	220	--	50	160	--	9	--	880
460645103021801	09-11-87	--	--	--	--	--	--	--	--	--	--
460705103025601	09-11-87	--	950	20	--	100	50	--	1	--	2400
460645103033302	09-22-87	--	5100	8600	--	420	2900	--	<1	--	4800
460705103041101	09-22-87	10	2300	1000	<1	250	570	0.1	<1	4	3500
	09-22-87	<1	3900	1500	<5	260	580	--	<2	<1	4000
461355103055701	09-21-87	--	950	20	--	60	60	--	5	--	860
460902103043601	09-17-87	--	320	55	--	41	240	--	5	--	3000
461355103043303	09-17-87	--	--	--	--	--	--	--	--	--	--
460856103024401	09-16-87	--	500	40	--	110	460	--	25	--	4600
	09-16-87	4	300	100	<1	110	410	<0.1	24	1	4900
460856103020701	09-16-87	--	1300	520	--	16	51	--	<1	--	160
460856103020702	09-16-87	--	850	80	--	40	20	--	1	--	440
460804103010101	09-15-87	--	950	48	--	20	15	--	1	--	100
460843103032001	09-02-87	--	1400	130	--	100	220	--	2	--	4500
460843103032003	09-02-87	--	1300	1100	--	18	91	--	<1	--	270
460823103030301	09-11-87	--	1400	200	--	100	4000	--	2	--	4200
460816103032702	09-10-87	--	1600	20	--	60	40	--	<1	--	2500
460830103044504	09-18-87	--	1000	14	--	45	26	--	1	--	900
460834103055501	09-03-87	--	860	71	--	21	9	--	1	--	160
460804103052301	09-03-87	--	7900	140	--	120	330	--	<1	--	7300
460725103051301	09-22-87	--	3100	60	--	160	230	--	1	--	3500
460747103032902	09-09-87	--	1100	20	--	50	40	--	1	--	920
460747103032903	09-09-87	--	1100	50	--	30	20	--	1	--	220
460757103021601	09-11-87	--	1200	40	--	130	30	--	16	--	2300
460744103014801	09-10-87	--	1200	330	--	17	63	--	<1	--	200
					BURLEIGH COUNTY						
464239100462401	09-25-87	6	220	10	<1	50	100	<0.1	1	<1	480
464540100222101	09-15-87	<1	330	2200	<1	240	850	<0.1	<1	1	700
464554100482401	09-25-87	1	170	90	<1	51	680	<0.1	2	<1	1000
					DIVIDE COUNTY						
484746104015901	09-22-87	1	150	80	<1	42	10	<0.1	19	<1	160
					GRAND FORKS COUNTY						
475646097372201	10-22-86	11	10	70	1	15	740	0.1	6	<1	300
480908097450001	10-22-86	1	20	1400	1	18	1500	<0.1	4	<1	180
					GRIGGS COUNTY						
472412098261201	10-21-86	4	190	100	3	1000	80	<0.1	11	1	2200
472555098013501	10-21-86	4	310	60	<1	90	370	<0.1	11	<1	280
					LA MOURE COUNTY						
461958098132901	09-16-87	<1	20	20	<1	7	190	0.1	1	<1	81
462447098432602	09-16-87	2	30	1900	<1	39	670	0.3	<1	<1	430
					LOGAN COUNTY						
463517099282502	09-15-87	5	60	70	<1	43	720	0.2	<1	<1	200
463417099271002	09-15-87	1	70	210	<1	51	470	<0.1	<1	1	220
					MCHENRY COUNTY						
480913100372501	09-21-87	10	190	10	<1	43	210	<0.1	5	<1	410
					MCLEAN COUNTY						
474026100583201	09-21-87	6	120	1200	<1	50	440	<0.1	<1	<1	1100
474444101064902	09-21-87	6	30	930	<1	49	680	0.1	<1	<1	590
					MOUNTRAIL COUNTY						
475840102295001	09-23-87	3	160	100	<1	190	320	0.2	2	15	1300

