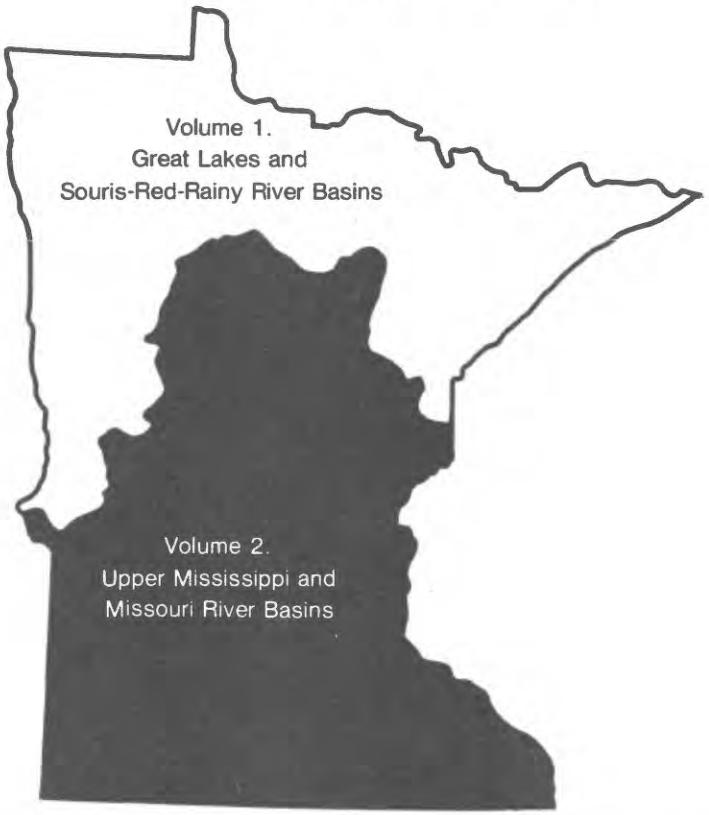
Water Resources Data Minnesota Water Year 1985

Volume 2. Upper Mississippi and Missouri River Basins



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT MN-85-2
Prepared in cooperation with the Minnesota Department of Natural Resources, Division of Waters; the Minnesota Department of Transportation; and with other State, municipal, and Federal agencies

CALENDAR FOR WATER YEAR 1985

1984

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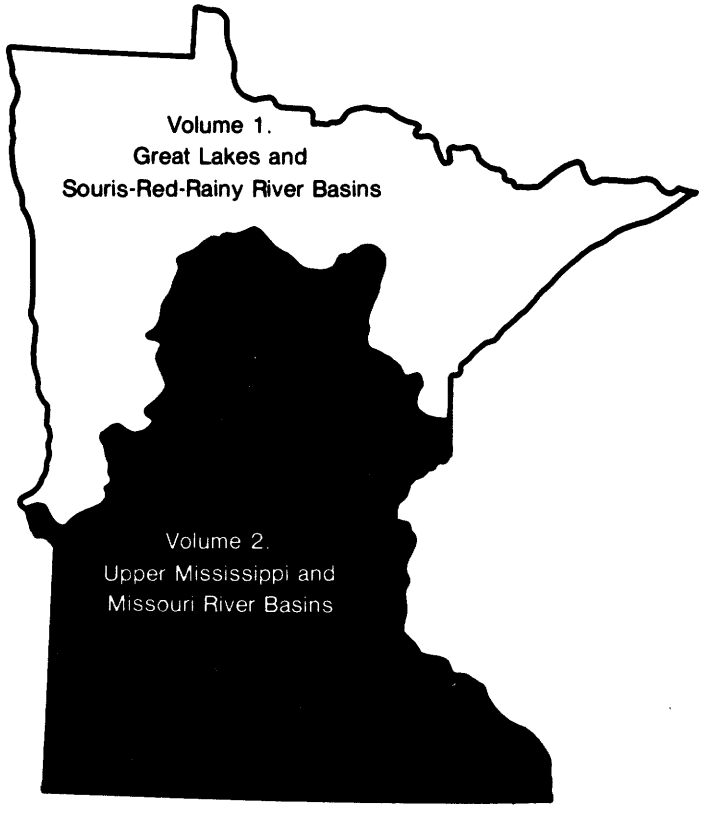
Water Resources Data Minnesota Water Year 1985

Volume 2. Upper Mississippi and Missouri River Basins

by Kurt T. Gunard, Joseph H. Hess, James L. Zirbel, and Charles E. Cornelius



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Prepared in cooperation with the Minnesota Department of Natural Resources, Division of Waters; the Minnesota Department of Transportation; and with other State, municipal, and Federal agencies

UNITED STATES DEPARTMENT OF THE INTERIOR

DONALD PAUL HODEL, Secretary

GEOLOGICAL SURVEY

Dallas L. Peck, Director

For additional information write to:

District Chief, Water Resources Division
U.S. Geological Survey
702 Post Office Building
St. Paul, Minnesota 55101

1987

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Volume 2, Upper Mississippi and Missouri River Basin

5. Report Date November 1987

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7. Author(s) Kurt T. Gunard, Joseph H. Hess, James L. Zirbel, and Charles E. Cornelius

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15. Supplementary Notes

Prepared in cooperation with the State of Minnesota and with other agencies.

16. Abstract (Limit: 200 words)

Water-resources data for the 1985 water year for Minnesota 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 in wells and springs. This volume contains discharge records for 59 gaging stations; stage and contents for 8 lakes and reservoirs; water quality for 14 stream stations, 2 partial-record stations, 1 lake station, 1 precipitation station, and 151 wells; and water levels for 152 observation wells. Also included are 96 high-flow partial-record stations and 99 low-flow partial-record stations. Additional water data were collected at various sites, not part of the systematic data collection program and are published as miscellaneous measurements. These data, together with the data in Volume 1, represent that part of the National Water Data System operated by the U. S. Geological Survey and cooperating State and Federal agencies in Minnesota

17. Document Analysis a. Descriptors

*Minnesota, *Hydrologic data, *Surface water, *Ground water, *Water quality, Flow rate, Gaging stations, Lakes, Reservoirs, Chemical analyses, Precipitation, Sediments, Water temperatures, Sampling sites, Water levels, Water analyses, Data collection

b. Identifiers/Open-Ended Terms

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PREFACE

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

Volume 1. Great Lakes and Souris-Red-Rainy River Basins
Volume 2. Upper Mississippi and Missouri River Basins

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 Geological Survey policy and established guidelines, the following individuals contributed significantly to the preparation of this report:

Mark R. Have, Water-Quality Specialist, Minnesota District
Henry W. Anderson, Jr., Ground-Water Project Chief, Minnesota District

Most of the data were collected, processed, and tabulated by the following individuals:

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John L. Callahan
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Paul E. Felsheim
William A. Gothard
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Wallace W. Larson
Gregory R. Melhus
Gregory B. Mitton
Charles J. Smith
Gregory W. Stratton
Sandra J. Surratt
Lan H. Tornes
Duane A. Wicklund

This report was prepared in cooperation with the State of Minnesota and with other agencies under the general supervision of Donald R. Albin, District Chief, Minnesota.

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CONTENTS

ILLUSTRATIONS

Page

ILLUSTRATIONS--Continued

GAGING STATIONS, IN DOWNSTREAM ORDER, FOR WHICH RECORDS ARE PUBLISHED

Note.--Data for partial-record stations and miscellaneous sites for both surface-water quantity and quality are published in separate sections of the data report. See references at the end of this list for page numbers for these sections.

[*Letters after station name designates type of data: (d) discharge; (e) gage height, elevation, or contents; (c) chemical, radio-chemical, or pesticides; (b) biological or micro-biological; (p) physical (water temperature, sediment, or specific conductance)*]

GROUND-WATER WELLS, BY COUNTY, FOR WHICH RECORDS ARE PUBLISHED

GROUND-WATER LEVELS

GROUND-WATER WELLS, BY COUNTY, FOR WHICH RECORDS ARE PUBLISHED--Continued

COUNTIES WITH QUALITY OF GROUND WATER RECORDS

PRECIPITATION SITES, FOR WHICH CHEMICAL QUALITY RECORDS ARE PUBLISHED

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 Minnesota each water year. These data, accumulated during many years, constitute a valuable data base for developing an improved understanding of the water resources of the State. To make these data readily available to interested parties outside the Geological Survey, the data are published annually in this report series entitled "Water Resources Data - Minnesota."

Water resources data for the 1985 water year for Minnesota 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. This volume contains discharge records for 59 gaging stations; stage and contents for 8 lakes and reservoirs; water quality for 14 stream stations, 2 partial-record stations, 1 lake station, 1 precipitation station, and 151 wells; and water levels for 152 observation wells. Also included are 96 high-flow partial-record stations. Additional water data were collected at various sites, not involved in the systematic data collection program, and are published as miscellaneous measurements. These data, together with the data in Volume 1, represent that part of the National Water Data System collected by the U.S. Geological Survey and cooperating State and Federal agencies in Minnesota.

This series of annual reports for Minnesota 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 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 Minnesota 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 4, 5 and 6A." For the 1961 through 1970 water years, the data were published in two 5-year reports. Data on chemical quality, temperature, and suspended sediment for the 1941 through 1970 water years were published annually under the title "Quality of Surface Waters of the United States," and water levels for the 1935 through 1974 water years were published under the title "Ground-Water Levels in the United States." The above mentioned Water-Supply papers can be consulted in the libraries of the principal cities of the United States and may be purchased from Distribution Branch, Text Products Section, U.S. Geological Survey, 604 Pickett Street, Alexandria, VA 22304

Publications similar to this report are published annually by the Geological Survey for all States. These official Survey reports have an identification number consisting of the two-letter State abbreviation, the last two digits of the water year, and volume number. For example, this volume is identified as the "U.S. Geological Survey Water-Data Report MN-85-2. For archiving and general distribution, the reports for 1971-1974 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 telephone (612) 725-7841.

COOPERATION

The U.S. Geological Survey and organizations of the State of Minnesota have had cooperative agreements for the systematic collection of streamflow records since 1909, for ground-water levels since 1948, and for water-quality records since 1952. Organizations that assisted in collecting data through cooperative agreement with the Survey are:

Minnesota Department of Natural Resources, Division of Waters, Lawrence D. Seymour, director.

Minnesota Department of Transportation, Richard P. Braun, commissioner.

Minnesota Pollution Control Agency, Thomas J. Kalitowski, executive director.

Metropolitan Waste Control Commission of the Twin Cities Area, Peter E. Meintsman, chairperson

Metropolitan Council of the Twin Cities Area, Sandra Gardebring, chairperson.

Elm Creek Conservation Commission, Gerald E. Butcher, chairperson.

Fond du Lac Reservation Business Committee, W. J. Houle, chairperson.

Red Lake Watershed District, Truman Sandland, president.

Red Lake Reservation Business Committee, Roger Jourdain, chairperson.

Middle River-Snake River Watershed District, Donald Rivard, chairperson.

White Earth Reservation Business Committee, Darrell Wadena, chairperson.

Assistance in the form of funds or services was given by the Corps of Engineers, U.S. Army, in collecting records for 48 gaging stations and 12 water-quality stations published in this report.

Thirteen gaging stations in the Hudson Bay and St. Lawrence River basins were maintained by funds appropriated to the United States Department of State. Eight of these, on water adjacent to the international boundary, are maintained by the United States (or Canada) under agreement with Canada (or the United States), and the records are obtained and compiled in a manner equally acceptable in both countries. These stations are designated herein as "International gaging stations."

SUMMARY OF HYDROLOGIC CONDITIONS

PRECIPITATION

Precipitation during the 1985 water year varied from normal in a small area of the southeast to 16 inches above normal in parts of north-central and northwestern Minnesota (fig. 1). Normal annual precipitation in Minnesota ranges from 19 inches in the northwest to 32 inches in the southeast. Precipitation during water year 1985 ranged from 24 inches in parts of the northwest to 40 inches in central Minnesota and small parts of the northeast and southeast. Except for November, precipitation was above normal statewide during the first quarter of the 1985 water year. During the second quarter, precipitation was near normal to slightly below, except during March when it was above normal statewide, with the exception of the "arrowhead" where it was slightly below. Precipitation during the third quarter generally was above normal over most of the State, except in the southeast where it was below normal during the entire quarter. The fourth quarter began with below-normal precipitation statewide during July. Precipitation during the remainder of the quarter was excessive over most of the State, being slightly below normal in parts of the north.

STREAMFLOW

Average annual runoff in Minnesota ranges from 1 inch in the west to 14 inches in the northeast. Annual runoff in 1985 ranged from 1.2 inches on the western border to almost 19 inches in the northeast (fig. 2) and varied from 60 to 80 percent of average in parts of northeast and south-central Minnesota to 300 percent of average in a small part of the northwest. The southwest had the greatest area of above-average runoff, ranging from 200 to 280 percent of the long-term average. Small areas in the south-central, southeast, and "arrowhead" regions of the State had the lowest average runoff, ranging from 63 to 102 percent of the long-term average. Runoff in the large remaining area of the State ranged from 125 to 200 percent of the long-term average, with a few exceptions.

Records for stations in central and southern Minnesota during 1985 indicate considerable variation in annual runoff from near average to much-above average. Runoff in the Mississippi River at Aitkin in east-central Minnesota was 8.59 inches or 133 percent of the 40-year average annual runoff of 6.48 inches. Runoff in the Crow River at Rockford, in the southern part of central Minnesota, was 9.64 inches, which is 2.5 times the average annual runoff of 3.80 inches and the 3rd highest in 60 years of record. 1985 was the 3rd consecutive year of record, or near-record, runoff in the Crow River basin. Runoff in 1983 was 9.84 inches, which broke the previous record of 9.14 inches set in 1972. Another new record of 11.01 inches was set in 1984. In west-central Minnesota, runoff in the Chippewa River near Milan was 7.26 inches, almost 3.5 times the average annual runoff of 2.14 inches and the highest in 48 years of record; the previous record of 5.81 inches occurred in 1952. Runoff to the Des Moines River at Jackson, in southwestern Minnesota, was 5.50 inches -- 1.5 times the average annual runoff of 3.53 inches but considerably below the 50-year record of 13.34 inches set in 1983. Annual and monthly mean discharges for these stations are compared to median discharges for a 30-year base period in figure 3.

Although record-breaking monthly and annual runoff volumes were recorded at several gaging stations, no peaks of record were exceeded during 1985 at any stations on streams for which records are published in this volume.

The combined storage in the six Mississippi River Headwater Reservoirs (Winnibigoshish, Leech, Pokegama, Pine, Sandy, and Gull), located in northern and central Minnesota, was 1,394,416 acre-feet at the end of the 1985 water year -- an increase of 26,252 acre-feet from the corresponding date a year ago.

WATER QUALITY

Three U.S. Geological Survey National Stream-Quality Accounting Network (NASQAN) stations

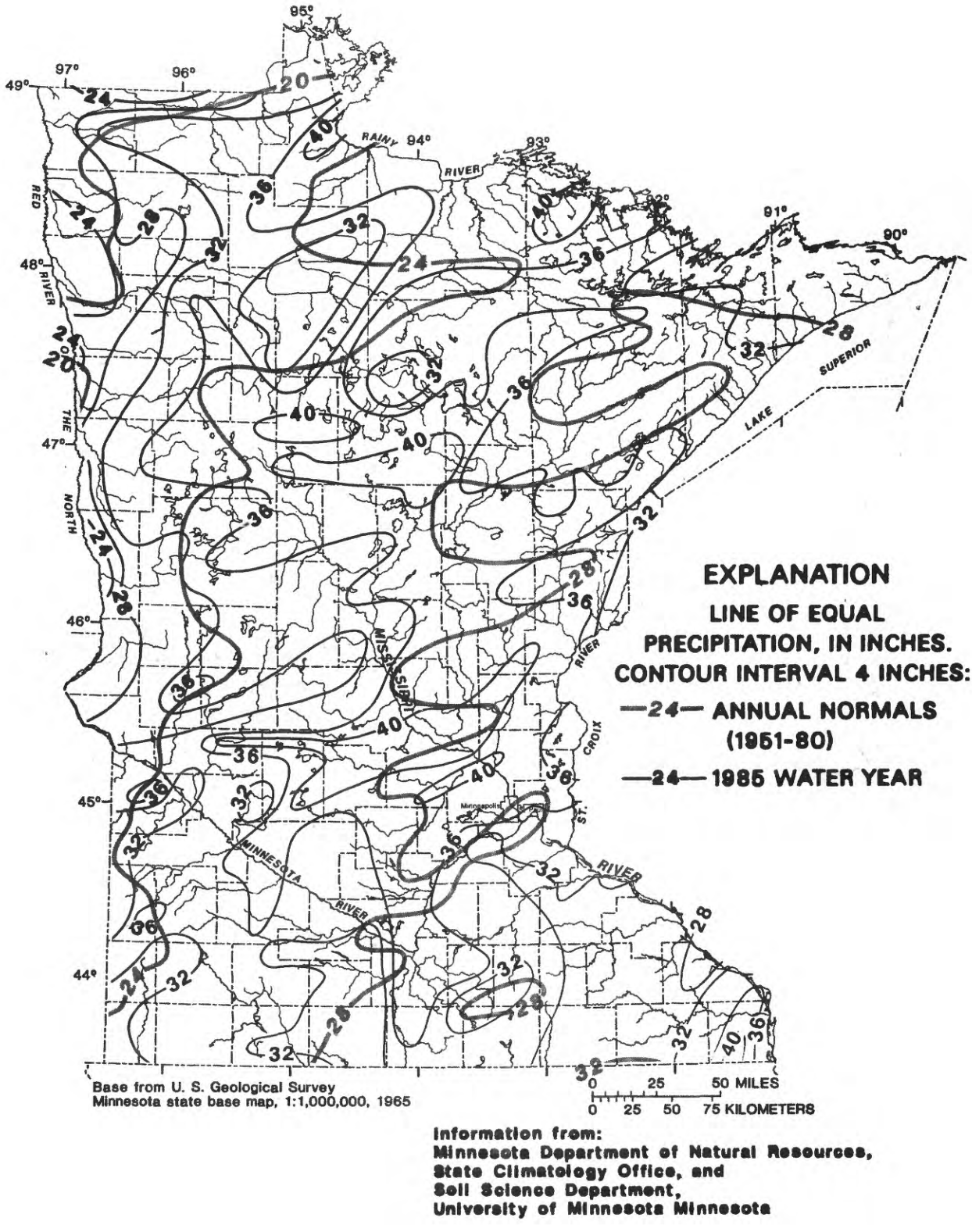


Figure 1.--Precipitation, in inches, during 1985 water year compared with normal annual precipitation for Minnesota

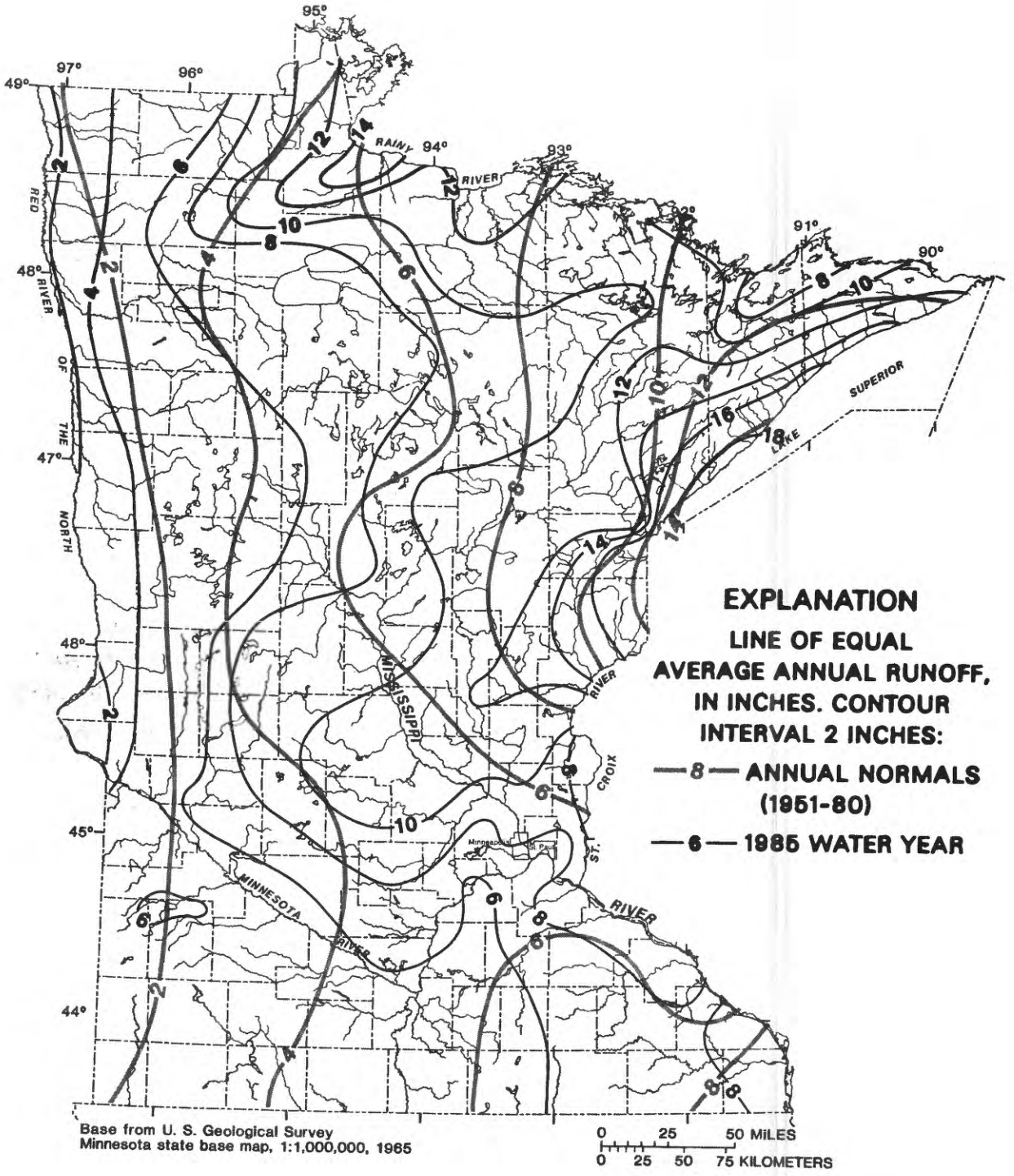


Figure 2.--Average annual runoff, in inches, for the 1985 water year compared with average annual runoff for a 30-year base period

and one bench-mark station are used to depict variability in concentrations of chloride and nitrate as nitrogen in the Upper Mississippi River basin (figs. 4 and 5); there are no water-quality stations in the Missouri River basin.

Chloride concentrations generally were higher than the monthly median for each of the four stations (fig. 4). Nitrate concentrations reported as nitrogen (analysis for nitrate plus nitrite as nitrogen, but nitrite concentration assumed to be negligible) generally were higher than the monthly median at each station except Mississippi River at Nininger. Nitrate concentrations were lower than the monthly median in three out of four samples collected at Nininger.

Water samples (224) were collected from 151 wells and analyzed for major ions; 9 samples also were analyzed for trace elements. Nitrate concentrations were above the primary drinking-water standard of 10 mg/L (U.S. Environmental Protection Agency, 1985) in 49 samples. The 49 samples are from 34 wells. Trace-element concentrations were not above the primary drinking water standards in any of the samples.

GROUND-WATER LEVELS

Water levels in unconfined (water-table) aquifers generally were above normal in 16 of 32 observation wells at the begining of the 1985 water year. Water levels rose during early fall and declined in late fall through winter. During winter 1985 (January through March), water levels in 47 percent of the observation wells were in the normal range, 34 percent were above normal, and 19 percent were below normal. Water levels rose slightly in spring 1985, such that water levels were normal in 56 percent of the observation wells, above normal in 31 percent, and below normal in 13 percent. Water levels continued to rise during summer so that they were above normal in 16 of the 32 observation wells in unconfined aquifers, water levels in 14 of the wells were in the normal range, and water levels in 2 of the wells were below normal. During summer 1985, new monthly record-high-water levels were recorded in 11 of the 32 observation wells. Figure 6 shows how water levels relate seasonally to normal levels, based on water-level fluctuations in 32 wells in unconfined aquifers. Levels for the 1985 water year are compared to the long-term normal for each month and grouped by seasons. Water levels in southeastern Minnesota were consistently above normal throughout the 1985 water year, similar to water levels in the adjacent area of Wisconsin. Water levels in parts of central and northwestern Minnesota also were above normal. Water levels in northeastern Minnesota were below normal in fall and winter but were in the normal range in spring and summer. In southwestern Minnesota, water levels declined and by the end of the water year (September 1985) were below normal, similar to water levels reported from adjacent areas in South Dakota.

Water levels in confined drift and bedrock aquifers were above normal throughout the 1985 water year. Water levels rose during winter and spring followed by a seasonal decline in summer 1985 (fig. 7). Seasonal water levels in 52 observation wells in confined aquifers were compared to long-term normal levels. Both in fall 1984 (October through December) and in winter 1985 (January through March) above-normal levels were recorded in 69 percent of the wells in confined aquifers, normal levels were recorded in 18 percent of the wells, and below-normal levels were recorded in about 13 percent of the wells. Water levels rose seasonally in spring, so that above-normal water levels were recorded during the months of April, May, and June 1985 in 65 percent of the observation wells in confined aquifers, normal levels were recorded in 21 percent of the wells, and below-normal levels were recorded in only 14 percent of the wells. During summer 1985, water levels in 30 of the 52 observation wells in confined aquifers remained above normal and were in the normal range in 16 wells. Numerous seasonal record-high-water levels were recorded in north-central, southeastern, and southwestern Minnesota. New monthly record-high-water levels were recorded in 21 of the 52 observation wells in confined aquifers during the fall. New monthly record-high-water levels were recorded in 18 of the wells during winter and again during spring. New monthly record-high-water levels were recorded in 15 of the wells during summer. Levels in the Mount Simon-Hinckley aquifer in the Twin Cities basin were consistently below normal, and new seasonal record-low-water levels were recorded.