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

STATION NUMBER	LOCAL IDENTIFIER	COUNTY	GEO-LOGIC UNIT	DEPTH OF WELL, TOTAL (FEET) (72008)	DATE	TIME	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET) (72019)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)
			OLIVER COUNTY						
471613101035402	144-082-27BBB2	065	112MIRV	68.00	09-21-87	0925	11.48	500	8.30
			PIERCE COUNTY						
475139099484801	151-072-36AAA1	069	112BGFV	238.00	09-17-87	1030	80.41	200	8.10
475225100075501	151-074-27BBC	069	112BGFV	177.00	09-17-87	0925	29.39	000	7.50
			SHERIDAN COUNTY						
472337100285501	145-077-09ADD	083	112PWCK	64.00	09-17-87	1440	35.97	900	7.20
			STARK COUNTY						
465755102410701	140-095-08AAA	089	125SNLB	160.00	09-24-87	0755	17.83	650	8.00
			WALSH COUNTY						
481841097490301	156-056-22DDD	099	112FDVL	57.00	10-22-86	1305	21.61	660	7.50
482449098095801	157-058-18DDD	099	211PIRR	100.00	10-22-86	1140	1.90	650	8.40
			WARD COUNTY						
481058101120403	154-082-03CDC3	101		220.00	09-21-87	1630	39.32	725	9.40
481421101185403	155-083-23BBB3	101	112MNOT	101.00	09-22-87	0750	49.19	800	7.90
			WILLIAMS COUNTY						
483127103373102	158-100-08DAA2	105	112GCDF	78.00	09-22-87	1435	27.69	2400	7.70

STATION NUMBER	DATE	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	HARD-NESS (MG/L AS CACO3) (00900)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3) (95902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)
					OLIVER COUNTY						
471613101035402	09-21-87	--	8.5	--	--	560	37	140	50	160	38
					PIERCE COUNTY						
475139099484801	09-17-87	--	8.0	--	--	260	0	66	22	170	58
475225100075501	09-17-87	--	8.0	--	--	520	0	140	42	22	8
					SHERIDAN COUNTY						
472337100285501	09-17-87	9.0	--	--	--	1100	840	290	95	14	3
					STARK COUNTY						
465755102410701	09-24-87	--	8.0	--	--	290	120	81	21	31	19
					WALSH COUNTY						
481841097490301	10-22-86	--	7.5	--	--	280	50	72	24	32	20
482449098095801	10-22-86	--	10.0	--	--	27	0	6.5	2.5	130	90
					WARD COUNTY						
481058101120403	09-21-87	--	8.0	--	--	72	0	5.5	14	130	78
481421101185403	09-22-87	--	8.5	--	--	270	6	65	25	70	35
					WILLIAMS COUNTY						
483127103373102	09-22-87	--	10.0	--	--	590	19	130	64	330	54

WATER-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

STATION NUMBER	DATE	SODIUM ADSORPTION RATIO (00931)	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	ALKALINITY LAB (MG/L AS CACO3) (90410)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301)	SOLIDS, DISSOLVED (TONS PER AC-FT) (70303)
					OLIVER COUNTY						
471613101035402	09-21-87	3	8.3	520	270	12	0.0	27	938	980	1.3
					PIERCE COUNTY						
475139099484801	09-17-87	5	9.7	620	240	3.4	0.40	22	799	710	1.1
475225100075501	09-17-87	0.4	8.7	740	190	8.9	0.20	30	570	580	0.78
					SHERIDAN COUNTY						
472337100285501	09-17-87	0.2	7.5	280	720	1.5	0.10	26	1310	1300	1.8
					STARK COUNTY						
465755102410701	09-24-87	0.8	4.7	170	130	4.2	0.10	22	432	400	0.59
					WALSH COUNTY						
481841097490301	10-22-86	0.9	4.0	229	92	15	0.20	25	408	400	0.55
482449098095801	10-22-86	11	4.5	200	95	9.6	0.20	24	414	390	0.56
					WARD COUNTY						
481058101120403	09-21-87	7	7.9	230	73	49	0.0	0.9	397	440	0.54
481421101185403	09-22-87	2	12	260	120	29	0.0	15	501	490	0.68
					WILLIAMS COUNTY						
483127103373102	09-22-87	6	11	570	680	10	0.30	22	1480	1600	2.0

STATION NUMBER	DATE	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BORON, DISSOLVED (UG/L AS B) (01020)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, DISSOLVED (UG/L AS PB) (01049)	LITHIUM DISSOLVED (UG/L AS LI) (01130)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MERCURY DISSOLVED (UG/L AS HG) (71890)	MOLYBDENUM, DISSOLVED (UG/L AS MO) (01060)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	STRONTIUM, DISSOLVED (UG/L AS SR) (01080)
					OLIVER COUNTY						
471613101035402	09-21-87	6	90	20	<1	60	460	0.1	4	<1	1300
					PIERCE COUNTY						
475139099484801	09-17-87	3	360	40	<1	97	130	<0.1	5	1	480
475225100075501	09-17-87	3	50	60	<1	76	10	0.1	1	1	590
					SHERIDAN COUNTY						
472337100285501	09-17-87	2	30	940	<1	41	1900	<0.1	<1	4	750
					STARK COUNTY						
465755102410701	09-24-87	1	50	80	<1	13	320	<0.1	1	<1	530
					WALSH COUNTY						
481841097490301	10-22-86	6	70	270	1	35	450	<0.1	2	<1	280
482449098095801	10-22-86	2	150	100	1	38	90	<0.1	1	<1	85
					WARD COUNTY						
481058101120403	09-21-87	7	110	10	<1	46	10	<0.1	<1	<1	110
481421101185403	09-22-87	10	80	700	9	28	550	0.1	1	<1	350
					WILLIAMS COUNTY						
483127103373102	09-22-87	8	160	1100	<1	89	280	<0.1	2	<1	1200

RED RIVER OF THE NORTH BASIN

484714097442301 ICELANDIC STATE PARK, ND
(National Trends Network precipitation-quality station)

LOCATION.--Lat 48°47'14", long 97°44'23", in SW¼NW¼SW¼ sec. 10, T.161 N., R.55 W., Pembina County, Hydrologic Unit 09020313, at Icelandic State Park 5.6 mi west of Cavalier.

PERIOD OF RECORD.--October 1983 to current year (weekly composite).

INSTRUMENTATION.--The composite sample collector is an Aerochem Metrics[1/] model 301 wet/dry precipitation collector mounted on ground surface. Precipitation quantity is determined by a Belfort[1/] model 5-780 recording rain gage equipped with an event recorder and an Alter-type wind screen. The recording rain gage is installed 20 ft east of the sample collector with gage mouth and collector bucket elevations of 50.75 in above land surface. A nonrecording National Weather Service rain gage is installed 28 ft south of the composite sample collector as a quality check on weekly composite precipitation volume.

REMARKS.--Data presented are provisional analyses by the Central Analytical Laboratory of the Illinois State Water Survey and have not completed quality-assurance review by the National Atmospheric Deposition Program. Unless noted starting and ending time for composite period is 9:00 a.m.

COOPERATION.--Onsite observers are provided by the North Dakota State Parks and Recreation Department.

PRECIPITATION-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

PERIOD OF COLLECTION	PRECIP-ITATION TOTAL INCHES/ WEEK (00046)	COL-LECTOR EFFI-CIENCY WET DEPOSITION PERCENT (82284)	PH (STAND-ARD UNITS) (00400)	SPE-CIFIC CON-DUCT-ANCE (µS/CM) (00095)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)
10/01 to 10/07	0.80	101	5.47	3.2	0.028
10/07 to 10/14	0.01	200	6.04*	8.8*	0.185
10/14 to 10/21	0.0	--	6.08*	3.6*	--
10/21 to 10/28	0.0	0.0	--	--	--
10/28 to 11/04	0.08	62	5.08	10.6	0.534
11/04 to 11/11	1.56	1.0	6.22*	16.9*	0.159
11/11 to 11/18	--	--	6.65*	14.8*	0.603
11/18 to 11/25	0.07	14	6.20*	11.2*	0.271
11/25 to 12/02	0.0	0.0	--	--	--
12/02 to 12/09	<0.01	100	--	--	--
12/09 to 12/16	0.11	36	4.95	7.1	--
12/16 to 12/23	0.0	0.0	--	--	--
12/23 to 12/29	0.0	0.0	--	--	--
12/29 to 01/06	0.13	69	5.65*	4.7*	0.169
01/06 to 01/13	<0.01	100	--	--	--
01/13 to 01/20	0.25	32	5.82*	4.3	0.093
01/20 to 01/27	0.06	17	--	--	--
01/27 to 02/03	0.57	35	5.19*	5.8	0.064
02/03 to 02/10	0.0	0.0	--	--	--
02/10 to 02/17	0.29	3.0	--	--	--
02/17 to 02/24	0.32	41	5.02	9.6	0.082
02/24 to 03/03	1.33	57	4.97	16.8	0.283
03/03 to 03/10	0.0	0.0	--	--	--
03/10 to 03/17	0.08	25	6.02*	15.1*	0.367
03/17 to 03/24	0.23	64	4.00	65.6	0.717
03/24 to 03/31	--	--	6.70*	14.5*	1.409
04/01 to 04/07	0.0	0.0	--	--	--
04/07 to 04/14	0.0	0.0	6.65*	24.6*	0.604

1/ The use of brand names in this report is for identification purposes only and does not imply endorsement by the U.S. Geological Survey.