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

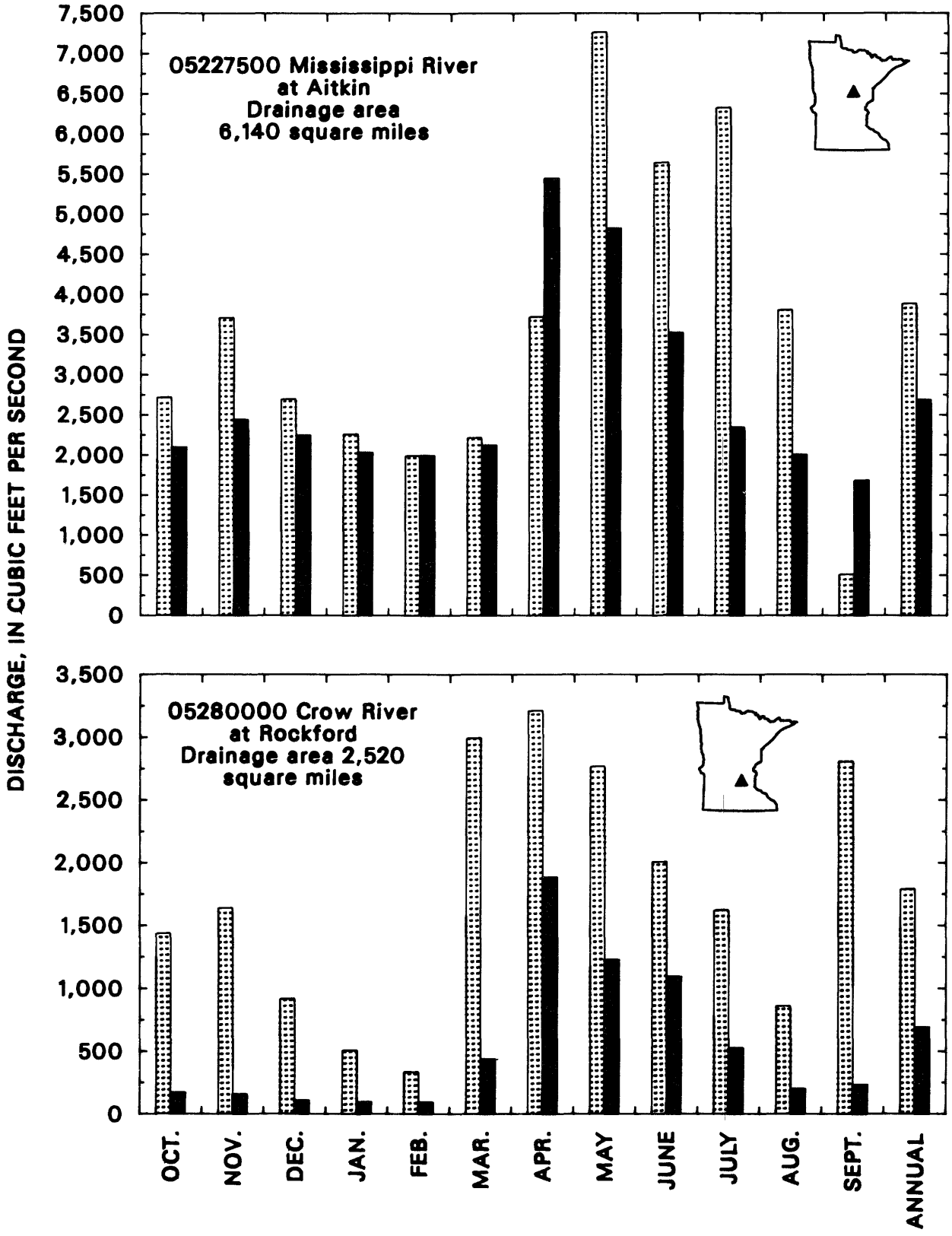
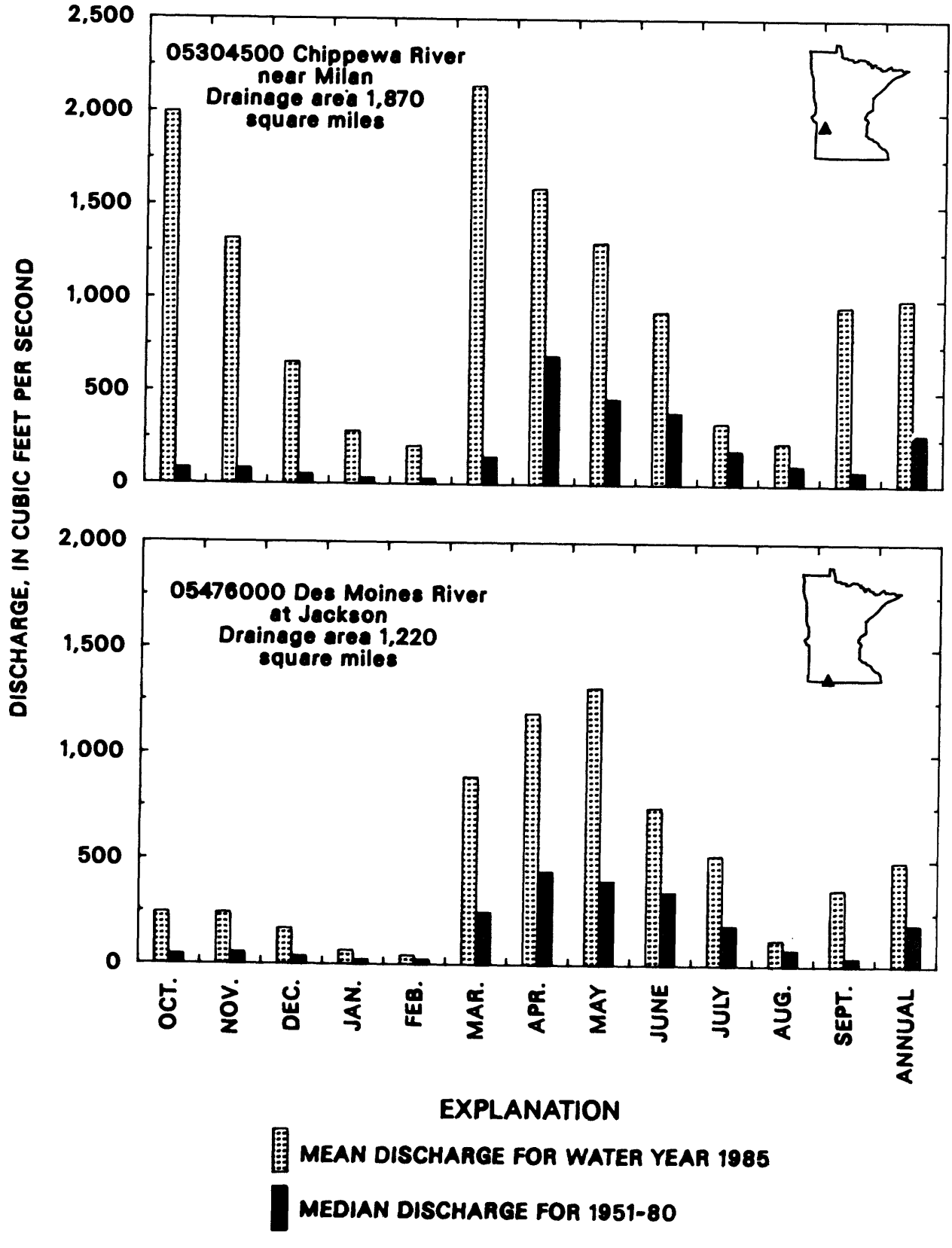


Figure 3.--Comparison of discharges at four long-term representative gaging



stations for the 1985 water year with median discharge for water years 1951-80

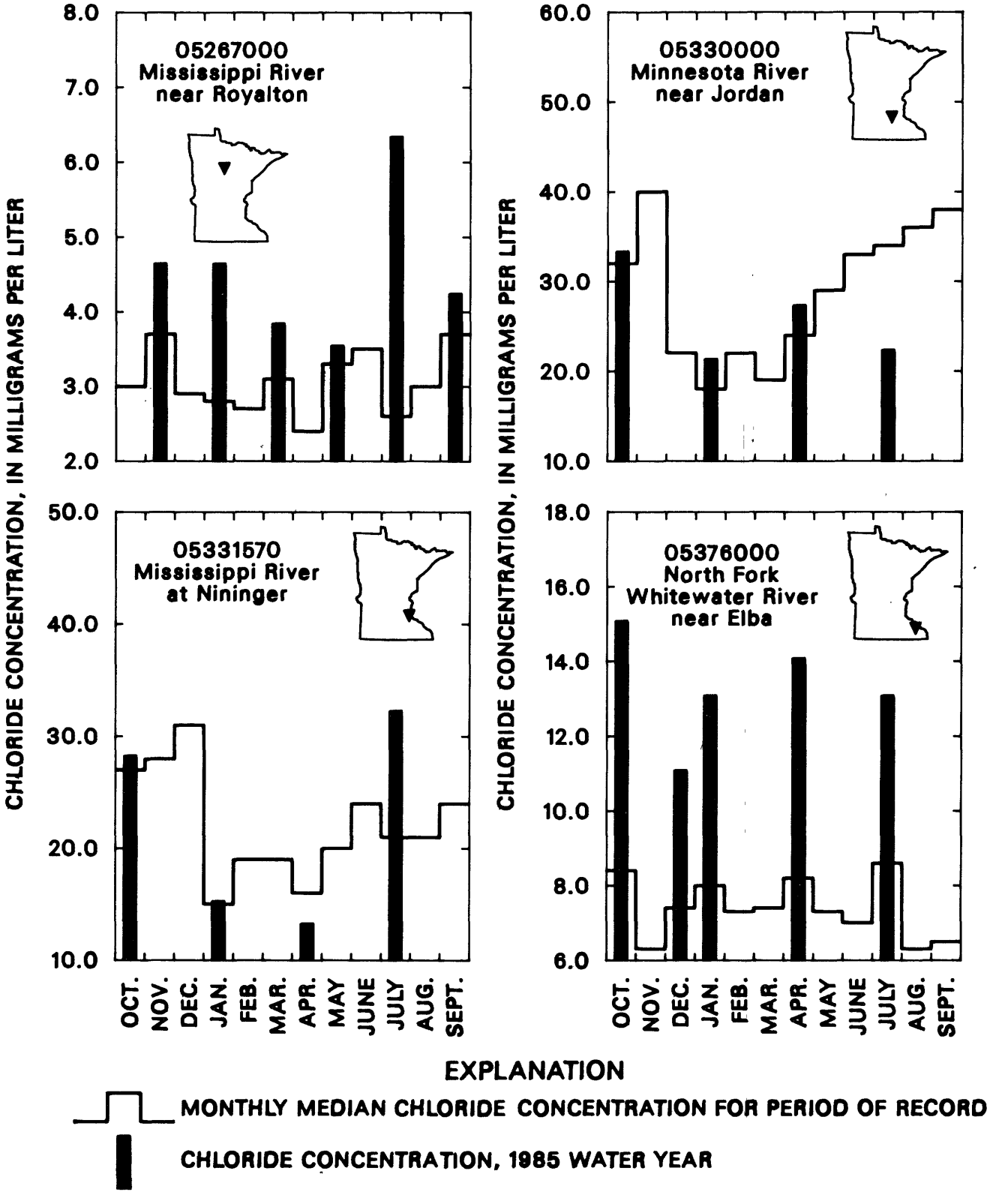


Figure 4.--Comparison of chloride concentrations for the 1985 water year with median monthly values for the period of record

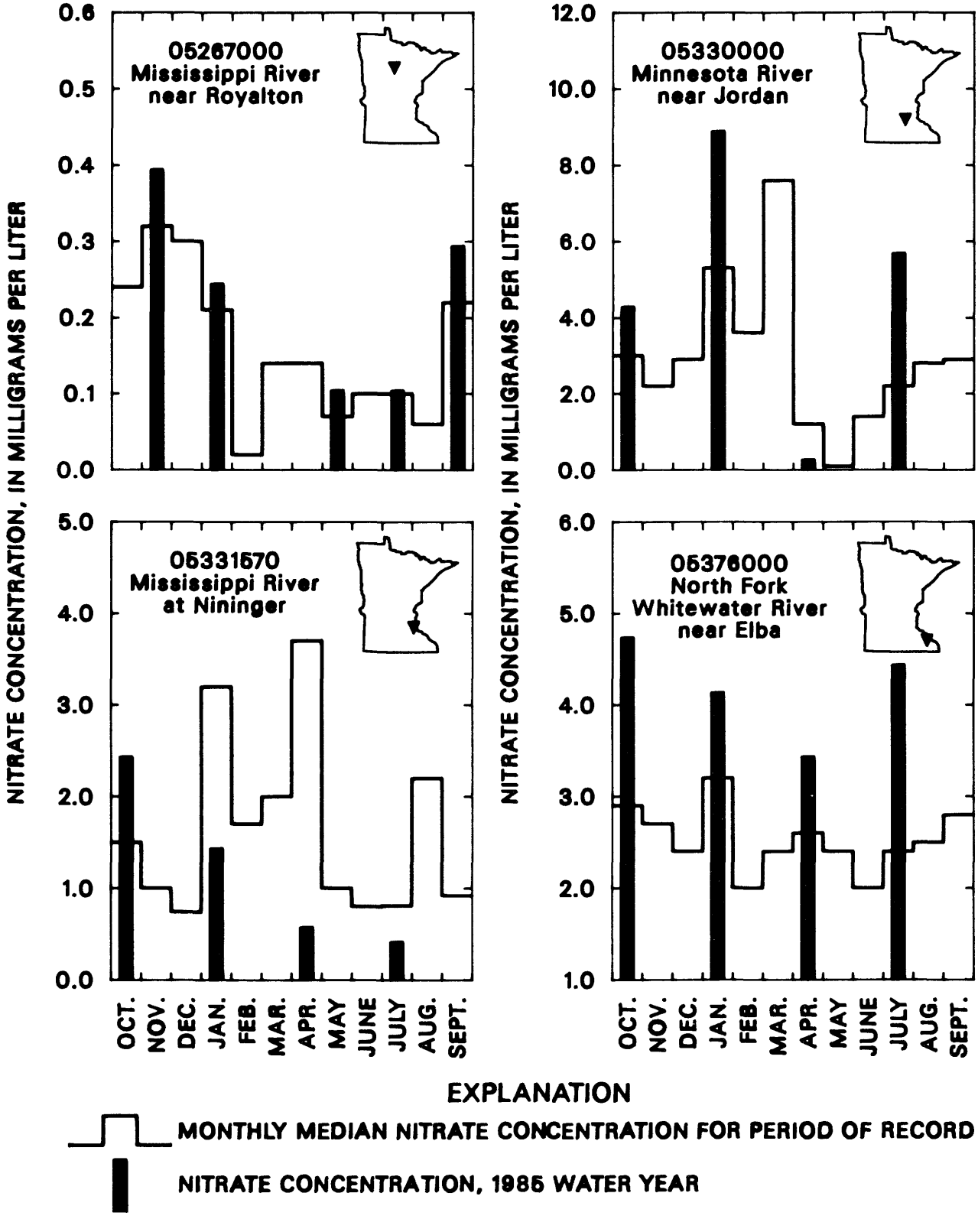


Figure 5.--Comparison of nitrate concentrations for the 1985 water year with median monthly values for the period of record

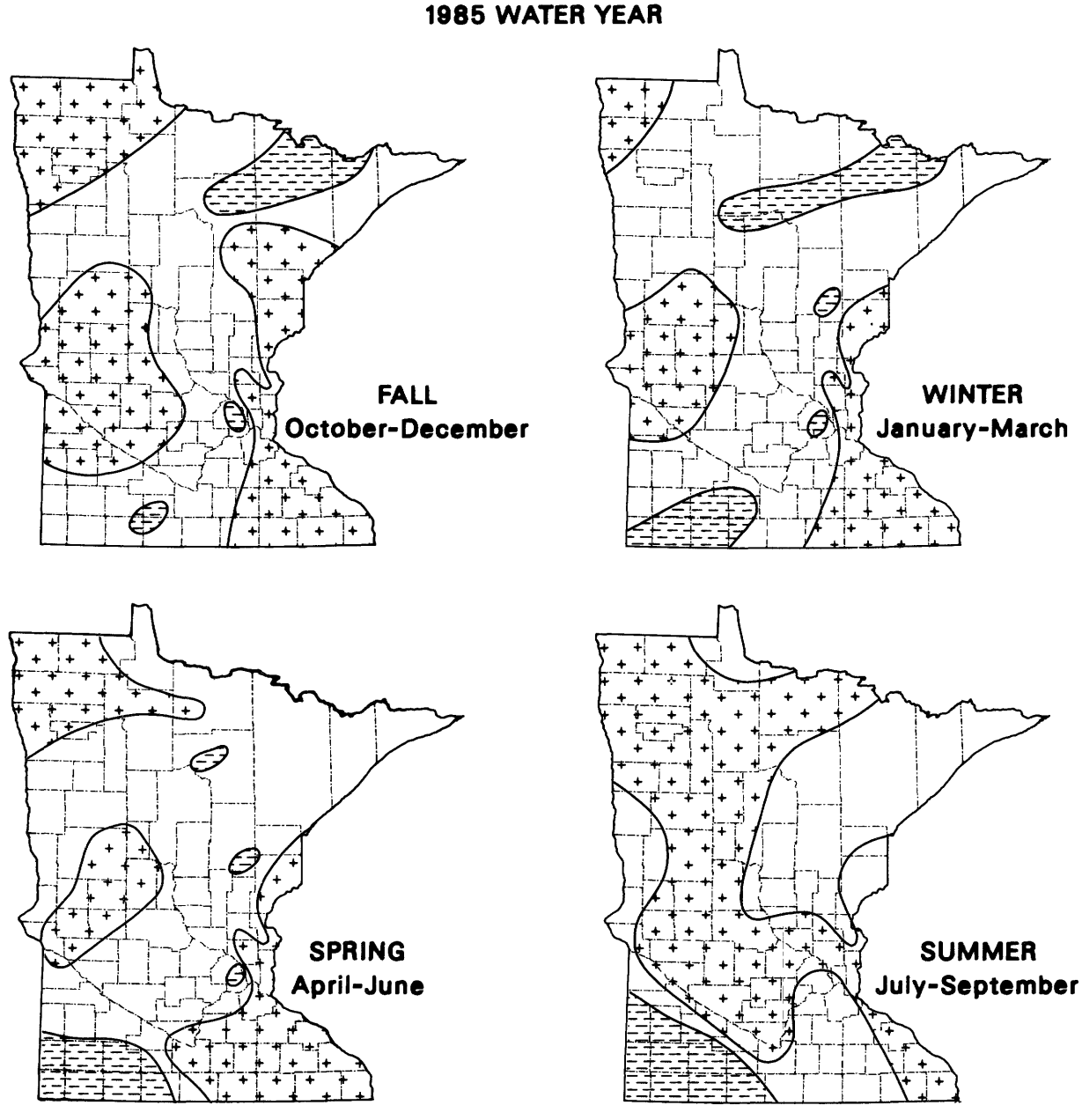


Figure 6.--Relationship of seasonal water-table levels to long-term mean levels

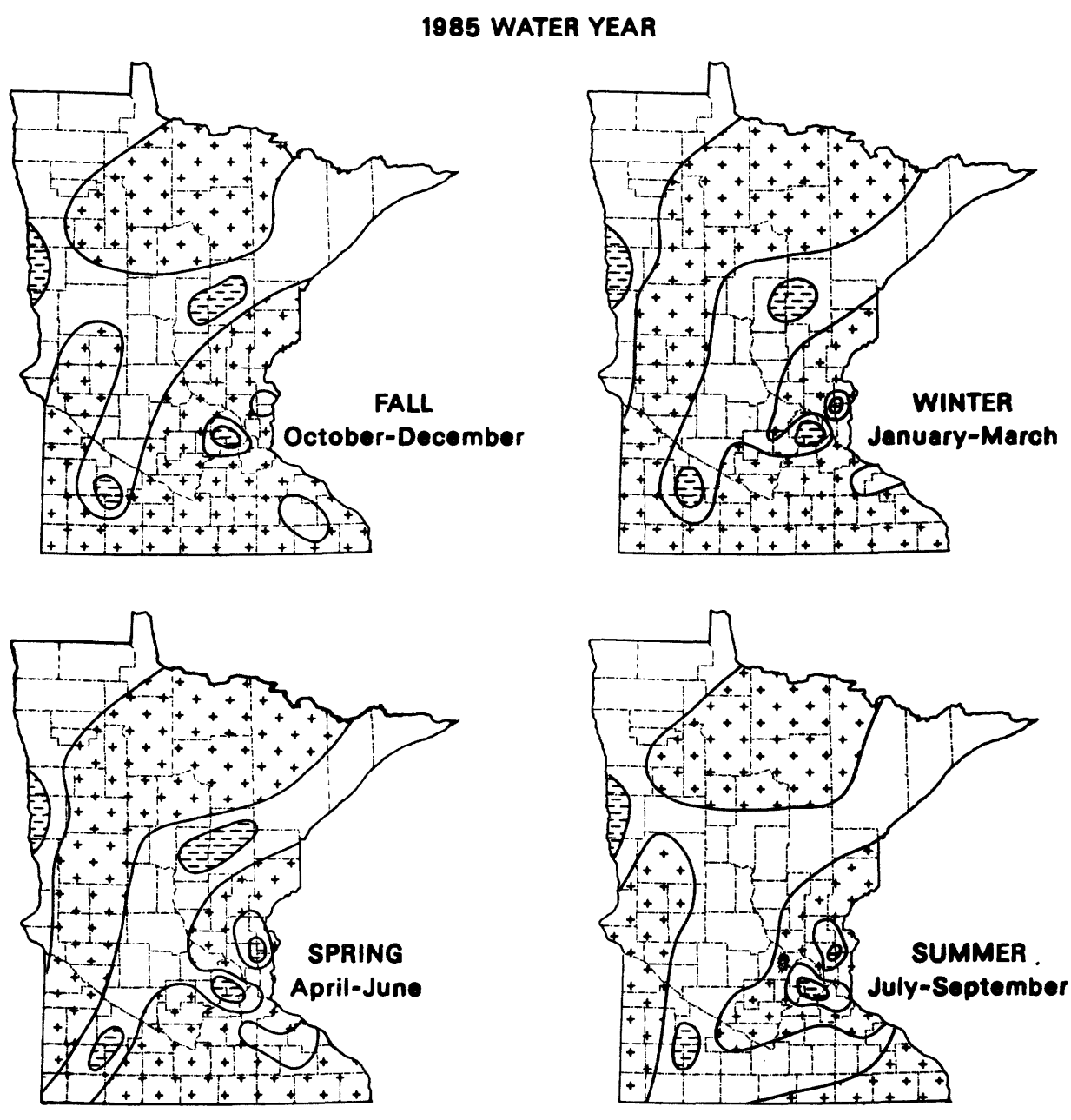


Figure 7.--Relationship of seasonal water levels in confined aquifers to long-term mean levels

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, and aerosols, and gases. The core from which the NTN was built was the already-existing deposition-monitoring network of the National Atmospheric Deposition Program (NADP).

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

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

EXPLANATION OF THE RECORDS

The surface-water and ground-water records published in this report are for the 1985 water year that began October 1, 1984, and ended September 30, 1985. A calendar of the water year is provided on the inside of the front cover. The records contain streamflow data, stage and content data for lakes and reservoirs, water-quality data for the 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 9, 10, 11, and 12. The following sections of the introductory text are presented to provide users with a more detailed explanation of how the hydrologic data published in this report were collected, analyzed, computed, and arranged for presentation.

STATION IDENTIFICATION NUMBERS

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

Downstream Order System and Station Number

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

As an added means of identification, each hydrologic station and partial-record station has been assigned a station number. These are in the same downstream order in this report. 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 8-digit number for each station such as 05041000, which appears just to the left of the station name, includes the 2-digit part number "05" plus the 6-digit downstream order number "041000."

Latitude-Longitude System for Wells and Miscellaneous Sites

The 8-digit downstream order station numbers are not assigned to wells and miscellaneous sites where only random water-quality samples or discharge measurements are taken.

The well and miscellaneous site numbering system of the U.S. Geological Survey is based on the grid system of latitude and longitude. The system provides the geographic location of the well or miscellaneous site and a unique number for each site. The number consists of 15 digits. The first 6 digits denote the degrees, minutes, and seconds of latitude, the next 7 digits denote degrees, minutes, and seconds of longitude, and the last 2 digits (assigned sequentially) identify the wells or other sites within a 1-second grid. See figure 8 on following page. Each well site is also identified by a local well number which consists of township, range, and section numbers, three letters designating 1/4, 1/4, 1/4 section location, and a two-digit sequential number.