* Data are laboratory determinations by the Central Analytical Laboratory of the Illinois State Water Survey. Nondesignated data are field determinations.

CHEMICAL QUALITY OF PRECIPITATION

RED RIVER OF THE NORTH BASIN

484714097442301 ICELANDIC STATE PARK, ND--CONTINUED
(National Trends Network precipitation-quality station)

PRECIPITATION-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

PERIOD OF COLLECTION	PRECIP-ITATION TOTAL INCHES/ WEEK (00046)	COL-LECTOR EFFI-CIENCY WET DEPOSITION PERCENT (82284)	PH (STAND-ARD UNITS) (00400)	SPE-CIFIC CON-DUCT-ANCE (µS/CM) (00095)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)
04/14 to 04/21	0.0	0.0	--	--	--
04/21 to 04/28	0.0	0.0	--	--	--
04/28 to 05/05	0.01	100	7.13*	93.2*	3.642
05/05 to 05/12	0.0	0.0	5.15*	4.1*	0.101
05/12 to 05/19	0.25	112	5.88	18.9	1.032
05/19 to 05/26	1.50	93	5.39	5.0	0.068
05/26 to 06/02	0.76	107	5.56	5.5	0.097
06/02 to 06/09	<0.01	100	--	--	--
06/09 to 06/16	0.48	88	5.38	4.9	0.073
06/16 to 06/23	0.93	99	5.53	7.6	0.294
06/23 to 06/30	0.05	140	6.49	18.9	1.816
06/30 to 07/07	0.48	85	5.28	5.4	0.097
07/07 to 07/14	0.96	100	5.62	4.5	0.159
07/14 to 07/21	2.51	100	5.10	4.4	0.098
07/21 to 07/28	0.68	100	5.34	6.8	0.172
07/28 to 08/04	--	--	5.90	13.0	0.532
08/04 to 08/11	<0.01	100	6.93*	26.0*	1.707
08/11 to 08/18	1.67	101	5.77	7.8	0.306
08/18 to 08/25	0.54	98	5.82	10.6	0.527
08/25 to 09/01	0.03	133	6.43*	12.5*	1.056
09/01 to 09/08	0.02	100	7.27*	50.2*	0.829
09/08 to 09/15	0.33	82	5.72	6.7	0.345
09/15 to 09/22	0.53	96	5.51	2.6	0.025
09/22 to 09/30	0.20	100	4.65	23.9	0.634

* Data are laboratory determinations by the Central Analytical Laboratory of the Illinois State Water Survey. Nondesignated data are field determinations.