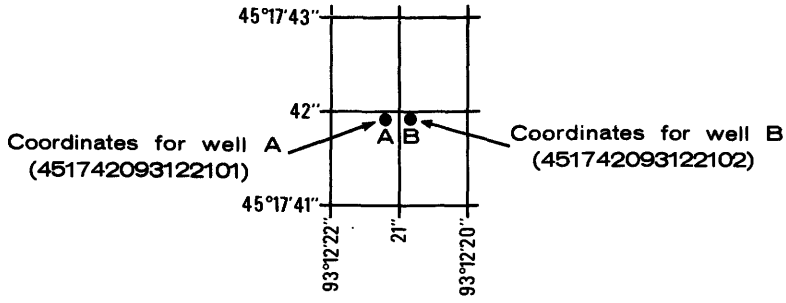


Figure 8.--Example of system for numbering wells and miscellaneous sites

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 discharge may be computed for any time, or any period of time, during the period of record. Complete records of lake or reservoir content, similarily, 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 "High-flow 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, but they are presented separately in this report. Location of all complete-record and high-flow partial-record stations for which data are given in this report are shown in figures 9 and 11.

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 adapted by the Geological Survey as a result of experience accumulated since 1880. These methods are described in standard textbooks, in Water-Supply Paper 2175, and in U.S. Geological Survey Techniques of Water-Resources Investigations, Book 3, Chapter A6.

In computing discharge records, results of individual measurements are plotted against the corresponding stages, and stage-discharge relation curves are then constructed. From these curves, rating tables indicating the approximate discharge for any stage within the range of the measurements are prepared. If it is necessary to define extremes of discharge outside the range of 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.

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.

At some stream-gaging stations the stage-discharge relation is affected by the backwater from reservoirs, tributary streams, or other sources. This necessitates the use of the slope method in which the slope or fall in a reach of the stream is a factor in computing discharge. The slope or fall is obtained by means, of an auxiliary gage set at some distance from the base gage. At some stations the stage-discharge relation is affected by changing stage; at these stations the rate of change in stage is used as a factor in computing discharge.

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 time since the last survey increases. Discharge 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 determined by methods given in "River Mileage Measurement," Bulletin 14, Revision of October 1968, prepared by the Water Resources Council or were provided by the U.S. Army Corps of Engineers.

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

PERIOD OF RECORD.--This indicates the period for which there are published records for the station or for an equivalent station. An equivalent station is one that was in operation at a time when 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 reports in which revisions have been published for the station and 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. If a remarks statement is used to identify estimated record, the paragraph will begin with this information presented as the first entry. The paragraph is also used to present information relative to the accuracy of the records, to special methods of computation, to conditions that affect natural flow at the station and, possibly, to other pertinent items. For reservoir stations, information is given on the dam forming the reservoir, the capacity, outlet works and spillway, and purpose and use of the reservoir.

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

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

EXTREMES FOR PERIOD OF RECORD.--Extremes may include maximum and minimum stages and maximum and minimum discharges or content. Unless otherwise qualified, the maximum discharge or content is the instantaneous maximum corresponding to the highest stage that occurred. The highest stage may have been obtained from a graphic or digital recorder, a crest-stage gage, or by 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 manner as the maximum.

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

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

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

For most gaging stations on lakes and reservoirs the data presented comprise a description of the station and a monthly summary table of stage and contents. For some reservoirs a table showing daily contents or stage is given.

The daily table for stream-gaging stations gives mean discharge for each day and is followed by monthly and yearly summaries. In the monthly summary below the daily table, the line headed "TOTAL" gives the sum of the daily figures. The line headed "MEAN" gives the average flow in cubic feet per second during the month. The lines headed "MAX" and "MIN" give the maximun and minimum daily discharges, respectively, for the month. Discharge for the month also is usually expressed in cubic feet per second per square mile (line headed "CFSM"), or in inches (line headed "IN."), or in acre-feet (line headed "AC-FT"). Figures for cubic feet per second per square mile and runoff in inches are omitted if there is extensive regulation or diversion or if the drainage area includes large noncontributing areas. In the yearly summary below the monthly summary, the figures shown are the appropriate discharges for the calendar and water years. At some stations monthly and (or) yearly observed discharges are adjusted for reservoir storage or diversion, or diversions or reservoir contents are given. These figures are identified by a symbol and corresponding footnote.

Data collected at partial-record stations follow the information for continuous-record sites. Data for partial-record discharge stations are presented in two tables. The first is a table of discharge measurements at low-flow partial-record stations, and the second is a table of annual maximum stage and discharge at crest-stage stations. The tables of partial-record stations are followed by a listing of discharge measurements made at sites other than continuous-record or partial-record stations. 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.

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 desciption.

Accuracy of the Records

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

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

Daily mean discharges in this report are given to the nearest hundreth of a cubic foot per second for values less than 1 ft^3/s; to the nearest tenth between 1.0 and 10 ft^3/s; to whole numbers between 10 and 1000 ft^3/s; and to 3 significant figures for more than 1000 ft^3/s. The number of significant figures used is based solely on the magnitude of the discharge value. The same rounding rules apply to discharges listed for partial-record stations and miscellaneous sites.

Discharge at many stations, as indicated by the monthly mean, may not reflect natural runoff due to the effects of diversion, consumption, regulation by storage, increase or decrease in evaporation due to artificial causes, or to other factors. For such stations, figures of cubic feet per second per square mile and of runoff, in inches, are not published unless satisfactory adjustments can be made for diversions, for changes in contents of reservoirs, or for other changes incident to use and control. Evaporation from a reservoir is not included in the adjustments for changes in reservoir contents, unless it is so stated. Even at those stations where adjustments are made, large errors in computed runoff may occur if adjustments or losses are large in comparison with the observed discharge.

Other Records Available

Information of a more detailed nature than that published for most of the gaging stations such as observations of water temperatures, discharge measurements, gage-height records, and rating tables is on file in the district office. Also most gaging-station records are available in computer-usable form and many statistical analyses have been made.

Information on the availability of unpublished data or statistical analyses may be obtained from the district office.

The National Water Data Exchange, Water Resources Division, U.S. Geological Survey, National Center, Reston, VA 22092, maintains an index of all discharge measurement sites in the State as well as an index of records of discharge collected by other agencies but not published by the Geological Survey. Information on records available at specific sites can be obtained upon request.

RECORDS OF SURFACE-WATER QUALITY

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

Classification of Records

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

A careful distinction needs to be made between "continuing records" as used in this report and "continuous recordings," which refers to a continuous graph or a series of discrete values punched at short intervals on a paper tape. Some records of water quality, such as temperature and specific conductance, may be obtained through continuous recordings; however, because of costs, most data are obtained only monthly or less frequently. Locations of stations for which records on the quality of surface water appear in this report are shown in figure 10.

Arrangement of Records

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

On-Site Measurement and Collection

In obtaining water quality data, a major concern needs to be assuring that the data obtained represents the in situ quality of water. To assure this, certain measurements, such as water temperature, pH, and dissolved oxygen need to be made onsite when the samples are taken. To assure that measurements made in the laboratory also represent the in situ water, carefully prescribed procedures need to be followed in collecting the samples, in treating the samples to prevent changes in quality pending analysis, and in shipping the samples to the laboratory. Procedures for onsite measurements and for collecting, treating, and shipping samples are given in publications on "Techniques of Water-Resources Investigations," Book 1, Chap. D2; Book 3, Chap. C2; Book 5 Chap. A1, A3, and A4. All of these references are listed on p. 17 of this report. Also, detailed information on collecting, treating, and shipping samples may be obtained from the Geological Survey District office.

One sample can define adequately the water quality at a given time if the mixture of solutes throughout the stream cross section is homogeneous. However, the concentration of solutes at different locations in the cross section may vary widely with different rates of water discharge, depending on the source of material and the turbulence and mixing of the stream. Some streams must be sampled through several vertical sections to obtain a representative sample needed for an accurate mean concentration and for use in calculating load. All samples obtained for the National Stream Quality Accounting Network (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.G.S. district office whose address is given on the back of the title page of this report.

Water Temperature

Water temperatures are measured at most of the water-quality stations. In addition, water temperatures are taken at time of discharge measurements for water-discharge stations. For stations where water temperatures are taken manually once or twice daily, the water temperatures are taken at about the same time each day. Large streams have a small diurnal temperature change; shallow streams may have a daily range of several degrees and may follow closely the changes in air temperature. Some streams may be affected by waste-heat discharges.

At stations where recording instruments are used, either mean temperatures or maximum and minimum temperatures for each day are published. Water temperatures measured at the time of water-discharge measurements are on file in the District office.

Sediment

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

During periods of rapidly changing flow or rapidly changing concentration, samples may have been collected more frequently (twice daily or, in some instances, hourly). The published sediment discharges for days of rapidly changing flow or concentration were computed by the subdivided-day method (time-discharge weighted average). Therefore, for those days when the published sediment discharge value differs from the value computed as the product of discharge times mean concentration times 0.0027, the reader can assume that the sediment discharge for that day was computed by the subdivided-day method. For periods when no samples were collected, daily loads of suspended sediment were estimated on the basis of water discharge, sediment concentrations observed

immediately before and after the periods, and suspended-sediment loads for other periods of similar discharge.

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

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

Laboratory Measurements

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

Data Presentation

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

In the descriptive headings, if the location is identical to that of the discharge gaging station, neither the LOCATION nor the DRAINAGE AREA statements are repeated. The following information, when 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 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. Enviromental Protection Agency's STORET system. Because the usual volume of updates makes it impractical to document individual changes in the State data-report series or elsewhere, potential users of U.S. Geological Survey water-quality data are encouraged to obtain all required data from the appropriate computer file to insure the most recent updates.

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

Remark Codes

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

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)
L	Biological organisms count less than 0.5 percent (organisms may be observed rather than counted)
D	Biological organism count equal to or greater than 15 percent (dominant)
&	Biological organism estimated as dominant

RECORDS OF GROUND-WATER LEVELS

Only water-level data from a national network of observation wells are given in this report. These data are intended to provide a sampling and historical record of water-level changes in the Nation's most important aquifers. Locations of the observation wells in this network in Minnesota are shown in figure 12.

Although, in this report, records of water levels are presented for fewer than 200 wells, records are obtained through cooperative efforts of many Federal, State, and local agencies for several hundred observation wells throughout Minnesota and are placed in computer storage. Each spring, the Minnesota Department of Natural Resources, Division of Waters publishes a report for the previous water year entitled "Observation Well Data Summary, Water Year 19__." This report contains hydrographs of recorder wells, detailed maps showing the location of active observation wells, and other useful items. Information about the availability of the data in the water-level file may be obtained from the District Chief, Minnesota District. (See address on back of front page).

Data Collection and Computation

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

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

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

Water levels are reported to as many significant figures as can be justified by the local conditions. For example, in a measurement of a depth to water of several hundred feet, the error in 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 only to a tenth of a foot or a larger unit.

Hydrographs showing water-level fluctuations are included for 66 representative wells; 31 bedrock, 19 surficial-sand, and 16 buried-sand wells.

Data Presentation

Each well consists of two parts, the station description and the data table of water levels observed during the water year. The description of the well is presented first through use of descriptive headings preceeding 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 includes additional information such as casing breaks, collapsed screen, and other changes since construction.

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 the top of casing, plug in pump base and so on), and in relation to land surface (such as 1.3 ft above land-surface datum). The elevation of the land-surface datum is described in feet above (or below) National Geodetic Vertical Datum of 1929 (NGVD of 1929); it is reported with a precision depending on the method of determination.

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 are also 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 the publication of water-level records by the U.S. Geological Survey and the words "to current year" if the records are to be continued into the following year. Periods for which water-level records are available, but are not published by the Geological Survey, may be noted.

EXTREMES FOR THE 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 level are listed. For wells equipped with recorders, abbreviated tables are published; generally, only water-level lows are listed for every fifth day and at the end of the month (eom). The highest 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.

RECORDS OF GROUND-WATER QUALITY

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

Data Collection and Computation

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

Data Presentation

The records of ground-water quality are published in a section titled QUALITY OF GROUND WATER 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 each of the Water Resources Division's district offices (see address given on 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 inch-pound units to International System of units (SI) on the inside of 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.

Adenosine triphosphate (ATP) is the primary energy donor in cellular life process. Its central role in living cells makes it an excellent indicator of the presence of living material in water. A measure of ATP, therefore, provides a sensitive and rapid estimate of biomass. ATP is reported in micrograms per liter of the original water sample.

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

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

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

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

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

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

Fecal coliform bacteria are bacteria that are present in the 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 which produce blue colonies within 24 hours when incubated at 44.5°C ± 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 also found in the intestine of warmblooded 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 ± 1.0°C on M-FC medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

Bed material is the unconsolidated material 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 microorganisms, such as bacteria.

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

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

Dry mass refers to the weight of residue present after drying in an oven at 60°C for zooplankton and 105°C for periphyton, until the mass remains unchanged. This mass represents the total organic matter, ash and sediment, in the sample. Dry mass values are expressed in the same units as ash mass.

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

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

Bottom material: See Bed Material.

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

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

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.

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

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

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

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

Cubic feet per second per square mile (CFSM) 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.

Cubic foot per second (FT^3/s, 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 approximately 7.48 gallons per second or 448.8 gallons per minute or 0.02832 cubic meters per second.

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

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

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

Dissolved refers to the amount of substance present in true chemical solution. In practice, however, the term includes all forms of substance that will pass through a 0.45-micrometer membrane filter, and thus may include some very small (colloidal) suspended particles. Analyses are performed on filtered samples.

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 bicatbonate value, in milligrams per liter, is multiplied by 0.492 to reflect the change.

Diversity index is a numerical expression of evenness of distribution of aquatic organisms. The formula for diversity index is:

$$\bar{d} = -\sum_{i=1}^{s} \frac{n_i}{n} \log_2 \frac{n_i}{n}$$

Where n_i is the number of individuals per taxon, n is the total number of individuals, and s is the total number of taxa in the sample of the community. Diversity index values range from zero, when all the organisms in the sample are the same, to some positive number, when some or all of the organisms in the sample are different.

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 river above the specified point. Figures of drainage area given herein include all closed basins, or noncontributing areas, within the area unless otherwise noted.

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

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

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

Hardness of water is a physical-chemical characteristic that is commonly recognized by the increased quantity of soap required to produce lather. It is attributable to the presence of alkaline earths (principally calcium and magnesium) and is expressed as equivalent 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 8-digit number.

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

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

Micrograms per gram (UG/G, ug/g) is a unit expressing the concentration of a chemical element as the mass (micrograms) of the element sorbed per unit mass (gram) of sediment.

Micrograms per kilogram (MG/KG, mg/kg) is a unit expressing the concentration of a chemical element as the mass (micrograms) of the element sorbed per unit mass (kilogram) of sediment.

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 represent 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 sediment per liter of water-sediment mixture.

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

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

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

Organism is any living entity, such as an insect, phytoplankter, or zooplankter.

Organism count/area refers to the number of organisms collected and enumerated in a sample and adjusted to the number per area habitat, usually square meters (m^2), acres, or hectares. Periphyton, benthic organisms, and macrophytes are expressed in these terms.

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

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

Parameter code numbers are unique five-digit code numbers assigned to each parameter placed into storage. These codes are assigned by the Environmental Protection Agency and are also used to identify data exchanged among agencies.

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 suspended sediment or bed material determined by either sieve or sedimentation methods. Sedimentation methods (pipet, bottom-withdrawal tube, visual-accumulation tube) determine fall diameter of particles in distilled water (chemically dispersed).

Particle-size classification used in this report agrees with recommendations made by the American Geophysical Union Subcommittee on Sediment Terminology.

The classification is as follows:

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

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

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.

Periphyton is the assemblage of microorganisms attached to and growing upon solid surfaces. While primarily consisting of algae, they also include bacteria, fungi, protozoa, rotifers, and other small organisms. Periphyton is a useful indicator of water quality.

Pesticides are chemical compounds used to control undesirable plants and animals. Major categories of pesticides include insecticides, miticides, fungicides, herbicides, and rodenticides. Insecticides and herbicides, which control insects and plants respectively, are the two categories reported.

Picocurie (PC, pCi) is one trillionth (1×10^{-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).

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

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

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

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

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

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

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

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

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

Milligrams of oxygen per area or volume per unit time [mg O_2/(m^2 · time) for periphyton and macrophytes and mg O_2/(m^3 · time) for phytoplankton] are the units for expressing primary productivity. They define production and respiration rates as estimated from changes in the measured dissolved oxygen concentration. The oxygen light and dark bottle method is preferred if the rate of primary production is sufficient for accurate measurements to be made within 24 hours. Unit time may be either the hour or day, depending on the incubation period.

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

Recoverable from bottom material is the amount of a given constituent that is in solution after a representative sample of bottom material has been digested by a method (usually using an acid or mixture of acids) that results in dissolution of only readily soluble substances. Complete dissolution of all bottom material is not achieved by the digestion treatment and thus the determination represents less than the total amount (that is, less than 95 percent) of the constituent in the sample. To achieve comparability of analytical data, equivalent digestion procedures would be required of all laboratories performing such analyses because different digestion procedures are likely to produce different analytical results.

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

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.

Bed load discharge (tons per day) is the quantity of bed load measured by dry weight that moves past a section as bed load in a given time.

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

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

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

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

Suspended-sediment load is quantity of suspended sediment passing a section in a specified period.

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

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

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

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

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

Specific conductance is a measure of the ability of a water to conduct an electrical current. It is expressed in micromhos per centimeter at 25°C. Specific conductance is related to the type and concentration of ions in solution and can be used for appoximating 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 micromhos). This relation is not constant from stream to stream, and it may vary in the same source with changes in the composition of the water.

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

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

Substrate is the physical surface upon which an organism lived.

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

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

Surface area of a lake is that area outlined on the latest USGS 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. All areas shown are those for the stage when the planimetered map was made.

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

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

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

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

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

Kingdom.....Animal
Phylum.....Arthropoda
Class.....Insects
Order.....Ephemeroptera
Family.....Ephermeridae
Genus.....Hexageria
Species.....Hexagenia limbata

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

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

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

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

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 determines all of the constituent in the sample.)

Total in bottom material is the total amount of a given constituent in a representative sample of bottom material. This term is used only when the analytical procedure assures measurement of at least 95 percent of the constituent determined. A knowledge of the expected form of the constituent in the sample, as well as the analytical methodology used, is required to judge when the results should be reported as "total in bottom material."

Total load (tons) is the total quantity of any individual constituent, as measured by dry mass or volume, that is dissolved in a specific amount of water (discharge) during a given time. It is computed by multiplying the total discharge, times the mg/L of the constituent, times the factor 0.0027, times the number of days.

Total recoverable refers to 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 percent in the dissolved and suspended phases of the sample. To achieve comparability of analytical data, equivalent digestion procedures would be required of all laboratories performing such analyses because different digestion procedures are likely to produce different analytical results.

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

Water year in Geological Survey reports dealing with surface-water supply is the 12-month period, October 1 through September 30. The water year is designated by the calendar year in which it ends and which includes 9 of the 12 months. Thus, the year ending September 30, 1980, is called the "1980 water year."

WDR is used as an abbreviation for "Water-Data Report" in reference to published reports beginning in 1975.

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.

WRD is used as an abbreviation for "Water-Resources Data" in the REVISED RECORDS paragraph to refer to State annual basic-data reports published before 1975.

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

1-D1. *Water temperature--influential factors, field measurement, and data presentation,* by H. H. Stevens, Jr., J. F. Ficke, and G. F. Smoot: USGS--TWRI Book 1, Chapter D1. 1975. 65 pages.

1-D2. *Guidelines for collection and field analysis of ground-water samples for selected unstable constituents,* by W. W. Wood: USGS--TWRI Book 1, Chapter D2. 1976. 24 pages.

2-D1. *Application of surface geophysics to ground-water investigations,* by A. A. R. Zohdy, G. P. Eaton, and D. R. Mabey: USGS--TWRI Book 2, Chapter D1. 1974. 116 pages.

2-E1. *Application of borehole geophysics to water-resources investigations,* by W. S. Keys and L. M. MacCary: USGS--TWRI Book 2, Chapter E1. 1971. 126 pages.

3-A1. *General field and office procedures for indirect discharge measurements,* by M. A. Benson and Tate Dalrymple: USGS--TWRI Book 3, Chapter A1. 1967. 30 pages.

3-A2. *Measurement of peak discharge by the slope-area method,* by Tate Dalrymple and M. A. Benson: USGS--TWRI Book 3, Chapter A2. 1967. 12 pages.

3-A3. *Measurement of peak discharge at culverts by indirect methods* by G. L. Bodhaine: USGS--TWRI Book 3, Chapter A3. 1968. 60 pages.

3-A4. *Measurement of peak discharge at width contractions by indirect methods,* by H. F. Matthai: USGS--TWRI Book 3, Chapter A4. 1967. 44 Pages.

3-A5. *Measurement of peak discharge at dams by indirect methods,* by Harry Hulsing: USGS--TWRI Book 3, Chapter A5. 1967. 29 pages.

3-A6. *General procedure for gaging streams,* by R. W. Carter and Jacob Davidian: USGS--TWRI Book 3, Chapter A6. 1968. 13 pages.

3-A7. *Stage measurements at gaging stations,* by T. J. Buchanan and W. P. Somers: USGS--TWRI Book 3, Chapter A7. 1968. 28 pages.

3-A8. *Discharge measurements at gaging stations,* by T. J. Buchanan and W. P. Somers: USGS--TWRI Book 3, Chapter A8. 1969. 65 pages.

3-A9. *Measurement of time of travel and dispersion in streams by dye tracing,* by E. F. Hubbard, F. A. Kilpatrick, L. A. Martens, and J. F. Wilson, Jr.: USGS--TWRI Book 3, Chapter A9. 1982. 44 pages.

3-A10. *Discharge ratings at gaging stations,* by E. J. Kennedy: USGS--TWRI Book 3, Chapter A10. 1984. 59 pages.

3-A11. *Measurement of discharge by moving-boat method,* by G. F. Smoot and C. E. Novak: USGS--TWRI Book 3, Chapter A11. 1969. 22 pages.

3-A13. *Computation of continuous records of streamflow,* by E. J. Kennedy: USGS--TWRI Book 3, Chapter A13. 1983. 53 pages.

3-A14. *Use of flumes in measuring discharge,* by F. A. Kilpatrick and V. R. Schneider: USGS--TWRI Book 3, Chapter A14. 1983. 46 pages.

3-A15. *Computation of water-surface profiles in open channels* by Jacob Davidian: USGS--TWRI Book 3, Chapter A15. 1984. 48 pages.

3-B1. *Aquifer-test design, observation, and data analysis,* by R. W. Stallman: USGS--TWRI Book 3, Chapter B1. 1971. 26 pages.

3-B2. *Introduction to ground-water hydraulics, a programed text for self-instruction,* by G. D. Bennett: USGS--TWRI Book 3, Chapter B2. 1976. 172 pages.

3-B3. *Type curves for selected problems of flow to wells in confined aquifers,* by J. E. Reed: USGS-TWRI Book 3, Chapter B3. 1980. 106 pages.

3-C1. *Fluvial sediment concepts* by H. P. Guy: USGS--TWRI Book 3, Chapter C1. 1970. 55 pages.

3-C2. *Field methods for measurement of fluvial sediment*. by H. P. Guy and V. W. Norman: USGS--TWRI Book 3, Chapter C2. 1970. 59 pages.

3-C3. *Computation of fluvial-sediment discharge*, by George Porterfield: USGS--TWRI Book 3, Chapter C3. 1972. 66 pages.

4-A1. *Some statistical tools in hydrology*, by H. C. Riggs: USGS--TWRI Book 4, Chapter A1. 1968. 39 pages.

4-A2. *Frequency curves*, by H. C. Riggs: USGS--TWRI Book 4, Chapter A2. 1968. 15 pages.

4-B1. *Low-flow investigations*, by H. C. Riggs: USGS--TWRI Book 4, Chapter B1. 1972. 18 pages.

4-B2. *Storage analyses for water supply*, by H. C. Riggs and C. H. Hardison: USGS--TWRI Book 4, Chapter B2. 1973. 20 pages.

4-B3. *Regional analyses of streamflow characteristics*. by H. C. Riggs: USGS--TWRI Book 4, Chapter B3. 1973. 15 pages.

4-D1. *Computation of rate and volume of stream depletion by wells* by C. T. Jenkins: USGS--TWRI Book 4, Chapter D1. 1970. 17 pages.

5-A1. *Methods for determination of inorganic substances in water and fluvial sediments* by M. W. Skougstad and others, editors: USGS--TWRI Book 5, Chapter A1. 1979. 626 pages.

5-A2. *Determination of minor elements in water by emission spectroscopy*. by P. R. Barnett and E. C. Mallory, Jr.: USGS--TWRI Book 5, Chapter A2. 1971. 31 pages.

5-A3. *Methods for analysis of organic substances in water*. by D. F. Goerlitz and Eugene Brown: USGS--TWRI Book 5, Chapter A3. 1972. 40 pages.

5-A4. *Methods for collection and analysis of aquatic biological and microbiological samples*. edited by P. E. Greeson, T. A. Ehlke, G. A. Irwin, B. W. Lium, and K. V. Slack: USGS--TWRI Book 5, Chapter A4. 1977. 332 pages.

5-A5. *Methods for determination of radioactive substances in water and fluvial sediments*. by L. L. Thatcher, V. J. Janzer, and K. W. Edwards: USGS--TWRI Book 5, Chapter A5. 1977. 95 pages.

5-A6. *Quality assurance practices for the chemical and biological analyses of water and fluvial 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.

DISCONTINUED GAGING STATIONS

The following continuous-record streamflow or stage stations in Minnesota have been discontinued or converted to partial-record stations. Daily streamflow or stage records were collected and published for the period of record shown for each station.

Station number	Station name	Drainage area (mi^2)	Period of record
	Upper Mississippi River basin		
05210000	Mississippi River near Deer River, MN	a3,190	1945-50
05212700	Prairie River near Taconite, MN	a360	1967-83
*05213000	Prairie River near Grand Rapids, MN	485	1909†, 1925-49
05216800	O'Brien Creek near Pengilly, MN	-	1963-68
05217000	Swan River near Warba, MN	254	1954-69
05217500	Swan River near Swan River, MN	a290	1929
05218000	Mississippi River above Sandy River near Libby (above Sandy River), MN	4,560	1895-1915, 1925-29
05221000	Willow River near Palisade, MN	442	1929
05226200	Ripple (Mud) River near Wealthwood, MN	-	1937-39
05232000	Pelican Brook (Long Lake) near Pequot Lakes, MN	-	1938-42, 1943-47
05241500	Rabbit River near Crosby, MN	8.38	1945-63
05242700	Little Sand Lake outlet (Sand Lake outlet) near Dorset, MN	a74	1930-41
*05244000	Crow Wing River at Nimrod, MN	a1,010	1910-14, 1930-81
05244500	Crow Wing River at Motley, MN	a2,140	1909†, 1913-17, 1930-31
05244980	Diversion from Long Prairie River near Osakis, MN	-	1939-47
05245000	Long Prairie River near Osakis, MN	-	1949-54
05245500	Long Prairie River near Motley, MN	973	1909-17, 1930-31
05246000	Crow Wing River at Pillager, MN	a3,230	1903†, 1909-13, 1925-50
*05261000	Mississippi River near Fort Ripley, MN	a11,010	1906, 1909-10, 1929
05261500	Nokasippi River near Fort Ripley, MN	210	1929
*05268000	Platte (Platt) River at Royalton, MN	338	1929-36
05269000	Mississippi River near Sauk Rapids, MN	a12,400	1903-06
05270000	Mississippi River at Sartell, MN	a12,450	1929, 1943-47†
05270500	Sauk River near St. Cloud, MN	925	1909-12, 1913, 1929, 1930, 1931, 1932, 1933, 1934-81
05273500	Clearwater River at Clearwater, MN	-	1937, 1940-42
05274500	Elk River above St. Francis River near Big Lake, MN	384	1929
05274700	St. Francis River at Santiago, MN	-	1965-70, 1980-81
05274750	St. Francis River above Zimmerman, MN	-	1980-84
05274900	St. Francis River near Big Lake, MN	-	1965-70
05275500	Mississippi River at Elk River, MN	a14,500	1915-56
05276000	North Fork Crow River near Regal, MN	215	1943-54

"See footnotes at end of table."

DISCONTINUED GAGING STATIONS

Station number	Station name	Drainage area (mi^2)	Period of record
	Upper Mississippi River basin--Continued		
05277000	Middle Fork Crow River at New London, MN	-	1939-42, 1943-47
05277500	Middle Fork Crow River (Calhoun Lake Diversion) near Spicer, MN	-	1939, 1940-46
05278400	North Fork Crow River near Rockford, MN	-	1909-10
05278500	South Fork Crow River at Cosmos, MN	221	1945-64
05278930	Buffalo River near Glencoe, MN	374	1972-80
*05279000	South Fork Crow River near Mayer, MN	a1,170	1934-79
05279500	South Fork Crow River near Rockford, MN	a1,250	1909-12
05283500	Mississippi River at Anoka, MN	a17,100	1897, 1905-13
05284500	Rum River at Onamia, MN	414	1910-12
05284750	Rum River at Spencer Brook MN	-	1960-64
05285000	Rum River at Cambridge, MN	a1,160	1909-14
05285500	Rum River at St. Francis, MN	-	1903
05286500	Rum River near Anoka, MN	1,430	1905-06, 1909
05289000	Minnetonka Lake (head of Minnehaha Creek) near Wayzata (at Excelsior), MN	-	1938-64
05289500	Minnehaha Creek at Minnetonka Mills, MN	130	1953-64
	Minnesota River basin		
05290000	Little Minnesota River near Peever, SD	447	1939-81
05292500	Minnesota River near Odessa, MN	a1,340	1909-12, 1944-63
05293500	Pomme de Terre River near Morris, MN	-	1937-39, 1940-47
05299500	Canby Creek at Canby, MN	-	1938-39, 1940-46
05300500	Ten Mile Creek near Boyd, MN	82.8	1949-51
05302000	Little Chippewa River near Lowry, MN	a54	1941
*05302500	Little Chippewa River near Starbuck, MN	111	1938-39
05303000	Chippewa River at diversion dam near Hancock, MN	-	1930-39, 1940-46
05303500	Chippewa River at Benson, MN	a1,270	1949-51
05304000	Shakopee Creek near Benson, MN	352	1949-54
05305000	Chippewa River near Watson, MN	a2,050	1910-17, 1931-36
05311500	Yellow Medicine River near Cottonwood, MN	465	1945-46
05312000	Spring Creek near Clarkfield, MN	a89	1945-46
05312500	Spring Creek near Hazel Run, MN	101	1945-48
05313000	Yellow Medicine River near Hanley Falls, MN	606	1945-47
05313521	Hawk Creek at outlet of Eagle Lake near Willmar, MN	-	1972-73
05313560	Eagle Lake tributary No. 7 near Willmar, MN	-	1972-73
05313570	Eagle Lake tributary No. 8 near Willmar, MN	-	1972-73
05314000	Chetomba Creek near Maynard, MN	a200	1949-51
*05314500	Hawk Creek near Maynard, MN	474	1949-54
*05315200	Prairie Ravine near Marshall, MN	5.63	1959-64
05315500	Redwood River near Green Valley, MN	436	1945-57

"See footnotes at end of table."

DISCONTINUED GAGING STATIONS

Station number	Station name	Drainage area (mi^2)	Period of record
	Minnesota River basin--Continued		
05316000	Redwood River near Seaforth, MN	573	1945-46
05316770	Minnesota River at New Ulm, MN	9,536	1968-76
05317500	Minnesota River at Judson, MN	a11,200	1938-50
*05318000	East Branch (East Fork) Blue Earth River near Bricelyn, MN	132	1951-70
05319000	South Fork Watonwan River at diversion dam near St. James, MN	-	1939, 1940-46
05321000	Blue Earth River at Mankato, MN	a3,550	1938-39, 1940-42
05330400	Sand Creek at diversion dam near Jordan, MN	-	1938-39, 1940-46
05330800	Purgatory Creek at Eden Prairie, MN	-	1975-80
05330900	Nine Mile Creek at Bloomington, MN	-	1963-73
	St. Croix River basin		
*05336200	Glaisby Brook near Kettle River, MN	24.2	1959-70
05336500	Kettle River near Sandstone, MN	825	1908-16
05337000	Grindstone River at Hinckley, MN	-	1940-47
05337500	Snake River at Mora, MN	422	1909-13
05338000	Snake River at Sanatorium Bridge near Pine City, MN	-	1937-38
*05338500	Snake River near Pine City, MN	958	1913-17, 1951-81
05339500	St. Croix River near Rush City, MN	a5,120	1923-61
05340000	Sunrise River near Stacy, MN	167	1949-65
	Lower Mississippi River basin		
05345500	Vermillion River at Empire (Empire City), MN	124	1942-44
05346000	Vermillion River at Hastings, MN	195	1942-47
*05355200	Cannon River at Welch, MN	a1,320	1909-14, 1930-71
05371500	Mississippi River at Wabasha, MN	a56,600	1934
*05372800	South Fork Zumbro River on Belt Line at Rochester, MN	155	1981
*05372930	Bear Creek at Rochester, MN	80.0	1981
*05372950	Silver Creek at Rochester, MN	17.3	1981
*05372990	Cascade Creek at Rochester, MN	35.8	1981
05373000	South Fork Zumbro River near Rochester, MN	304	1952-81
05373500	Zumbro River (South Branch) near Zumbro Falls, MN	821	1911-17
05374000	Zumbro River at Zumbro Falls, MN	-	1909-17, 1929-80
05374500	Zumbro River at Theilman, MN	a1,320	1938-56
*05376500	South Fork Whitewater River near Altura, MN	76.8	1939-71
05377000	Beaver Creek at Beaver, MN	15.4	1939-40
05377500	Whitewater River at Beaver, MN	288	1936-38 1939-56
05379000	Gilmore Creek at Winona, MN	8.95	1939-63
05380500	Mississippi River at Lamoile, MN	a60,000	1930-31
05383500	Mississippi River at LaCrosse, WI	-	1929-55
05383600	North Branch Root River tributary near Stewartville, MN	0.73	1959-64

"See footnotes at end of table."

DISCONTINUED GAGING STATIONS

Station number	Station name	Drainage area (mi^2)	Period of record
	Lower Mississippi River basin--Continued		
*05384500	Rush Creek near Rushford, MN	129	1942-79
b05385000	Root River near Houston, MN	a1,270	1909-17 1929 1930-83
b05385500	South Fork Root River near Houston, MN	275	1953-83
05386000	Root River below South Fork near Houston, MN	a1,560	1938-61
05456500	Turtle Creek near Austin, MN	144	1947-51
05475000	Heron Lake outlet near Heron Lake, MN	-	1930-43
	Big Sioux River basin		
*06483000	Rock River at Luverne, MN	440	1911-14
06603000	Little Sioux River near Lakefield, MN	17.1	1948-63
06603500	Jackson County ditch No. 11 near Lakefield, MN	7.69	1948-61

* Presently operated as a high-flow partial-record station.
† Stage records only.
a Approximately.
b Discharge measurements made to maintain a current rating.

Volume 1
Volume 2

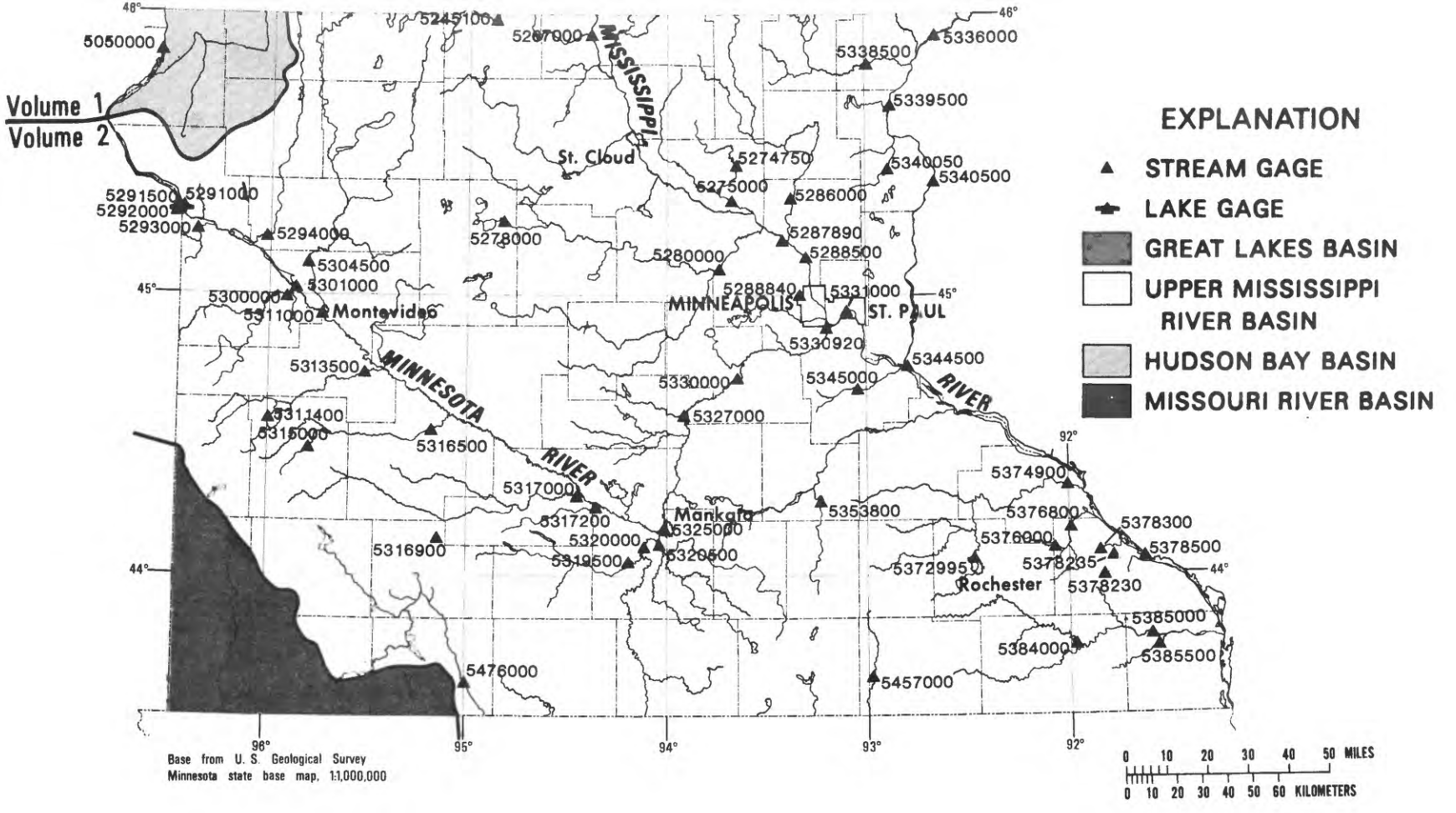
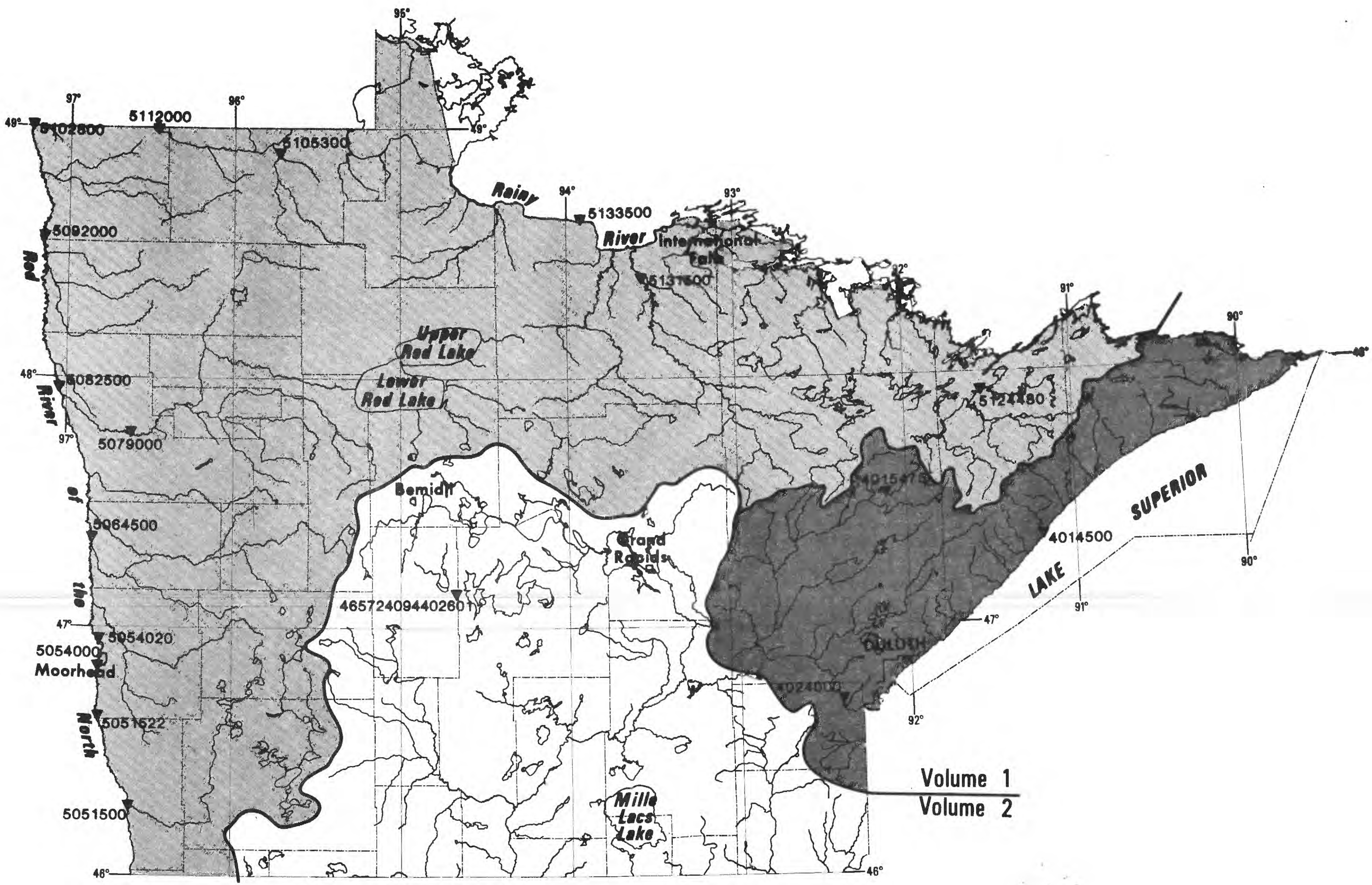


Figure 9.--Location of lake and stream-gaging stations



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Rainy River
5133500
International Falls
5131500
5124480
Upper Red Lake
Lower Red Lake
5082500
5079000
Red River of the North
Bemidji
Grand Rapids
465724094402601
5064500
5054020
5054000
Moorhead
5051622
5051500
4014500
LAKE SUPERIOR
Mille Lacs Lake
Volume 1
Volume 2

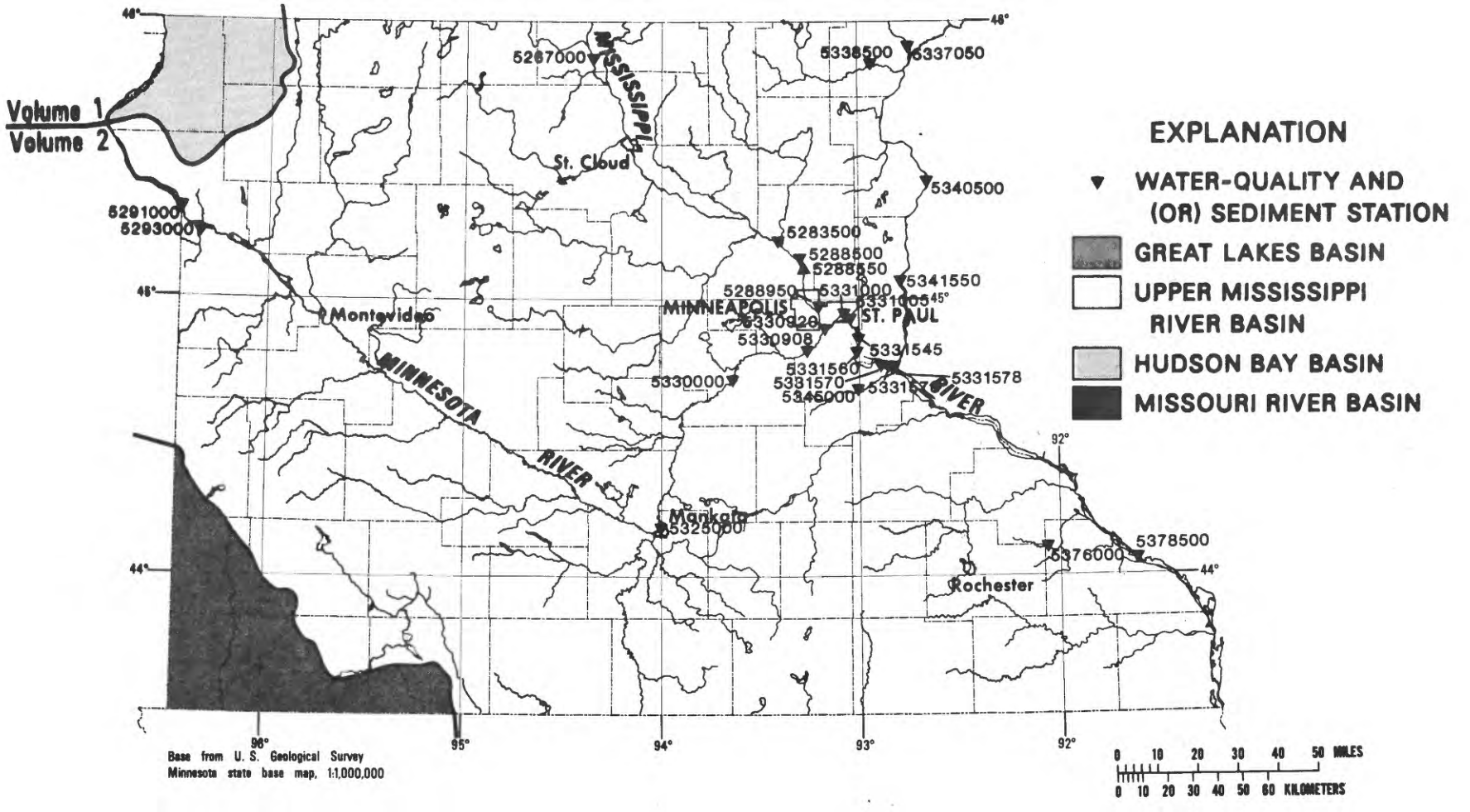


Figure 10.--Location of surface-water-quality stations

UPPER MISSISSIPPI RIVER BASIN

MISSISSIPPI RIVER MAIN STEM

05201000 WINNIBIGOSHISH LAKE NEAR DEER RIVER, MN

LOCATION.--Lat 47°25'42", long 94°03'00", in sec.25, T.146 N., R.27 W., Itasca County, Hydrologic Unit 07010101, on Leech Lake Indian Reservation, at dam on Mississippi River, 1 mi northwest of Little Winnibigoshish Lake, 14 mi northwest of town of Deer River, and at mile 1,248 upstream from Ohio River.

DRAINAGE AREA.--1,442 mi^2.

PERIOD OF RECORD.--April 1884 to current year. Prior to October 1941 monthend contents only, published in WSP 1308. Published as Winnibigoshish Reservoir near Deer River October 1941 to September 1956.

REVISED RECORDS.--WSP 1308: 1905(M).

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by Corps of Engineers). Prior to July 8, 1949, nonrecording gage at same site, and July 9, 1949, to July 10, 1973, water-stage recorder at same site and at datum of 1,288.94 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Reservoir is formed by Winnibigoshish Lake and several other natural lakes controlled by a concrete and timber dam, completed in 1884; storage began in 1884. Capacity between elevations 1,294.94 ft and 1,303.14 ft (maximum allowable range) is 668,737 acre-ft of which 439,636 acre-ft is controlled storage between elevations 1,294.94 ft and 1,300.94 ft (normal operating range). Contents shown herein are contents above elevation 1,286.00 ft. Prior to September 1978, published contents as contents above elevation 1,288.94 ft. Water is used to benefit navigation on Mississippi River below Minneapolis.

COOPERATION.--Records furnished by Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 996,500 acre-ft, capacity table then in use, July 30, 1905, elevation, 1,303.39 ft; minimum observed, 33,680 acre-ft, below zero of capacity table then in use, Oct. 20, 1931, elevation, 1,288.25 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 762,640 acre-ft, June 19, elevation, 1,299.75 ft; minimum, 556,460 acre-ft, Mar. 3, elevation, 1,296.77 ft.

MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	1,298.01	635,820	
Oct. 31	1,298.01	635,820	0
Nov. 30	1,297.80	622,030	-13,790
Dec. 31	1,297.50	602,570	-19,460
CAL YR 1984			-10,990
Jan. 31	1,297.03	572,680	-29,890
Feb. 28	1,296.78	557,080	-15,600
Mar. 31	1,297.12	578,350	+21,270
Apr. 30	1,298.04	637,810	+59,460
May 31	1,299.46	738,040	+100,230
June 30	1,299.56	746,300	+8,260
July 31	1,299.44	736,420	-9,880
Aug. 31	1,298.92	697,340	-39,080
Sept. 30	1,298.33	657,130	-40,210
WTR YR 1985			+21,310

MISSISSIPPI RIVER MAIN STEM

05201500 MISSISSIPPI RIVER AT WINNIBIGOSHISH DAM NEAR DEER RIVER, MN

LOCATION.--Lat 47°25'42", long 94°03'00", in SW¼ sec.25, T.146 N., R.27 W., Itasca County, Hydrologic Unit 07010101, on Leech Lake Indian Reservation, at dam 1 mi northwest of Little Winnibigoshish Lake, 14 mi northwest of town of Deer River, and at mile 1,248 upstream from Ohio River.

DRAINAGE AREA.--1,442 mi^2.

PERIOD OF RECORD.--May 1884 to current year. Monthly discharge only for some periods, published in WSP 1308.

GAGE.--Water-stage recorder on headwater and nonrecording gage on tailwater. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by Corps of Engineers). Prior to June 30, 1973, gages at same sites with datum at 1,289.47 ft, adjustment of 1912. Prior to July 8, 1949, nonrecording headwater gage at same site and datum in use.

REMARKS.--Daily discharge is computed on the basis of modified weir formula and corrected to conform with discharge measurements, the head being determined from readings of headwater and tailwater gages. Flow completely regulated by Winnibigoshish Lake (station 05201000).

COOPERATION.--Daily discharge computed by Corps of Engineers.