RED RIVER OF THE NORTH BASIN

484714097442301 ICELANDIC STATE PARK, ND--CONTINUED
(National Trends Network precipitation-quality station)

PRECIPITATION-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

PERIOD OF COLLECTION	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P) (00666)
10/01 to 10/07	0.005	0.022	0.037	0.34	<0.03	0.08	0.06	<0.003
10/07 to 10/14	0.053	0.053	0.412	1.03	0.32	0.19	0.16	<0.012
10/14 to 10/21	--	--	--	--	--	--	--	--
10/21 to 10/28	--	--	--	--	--	--	--	--
10/28 to 11/04	0.141	0.244	0.305	1.75	0.35	0.42	0.22	0.010
11/04 to 11/11	0.045	0.019	0.574	1.15	0.51	<0.10	0.10	<0.021
11/11 to 11/18	0.161	0.040	0.298	0.88	0.56	<0.12	0.22	0.080
11/18 to 11/25	0.042	0.076	0.567	1.35	0.34	<0.13	<0.06	<0.280
11/25 to 12/02	--	--	--	--	--	--	--	--
12/02 to 12/09	--	--	--	--	--	--	--	--
12/09 to 12/16	--	--	--	--	--	--	--	--
12/16 to 12/23	--	--	--	--	--	--	--	--
12/23 to 12/29	--	--	--	--	--	--	--	--
12/29 to 01/06	0.035	0.008	0.059	0.42	0.04	0.16	0.19	<0.003
01/06 to 01/13	--	--	--	--	--	--	--	--
01/13 to 01/20	0.020	0.029	0.125	0.22	0.12	0.05	0.09	<0.003
01/20 to 01/27	--	--	--	--	--	--	--	--
01/27 to 02/03	0.008	0.063	0.041	0.31	0.10	0.12	0.16	<0.003
02/03 to 02/10	--	--	--	--	--	--	--	--
02/10 to 02/17	--	--	--	--	--	--	--	--
02/17 to 02/24	0.021	0.011	0.041	1.01	0.09	0.40	0.27	<0.003
02/24 to 03/03	0.040	0.020	0.033	1.66	0.08	0.80	0.66	<0.003
03/03 to 03/10	--	--	--	--	--	--	--	--
03/10 to 03/17	0.105	<0.012	0.098	1.56	0.16	0.40	0.46	<0.013
03/17 to 03/24	0.082	0.058	0.320	7.14	0.56	0.84	0.80	<0.003
03/24 to 03/31	0.211	0.039	0.295	2.00	0.14	0.16	0.37	<0.003
04/01 to 04/07	--	--	--	--	--	--	--	--
04/07 to 04/14	0.201	<0.086	1.094	1.73	1.15	<0.45	0.33	<0.096
04/14 to 04/21	--	--	--	--	--	--	--	--
04/21 to 04/28	--	--	--	--	--	--	--	--
04/28 to 05/05	0.890	0.101	0.486	6.47	1.01	1.89	1.78	<0.067
05/05 to 05/12	0.024	0.010	0.028	0.13	0.04	<0.02	0.03	<0.003
05/12 to 05/19	0.215	0.128	0.079	1.92	0.13	1.00	0.57	<0.003
05/19 to 05/26	0.017	0.009	0.020	0.54	<0.03	0.26	0.11	<0.003
05/26 to 06/02	0.021	0.017	0.026	0.56	0.05	0.28	0.17	<0.003
06/02 to 06/09	--	--	--	--	--	--	--	--
06/09 to 06/16	0.013	0.005	0.026	0.48	0.05	0.21	0.13	<0.007
06/16 to 06/23	0.063	0.033	0.037	0.84	0.07	0.37	0.30	<0.007
06/23 to 07/01	0.469	0.228	0.196	2.12	0.24	0.32	0.37	<0.007
07/01 to 07/07	0.023	0.011	0.076	0.42	0.06	0.19	0.17	<0.007
07/07 to 07/14	0.043	0.018	0.019	0.38	0.05	0.19	0.12	<0.007
07/14 to 07/21	0.020	0.016	0.042	0.54	0.04	0.12	0.11	<0.007
07/21 to 07/28	0.037	0.048	0.057	0.83	0.11	0.24	0.20	<0.007
07/28 to 08/04	0.094	0.087	0.184	1.76	0.19	0.81	0.66	<0.007
08/04 to 08/11	0.459	0.267	0.416	1.86	0.37	0.24	0.55	<0.041
08/11 to 08/18	0.084	0.038	0.035	1.14	0.08	0.36	0.28	<0.007
08/18 to 08/25	0.109	0.061	0.113	1.61	0.11	0.50	0.41	<0.007
08/25 to 09/01	0.269	0.142	0.084	1.05	0.16	0.07	0.40	0.013
09/01 to 09/08	0.166	0.509	0.629	2.31	0.58	1.08	0.84	<0.026
09/08 to 09/15	0.089	0.045	0.079	1.16	0.08	0.22	0.18	<0.007
09/15 to 09/22	0.007	0.004	0.020	0.28	0.04	0.09	0.04	<0.007
09/22 to 09/30	0.099	0.058	0.093	2.71	0.16	0.92	0.59	<0.007

JAMES RIVER BASIN

470732099140204 WOODWORTH, ND
(National Trends Network precipitation-quality station)

LOCATION.--Lat 47°14'32", long 99°14'02", in SE¼SW¼SW¼ sec.12, T.142 N., R.68 W., Stutsman County, Hydrologic Unit 10160002, at U.S. Fish and Wildlife Service Northern Prairie Wildlife Research Center, Woodworth Experiment Station, 2.8 mi east and 1 mi south of Woodworth.

PERIOD OF RECORD.--November 1983 to current year (weekly composite).

INSTRUMENTATION.--The composite sample collector is an Aerochem Metrics1/ model 301 wet/dry precipitation collector mounted on ground surface. Precipitation quantity is determined by a Belfort1/ model 5-780 recording rain gage equipped with an event recorder and an Alter-type wind screen. The recording rain gage is installed 17 ft east of the sample collector with gage mouth and collector bucket elevations of 50.75 in above land surface. A Belfort1/ model 5-780 rain gage with Omnidata pod recorder is installed 30 ft east of the recording rain gage as a quality check on weekly composite precipitation volume.

REMARKS.--The station is located 300 ft west of an event sample-collection station which was operated by the North Dakota State Health Department (station discontinued 1987). Continuously recording meteorological instrumentation for air temperature, wind speed, and wind direction were installed 9.8 ft above land surface at the event station. Data presented are provisional analyses by the Central Analytical Laboratory of the Illinois State Water Survey and have not completed quality-assurance review by the National Atmospheric Deposition Program. Unless noted starting and ending time for composite periods is 9:00 a.m.

COOPERATION.--Onsite observers are provided by the U.S. Fish and Wildlife Service.

PRECIPITATION-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

PERIOD OF COLLECTION	PRECIP-ITATION TOTAL INCHES, WEEK (00046)	COL-ECTOR EFFI-CIENCY WET DEPOSITION PERCENT (82284)	PH (STAND-ARD UNITS) (00400)	SPEC-CIFIC CON-DUCT-ANCE (mS/CM) (00095)	CALCIUM DIS-SOLVED (MG/L) AS CA) (00915)
10/01 to 10/07	0.63	105	5.83	7.7	0.135
10/07 to 10/14	0.0	--	--	--	--
10/14 to 10/21	0.0	--	--	--	--
10/21 to 10/28	0.02	50	6.55*	15.7*	0.695
10/28 to 11/04	0.07	100	5.28	7.4	0.318
11/04 to 11/11	0.68	69	5.71	7.5	0.361
11/11 to 11/18	--	--	5.77	10.3	1.649
11/18 to 11/25	0.05	80	4.83	10.9	0.524
11/25 to 12/02	0.0	0.0	--	--	--
12/02 to 12/09	0.0	0.0	6.45*	3.9*	0.353
12/09 to 12/16	0.0	0.0	5.89*	2.1*	0.084
12/16 to 12/23	0.0	0.0	5.68*	3.4*	0.060
12/23 to 12/30	0.0	0.0	5.78*	2.1*	0.095
12/30 to 01/06	0.0	0.0	--	--	--
01/06 to 01/13	0.0	0.0	5.90*	2.3*	0.145
01/13 to 01/20	0.05	20	7.17*	125.8*	--
01/20 to 01/27	0.04	25	7.40*	50.6*	0.789
01/27 to 02/03	0.12	58	5.68	8.1	0.740
02/03 to 02/10	0.0	0.0	6.91*	9.6*	0.726
02/10 to 02/17	0.05	20	6.28*	5.1*	0.293
02/17 to 02/24	0.02	50	6.68*	6.6*	0.752
02/24 to 03/03	0.42	48	5.36	21.6	0.565
03/03 to 03/10	0.0	0.0	6.21*	5.1*	0.282
03/10 to 03/17	0.19	21	5.68	34.5	2.096
03/17 to 03/24	0.25	108	4.84	41.3	1.006
03/24 to 03/31	0.0	0.0	--	--	--
03/31 to 04/07	0.0	0.0	6.66*	6.0*	0.562
04/07 to 04/14	0.03	67	7.48*	55.6*	6.330

1/ The use of brand names in this report is for identification purposes only and does not imply endorsement by the U.S. Geological Survey.

* Data are laboratory determinations by the Central Analytical Laboratory of the Illinois State Water Survey. Nondesignated data are field determinations.

JAMES RIVER BASIN

470732099140204 WOODWORTH, ND--CONTINUED
(National Trends Network precipitation-quality station)

PRECIPITATION-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

PERIOD OF COLLECTION	PRECIP-ITATION TOTAL INCHES, WEEK (00046)	COL-ECTOR EFFI-CIENCY WET DEPOSITION PERCENT (82284)	PH (STAND-ARD UNITS) (00400)	SPEC-CIFIC CON-DUCT-ANCE (µs/CM) (00095)	CALCIUM DIS-SOLVED (MG/L) AS CA) (00915)
04/14 to 04/21	0.0	0.0	6.40*	3.7*	0.351
04/21 to 04/28	0.02	50	6.26*	61.2*	3.200
04/28 to 05/05	0.04	175	5.32	25.8	1.056
05/05 to 05/12	0.0	0.0	6.25*	3.8*	0.354
05/12 to 05/19	0.04	575	5.57	12.3	0.319
05/19 to 05/26	1.53	177	5.36	6.1	0.036
05/26 to 06/02	0.23	65	5.79	14.5*	0.659
06/02 to 06/09	0.19	79	5.27	17.4*	1.042
06/09 to 06/16	0.35	86	5.75	6.0	0.251
06/16 to 06/23	1.78	92	5.68	9.0*	0.300
06/23 to 06/30	0.02	150	6.61*	15.4*	0.799
06/30 to 07/07	--	--	5.86	10.0*	0.400
07/07 to 07/14	--	--	5.96	6.5	0.171
07/14 to 07/21	2.45	96	5.86	4.0*	0.122
07/21 to 07/28	0.72	118	5.28	11.6*	0.475
07/28 to 08/04	0.31	103	5.17	12.9*	0.432
08/04 to 08/11	0.0	0.0	6.75*	5.4*	0.700
08/11 to 08/18	1.07	21	5.94	4.0	0.247
08/18 to 08/25	0.51	88	5.32	6.8	0.117
08/25 to 09/01	0.40	0.0	--	--	--
09/01 to 09/08	0.08	100	5.69	13.3	0.875
09/08 to 09/15	0.11	100	5.93	6.0	0.466
09/15 to 09/22	0.45	93	5.28	16.9	0.440
09/22 to 09/30	0.13	77	5.68	20.5	1.182