AVERAGE DISCHARGE (unadjusted).--101 years, 519 ft^3/s, 4.89 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 4,370 ft^3/s, Aug. 6, 1905; no flow at times in several years.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 1,410 ft^3/s, June 15-19, 22, 23; minimum daily, 100 ft^3/s, Mar. 12 to Apr. 13.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	102	975	970	966	823	445	100	102	1110	1290	1280	1280
2	204	975	970	966	776	347	100	102	1110	1290	1280	1280
3	204	970	970	966	776	347	100	102	1110	1290	1280	1280
4	203	971	970	966	776	347	100	102	1110	1290	1280	1280
5	203	973	970	966	776	348	100	102	1110	1290	1280	1280
6	304	973	970	966	729	249	100	102	1110	1290	1280	1280
7	304	973	968	966	729	249	100	204	1110	1290	1280	1280
8	304	971	968	966	729	250	100	204	1210	1290	1280	1280
9	304	973	968	966	682	150	100	204	1210	1290	1280	1280
10	404	973	968	965	682	150	100	204	1210	1290	1280	1280
11	502	971	968	965	683	150	100	204	1300	1290	1280	1280
12	599	971	968	965	683	100	100	205	1300	1280	1280	1280
13	694	971	968	965	635	100	100	308	1300	1280	1280	1280
14	693	971	968	965	635	100	101	510	1290	1280	1280	1280
15	693	971	968	965	636	100	101	509	1410	1280	1280	1280
16	692	978	968	965	587	100	101	513	1410	1280	1280	1270
17	692	973	968	963	588	100	101	609	1410	1280	1280	1270
18	788	973	968	963	588	100	101	609	1410	1280	1280	1270
19	882	971	968	963	588	100	101	608	1410	1280	1280	1270
20	885	971	968	963	540	100	101	608	1400	1280	1280	1280
21	884	971	968	961	540	100	101	707	1400	1280	1280	1280
22	884	971	968	961	541	100	101	804	1410	1280	1280	1270
23	884	971	966	915	492	100	101	804	1410	1280	1280	1270
24	884	970	966	915	492	100	101	804	1400	1280	1280	1280
25	979	970	966	915	492	100	101	898	1400	1280	1280	1280
26	979	970	966	870	492	100	101	898	1400	1280	1280	1280
27	978	970	966	870	445	100	101	899	1280	1280	1280	1280
28	976	970	966	870	445	100	101	899	1290	1280	1280	1270
29	975	970	966	870	---	100	101	992	1290	1280	1280	1280
30	975	970	966	822	---	100	102	992	1290	1280	1280	1270
31	975	---	966	822	---	100	---	1110	---	1280	1280	---
TOTAL	20029	29151	30002	29092	17580	5032	3018	15918	38610	39790	39680	38320
MEAN	646	972	968	938	628	162	101	513	1287	1284	1280	1277
MAX	979	978	970	966	823	445	102	1110	1410	1290	1280	1280
MIN	102	970	966	822	445	100	100	102	1110	1280	1280	1270
CFSM	.45	.67	.67	.65	.44	.11	.07	.36	.89	.89	.89	.89
IN.	.52	.75	.77	.75	.45	.13	.08	.41	1.00	1.03	1.02	.99
AC-FT	39730	57820	59510	57700	34870	9980	5990	31570	76580	78920	78710	76010

CAL YR 1984	TOTAL 200234	MEAN 547	MAX 986	MIN 101	CFSM .38	IN 5.17	AC-FT 397200		
WTR YR 1985	TOTAL 306222	MEAN 839	MAX 1410	MIN 100	CFSM .58	IN 7.90	AC-FT 607400		

LEECH LAKE RIVER BASIN

465724094402601 WILLIAMS LAKE NEAR AKELEY, MN

LOCATION.--Lat 46°57'24", long 94°40'26", in SE¼NW¼ sec.12, T.140 N., R.32 W., Hubbard County, Hydrologic Unit 07010102. Samples are collected near center of lake at the deepest point.

DRAINAGE AREA.--0.875 mi^2 (2.27 km^2).

PERIOD OF RECORD.--Water years 1977 to current year.

REMARKS.--Some meteorological and phytoplankton data are available by contacting the District office. Letter E indicates estimated value.

WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	SAMPLING DEPTH (FEET) (00003)	SPECIFIC CONDUCTANCE (US/CM) (00095)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	PH (STANDARD UNITS) (00400)	PH LAB (STANDARD UNITS) (00403)	TEMPERATURE, AIR (DEG C) (00020)	TEMPERATURE (DEG C) (00010)	BAROMETRIC PRESSURE (MM OF HG) (00025)	OXYGEN, DISSOLVED (MG/L) (00300)
OCT										
13...	1200	0.0	166	--	8.5	--	20.5	14.5	760	10.1
13...	1215	3.0	165	167	8.5	8.0	20.5	14.5	760	10.1
13...	1220	7.0	165	--	8.5	--	20.5	14.5	760	10.1
13...	1230	13.0	164	--	8.5	--	20.5	14.5	760	10.1
13...	1240	20.0	163	--	8.4	--	20.5	13.5	760	9.4
13...	1255	26.0	164	167	8.1	7.7	20.5	13.0	760	6.1
13...	1300	--	--	--	--	--	20.5	--	760	--
27...	1300	0.0	162	--	8.3	--	13.5	10.0	--	10.2
27...	1315	3.0	162	162	8.2	7.7	13.5	4.5	--	10.1
27...	1320	7.0	162	--	8.2	--	13.5	9.5	--	10.1
27...	1330	13.0	161	--	8.2	--	13.5	9.5	--	10.1
27...	1340	20.0	161	--	8.2	--	13.5	9.5	--	10.0
27...	1355	26.0	160	160	8.2	7.8	13.5	9.5	--	9.9
27...	1400	--	--	--	--	--	13.5	--	--	--
NOV										
23...	1000	0.0	162	--	8.3	--	0.0	2.5	764	13.6
23...	1015	3.0	161	166	8.3	8.0	0.0	3.5	764	13.4
23...	1020	7.0	161	--	8.3	--	0.0	3.5	764	13.4
23...	1030	13.0	160	--	8.3	--	0.0	3.5	764	13.3
23...	1040	20.0	161	--	8.3	--	0.0	4.0	764	13.3
23...	1055	26.0	165	168	8.3	8.1	0.0	4.0	764	12.5
23...	1100	--	--	--	--	--	0.0	--	764	--
DEC										
23...	1100	0.0	175	--	8.2	--	--	1.5	762	14.7
23...	1115	3.0	167	170	8.2	8.2	--	4.5	762	12.5
23...	1120	7.0	167	--	8.2	--	--	4.5	762	12.1
23...	1130	13.0	167	--	8.2	--	--	4.5	762	10.8
23...	1140	20.0	171	--	8.0	--	--	4.5	762	10.5
23...	1155	26.0	175	168	7.9	7.8	--	4.5	762	10.2
23...	1200	--	--	--	--	--	--	--	762	--
FEB										
16...	1200	0.0	181	--	8.0	--	1.5	1.0	755	11.2
16...	1215	3.0	181	205	7.9	7.6	1.5	3.0	755	10.3
16...	1220	7.0	180	--	7.9	--	1.5	4.0	755	9.5
16...	1230	13.0	181	--	7.9	--	1.5	4.5	755	7.2
16...	1240	20.0	186	--	7.7	--	1.5	4.5	755	4.6
16...	1255	26.0	191	203	7.5	--	1.5	4.5	755	5.1
16...	1300	--	--	--	--	--	1.5	--	755	--
MAR										
10...	1000	0.0	185	--	7.8	--	1.5	1.0	761	11.3
10...	1015	3.0	186	202	7.8	7.5	1.5	2.5	761	10.3
10...	1020	7.0	187	--	7.8	--	1.5	4.5	761	8.9
10...	1030	13.0	188	--	7.8	--	1.5	4.5	761	8.1
10...	1040	20.0	191	--	7.7	--	1.5	4.5	761	6.8
10...	1055	26.0	194	205	7.6	7.4	1.5	4.5	761	4.9
10...	1100	--	--	--	--	--	1.5	--	761	--
MAY										
11...	1100	0.0	159	--	8.8	--	19.5	17.5	747	10.4
11...	1115	3.0	158	184	8.8	8.5	19.5	17.5	747	10.4
11...	1120	7.0	158	--	8.9	--	19.5	17.5	747	10.5
11...	1130	13.0	--	--	8.9	--	19.5	15.5	747	12.2
11...	1140	20.0	151	--	9.1	--	19.5	9.0	747	14.3
11...	1155	26.0	154	182	8.6	8.4	19.5	8.0	747	7.8
11...	1200	--	--	--	--	--	19.5	--	747	--
29...	1200	0.0	159	--	8.9	--	13.5	17.5	757	10.9
29...	1215	3.0	160	178	E8.9	8.5	13.5	17.5	757	10.8
29...	1220	7.0	160	--	8.9	--	13.5	17.5	757	10.5
29...	1230	13.0	160	--	8.9	--	13.5	17.0	757	10.0
29...	1240	20.0	159	--	8.7	--	13.5	11.5	757	12.5
29...	1255	26.0	161	182	8.8	8.4	13.5	9.0	757	6.5
29...	1300	--	--	--	--	--	13.5	--	757	--

LEECH LAKE RIVER BASIN

465724094402601 WILLIAMS LAKE NEAR AKELEY, MN--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	SAMPLING DEPTH (FEET) (00003)	SPECIFIC CONDUCTANCE (US/CM) (00095)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	PH (STANDARD UNITS) (00400)	PH LAB (STANDARD UNITS) (00403)	TEMPERATURE, AIR (DEG C) (00020)	TEMPERATURE (DEG C) (00010)	BAROMETRIC PRESSURE (MM OF HG) (00025)	OXYGEN, DISSOLVED (MG/L) (00300)
JUN										
14...	1000	0.0	144	--	9.0	--	15.0	18.0	759	10.9
14...	1015	3.0	144	172	9.0	8.6	15.0	18.0	759	10.8
14...	1020	7.0	144	--	9.0	--	15.0	18.0	759	10.7
14...	1030	13.0	145	--	9.0	--	15.0	17.5	759	10.4
14...	1040	20.0	148	--	8.7	--	15.0	16.0	759	9.8
14...	1055	26.0	156	185	8.0	7.9	15.0	10.0	759	4.5
14...	1100	--	--	--	--	--	15.0	--	759	--
25...	1000	0.0	152	--	8.9	--	20.0	19.0	760	10.0
25...	1015	3.0	153	170	E8.8	8.9	20.0	19.0	760	9.9
25...	1020	7.0	153	--	8.8	--	20.0	19.0	760	9.9
25...	1030	13.0	153	--	8.8	--	20.0	18.5	760	9.9
25...	1040	20.0	154	--	8.7	--	20.0	18.0	760	9.4
25...	1055	26.0	167	189	8.0	8.6	20.0	11.0	760	3.7
25...	1100	--	--	--	--	--	20.0	--	760	--
JUL										
09...	1200	0.0	141	--	9.1	--	23.5	25.0	762	10.3
09...	1215	3.0	141	156	9.1	8.9	23.5	25.0	762	10.2
09...	1220	7.0	141	--	9.1	--	23.5	25.0	762	10.2
09...	1230	13.0	147	--	9.2	--	23.5	21.0	762	11.5
09...	1240	20.0	151	--	8.9	--	23.5	18.5	762	8.2
09...	1255	26.0	164	164	7.7	8.0	23.5	13.0	762	0.7
09...	1300	--	--	--	--	--	23.5	--	762	--
26...	1100	0.0	145	--	9.0	--	17.5	23.0	763	9.6
26...	1115	3.0	144	150	8.9	8.8	17.5	23.0	763	9.4
26...	1120	7.0	144	--	8.9	--	17.5	23.0	763	9.3
26...	1130	13.0	143	--	8.9	--	17.5	23.0	763	9.1
26...	1140	20.0	163	--	8.0	--	17.5	19.5	763	7.0
26...	1155	26.0	177	184	7.3	7.4	17.5	13.5	763	0.7
26...	1200	--	--	--	--	--	17.5	--	763	--
AUG										
07...	1000	0.0	140	--	8.9	--	22.0	23.5	762	9.0
07...	1015	3.0	140	148	8.9	8.8	22.0	23.5	762	9.0
07...	1020	7.0	140	--	8.9	--	22.0	23.5	762	8.8
07...	1030	13.0	139	--	8.9	--	22.0	23.5	762	8.8
07...	1040	20.0	159	--	8.1	--	22.0	21.0	762	6.6
07...	1055	26.0	177	182	7.3	7.6	22.0	14.0	762	0.3
07...	1100	--	--	--	--	--	22.0	--	762	--
28...	1100	0.0	143	--	8.6	--	15.5	19.5	769	9.8
28...	1115	3.0	142	155	8.6	8.7	15.5	19.5	769	9.5
28...	1120	7.0	142	--	8.6	--	15.5	19.5	769	9.2
28...	1130	13.0	142	--	8.5	--	15.5	19.0	769	8.7
28...	1140	20.0	142	--	8.3	--	15.5	18.5	769	5.4
28...	1155	26.0	156	182	7.2	--	15.5	16.5	769	0.8
28...	1200	--	--	--	--	--	15.5	--	769	--

LEECH LAKE RIVER BASIN

465724094402601 WILLIAMS LAKE NEAR AKELEY, MN--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

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)	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)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)
OCT								
13...	--	--	--	--	--	--	--	--
13...	22	7.4	1.4	1.0	86	0.6	0.6	0.8
13...	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--
13...	22	7.4	1.4	1.0	86	0.6	0.5	0.9
13...	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--
27...	21	7.2	1.7	0.8	86	0.8	1.1	0.5
27...	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--
27...	21	7.1	1.6	0.9	86	1.1	1.2	0.4
27...	--	--	--	--	--	--	--	--
NOV								
23...	--	--	--	--	--	--	--	--
23...	23	7.3	1.3	1.0	88	0.8	1.0	0
23...	--	--	--	--	--	--	--	--
23...	--	--	--	--	--	--	--	--
23...	--	--	--	--	--	--	--	--
23...	23	7.4	1.4	1.0	89	0.5	1.2	0.1
23...	--	--	--	--	--	--	--	--
DEC								
23...	--	--	--	--	--	--	--	--
23...	24	7.7	1.4	1.0	96	0.9	0.9	0.1
23...	--	--	--	--	--	--	--	--
23...	--	--	--	--	--	--	--	--
23...	--	--	--	--	--	--	--	--
23...	24	7.6	1.3	1.0	--	1.1	0.8	0.2
23...	--	--	--	--	--	--	--	--
FEB								
16...	--	--	--	--	--	--	--	--
16...	27	8.3	1.6	1.3	104	0.6	0.8	0.3
16...	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--
16...	27	8.0	1.6	1.3	--	0.5	0.8	1
16...	--	--	--	--	--	--	--	--
MAR								
10...	--	--	--	--	--	--	--	--
10...	27	8.5	1.5	1.0	104	0.7	0.8	0.4
10...	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--
10...	28	8.3	1.6	1.0	104	0.8	0.9	0.7
10...	--	--	--	--	--	--	--	--
MAY								
11...	--	--	--	--	--	--	--	--
11...	26	7.1	1.2	0.9	88	1.1	0.6	0.2
11...	--	--	--	--	--	--	--	--
11...	--	--	--	--	--	--	--	--
11...	--	--	--	--	--	--	--	--
11...	26	7.1	1.2	0.9	88	1.0	0.6	0.2
11...	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--
29...	25	7.4	1.4	2.0	87	1.5	0.6	0.3
29...	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--
29...	25	7.3	1.3	1.4	90	1.1	0.6	0.1
29...	--	--	--	--	--	--	--	--

LEECH LAKE RIVER BASIN

465724094402601 WILLIAMS LAKE NEAR AKELEY, MN--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

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)	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)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)
JUN								
14...	--	--	--	--	--	--	--	--
14...	24	7.1	1.3	1.0	83	1.4	0.5	0.3
14...	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--
14...	26	7.3	1.3	1.2	90	1.0	0.6	0.1
14...	--	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--
25...	23	7.0	1.2	1.1	83	0.8	0.5	0.4
25...	--	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--
25...	25	7.3	1.3	1.2	89	0.9	0.6	0.2
25...	--	--	--	--	--	--	--	--
JUL								
09...	--	--	--	--	--	--	--	--
09...	20	6.9	1.3	1.4	76	1.9	0.5	0.6
09...	--	--	--	--	--	--	--	--
09...	--	--	--	--	--	--	--	--
09...	--	--	--	--	--	--	--	--
09...	24	7.1	1.2	1.4	88	1.2	0.6	0.4
09...	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--
26...	19	7.0	1.2	0.8	73	1.2	0.2	0.6
26...	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--
26...	25	7.3	1.3	1.0	90	1.7	0.6	0.4
26...	--	--	--	--	--	--	--	--
AUG								
07...	--	--	--	--	--	--	--	--
07...	19	6.8	1.2	1.1	72	0.4	0.5	0.8
07...	--	--	--	--	--	--	--	--
07...	--	--	--	--	--	--	--	--
07...	--	--	--	--	--	--	--	--
07...	24	7.3	1.5	1.3	88	0.5	0.6	0.5
07...	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--
28...	--	6.7	1.2	0.9	73	1.7	0.5	0.9
28...	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--
28...	23	7.0	1.2	1.1	--	1.9	0.4	0.2
28...	--	--	--	--	--	--	--	--

LEECH LAKE RIVER BASIN

465724094402601 WILLIAMS LAKE NEAR AKELEY, MN--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	NITROGEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P) (00671)	IRON, DISSOLVED (UG/L AS FE) (01046)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	CHLOR-A PHYTOPLANKTON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTOPLANKTON CHROMO FLUOROM (UG/L) (70954)
OCT										
13...	--	--	--	--	0.028	--	--	--	--	--
13...	--	--	--	--	--	--	23	2	--	--
13...	--	--	--	--	0.025	--	--	--	--	--
13...	--	--	--	--	0.025	--	--	--	--	--
13...	--	--	--	--	0.026	--	--	--	--	--
13...	--	--	--	--	0.016	--	20	6	--	--
13...	<0.10	--	--	--	0.018	--	--	--	1.90	<0.10
27...	--	--	--	--	<0.001	--	--	--	--	--
27...	--	--	--	--	--	--	41	3	--	--
27...	--	--	--	--	0.179	--	--	--	--	--
27...	--	--	--	--	0.085	--	--	--	--	--
27...	--	--	--	--	0.073	--	--	--	--	--
27...	--	--	--	--	0.085	--	24	3	--	--
27...	<0.10	--	--	0.3	0.113	--	--	--	1.80	<0.10
NOV										
23...	--	--	--	--	<0.001	--	--	--	--	--
23...	--	--	--	--	--	--	16	4	--	--
23...	--	--	--	--	<0.001	--	--	--	--	--
23...	--	--	--	--	<0.001	--	--	--	--	--
23...	--	--	--	--	<0.001	--	--	--	--	--
23...	--	--	--	--	<0.001	--	21	4	--	--
23...	<0.10	--	--	2.5	<0.001	--	--	--	0.70	<0.10
DEC										
23...	--	--	--	--	0.019	--	--	--	--	--
23...	--	--	--	--	--	--	14	3	--	--
23...	--	--	--	--	0.007	--	--	--	--	--
23...	--	--	--	--	0.006	--	--	--	--	--
23...	--	--	--	--	0.014	--	--	--	--	--
23...	--	--	--	--	<0.001	--	26	8	--	--
23...	--	--	--	--	0.006	--	--	--	0.10	--
FEB										
16...	--	--	--	--	0.748	--	--	--	--	--
16...	<0.10	--	--	1.4	0.009	--	12	1	1.40	<0.10
16...	--	--	--	--	0.039	--	--	--	--	--
16...	--	--	--	--	0.058	--	--	--	--	--
16...	--	--	--	--	0.751	--	--	--	--	--
16...	--	--	--	--	0.009	--	78	16	--	--
16...	--	--	--	--	0.709	--	--	--	1.40	--
MAR										
10...	--	--	--	--	<0.001	--	--	--	--	--
10...	--	--	--	--	--	--	13	1	--	--
10...	--	--	--	--	<0.001	--	--	--	--	--
10...	--	--	--	--	<0.001	--	--	--	--	--
10...	--	--	--	--	<0.001	--	--	--	--	--
10...	--	--	--	--	0.039	--	15	1	--	--
10...	<0.10	--	--	0.8	0.028	--	--	--	1.10	<0.10
MAY										
11...	--	--	--	--	0.005	--	--	--	--	--
11...	--	--	--	--	0.003	--	20	2	--	--
11...	--	--	--	--	0.008	--	--	--	--	--
11...	--	--	--	--	0.007	--	--	--	--	--
11...	--	--	--	--	0.014	--	--	--	--	--
11...	--	--	--	--	0.020	--	5	1	--	--
11...	<0.10	--	--	1.0	0.011	--	--	--	7.90	0.40
29...	--	--	--	--	0.012	--	--	--	--	--
29...	--	--	--	--	--	--	--	26	--	--
29...	--	--	--	--	0.014	--	--	--	--	--
29...	--	--	--	--	0.011	--	--	--	--	--
29...	--	--	--	--	0.016	--	--	--	--	--
29...	--	--	--	--	0.018	--	<3	2	--	--
29...	<0.10	--	--	0.7	0.138	--	--	--	5.10	0.30

LEECH LAKE RIVER BASIN

465724094402601 WILLIAMS LAKE NEAR AKELEY, MN--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	NITROGEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P) (00671)	IRON, DISSOLVED (UG/L AS FE) (01046)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	CHLOR-A PHYTOPLANKTON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTOPLANKTON CHROMO FLUOROM (UG/L) (70954)
JUN										
14...	--	--	--	--	0.010	--	--	--	--	--
14...	--	--	--	--	--	--	<3	1	--	--
14...	--	--	--	--	0.010	--	--	--	--	--
14...	--	--	--	--	0.011	--	--	--	--	--
14...	--	--	--	--	0.013	--	--	--	--	--
14...	--	--	--	--	0.029	--	36	25	--	--
14...	<0.10	--	--	0.6	0.021	--	--	--	3.40	0.10
25...	--	--	--	--	0.007	--	--	--	--	--
25...	--	--	--	--	--	--	13	<1	--	--
25...	--	--	--	--	0.009	--	--	--	--	--
25...	--	--	--	--	0.017	--	--	--	--	--
25...	--	--	--	--	0.022	--	--	--	--	--
25...	--	--	--	--	0.015	--	19	4	--	--
25...	<0.10	--	--	0.8	0.020	--	--	--	3.00	0.30
JUL										
09...	--	--	--	--	0.004	--	--	--	--	--
09...	--	--	--	--	--	--	20	2	--	--
09...	--	--	--	--	0.006	--	--	--	--	--
09...	--	--	--	--	0.013	--	--	--	--	--
09...	--	--	--	--	0.009	--	--	--	--	--
09...	--	--	--	--	0.020	--	37	44	--	--
09...	<0.10	--	--	0.5	0.010	--	--	--	3.60	<0.30
26...	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	<3	2	--	--
26...	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	0.015	--	17	110	--	--
26...	--	--	--	--	--	--	--	--	3.90	0.30
AUG										
07...	--	--	--	--	0.009	--	--	--	--	--
07...	--	--	--	--	--	--	5	6	--	--
07...	--	--	--	--	0.009	--	--	--	--	--
07...	--	--	--	--	0.007	--	--	--	--	--
07...	--	--	--	--	0.008	--	--	--	--	--
07...	--	--	--	--	0.008	--	33	12	--	--
07...	<0.10	<0.01	0.02	0.7	0.011	0.002	--	--	4.40	0.20
28...	--	--	--	--	0.010	--	--	--	--	--
28...	--	--	--	--	--	--	4	3	--	--
28...	--	--	--	--	0.010	--	--	--	--	--
28...	--	--	--	--	0.010	--	--	--	--	--
28...	--	--	--	--	0.012	--	--	--	--	--
28...	--	--	--	--	0.014	--	15	11	--	--
28...	<0.10	<0.01	0.016	0.6	0.009	0.005	--	--	3.50	0.20

LEECH LAKE RIVER BASIN

05206000 LEECH LAKE AT FEDERAL DAM, MN

LOCATION.--Lat 47°12'23", long 94°18'31", in lot 2, sec.14, T.143 N., R.29 W., Cass County, Hydrologic Unit 07010102, on Leech Lake Indian Reservation, at head of Leech Lake River on Waboose Bay, 5 mi southwest of town of Federal Dam.

DRAINAGE AREA.--1,163 mi^2.

PERIOD OF RECORD.--April 1884 to current year. Monthend contents only for some periods, published in WSP 1308. Prior to October 1956, published as "Leech Lake Reservoir."

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by Corps of Engineers). Prior to Dec. 31, 1884, nonrecording gage 0.5 mi north of outlet to Leech Lake River at datum 98.47 ft higher. Dec. 31, 1884, to May 24, 1931, nonrecording gage 0.5 mi north of outlet to Leech Lake River and May 25, 1931, to July 10, 1973, water-stage recorder at same site and at datum 92.70 ft higher.

REMARKS .--Reservoir is formed by Leech Lake and several other natural lakes controlled by concrete and timber dam; storage began in 1884; original timber structure completed in 1884, replaced by present dam in 1902. Capacity between elevation 1,292.70 ft and 1,297.94 ft (maximum allowable range) is 688,985 acre-ft of which 352,637 acre-ft is controlled storage between elevations 1,292.70 ft and 1,295.70 ft (normal operating range). Contents shown herein are contents above elevation 1,290.00 ft. Prior to September 1978, published contents as contents above elevation 1,292.20 ft. Water is used to benefit navigation on Mississippi River below Minneapolis.