* Data are laboratory determinations by the Central Analytical Laboratory of the Illinois State Water Survey. Nondesignated data are field determinations.

JAMES RIVER BASIN

470732099140204 WOODWORTH, ND--CONTINUED
(National Trends Network precipitation-quality station)

PRECIPITATION-QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

PERIOD OF COLLECTION	MAGNE-SIUM, DIS-SOLVED (MG/L) (00925)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	SODIUM DIS-SOLVED (MG/L AS NA) (00930)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	NITRO-GEN, AMMONIA DIS SOLVED (MG/L AS N) (00608)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P) (00666)
10/01 to 10/07	0.036	0.023	0.037	0.83	<0.03	0.54	0.16	<0.003
10/07 to 10/14	--	--	--	--	--	--	--	--
10/14 to 10/21	--	--	--	--	--	--	--	--
10/21 to 10/28	0.156	0.066	0.520	1.64	0.20	<0.06	0.28	<0.013
10/28 to 11/04	0.077	0.079	0.284	0.74	0.15	0.60	0.18	<0.003
11/04 to 11/11	0.287	0.176	0.297	1.55	0.16	0.05	0.11	<0.003
11/11 to 11/18	0.451	0.343	0.567	1.30	0.69	0.16	0.77	<0.008
11/18 to 11/25	0.106	0.133	0.410	1.42	0.40	<0.02	0.14	<0.003
11/25 to 12/02	--	--	--	--	--	--	--	--
12/02 to 12/09	0.064	0.168	0.069	0.13	0.11	<0.02	<0.01	<0.003
12/09 to 12/16	0.022	0.087	0.160	0.09	0.22	0.02	<0.01	0.007
12/16 to 12/23	0.015	0.013	0.041	<0.03	0.07	0.02	<0.01	<0.003
12/23 to 12/30	0.024	0.011	0.040	0.04	0.08	<0.02	0.01	<0.003
12/30 to 01/06	--	--	--	--	--	--	--	--
01/06 to 01/13	0.044	0.032	0.143	0.09	0.29	0.05	<0.01	0.010
01/13 to 01/20	--	--	--	--	--	--	--	--
01/20 to 01/27	0.197	<0.118	0.631	<1.18	<1.18	<0.61	<0.27	<0.132
01/27 to 02/03	0.094	0.204	0.700	0.79	0.59	0.29	0.13	<0.003
02/03 to 02/10	0.131	0.781	0.115	0.25	0.27	0.15	0.02	0.020
02/10 to 02/17	0.058	0.212	0.146	0.08	0.36	0.04	0.15	<0.003
02/17 to 02/24	0.133	0.061	0.066	0.09	0.12	<0.02	<0.01	<0.003
02/24 to 03/03	0.196	0.196	0.334	3.02	0.50	1.02	1.01	<0.003
03/03 to 03/10	0.065	0.049	0.368	0.09	0.46	<0.02	<0.01	<0.003
03/10 to 03/17	1.010	1.260	2.280	5.01	3.0	0.80	0.56	<0.003
03/17 to 03/24	0.193	0.253	0.164	6.42	0.29	2.12	1.45	<0.003
03/24 to 03/31	--	--	--	--	--	--	--	--
03/31 to 04/07	0.104	0.056	0.077	0.34	0.13	<0.02	<0.01	<0.003
04/07 to 04/14	0.938	0.831	0.708	5.50	0.90	0.56	0.66	<0.003
04/14 to 04/21	0.085	0.027	0.053	0.08	0.12	<0.02	0.01	<0.003
04/21 to 04/28	0.566	0.603	0.437	3.14	0.55	<0.09	1.06	<0.021
04/28 to 05/05	0.244	0.177	0.215	3.18	0.39	1.32	0.76	<0.003
05/05 to 05/12	0.084	0.053	0.053	0.07	0.08	0.03	<0.01	<0.003
05/12 to 05/19	0.067	0.061	0.096	0.80	0.16	0.34	0.28	<0.003
05/19 to 05/26	0.013	0.013	0.022	0.33	<0.03	0.22	0.15	<0.003
05/26 to 06/02	0.140	0.116	0.197	2.12	0.28	0.70	0.50	<0.003
06/02 to 06/09	0.285	0.172	0.404	1.87	0.32	0.44	0.48	<0.003
06/09 to 06/16	0.082	0.088	0.143	0.50	0.16	0.25	0.14	<0.007
06/16 to 06/23	0.068	0.046	0.060	0.88	0.10	0.54	0.32	<0.007
06/23 to 06/30	0.240	0.165	0.539	1.33	0.64	0.23	0.23	0.050
06/30 to 07/07	0.076	0.064	0.122	0.83	0.23	0.52	0.34	<0.007
07/07 to 07/14	0.035	0.028	0.027	0.58	0.09	0.33	0.19	<0.007
07/14 to 07/21	0.023	0.010	0.048	0.44	0.08	0.16	0.12	<0.007
07/21 to 07/28	0.083	0.117	0.083	1.22	0.15	0.71	0.37	<0.007
07/28 to 08/04	0.083	0.053	0.074	1.46	0.18	0.59	0.57	<0.007
08/04 to 08/11	0.152	0.061	0.034	0.06	0.05	<0.02	<0.01	<0.007
08/11 to 08/18	0.067	0.131	0.362	1.44	0.28	0.37	0.18	<0.007
08/18 to 08/25	0.024	0.032	0.060	0.50	0.09	0.19	0.16	<0.007
08/25 to 09/01	--	--	--	--	--	--	--	--
09/01 to 09/08	0.227	0.131	0.484	1.54	0.41	0.14	0.33	<0.007
09/08 to 09/15	0.121	0.123	0.468	1.05	0.26	0.12	0.09	<0.007
09/15 to 09/22	0.105	0.080	0.103	1.97	0.12	0.74	0.56	<0.007
09/22 to 09/30	0.188	0.367	0.365	2.66	0.45	0.79	0.54	<0.007