COOPERATION.--Records furnished by Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 734,300 acre-ft, capacity table then in use, June 30, 1916, elevation, 1,297.88 ft; minimum, 51,380 acre-ft, capacity table then in use, Dec. 8, 24, 1976, elevation, 1,292.69 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 604,390 acre-ft, June 28, elevation, 1,295.42 ft; minimum, 327,380 acre-ft, Feb. 25, elevation, 1,293.06 ft.

MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1984 to SEPTEMBER 1985

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	1,294.14	445,550	
Oct. 31	1,293.93	421,920	-23,630
Nov. 30	1,293.78	405,360	-16,560
Dec. 31	1,293.49	373,680	-31,680
CAL YR 1984			+30,220
Jan. 31	1,293.16	338,100	-35,580
Feb. 28	1,293.12	333,820	-4,280
Mar. 31	1,293.72	398,780	+64,960
Apr. 30	1,294.48	485,240	+84,460
May 31	1,295.08	559,660	+74,420
June 30	1,295.06	557,090	-2,570
July 31	1,294.68	509,420	-47,670
Aug. 31	1,294.47	484,040	-25,380
Sept. 30	1,294.27	460,520	-23,520
WTR YR 1985			+14,970

LEECH LAKE RIVER BASIN

05206500 LEECH LAKE RIVER AT FEDERAL DAM, MN

LOCATION.--Lat 47°14'45", long 94°13'12", in sec.34, T.144 N., R.28 W., Cass County, Hydrologic Unit 07010102, on Leech Lake Indian Reservation, on right bank at dam on Leech Lake River at town of Federal Dam, 2 mi downstream from natural outlet of Leech Lake.

DRAINAGE AREA.--1,163 mi^2.

PERIOD OF RECORD.--May 1884 to current year. Monthly discharge only for some periods, published in WSP 1308.

GAGE.--Water-stage recorder, headwater gage, and nonrecording tailwater gage. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by Corps of Engineers). Prior to June 30, 1973, gages (nonrecording headwater gage prior to July 3, 1948) at same sites with datum at 1,293.23 ft, adjustment of 1912. May 27 to Nov. 30, 1929, nonrecording gage at site 600 ft downstream at different datum.

REMARKS.--Discharge computed on basis of modified weir formula, the head being obtained from readings on tailwater gage and mean gage height from recording headwater gage. Flow completely regulated by Leech Lake (station 05206000).

COOPERATION.--Computations of daily discharge furnished by Corps of Engineers.

AVERAGE DISCHARGE (unadjusted).--101 years, 368 ft^3/s, 4.30 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 2,520 ft^3/s, June 7, 1957 (result of dam failure); no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 1,060 ft^3/s, June 9; minimum daily, 92 ft^3/s, Oct. 1.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	92	983	910	818	745	599	133	173	999	1000	840	840
2	199	828	917	833	725	495	133	178	1030	997	840	820
3	199	927	905	855	725	494	135	173	1010	995	840	840
4	195	935	904	856	724	494	133	173	1060	969	840	840
5	195	919	900	854	722	506	133	180	1010	964	840	840
6	312	948	732	872	800	440	135	180	1010	973	840	860
7	312	948	735	840	800	450	135	180	1010	975	840	840
8	312	955	857	811	800	353	135	180	961	969	840	840
9	312	955	880	828	798	245	135	193	1060	970	840	840
10	392	948	895	847	800	245	135	193	1010	970	880	840
11	517	945	894	849	821	245	135	205	1010	965	840	840
12	607	950	900	848	819	245	133	215	1020	940	840	840
13	710	945	869	845	758	130	138	308	1010	940	840	840
14	710	939	869	843	720	128	135	500	990	937	840	840
15	726	943	864	799	720	128	138	500	990	936	840	840
16	730	907	855	844	700	128	138	687	1010	930	840	840
17	743	904	896	841	700	128	135	700	1040	936	840	840
18	756	906	851	840	700	128	138	688	984	943	840	840
19	880	910	819	772	700	128	138	688	985	945	840	840
20	840	908	850	670	646	128	138	700	964	860	820	860
21	840	907	847	673	646	128	138	688	920	860	820	840
22	840	907	766	776	646	128	138	688	1010	860	820	840
23	840	907	786	754	646	130	153	688	995	860	820	840
24	840	910	784	755	646	130	160	700	965	860	820	840
25	840	910	820	783	646	130	165	795	959	860	840	840
26	840	907	819	750	646	130	166	780	1000	860	840	840
27	965	910	819	748	599	133	160	980	975	860	840	840
28	1000	940	820	749	599	130	165	780	1010	860	820	840
29	966	940	819	747	---	133	173	920	999	860	840	840
30	973	910	817	748	---	133	173	900	998	840	840	840
31	930	---	818	726	---	133	---	900	---	840	840	---
TOTAL	19613	27751	26217	24774	19997	7275	4299	15813	29994	28534	25960	25220
MEAN	633	925	846	799	714	235	143	510	1000	920	837	841
MAX	1000	983	917	872	821	599	173	980	1060	1000	880	860
MIN	92	828	732	670	599	128	133	173	920	840	820	820
CFSM	.54	.80	.73	.69	.61	.20	.12	.44	.86	.79	.72	.72
IN.	.63	.89	.84	.79	.64	.23	.14	.51	.96	.91	.83	.81
AC-FT	38900	55040	52000	49140	39660	14430	8530	31370	59490	56600	51490	50020

CAL YR 1984 TOTAL 175778 MEAN 480 MAX 1000 MIN 87 CFSM .41 IN 5.62 AC-FT 348700
WTR YR 1985 TOTAL 255447 MEAN 700 MAX 1060 MIN 92 CFSM .60 IN 8.17 AC-FT 506700

MISSISSIPPI RIVER MAIN STEM

05210500 POKEGAMA LAKE NEAR GRAND RAPIDS, MN

LOCATION.--Lat 47°10'00", long 93°33'20", in NW¼ sec.17, T.54 N., R.25 W., Itasca County, Hydrologic Unit 07010101, at narrows on U.S. Highway 169, 4 mi south of Grand Rapids and at mile 1,184 upstream from Ohio River.

DRAINAGE AREA.--3,265 mi^2.

PERIOD OF RECORD.--April 1884 to current year. Prior to October 1941 monthend contents only, published in WSP 1308. Published as Pokegama Reservoir near Grand Rapids, October 1941 to September 1956.

REVISED RECORDS.--WSP 1914: 1897(M).

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by Corps of Engineers). Prior to May 30, 1949, nonrecording gage at Pooles Arm of Pokegama Lake 5 mi northwest, and May 31, 1949, to July 12, 1973, water-stage recorder at same site and at datum 64.42 ft higher.

REMARKS.--Reservoir is formed by Pokegama Lake and several other natural lakes controlled by concrete dam; storage began in 1884; original timber dam completed in 1884, replaced by present structure in 1888-89. Capacity between elevation 1,270.42 ft and 1,276.42 ft (maximum allowable range) is 80,126 acre-ft of which 52,483 acre-ft is controlled storage between elevations 1,270.42 ft and 1,274.42 ft (normal operating range). Contents shown herein are contents above elevation 1,267.00 ft. Prior to September 1978, published contents as contents above elevation 1,268.92 ft. Water is used to benefit navigation on Mississippi River below Minneapolis.

COOPERATION.--Records furnished by Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 124,100 acre-ft, Apr. 30, 1979, elevation, 1,276.85 ft; maximum elevation, 1,277.92 ft, May 8, 1897; minimum contents observed, 4,520 acre-ft, below zero of capacity table then in use, Sept. 30, 1934, elevation, 1,268.54 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 90,480 acre-ft, May 17, elevation, 1,274.42 ft; minimum, 28,340 acre-ft, Feb. 25, elevation, 1,269.60 ft.

MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	1,272.87	69,370	
Oct. 31	1,270.64	40,670	-28,700
Nov. 30	1,270.44	38,240	-2,430
Dec. 31	1,269.81	30,770	-7,470
CAL YR 1984			-15,730
Jan. 31	1,269.79	30,540	-230
Feb. 28	1,271.29	48,770	+18,230
Mar. 31	1,272.23	60,870	+12,100
Apr. 30	1,273.80	81,980	+21,110
May 31	1,272.92	70,040	-11,940
June 30	1,273.03	71,520	+1,480
July 31	1,272.23	60,870	-10,650
Aug. 31	1,272.11	59,300	-1,570
Sept. 30	1,271.74	54,510	-4,790
WTR YR 1985			-14,860

MISSISSIPPI RIVER MAIN STEM

05211000 MISSISSIPPI RIVER AT GRAND RAPIDS, MN

LOCATION.--Lat 47°13'56", long 93°31'48", in SW¼NW¼ sec.21, T.55 N., R.25 W., Itasca County, Hydrologic Unit 07010103, on left bank, in super-calendar room of Blandin Paper Mill in Grand Rapids, 400 ft downstream from Blandin Dam, 400 ft upstream from bridge on U.S. Highway 169, 2.5 mi upstream from Prairie River, and at mile 1,182 upstream from Ohio River.

DRAINAGE AREA.--3,370 mi^2, approximately.

PERIOD OF RECORD.--October 1883 to current year. Monthly discharge only for some periods, published in WSP 1308. Published as "at Pokegama Dam near Grand Rapids" 1942-44.

GAGE.--Water-stage recorder. Datum of gage is 1,242.03 ft above National Geodetic Vertical Datum of 1929. See WSP 1914 for history of changes prior to Jan. 17, 1951.

REMARKS.--Estimated daily discharges: Dec. 6 to Feb. 25 and Mar. 3-7. Records fair. Flow regulated by Winnibigoshish Lake (station 05201000), Leech Lake (station 05206000), Pokegama Lake (station 05210500) and occasionally at low flow by powerplant at Blandin Dam. Backwater from Prairie River occurs at times in most years.

AVERAGE DISCHARGE.--102 years, 1,184 ft^3/s; median of yearly mean discharges, 1,060 ft^3/s.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,500 ft^3/s, Sept. 3, 1948, gage height, 15.2 ft, from floodmark, caused by dam failure at gage, from rating curve extended above 4,500 ft^3/s; maximum daily, 5,250 ft^3/s, Sept. 5, 8, 1905; no flow at times in several years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,080 ft^3/s, July 12, gage height, 8.86 ft; maximum gage height, 10.61 ft, May 18 (backwater from Prairie River); minimum daily discharge, 367 ft^3/s, Oct. 1; minimum gage height, 2.69 ft, Apr. 17.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	367	2290	2040	1780	1770	1080	922	1710	2520	2790	2350	2640
2	451	2190	2000	1780	1750	960	900	1340	2460	2800	2310	2640
3	510	2090	1820	1790	1720	960	916	988	2400	2790	2290	2690
4	514	2250	1630	1800	1710	980	890	1280	2230	2810	2330	2670
5	670	2220	1650	1810	1710	980	906	1350	2310	2790	2550	2680
6	650	2140	1700	1830	1720	990	890	1380	2510	2850	2570	2730
7	650	2020	1800	1840	1720	1000	911	1400	2390	2840	2480	2730
8	630	2000	1850	1840	1720	1280	885	1540	2210	2880	2430	2700
9	635	2080	1850	1840	1720	1360	900	1480	2160	2850	2420	2790
10	645	2080	1900	1840	1720	1350	870	1520	2300	2910	2380	3000
11	745	2070	1900	1850	1730	1310	875	1420	2360	2900	2350	2980
12	966	2100	1900	1850	1730	1330	785	1910	2030	3000	2460	2950
13	1070	2090	1900	1850	1720	1310	770	2740	1750	2960	2480	2920
14	1060	2100	1900	1850	1710	1260	675	2800	1690	2910	2420	2890
15	1040	2050	1900	1850	1700	1240	785	2560	1800	2900	2480	2860
16	1090	1840	1900	1850	1700	1210	745	2650	1770	2850	2480	2800
17	1270	1840	1880	1860	1690	1190	665	2640	1910	2720	2490	2780
18	1430	1790	1860	1860	1670	999	760	2670	2080	2950	2490	2840
19	1780	1880	1840	1860	1640	845	745	2550	2010	2810	2470	2830
20	1970	1910	1820	1860	1600	740	740	2530	2030	2750	2400	2830
21	1970	1920	1800	1860	1550	765	735	2530	2020	2690	2440	2790
22	2000	1920	1790	1850	1500	755	800	2530	2100	2570	2500	2700
23	2000	1920	1750	1850	1430	785	1040	2480	2080	2610	2530	2720
24	2080	1990	1670	1840	1320	775	1240	2520	2130	2550	2590	2780
25	2260	1990	1580	1840	1150	780	1190	2520	2130	2530	2610	2790
26	2290	2010	1580	1830	1040	785	1190	2530	2400	2420	2610	2780
27	2290	2020	1650	1820	1080	790	1100	2440	2740	2450	2640	2750
28	2420	2040	1720	1810	1120	785	1650	2400	2780	2420	2610	2730
29	2370	2020	1770	1800	---	885	1810	2360	2810	2370	2680	2700
30	2350	2040	1780	1800	---	916	1800	2390	2790	2400	2680	2760
31	2280	---	1780	1790	---	938	---	2520	---	2410	2650	---
TOTAL	42453	60900	55910	56780	44340	31333	29090	65678	66900	84480	77170	83450
MEAN	1369	2030	1804	1832	1584	1011	970	2119	2230	2725	2489	2782
MAX	2420	2290	2040	1860	1770	1360	1810	2800	2810	3000	2680	3000
MIN	367	1790	1580	1780	1040	740	665	988	1690	2370	2290	2640
CFSM	.41	.60	.54	.54	.47	.30	.29	.63	.66	.81	.74	.83
IN.	.47	.67	.62	.63	.49	.35	.32	.72	.74	.93	.85	.92
AC-FT	84210	120800	110900	112600	87950	62150	57700	130300	132700	167600	153100	165500

CAL YR 1984 TOTAL 488679 MEAN 1335 MAX 2420 MIN 149 CFSM .40 IN 5.39 AC-FT 969300
WTR YR 1985 TOTAL 698484 MEAN 1914 MAX 3000 MIN 367 CFSM .57 IN 7.71 AC-FT 1385000

SWAN RIVER BASIN

05216820 INITIAL TAILINGS BASIN OUTFLOW NEAR KEEWATIN, MN

LOCATION.--Lat 47°22'20", long 93°01'58", in SW¼SE¼ sec.32, T.57 N., R.21 W., St. Louis County, Hydrologic Unit 07010103, on right bank at breach in dike of initial tailings pond, 200 ft upstream of Baseline Road and 2.8 mi southeast of Keewatin.

DRAINAGE AREA.--2.5 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1982 to June 30, 1985 (discontinued).

GAGE.--Water-stage recorder. Datum of gage is 1488.40 ft above National Geodetic Vertical Datum of 1929. Prior to July 7, 1982, nonrecording gage at site 15 ft downstream at same datum.

REMARKS.--Estimated daily discharges: Oct. 1 to Apr. 22 and June 9-30. Records fair except those for periods of no gage-height record, Oct. 1 to Apr. 22 and June 9-30, which are poor.

EXTREMES FOR PERIOD OF RECORD.-- Maximum discharge, 142 ft^3/s, Apr. 15, 1982, gage height, 5.72 ft, site then in use; no flow on many days each year.

EXTREMES FOR CURRENT PERIOD.--October 1984 to June 1985: Maximum discharge during period, 37 ft^3/s, Apr. 23, gage height, 5.09 ft; maximum gage-height, 5.16 ft, May 31; no flow on many days.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.08	.37	8.0			
2	.00	.00	.00	.00	.00	---	.06	.34	2.7			
3	.00	.00	.00	.00	.00	---	.05	.21	1.1			
4	.00	.00	.00	.00	.00	---	.05	.17	.72			
5	.00	.00	.00	.00	.00	---	.04	.25	.44			
6	.00	.00	.00	.00	.00	---	.04	.34	.23			
7	.00	.00	.00	.00	.00	---	.04	.19	.28			
8	.00	.00	.00	.00	.00	---	.04	.11	.07			
9	.00	.00	.00	.00	.00	---	.04	.11	.02			
10	.00	.00	.00	.00	.00	---	.04	2.4	.00			
11	.00	.00	.00	.00	.00	---	.03	13	.00			
12	.00	.00	.00	.00	.00	---	.03	12	.00			
13	.00	.00	.00	.00	.00	---	.03	3.9	.00			
14	.00	.00	.00	.00	.00	---	.03	1.5	.00			
15	.00	.00	.00	.00	.00	---	.03	1.1	.00			
16	.00	.00	.00	.00	.00	---	.02	.95	.00			
17	.00	.00	.00	.00	.00	---	.02	.72	.00			
18	.00	.00	.00	.00	.00	---	.02	.28	.00			
19	.05	.00	.00	.00	.00	.01	.02	.25	.00			
20	1.0	.00	.00	.00	.00	.02	.02	.15	.00			
21	.70	.00	.00	.00	.00	.03	.01	.08	.00			
22	.50	.00	.00	.00	.00	.07	.01	.04	.00			
23	.30	.00	.00	.00	.00	.20	21	.02	.00			
24	.20	.00	.00	.00	.00	.40	18	.00	.00			
25	.10	.00	.00	.00	.00	.51	6.2	.00	.00			
26	.05	.00	.00	.00	.00	.67	2.3	.01	.05			
27	.02	.00	.00	.00	.00	.50	1.5	.00	1.0			
28	.01	.00	.00	.00	.00	.30	1.1	.00	5.0			
29	.00	.00	.00	.00	---	.20	.67	.02	2.0			
30	.00	.00	.00	.00	---	.15	.48	.04	1.0			
31	.00	---	.00	.00	---	.10	---	18	---			
TOTAL	2.93	.00	.00	.00	.00	---	52.00	56.55	22.61			
MEAN	.095	.000	.000	.000	.000	---	1.73	1.82	.75			
MAX	1.0	.00	.00	.00	.00	---	21	18	8.0			
MIN	.00	.00	.00	.00	.00	---	.01	.00	.00			
CFSM	.04	.000	.000	.000	.000	---	.69	.73	.30			
IN.	.04	.00	.00	.00	.00	---	.77	.84	.34			
AC-FT	5.8	.00	.00	.00	.00	---	103	112	45			

CAL YR 1984 TOTAL 133.64 MEAN .37 MAX 19 MIN .00 CFSM .15 IN 1.99 AC-FT 265

SWAN RIVER BASIN

05216820 INITIAL TAILINGS BASIN OUTFLOW NEAR KEEWATIN, MN--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1983 to current year (discontinued).

WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	TEMPER-ATURE (DEG C) (00010)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
MAR 25...	1200	0.51	390	1.5	43	90

SWAN RIVER BASIN

05216860 SWAN RIVER NEAR CALUMET, MN

LOCATION.--Lat 47°17'20", long 93°13'54", in NW¼SW¼ sec.35, T.56 N., R.23 W., Itasca County, Hydrologic Unit 07010103, on left bank 1.0 mi downstream from Snowball Creek, 2.1 mi downstream from bridge on U.S. Highway 65 at outlet of Swan Lake and 3.1 mi southeast of Calumet.

DRAINAGE AREA.--114 mi^2.

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

GAGE.--Water-stage recorder. Datum of gage is 1,331.19 ft above National Geodetic Vertical Datum of 1929. Prior to June 5, 1964, reference point at present site and datum.

REMARKS.--No estimated daily discharges. Records good. Natural flow of stream affected by continually changing iron-mining activities that include diversions for iron-ore processing, storage in tailing ponds and Swan Lake, and mine pit dewatering.

AVERAGE DISCHARGE.--21 years, 65.9 ft^3/s, 7.85 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 773 ft^3/s, Apr. 15, 1969, gage height, 5.83 ft; maximum gage height, 5.96 ft, Apr. 23, 1979; minimum discharge 0.38 ft^3/s, Oct. 14, 1976, gage height, 4.16 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 430 ft^3/s, Apr. 25, gage height, 5.68 ft; minimum, 9.2 ft^3/s, Oct. 2, 3, gage height, 4.52 ft.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10	71	42	30	25	22	65	282	192	154	31	19
2	10	72	40	31	26	22	62	252	209	148	28	22
3	10	71	38	30	26	22	68	230	210	141	27	24
4	13	70	38	29	26	23	69	205	200	135	25	24
5	14	69	37	28	26	23	67	186	190	133	24	24
6	13	70	36	29	26	22	66	182	183	127	24	27
7	13	69	34	29	26	22	64	174	166	120	23	30
8	14	65	34	28	26	22	64	162	154	110	20	31
9	14	66	34	28	26	22	61	158	132	104	18	33
10	14	62	33	27	26	22	59	178	136	96	17	33
11	14	61	33	28	24	22	60	264	130	89	17	33
12	15	58	31	27	24	22	62	347	116	82	21	30
13	15	56	30	27	24	22	62	400	111	75	19	27
14	18	56	30	27	24	22	62	413	108	70	18	26
15	24	49	30	26	24	20	62	410	105	62	18	24
16	27	51	40	26	23	20	63	397	98	58	18	23
17	48	50	44	25	23	22	63	374	94	56	16	26
18	60	48	44	25	24	24	61	346	92	70	15	28
19	88	46	42	27	24	27	65	309	89	68	16	30
20	103	44	41	27	24	28	68	275	86	65	16	28
21	110	44	40	27	24	31	77	246	84	65	15	30
22	115	44	38	26	23	33	104	218	80	62	15	33
23	115	42	36	25	23	37	217	196	79	54	16	36
24	115	42	35	25	23	40	349	175	78	56	18	38
25	112	42	35	25	23	44	409	166	88	56	18	40
26	105	42	34	25	23	50	404	154	106	52	18	40
27	101	44	33	27	22	52	391	138	123	46	18	38
28	99	44	32	27	22	58	358	129	144	40	18	38
29	97	44	32	26	---	62	326	127	154	37	20	38
30	90	42	31	25	---	68	306	128	155	36	19	42
31	89	---	31	25	---	65	---	163	---	33	19	---
TOTAL	1685	1634	1108	837	680	991	4214	7384	3892	2500	605	915
MEAN	54.4	54.5	35.7	27.0	24.3	32.0	140	238	130	80.6	19.5	30.5
MAX	115	72	44	31	26	68	409	413	210	154	31	42
MIN	10	42	30	25	22	20	59	127	78	33	15	19
CFSM	.48	.48	.31	.24	.21	.28	1.23	2.09	1.14	.71	.17	.27
IN.	.55	.53	.36	.27	.22	.32	1.38	2.41	1.27	.82	.20	.30
AC-FT	3340	3240	2200	1660	1350	1970	8360	14650	7720	4960	1200	1810

CAL YR 1984 TOTAL 22117.9 MEAN 60.4 MAX 299 MIN 5.2 CFSM .53 IN 7.22 AC-FT 43870
WTR YR 1985 TOTAL 26445.0 MEAN 72.5 MAX 413 MIN 10 CFSM .64 IN 8.63 AC-FT 52450

SANDY RIVER BASIN

05218500 SANDY LAKE AT LIBBY, MN

LOCATION.--Lat 46°47'20", long 93°19'10", in sec.25, T.50 N., R.24 W., Aitkin County, Hydrologic Unit 07010103, on dam on Sandy River at Libby, 1.2 mi upstream from mouth, and 14 mi north of McGregor.

DRAINAGE AREA.--421 mi^2.

PERIOD OF RECORD.--July to December 1893, October to December 1894, July 1895 to current year. Monthend contents only for some periods, published in WSP 1308. Published as Sandy Lake Reservoir at Libby, October 1941 to September 1956.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by Corps of Engineers). Prior to Sept. 23, 1949, nonrecording gage and Sept. 24, 1949, to Nov. 28, 1962, water-stage recorder at site 1 mi upstream at datum 1,207.71 ft, adjustment of 1912. Nov. 29, 1962, to June 30, 1973, water-stage recorder at present site at datum 1,207.71 ft, adjustment of 1912.

REMARKS.--Lake is formed by concrete dam which controls Sandy, Flowage, Snake, and Aitkin Lakes. Storage began in 1893; original timber crib dam completed in 1895, replaced by present structure in 1911. Capacity between elevation 1,214.31 ft and 1,221.31 ft (top of structure) is 73,037 acre-ft, of which 37,539 acre-ft is controlled storage between elevations 1,214.31 ft and 1,218.31 ft (normal operating range). Contents shown herein are contents above elevation 1,207.00 ft. Prior to September 1978, published contents as contents above elevation 1,209.03 ft. Water is used to benefit navigation on Mississippi River below Minneapolis.

COOPERATION.--Records furnished by Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 167,200 acre-ft, capacity table then in use, May 19, 1950, elevation, 1,224.82 ft; minimum observed, 5,950 acre-ft, below zero of capacity table then in use, Jan. 20, 1921, elevation, 1,207.96 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 82,690 acre-ft, May 4, elevation, 1,218.24 ft; minimum, 46,120 acre-ft, Jan. 29, elevation, 1,214.34 ft.

MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	1,215.89	59,530	
Oct. 31	1,215.71	57,930	-1,630
Nov. 30	1,215.32	54,430	-3,470
Dec. 31	1,214.09	51,560	-2,870
CAL YR 1984			+6,580
Jan. 31	1,214.35	46,200	-5,360
Feb. 28	1,214.43	46,860	+660
Mar. 31	1,215.66	57,450	+10,590
Apr. 30	1,218.01	80,270	+22,820
May 31	1,216.79	68,000	-12,270
June 30	1,217.14	71,420	+3,420
July 31	1,216.31	63,420	-8,000
Aug. 31	1,216.30	63,330	- 90
Sept. 30	1,216.34	63,700	+370
WTR YR 1985			+4,170

SANDY RIVER BASIN

05219000 SANDY RIVER AT SANDY LAKE DAM, AT LIBBY, MN

LOCATION.--Lat 46°47'20", long 93°19'10", in sec.25, T.50 N., R.24 W., Aitkin County, Hydrologic Unit 07010103, at dam at outlet of Sandy Lake, at Libby, 1.2 mi above mouth, and 14 mi north of McGregor.

DRAINAGE AREA.--421 mi^2.

PERIOD OF RECORD.--July 1893 to March 1894, July 1894, November 1894 to March 1895, August 1895 to current year. Monthly discharge only for some periods, published in WSP 1308. Published as "below Sandy Lake Reservoir" 1893-1916.

GAGE.--Water-stage recorders on headwater and tailwater. Datum of gages is National Geodetic Vertical Datum of 1929 (levels by Corps of Engineers). Prior to June 30, 1973, gages (nonrecording gages prior to June 20, 1949) at same site with datum at 1,207.71 ft, adjustment of 1912.

REMARKS.--Discharge computed on basis of head over dam, using modified weir formula, head being obtained from headwater and tailwater recorder records. Flow completely regulated by Sandy Lake (station 05218500).

COOPERATION.--Computations of daily discharge furnished by Corps of Engineers; discharge measurements made and records reviewed by Geological Survey.

AVERAGE DISCHARGE (unadjusted).--90 years (water years 1896-1985), 221 ft^3/s, 7.13 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 3,740 ft^3/s, July 12, 1897; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 1,320 ft^3/s, May 11,12; minimum daily, 0 ft^3/s, May 20-23.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23	546	183	198	19	23	28	936	816	864	408	300
2	23	546	185	195	19	22	93	864	768	865	414	300
3	23	557	190	195	19	22	93	816	864	936	213	296
4	23	557	176	192	19	23	94	864	864	984	222	292
5	23	557	173	192	19	23	94	912	912	984	228	288
6	79	280	173	189	19	23	95	1060	984	1010	228	288
7	77	300	173	186	19	23	96	1150	1010	1080	228	288
8	76	305	104	183	19	23	97	1220	1060	1060	222	284
9	76	315	104	183	19	23	190	1270	1010	1060	222	284
10	76	320	102	183	19	22	190	1300	1010	1060	222	284
11	76	320	98	183	19	22	194	1320	1060	1060	225	284
12	76	325	93	183	19	21	194	1320	1080	1080	228	284
13	75	325	90	180	19	21	196	1300	1060	1060	225	280
14	72	201	90	177	19	21	198	1220	1060	1060	222	276
15	70	201	93	177	19	21	200	1060	385	1080	225	276
16	70	201	95	177	19	21	202	816	455	588	225	276
17	67	207	95	177	19	21	202	480	469	648	228	140
18	558	215	95	60	19	21	152	240	107	236	231	142
19	458	235	189	61	19	21	152	144	113	1020	231	142
20	880	231	192	61	19	22	52	0	113	880	231	142
21	462	207	198	62	20	23	52	0	113	900	231	142
22	455	102	198	62	19	24	52	0	114	960	234	142
23	441	101	201	62	19	26	50	0	116	980	237	140
24	434	95	201	62	20	26	900	480	116	980	237	138
25	630	89	207	62	20	26	1220	528	117	980	234	138
26	609	87	207	62	20	26	1060	648	116	980	231	235
27	588	86	207	62	21	26	1060	720	992	648	231	235
28	578	95	204	62	22	26	1060	768	1080	696	228	512
29	567	168	201	62	---	27	1060	864	912	696	117	488
30	546	178	201	19	---	27	1030	912	816	378	117	496
31	546	---	201	19	---	28	---	912	---	402	308	---
TOTAL	8757	7952	4919	3928	541	724	10356	24124	19692	27215	7283	7812
MEAN	282	265	159	127	19.3	23.4	345	778	656	878	235	260
MAX	880	557	207	198	22	28	1220	1320	1080	1080	414	512
MIN	23	86	90	19	19	21	28	0	107	236	117	138
CFSM	.67	.63	.38	.30	.05	.06	.82	1.85	1.56	2.09	.56	.62
IN.	.77	.70	.43	.35	.05	.06	.92	2.13	1.74	2.40	.64	.69
AC-FT	17370	15770	9760	7790	1070	1440	20540	47850	39060	53980	14450	15500

CAL YR 1984 TOTAL 102935 MEAN 281 MAX 1690 MIN 20 CFSM .67 IN 9.10 AC-FT 204200
WTR YR 1985 TOTAL 123303 MEAN 338 MAX 1320 MIN 0 CFSM .80 IN 10.90 AC-FT 244600

MISSISSIPPI RIVER MAIN STEM

05220500 MISSISSIPPI RIVER BELOW SANDY RIVER, NEAR LIBBY, MN

LOCATION.--Lat 46°47'23", long 93°19'43", in SE¼NE¼ sec.25, T.50 N., R.24 W., Aitkin County, Hydrologic Unit 07010103, on right bank 600 ft downstream from Sandy River, 0.8 mi northwest of Libby, and at mile 1,106 upstream from Ohio River.

DRAINAGE AREA.--5,060 mi^2, approximately.

PERIOD OF RECORD.--April 1930 to current year.

REVISED RECORDS.--WSP 1914: 1958.

GAGE.--Water-stage recorder. Datum of gage is 1,204.06 ft above National Geodetic Vertical Datum of 1929. Prior to July 28, 1931, nonrecording gage at site 600 ft upstream at datum 3.16 ft higher.

REMARKS.--Estimated daily discharges: Nov. 19-22 and Nov. 30 to Mar. 21. Records good except those for periods with ice effect, Nov. 19-22 and Nov. 30 to Mar. 21, which are fair. Flow regulated by Winnibigoshish Lake (station 05201000), Leech Lake (station 05206000), Pokegama Lake (station 05210500), and Sandy Lake (station 05218500).

AVERAGE DISCHARGE.--55 years, 2,073 ft^3/s, 5.56 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,000 ft^3/s, May 17, 1950, gage height, 20.02 ft; minimum, 83 ft^3/s, Nov. 16, 1936, gage height, 1.44 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 6,260 ft^3/s, May 20, 21, gage height, 12.99 ft; mimimum daily, 581 ft^3/s, Oct. 2.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	597	4000	2550	2300	2100	1580	1890	5990	5460	5470	3550	3200
2	581	3930	2300	2300	2100	1560	1860	6130	5510	5470	3460	3200
3	616	3860	2150	2300	2100	1550	1840	6160	5480	5440	3290	3310
4	721	3810	2100	2290	2100	1530	1830	6060	5410	5440	3210	3390
5	829	3730	2100	2290	2100	1510	1800	5850	5330	5430	3170	3390
6	956	3520	2100	2290	2050	1500	1770	5600	5220	5360	3170	3400
7	1060	3460	2150	2280	2050	1500	1760	5350	5140	5290	3250	3410
8	1050	3400	2000	2280	2050	1500	1760	5140	5110	5230	3300	3400
9	1040	3290	2300	2270	2050	1500	1780	4990	5050	5160	3280	3400
10	1020	3240	2400	2270	2050	1500	1760	4860	4930	5070	3220	3400
11	1040	3240	2450	2260	2050	1520	1720	4730	4820	4990	3160	3410
12	1080	3230	2500	2250	2050	1540	1680	4680	4760	4910	3220	3460
13	1260	3170	2500	2230	2050	1560	1670	4730	4700	4840	3310	3490
14	1520	3090	2500	2220	2050	1600	1610	4910	4350	4760	3310	3490
15	1650	3110	2500	2210	2050	1650	1580	5270	3810	4560	3270	3480
16	1720	3060	2480	2200	2050	1750	1570	5670	3600	4290	3220	3430
17	1990	2910	2460	2200	2050	1850	1580	5960	3400	4110	3190	3370
18	2320	2700	2450	2190	2050	2000	1530	6130	3180	4330	3170	3340
19	2850	2500	2450	2190	2050	2150	1470	6200	3170	4810	3150	3330
20	3360	2300	2450	2190	2050	2200	1480	6250	3180	4800	3130	3360
21	3480	2400	2440	2190	2030	2100	1520	6250	3140	4710	3090	3380
22	3620	2700	2430	2180	2000	2040	1640	6140	3110	4610	3040	3410
23	3690	3270	2420	2180	1950	1970	2830	6020	3080	4510	3030	3450
24	3760	3510	2400	2170	1900	2020	4510	5950	3070	4480	3080	3550
25	3870	3620	2380	2160	1800	2030	5100	5790	3100	4490	3120	3640
26	3910	3570	2350	2150	1700	2030	5240	5640	3800	4360	3130	3710
27	3950	3450	2350	2140	1650	2050	5330	5490	4690	4160	3130	3820
28	3990	3240	2330	2130	1600	2040	5440	5340	5140	4090	3090	3950
29	4020	2960	2330	2120	---	1950	5570	5190	5350	3920	3070	3930
30	4050	2700	2320	2110	---	1880	5780	5090	5450	3680	3120	3930
31	4040	---	2310	2100	---	1890	---	5240	---	3600	3190	---
TOTAL	69640	96970	72950	68640	55880	55050	76900	172800	131540	146370	99120	104430
MEAN	2246	3232	2353	2214	1996	1776	2563	5574	4385	4722	3197	3481
MAX	4050	4000	2550	2300	2100	2200	5780	6250	5510	5470	3550	3950
MIN	581	2300	2000	2100	1600	1500	1470	4680	3070	3600	3030	3200
CFSM	.44	.64	.47	.44	.39	.35	.51	1.10	.87	.93	.63	.69
IN.	.51	.71	.54	.50	.41	.40	.57	1.27	.97	1.08	.73	.77
AC-FT	138100	192300	144700	136100	110800	109200	152500	342700	260900	290300	196600	207100

CAL YR 1984 TOTAL 852035 MEAN 2328 MAX 5330 MIN 336 CFSM .46 IN 6.26 AC-FT 1690000
WTR YR 1985 TOTAL 1150290 MEAN 3151 MAX 6250 MIN 581 CFSM .62 IN 8.46 AC-FT 2282000

MISSISSIPPI RIVER MAIN STEM

05227500 MISSISSIPPI RIVER AT AITKIN, MN

LOCATION.--Lat 46°32'26", long 93°42'26", in SW¼NW¼ sec.24, T.47 N., R.27 W., Aitkin County, Hydrologic Unit 07010104, on right bank upstream side of highway bridge at north edge of Aitkin, 1 mi downstream from Ripple River and at mile 1,055.9 upstream from Ohio River.

DRAINAGE AREA.--6,140 mi^2, approximately.

PERIOD OF RECORD.--March 1945 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,182.41 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Mar. 1, 1945, to Mar. 14, 1961, nonrecording gage, and Mar. 15, 1961, to Sept. 30, 1967, water-stage recorder at same site at datum 3.0 ft higher. Diversion channel: Non-recording gage. Datum of gage is 1,182.02 ft above National Geodetic Vertical Datum of 1929. Apr. 9, 1955, to Apr. 10, 1956, nonrecording gage at site 4 mi downstream at different datum. Apr. 11, 1956, to Sept. 30, 1967, non-recording gage at same site at datum 3.0 ft higher.

REMARKS.--Estimated daily discharges: Oct. 5-23, 25, Nov. 2-7, Nov. 30 to Mar. 30, and Apr. 2-4. Records good except those for periods of no gage-height record, Oct. 5-23, 25, Nov. 2-5, 7 and Apr. 2-4, and those for periods with ice effect, Nov. 6 and Nov. 30 to Mar. 30, which are fair. Flow regulated by Winnibigoshish Lake (sta 05201000), Leech Lake (sta 05206000), Pokegama Lake (sta 05210500), and Sandy Lake (sta 05218500). Water diverted at medium and high stages into Aitkin diversion channel 6.5 mi above station, bypasses station and returns to river 15.5 mi below station. Diversion began Apr. 2, 1955. These records include flow in diversion channel.

AVERAGE DISCHARGE.--40 years, 2,929 ft^3/s, 6.48 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 20,000 ft^3/s, May 20, 1950, gage height, 22.49 ft, present datum; minimum, 151 ft^3/s, Sept. 1, 1961, gage height, 0.60 ft.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 9,370 ft^3/s, May 2; minimum daily, 653 ft^3/s, Oct. 1. River gage: Maximum discharge, 5,530 ft^3/s, May 2, gage height, 1390 ft; minimum, 635 ft^3/s, Oct. 1. Diversion gage: Maximum discharge, 4,230 ft^3/s, May 2, gage height, 13.80 ft, from graph based on gage readings; no flow on many days.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	653	5080	2800	2500	2100	1650	3370	9320	6930	7430	4650	3670
2	674	5050	2500	2500	2100	1600	3200	9370	7190	7580	4490	3720
3	684	5000	2300	2450	2100	1570	3000	9300	7280	7640	4300	3820
4	666	4800	2200	2400	2100	1540	2850	9160	7310	7640	4030	4010
5	800	4500	2200	2350	2100	1530	2510	8900	7310	7610	3900	4150
6	920	4200	2200	2300	2100	1530	2370	8540	7250	7470	3840	4210
7	1100	4100	2250	2300	2100	1530	2300	8080	7170	7280	3760	4240
8	1200	4010	2350	2300	2050	1530	2220	7610	7080	7000	3780	4230
9	1250	3900	2450	2300	2050	1530	2160	7180	6970	6760	3780	4240
10	1240	3780	2530	2300	2050	1530	2160	6760	6750	6530	3700	4290
11	1210	3680	2610	2300	2050	1530	2100	6420	6500	6270	3610	4280
12	1230	3640	2700	2300	2050	1560	2040	6220	6280	6070	3750	4250
13	1350	3670	2800	2300	2000	1600	2000	6050	6040	5890	4140	4210
14	1600	3630	2950	2300	2000	1680	2000	5930	5760	5750	4240	4180
15	2000	3560	3050	2300	2000	1800	1980	6180	5340	5620	4180	4100
16	2200	3420	3100	2250	2000	1900	1940	6620	4780	5400	4030	4010
17	2400	3330	3100	2250	2000	2000	1940	6960	4400	5190	3900	3970
18	2800	3310	3100	2250	2000	2100	1970	7240	4100	5580	3780	3850
19	3100	2960	3100	2200	1950	2200	1960	7370	3830	6260	3680	3780
20	3500	2580	3050	2200	1950	2350	1960	7440	3700	6540	3590	3760
21	3900	2580	3000	2200	1950	2500	2040	7440	3610	6440	3500	3740
22	4200	2700	2950	2200	1950	2650	2310	7380	3600	6260	3480	3810
23	4500	2890	2900	2200	1950	2800	3600	7310	3580	6120	3520	3920
24	4690	3090	2850	2200	1900	3000	6080	7150	3550	6140	3500	4120
25	4950	3530	2800	2190	1900	3200	7590	7010	3560	6300	3530	4300
26	5170	3800	2750	2170	1800	3300	8280	6800	3990	6240	3540	4410
27	5280	3930	2700	2150	1750	3400	8620	6580	5090	5980	3550	4490
28	5290	3800	2650	2130	1700	3400	8860	6350	6220	5690	3540	4590
29	5260	3560	2600	2130	---	3400	9030	6170	6890	5410	3540	4700
30	5220	3200	2550	2100	---	3400	9180	6090	7210	5180	3550	4780
31	5140	---	2500	2100	---	3390	---	6330	---	4880	3620	---
TOTAL	84177	111280	83590	70120	55750	68700	111620	225260	169270	196150	118000	123830
MEAN	2715	3709	2696	2262	1991	2216	3721	7266	5642	6327	3806	4128
MAX	5290	5080	3100	2500	2100	3400	9180	9370	7310	7640	4650	4780
MIN	653	2580	2200	2100	1700	1530	1940	5930	3550	4880	3480	3670
CFSM	.44	.60	.44	.37	.32	.36	.61	1.18	.92	1.03	.62	.67
IN.	.51	.67	.51	.42	.34	.42	.68	1.36	1.03	1.19	.71	.75
AC-FT	167000	220700	165800	139100	110600	136300	221400	446800	335700	389100	234100	245600

CAL YR 1984 TOTAL 1063095 MEAN 2905 MAX 9020 MIN 415 CFSM .47 IN 6.44 AC-FT 2109000
WTR YR 1985 TOTAL 1417747 MEAN 3884 MAX 9370 MIN 653 CFSM .63 IN 8.59 AC-FT 2812000

05230500 PINE RIVER RESERVOIR AT CROSS LAKE, MN

LOCATION.--Lat 46°40'09", long 94°06'44", in SW¼NW¼ sec.21, T.137 N., R.27 W., Crow Wing County, Hydrologic Unit 07010105, at dam on Pine River, at outlet of Cross Lake at village of Cross Lake.

DRAINAGE AREA.--562 mi^2.

PERIOD OF RECORD.--March 1886 to current year. Monthend contents only for some periods, published in WSP 1308.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by Corps of Engineers). Prior to May 3, 1949, nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed by Trout, Whitefish, Rush, and Cross Lakes and several other natural lakes controlled by timber crib dams; storage began in 1886; dam completed in 1886. Capacity between elevations 1,226.32 ft and 1,234.82 ft (maximum allowable range) is 118,703 acre-ft of which 53,272 acre-ft is controlled storage between elevations 1,226.32 ft and 1,230.32 ft (normal operating range). Contents shown herein are contents above an elevation 1,216.00 ft. Prior to September 1978, published contents as contents above elevation 1,218.67 ft. Water is used to benefit navigation on Mississippi River below Minneapolis.

COOPERATION.--Records furnished by Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 173,600 acre-ft, capacity table then in use, July 10, 1916, elevation, 1,234.56 ft; minimum observed, 1,310 acre-ft, below zero of capacity table then in use, Aug. 20, 1918, elevation, 1,217.67 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 108,660 acre-ft, July 20, elevation, 1,229.92 ft; minimum, 86,180 acre-ft, Jan. 29, elevation, 1,228.26 ft.

MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	1,229.03	96,510	
Oct. 31	1,229.11	97,590	+1,080
Nov. 30	1,228.73	92,460	-5,130
Dec. 31	1,228.47	88,980	-3,480
CAL YR 1984			-13,100
Jan. 31	1,228.28	86,440	-2,540
Feb. 28	1,228.52	89,650	+3,210
Mar. 31	1,228.97	95,700	+6,050
Apr. 30	1,229.56	103,720	+8,020
May 31	1,229.56	103,720	0
June 30	1,229.43	101,940	-1,780
July 31	1,229.37	101,120	-820
Aug. 31	1,229.30	100,170	-950
Sept. 30	1,229.23	99,220	-950
WTR YR 1985			+2,710

PINE RIVER BASIN

05231000 PINE RIVER AT CROSS LAKE DAM, AT CROSS LAKE, MN

LOCATION.--Lat 46°40'09", long 94°06'44", in SW¼NW¼ sec.21, T.137 N., R.27 W., Crow Wing County, Hydrologic Unit 07010105, at dam at outlet of Cross Lake at Village of Cross Lake.

DRAINAGE AREA.--562 mi^2.

PERIOD OF RECORD.--April 1886 to current year. Monthly discharge only for some periods, published in WSP 1308. Published as "below Pine River Reservoir" 1895-1916, 1929, and as "at Pine River Dam, at Cross Lake" 1941-56.

GAGE.--Water-stage recorder, headwater gage, and nonrecording tailwater gage. Datum of gages is 1,216.32 ft above National Geodetic Vertical Datum of 1929 (levels by Corps of Engineers). Mar. 26, 1886, to May 31, 1929, nonrecording gages on headwater and tail water at same sites and datum. June 1 to Nov. 30, 1929, nonrecording gage in tailwater at datum 1.60 ft (0.49 m) lower. Dec. 1, 1929, to May 2, 1949, nonrecording gage on headwater and Dec. 1, 1929, to August 1949, nonrecording gage on tailwater at present sites and datum.

REMARKS.--Discharge computed principally on basis of modified weir formula, the head being obtained from twice-daily readings on tailwater gage and from headwater recorder. Flow completely regulated by Pine River Reservoir (station 05230500).

COOPERATION.--Computations of daily discharge furnished by Corps of Engineers.

AVERAGE DISCHARGE (unadjusted).--99 years, 219 ft^3/s, 5.29 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 2,250 ft^3/s, in June 1896 (does not include flow bypassing dam through crevasse); no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 2,150 ft^3/s, July 21-26; minimum daily, 30 ft^3/s, Oct. 1-5, July 17.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	30	338	300	220	70	70	200	760	810	720	940	400
2	30	300	300	220	70	70	258	522	950	700	940	400
3	30	300	300	220	70	70	270	500	950	700	530	400
4	30	300	300	220	70	70	270	406	950	700	530	583
5	30	300	300	220	70	70	270	350	950	500	530	600
6	48	300	300	220	70	88	270	350	850	500	530	600
7	70	300	300	220	70	110	270	350	750	500	530	600
8	70	300	230	220	70	110	270	350	650	500	530	600
9	70	300	220	220	70	250	270	350	550	308	530	600
10	70	300	220	220	70	250	270	350	550	280	465	600
11	70	300	220	220	70	250	235	350	495	280	400	600
12	70	300	220	220	70	250	230	423	440	280	400	600
13	70	300	220	220	70	250	169	570	440	280	692	600
14	70	300	220	220	70	250	160	1140	440	280	900	355
15	70	300	220	220	70	250	160	1620	330	280	792	355
16	143	300	220	220	70	250	85	1700	220	124	700	355
17	180	300	220	220	70	250	70	1910	220	30	758	355
18	320	300	220	220	70	250	70	1910	340	590	800	355
19	320	300	220	159	70	250	70	1600	360	690	800	355
20	830	300	220	150	70	250	70	1600	360	1300	692	355
21	830	300	220	150	70	250	70	1350	360	2150	600	355
22	830	300	220	150	70	250	70	1100	360	2150	475	355
23	830	300	220	150	70	125	70	981	491	2150	400	355
24	830	300	220	150	70	100	70	900	500	2150	400	355
25	830	300	220	150	70	100	149	721	442	2150	400	355
26	830	300	220	150	70	100	160	630	462	2150	400	355
27	608	300	220	150	70	100	554	590	923	1760	400	355
28	450	300	220	150	70	188	610	590	1000	1860	400	355
29	450	300	220	150	---	200	760	590	1000	1730	400	355
30	450	300	220	103	---	200	760	590	753	1620	400	355
31	450	---	220	70	---	200	---	590	---	1230	400	---
TOTAL	10009	9038	7390	5792	1960	5471	7210	25743	17896	30642	17664	13218
MEAN	323	301	238	187	70.0	176	240	830	597	988	570	441
MAX	830	338	300	220	70	250	760	1910	1000	2150	940	600
MIN	30	300	220	70	70	70	70	350	220	30	400	355
CFSM	.58	.54	.42	.33	.13	.31	.43	1.48	1.06	1.76	1.01	.79
IN.	.66	.60	.49	.38	.13	.36	.48	1.70	1.18	2.03	1.17	.87
AC-FT	19850	17930	14660	11490	3890	10850	14300	51060	35500	60780	35040	26220

CAL YR 1984 TOTAL 77053 MEAN 211 MAX 830 MIN 30 CFSM .38 IN 5.10 AC-FT 152800
WTR YR 1985 TOTAL 152033 MEAN 417 MAX 2150 MIN 30 CFSM .74 IN 10.06 AC-FT 30160

CROW WING RIVER BASIN

05245100 LONG PRAIRIE RIVER AT LONG PRAIRIE, MN

LOCATION.--Lat 45°58'30", long 94°51'56", in NE¼NW¼ sec.20, T.129 N., R.33 W., Todd County, Hydrologic Unit 07010108, on right bank 90 ft upstream from bridge on First Avenue at Long Prairie and 400 ft downstream from Venewitz Creek.

DRAINAGE AREA.--432 mi^2.

PERIOD OF RECORD.--October 1971 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,281.74 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Nov. 1 to Mar. 27. Records good except those for period with ice effect, Nov. 1 to Mar. 27, which are fair.

AVERAGE DISCHARGE.--14 years, 156 ft^3/s, 4.90 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,270 ft^3/s, July 22, 1972, gage height, 9.37 ft; minimum daily, 0.84 ft^3/s, Jan. 12-18, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,060 ft^3/s, Oct.20, gage height, 6.41 ft; minimum, 61 ft^3/s, Oct. 5, gage height, 1.80 ft.