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October 1, 1978

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).

Multiply inch-pound units	By	To obtain SI units
	Length	
inches (in)	2.54×10^{1}	millimeters (mm)
	2.54×10^{-2}	meters (m)
feet (ft)	3.048×10^{-1}	meters (m)
miles (mi)	1.609×10^{0}	kilometers (km)
	Area	
acres	4.047×10^{3}	square meters (m^2)
	4.047×10^{-1}	square hectometers (hm^2)
	4.047×10^{-3}	square kilometers (km^2)
square miles (mi^2)	2.590×10^{0}	square kilometers (km^2)
	Volume	
gallons (gal)	3.785×10^{0}	liters (L)
	3.785×10^{0}	cubic decimeters (dm^3)
	3.785×10^{-3}	cubic meters (m^3)
million gallons	3.785×10^{3}	cubic meters (m^3)
	3.785×10^{-3}	cubic hectometers (hm^3)
cubic feet (ft^3)	2.832×10^{1}	cubic decimeters (dm^3)
	2.832×10^{-2}	cubic meters (m^3)
cfs-days	2.447×10^{3}	cubic meters (m^3)
	2.447×10^{-3}	cubic hectometers (hm^3)
acre-feet (acre-ft)	1.233×10^{3}	cubic meters (m^3)
	1.233×10^{-3}	cubic hectometers (hm^3)
	1.233×10^{-6}	cubic kilometers (km^3)
	Flow	
cubic feet per second (ft^3/s)	2.832×10^{1}	liters per second (L/s)
	2.832×10^{1}	cubic decimeters per second (dm^3/s)
	2.832×10^{-2}	cubic meters per second (m^3/s)
gallons per minute (gal/min)	6.309×10^{-2}	liters per second (L/s)
	6.309×10^{-2}	cubic decimeters per second (dm^3/s)
	6.309×10^{-5}	cubic meters per second (m^3/s)
million gallons per day	4.381×10^{1}	cubic decimeters per second (dm^3/s)
	4.381×10^{-2}	cubic meters per second (m^3/s)
	Mass	
tons (short)	9.072×10^{-1}	megagrams (Mg) or metric tons

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