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

MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	75	450	204	152	136	157	439	455	405	307	228	129
2	72	368	172	148	133	160	413	432	410	297	251	145
3	67	335	145	145	132	161	395	413	430	285	270	199
4	64	334	155	143	131	160	387	398	440	273	276	192
5	62	332	209	143	130	160	377	383	431	259	274	181
6	67	332	234	143	129	155	365	368	399	248	253	177
7	73	340	234	143	128	152	349	359	367	244	230	171
8	71	360	215	143	128	153	336	349	340	232	207	175
9	70	344	205	143	128	161	322	337	327	222	191	224
10	71	330	205	143	127	180	314	328	307	209	180	258
11	72	300	200	143	127	200	304	333	337	200	165	251
12	68	284	196	143	127	225	295	369	405	193	216	238
13	66	270	190	143	128	250	301	445	416	189	241	226
14	82	265	188	143	128	285	307	609	446	185	211	224
15	212	261	183	143	129	286	306	807	524	181	192	227
16	347	247	180	143	131	302	302	840	574	175	187	231
17	392	220	180	143	133	349	302	765	578	172	200	229
18	425	216	180	143	134	417	299	692	558	179	214	237
19	701	208	180	143	137	654	296	628	534	172	218	244
20	1030	206	180	143	139	870	309	574	510	162	220	238
21	989	213	178	143	143	812	351	537	480	160	201	245
22	977	234	175	143	145	950	426	504	462	152	181	241
23	969	248	172	143	147	996	549	466	435	147	169	227
24	923	248	170	143	149	968	647	432	410	170	163	224
25	848	254	163	143	150	860	690	410	385	164	150	224
26	756	254	160	143	151	776	703	396	378	152	141	220
27	677	244	160	143	153	682	672	375	359	183	138	212
28	609	238	158	143	155	612	611	355	349	207	137	208
29	549	225	158	140	---	567	552	345	332	188	147	200
30	510	218	157	138	---	522	504	354	319	186	138	192
31	475	---	154	137	---	478	---	423	---	207	132	---
TOTAL	12369	8378	5640	4435	3808	13660	12423	14481	12647	6300	6121	6389
MEAN	399	279	182	143	136	441	414	467	422	203	197	213
MAX	1030	450	234	152	155	996	703	840	578	307	276	258
MIN	62	206	145	137	127	152	295	328	307	147	132	129
CFSM	.92	.65	.42	.33	.32	1.02	.96	1.08	.98	.47	.46	.49
IN.	1.07	.72	.49	.38	.33	1.18	1.07	1.25	1.09	.54	.53	.55
AC-FT	24530	16620	11190	8800	7550	27090	24640	28720	25090	12500	12140	12670

CAL YR 1984 TOTAL 76623 MEAN 209 MAX 1030 MIN 50 CFSM .48 IN 6.60 AC-FT 152000
WTR YR 1985 TOTAL 106651 MEAN 292 MAX 1030 MIN 62 CFSM .68 IN 9.18 AC-FT 211500

CROW WING RIVER BASIN

05246500 GULL LAKE NEAR BRAINERD, MN

LOCATION.--Lat 46°24'40", long 94°21'26", in N½ sec.20, T.134 N., R.29 W., Cass County, Hydrologic Unit 07010106, in pool of dam on Gull River, 800 ft south of outlet of Gull Lake, 0.2 mi upstream from Gull Lake Dam, and 8 mi northwest of Brainerd.

DRAINAGE AREA.--287 mi^2.

PERIOD OF RECORD.--August 1911 to current year. Prior to October 1941 monthend contents only, published in WSP 1308. Published as Gull Lake Reservoir October 1941 to September 1956.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by Corps of Engineers). Prior to Aug. 10, 1949, nonrecording gage 800 ft north of present site at same datum. Aug. 11, 1949, to June 30, 1973, water-stage recorder at present site and at datum 1,188.14 ft, adjustment of 1912.

REMARKS.--Reservoir is formed by Gull Lake and several other natural lakes controlled by concrete dam completed in 1913; storage began in 1912. Capacity between elevation 1,192.75 ft and 1,194.75 ft (maximum allowable range and normal operating range) is 26,008 acre-ft. Contents shown herein are contents above elevation 1,188.00 ft. Prior to September 1978, published contents as contents above elevation 1,188.75 ft. Water is used to benefit navigation on Mississippi River below Minneapolis.

COOPERATION.--Records furnished by Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 74,800 acre-ft, capacity table then in use, June 30, 1914, elevation, 1,195.05 ft; minimum observed, 22,250 acre-ft, capacity table then in use, Mar. 20, 1924, elevation, 1,190.75 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 67,300 acre-ft, May 17, elevation, 1,194.46 ft; minimum, 53,890 acre-ft, Feb. 27, 28, Mar. 1, 2, 3, elevation, 1,193.43 ft.

MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	1,193.51	54,920	
Oct. 31	1,193.64	56,610	+1,690
Nov. 30	1,193.77	58,300	+1,690
Dec. 31	1,193.71	57,520	-780
CAL YR 1984			0
Jan. 31	1,193.55	55,440	-2,080
Feb. 28	1,193.43	53,890	-1,550
Mar. 31	1,193.96	60,770	+6,880
Apr. 30	1,193.87	59,600	-1,170
May 31	1,193.90	59,990	+390
June 30	1,193.78	58,430	-1,560
July 31	1,193.90	59,990	+1,560
Aug. 31	1,193.98	61,030	+1,040
Sept. 30	1,193.85	59,340	-1,690
WTR YR 1985			+4,420

CROW WING RIVER BASIN

05247000 GULL RIVER AT GULL LAKE DAM, NEAR BRAINERD, MN

LOCATION.--Lat 46°24'40", long 94°21'12", in sec.20, T.134 N., R.29 W., Cass County, Hydrologic Unit 07010106, in headwater and tailwater of dam at outlet of Gull Lake, 8 mi northwest of Brainerd.

DRAINAGE AREA.--287 mi^2.

PERIOD OF RECORD.--August 1911 to current year. Monthly discharge only for some periods, published in WSP 1308. Published as "Gull Lake Reservoir" 1929.

GAGE.--Water-stage recorder on headwater and nonrecording gage on tailwater. Datum of gages is National Geodetic Vertical Datum of 1929 (levels by Corps of Engineers). August 1911 to May 23, 1929, and Dec. 1, 1929, to Aug. 1, 1949, both gages were nonrecording gages at same site and datum in use. May 24 to Nov. 30, 1929, nonrecording gage 500 ft downstream at different datum. Aug. 2, 1949, to June 30, 1973, at present sites with datum of gage at 1,188.14 ft, adjustment of 1912.

REMARKS.--Discharge computed at dam on basis of modified weir formulas, the head being obtained from twice-daily readings on tailwater gage and from headwater recorder. Flow completely regulated by Gull Lake (station 05246500).

COOPERATION.--Computations of daily discharge furnished by Corps of Engineers.

AVERAGE DISCHARGE (unadjusted).--74 years, 109 ft^3/s, 5.16 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 1,120 ft^3/s, May 15, 1938; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 600 ft^3/s, May 16-18; minimum daily, 16 ft^3/s, Aug.30.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18	118	108	108	107	106	195	435	425	425	75	86
2	18	108	104	108	107	106	195	430	425	400	75	86
3	18	108	96	108	107	106	195	425	345	400	17	87
4	18	108	103	108	106	106	195	286	260	400	17	237
5	18	108	104	108	106	108	195	286	260	400	17	237
6	59	108	104	108	107	108	195	190	260	189	17	237
7	59	108	105	108	107	108	195	191	260	189	17	237
8	59	108	108	106	107	108	195	192	128	187	17	237
9	59	108	108	108	106	108	195	96	128	90	17	237
10	59	102	108	108	106	108	195	96	128	90	17	319
11	59	108	108	107	106	108	162	96	128	46	17	319
12	59	108	108	108	106	108	162	98	128	46	17	315
13	59	108	108	108	106	108	113	100	128	46	319	315
14	59	108	108	106	106	108	113	460	128	46	319	220
15	60	108	108	107	106	108	113	465	250	45	319	217
16	61	94	108	108	106	108	113	600	249	17	319	216
17	63	108	108	108	106	108	113	600	249	17	316	103
18	150	108	108	107	106	108	113	600	247	18	315	103
19	150	108	108	107	106	108	113	593	245	240	315	103
20	425	108	108	107	106	109	113	585	240	337	46	103
21	425	108	108	107	106	110	113	585	92	334	17	103
22	425	108	108	107	106	111	116	585	94	318	17	103
23	425	108	108	107	106	111	275	555	94	315	17	103
24	425	108	108	107	106	112	275	555	92	315	17	103
25	425	108	108	103	106	113	450	540	92	315	17	103
26	425	108	108	107	106	113	450	540	95	191	17	103
27	425	108	108	107	106	113	450	525	425	191	17	103
28	420	108	108	107	106	131	450	450	425	191	17	103
29	420	108	108	108	---	131	450	257	425	191	17	103
30	420	108	108	107	---	195	440	260	425	75	16	103
31	420	---	108	107	---	195	---	265	---	75	86	---
TOTAL	6185	3230	3316	3325	2974	3588	6647	11941	6870	6139	2843	5044
MEAN	200	108	107	107	106	116	222	385	229	198	91.7	168
MAX	425	118	108	108	107	195	450	600	425	425	319	319
MIN	18	94	96	103	106	106	113	96	92	17	16	86
CFSM	.70	.38	.37	.37	.37	.40	.77	1.34	.80	.69	.32	.59
IN.	.80	.42	.43	.43	.39	.47	.86	1.55	.89	.80	.37	.65
AC-FT	12270	6410	6580	6600	5900	7120	13180	23680	13630	12180	5640	10000

CAL YR 1984 TOTAL 45708 MEAN 125 MAX 513 MIN 17 CFSM .44 IN 5.92 AC-FT 90660
WTR YR 1985 TOTAL 62102 MEAN 170 MAX 600 MIN 16 CFSM .59 IN 8.05 AC-FT 123200

CROW WING RIVER BASIN

05247500 CROW WING RIVER NEAR PILLAGER, MN

LOCATION.--Lat 46°18'18", long 94°22'38", in SW¼NE¼ sec.30, T.133 N., R.29 W., Cass County, Hydrologic Unit 07010106, at Sylvan dam powerplant of Minnesota Power Co., 3.6 mi above mouth and 4.9 mi southeast of Pillager.

PERIOD OF RECORD.--October 1968 to current year. Records for August 1924 to September 1968 available in files of the Minnesota District Office.

REMARKS.--Records poor. Discharge computed on basis of powerplant records. Records for Oct. 1, 1968 to Sept. 30, 1975, were adjusted for storage change in the Sylvan dam reservoir. Flow partly regulated by powerplants and Gull Lake (station 05246500).

COOPERATION.--Records collected by Minnesota Power Co. under general supervision of Geological Survey, in connection with a Federal Power Commission project.

AVERAGE DISCHARGE.--17 years, 1,320 ft^3/s.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 16,600 ft^3/s, Apr. 12, 13, 1969; minimum daily, 60 ft^3/s, Aug. 10, 11, 13, 14, 1976.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum daily discharge since 1924, 18,300 ft^3/s (518 m^3/s) Apr. 14, 1965.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 5,650 ft^3/s, Mar. 24; minimum daily, 398 ft^3/s, Oct. 4, Feb. 17.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	517	2810	1010	717	568	699	3640	4780	3400	3520	2910	2010
2	531	2640	875	840	501	795	3560	4680	3960	3380	2810	2020
3	536	2310	779	750	724	993	3490	4530	4020	2850	2760	2070
4	398	2050	556	712	808	1090	3330	3960	4380	2740	2680	2270
5	581	2240	770	910	447	918	3230	3660	4370	2810	2280	2380
6	400	2430	815	760	505	595	3180	3520	3980	2720	2240	2650
7	541	2460	815	884	665	841	2860	3800	3680	2130	2310	2490
8	480	2240	1030	857	526	799	2740	3570	3540	2150	2280	2340
9	503	1900	1250	857	428	574	2570	3340	3040	2890	2100	2900
10	551	1830	993	763	531	606	2680	2350	2670	1830	2020	2570
11	576	1850	1140	874	581	630	2520	1700	3080	686	1710	2450
12	518	1830	1060	853	685	851	2390	4060	3250	1770	2310	2520
13	588	1860	1100	853	541	963	2400	4620	3480	1910	2440	2560
14	639	1860	1000	822	534	888	2440	4800	3560	1820	2380	2560
15	1170	1750	931	855	603	883	2110	4930	3550	1530	2960	2550
16	1810	1670	1020	784	590	1100	1030	4880	3540	1190	3030	2470
17	2440	1360	1060	830	398	1360	1070	4920	3510	1380	2950	2430
18	2500	1010	1040	862	544	1640	1620	4900	3550	2280	2930	2390
19	3740	805	1100	785	693	2190	1760	4870	3450	2410	2650	2320
20	3880	863	965	604	625	2870	1700	4780	3410	2620	2470	2330
21	4410	1380	926	773	648	2960	1840	4660	3220	3090	2470	2350
22	4690	1320	1070	815	722	2910	2070	4290	2880	3220	2350	2350
23	4710	1380	888	714	578	4980	3140	4110	2600	3300	2110	2180
24	4770	1370	997	714	610	5650	3980	3480	2730	3300	2020	2120
25	4810	1700	951	714	715	4990	4430	2850	2740	2860	2170	2110
26	4770	1650	741	714	751	5460	4740	3210	3230	2940	2140	2110
27	4600	1610	803	714	758	4950	4920	2900	3130	3220	1880	2010
28	4450	1610	900	761	750	4800	4970	2900	4140	3210	1740	1990
29	4440	1150	725	696	---	4470	4940	2860	4480	3140	1940	1990
30	4330	1100	725	683	---	5620	4880	2580	3930	3000	2030	1990
31	3220	---	696	756	---	3950	---	3020	---	2900	1970	---
TOTAL	72099	52038	28731	24226	17029	72025	90230	119510	104500	78796	73040	69480
MEAN	2326	1735	927	781	608	2323	3008	3855	3483	2542	2356	2316
MAX	4810	2810	1250	910	808	5650	4970	4930	4480	3520	3030	2900
MIN	398	805	556	604	398	574	1030	1700	2600	686	1710	1990
CFSM	.71	.53	.28	.24	.18	.70	.91	1.17	1.06	.77	.71	.70
IN.	.81	.59	.32	.27	.19	.81	1.02	1.35	1.18	.89	.82	.78
AC-FT	143000	103200	56990	48050	33780	142900	179000	237000	207300	156300	144900	137800

CAL YR 1984 TOTAL 527155 MEAN 1440 MAX 4810 MIN 356 CFSM .44 IN 5.94 AC-FT 1046000
WTR YR 1985 TOTAL 801704 MEAN 2196 MAX 5650 MIN 398 CFSM .67 IN 9.04 AC-FT 1590000

MISSISSIPPI RIVER MAIN STEM

05267000 MISSISSIPPI RIVER NEAR ROYALTON, MN

LOCATION.--Lat 45°51'41", long 94°21'33", in lot 2, sec.20, T.39 N., R.32 W., Morrison County, Hydrologic Unit 07010104, at plant of Minnesota Power Co., 4 mi northwest of Royalton, 4.5 mi downstream from Swan River, and at mile 956 upstream from Ohio River.

DRAINAGE AREA.--11,600 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1924 to current year.

REMARKS.--Estimated daily discharges: July 31 to Aug. 19. Records good except those for period of no gage-height record, July 31 to Aug. 19, which are poor. Discharge computed using average tailwater readings furnished by powerplant. Flow partly regulated by powerplants and Winnibigoshish, Leech, Pokegama, Sandy, and Gull Lakes and by Pine River Reservoir (see stations 05201000, 05206000, 05210500, 05218500, 05230500, 05246500).

COOPERATION.--Records collected by Minnesota Power Co. under general supervision of Geological Survey, in connection with a Federal Power Commission project.

AVERAGE DISCHARGE.--61 years, 4,568 ft^3/s, 5.35 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 37,700 ft^3/s, Apr. 16, 1965; minimum daily, 254 ft^3/s, Nov. 25, 1936.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 18,400 ft^3/s, Apr. 28, 30, May 1; minimum daily, 716 ft^3/s; Oct. 1-3.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	716	9850	5280	3530	3060	2800	7460	18400	13000	13700	11000	6300
2	716	10200	4710	3330	2720	2740	7220	17600	13700	14000	10500	6520
3	716	9560	3480	4680	2860	2740	7460	17200	14700	14000	10000	6980
4	875	8700	2750	3480	2830	2570	7460	16100	15400	13300	9500	7220
5	1040	8440	2330	3360	2950	2650	7460	16100	15800	13300	9000	7700
6	1480	8700	2080	3360	2550	2610	7460	15800	15000	13300	8500	8190
7	1210	8440	2340	3570	2790	2390	6520	15000	14700	12300	8800	8190
8	1820	8440	3990	3570	2850	2650	5280	14700	14400	12000	9000	8190
9	1590	7940	4520	3600	2800	2500	5880	14000	13700	12000	8600	8440
10	2180	7220	4340	3430	2610	2310	5480	12700	12700	12000	8000	8440
11	2180	6980	4520	3380	2710	2700	5680	10800	12700	9260	8200	8190
12	2180	6980	4340	3520	2750	3000	5480	12700	13700	9560	8500	8440
13	1700	6750	3820	3550	2910	3160	5280	13300	13000	9850	9200	8440
14	2310	7460	4520	3600	2650	3320	5090	14400	13000	9260	9200	8190
15	3320	7220	4710	3500	2800	3820	5090	16100	12700	8980	9500	8190
16	4160	6090	5090	3430	2820	4340	4520	16900	12000	8190	10000	7940
17	5480	6750	4900	3400	2720	5090	4160	17600	11400	8190	9300	7700
18	6520	5480	4520	3430	2580	5680	4340	18000	10400	8980	9000	7460
19	9260	4340	4710	3400	2740	6750	4710	18400	9850	10800	8400	7220
20	10400	3650	4900	3370	2850	8190	4900	17200	9560	10800	8190	7940
21	11700	3650	4700	3070	2800	8980	4900	16100	9560	10800	7460	9560
22	13000	5280	4300	3190	2800	10200	5680	15400	8980	12700	7460	9200
23	13300	5280	4600	3200	2800	8190	8190	15400	8440	12300	7220	7940
24	13700	5280	4500	3120	2800	11100	11100	15000	8190	13000	6980	7460
25	14000	5680	4300	3040	2740	10800	11700	14000	8700	13000	6300	7460
26	14000	6090	4400	3030	2920	11100	15800	14000	9850	12300	6520	5090
27	13700	6750	3990	3100	2920	10800	17200	12700	10200	13300	6300	5480
28	13700	6300	4160	3110	2850	9560	18400	12300	12000	13300	5880	7460
29	12700	6090	4160	3200	---	9560	18000	12300	14000	12300	6090	7940
30	12700	5280	3700	3020	---	8700	18400	11700	14400	12300	6090	8440
31	11700	---	3530	3100	---	8440	---	12300	---	11500	6090	---
TOTAL	204053	204870	128190	104670	78180	179440	246300	464200	365730	360570	254780	231910
MEAN	6582	6829	4135	3376	2792	5788	8210	14970	12190	11630	8219	7730
MAX	14000	10200	5280	4680	3060	11100	18400	18400	15800	14000	11000	9560
MIN	716	3650	2080	3020	2550	2310	4160	10800	8190	8190	5880	5090
CFSM	.57	.59	.36	.29	.24	.50	.71	1.29	1.05	1.00	.71	.67
IN.	.65	.66	.41	.34	.25	.58	.79	1.49	1.17	1.16	.82	.74
AC-FT	404700	406400	254300	207600	155100	355900	488500	920700	725400	715200	505400	460000

WTR YR 1985 TOTAL 2822893 MEAN 7734 MAX 18400 MIN 716 CFSM .67 IN 9.05 AC-FT 5599000

05267000 MISSISSIPPI RIVER NEAR ROYALTON, MN--Continued
(National stream-quality accounting network station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1964-66, 1975 to current year.

REMARKS.--Letter K indicates non-ideal colony count.

WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (90095)	PH (STAND-ARD UNITS) (00400)	PH LAB (STAND-ARD UNITS) (00403)	TEMPER-ATURE, AIR (DEG C) (00020)	TEMPER-ATURE (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	OXYGEN, DIS-SOLVED (MG/L) (00300)
OCT											
11...	1230	2140	360	350	8.3	8.1	17.0	13.5	3.0	737	9.2
DEC											
13...	1400	3810	330	315	--	7.9	5.0	0.5	1.0	740	12.8
FEB											
20...	1200	2880	--	360	7.9	7.6	6.0	0.0	1.5	725	9.2
APR											
08...	1050	5950	265	260	8.1	7.7	-1.0	4.0	1.5	--	13.0
JUN											
18...	1000	10300	270	263	8.2	7.8	14.5	16.5	5.5	754	11.0
AUG											
20...	1045	8100	280	275	8.4	7.8	16.5	17.5	6.0	763	9.7

DATE	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	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)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY FIELD (MG/L AS CACO3) (00410)	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)
OCT											
11...	K7	K1	43	16	8.0	1.7	160	161	15	6.3	0.1
DEC											
13...	190	74	42	15	5.9	1.4	--	160	9.2	4.2	0.1
FEB											
20...	250	60	45	17	6.6	2.3	180	178	9.6	4.6	0.1
APR											
08...	K4	K6	34	11	4.2	2.4	118	122	8.2	4.6	0.1
JUN											
18...	32	32	36	11	3.6	1.3	134	133	7.4	3.8	<0.1
AUG											
20...	82	110	38	12	4.2	1.3	135	140	3.9	3.5	0.2

DATE	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	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)	PHOS-PHORUS, ORTHO, DIS-SOLVED (MG/L AS P) (00671)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT										
11...	4.4	191	<0.10	<0.01	0.4	0.02	<0.01	<0.01	--	--
DEC										
13...	9.3	210	0.29	0.06	0.3	<0.01	<0.01	<0.01	--	--
FEB										
20...	10	224	0.39	0.11	0.8	<0.01	<0.01	<0.01	--	--
APR										
08...	8.2	153	0.24	0.04	0.6	0.05	<0.01	<0.01	5	92
JUN										
18...	6.6	188	--	--	2.2	0.02	<0.01	--	46	98
AUG										
20...	10	183	<0.10	0.02	0.7	0.01	<0.01	<0.01	20	99

MISSISSIPPI RIVER MAIN STEM

05267000 MISSISSIPPI RIVER NEAR ROYALTON, MN--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	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)	LEAD, DISSOLVED (UG/L AS PB) (01049)
FEB											
20...	1200	<10	<1	53	0.9	<1	4	<3	1	64	<1
APR											
08...	1050	10	1	41	<0.5	<1	<1	<3	2	250	2
JUN											
18...	1000	<10	1	43	1	<1	3	<3	<1	150	<1
AUG											
20...	1045	10	1	42	<0.5	<1	<1	<3	7	140	<1

DATE	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)
FEB										
20...	15	32	0.2	<10	<1	<1	<1	100	<6	23
APR										
08...	5	31	0.1	<10	1	<1	<1	67	<6	8
JUN										
18...	7	29	0.1	<10	<1	<1	<1	70	<6	5
AUG										
20...	7	21	0.2	<10	1	<1	<1	74	<6	6

ELK RIVER BASIN

05275000 ELK RIVER NEAR BIG LAKE, MN

LOCATION.--Lat 45°20'02", long 93°40'00", in NE¼SW¼ sec.23, T.33 N., R.27 W., Sherburne County, Hydrologic Unit 07010203, on right bank at upstream side of highway bridge, 4 mi east of Big Lake and 4 mi downstream from St. Francis River.

DRAINAGE AREA.--615 mi^2.

PERIOD OF RECORD.--April 1911 to September 1917, April to September 1931, April to November 1932, March to November 1933, March 1934 to current year.

REVISED RECORDS.--WSP 895: 1939. WSP 1308: 1912(M), 1915-17(M).

GAGE.--Water-stage recorder. Datum of gage is 899.60 ft above National Geodetic Vertical Datum of 1929. April 1911 to Sept. 30, 1917, April 1, 1931, to July 26, 1934, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Dec. 3-12, 14, 15, and Dec. 19 to Mar. 18. Records good except those for periods with ice effect, Dec. 3-12, 14, 15, and Dec. 19 to Mar. 18, which are fair.

AVERAGE DISCHARGE.--57 years (water years 1912-17, 1935-85), 269 ft^3/s, 5.94 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,360 ft^3/s, Apr. 16, 1965, gage height, 10.86 ft; minimum, 3.6 ft^3/s, July 31, 1934.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,520 ft^3/s, Apr. 28, gage height, 6.36 ft; minimum daily discharge, 152 ft^3/s, Feb. 8-16; minimum gage height, 1.09 ft, Dec. 3.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	308	973	296	250	156	250	829	1900	384	699	200	206
2	275	859	284	240	155	225	767	1610	387	781	195	210
3	257	768	280	235	155	200	714	1350	382	804	189	289
4	243	700	290	230	154	190	651	1160	373	777	181	312
5	233	634	297	225	154	180	593	998	357	728	186	300
6	219	570	298	220	153	180	543	892	337	670	198	314
7	218	513	292	215	153	182	498	798	321	596	189	336
8	230	462	287	210	152	210	451	721	315	540	183	349
9	238	430	282	205	152	250	418	656	301	493	177	558
10	235	411	277	200	152	305	392	610	288	453	190	899
11	225	396	271	198	152	361	370	587	296	407	188	1250
12	219	378	270	195	152	420	357	568	312	368	193	1340
13	216	359	261	190	152	490	366	550	312	331	261	1420
14	211	356	270	187	152	585	360	543	305	301	264	1640
15	230	348	285	183	152	690	370	546	308	279	247	1790
16	306	326	435	180	152	800	376	604	311	263	242	1730
17	417	321	437	177	156	930	392	572	337	252	238	1590
18	493	329	392	175	158	1110	421	544	334	246	240	1380
19	708	334	375	170	160	1200	485	531	323	254	234	1170
20	952	315	360	168	162	1320	550	512	312	249	219	986
21	1170	343	350	167	163	1350	575	474	299	238	196	870
22	1410	327	340	165	164	1460	644	430	287	227	189	809
23	1700	311	330	163	167	1530	916	424	277	216	188	778
24	2010	287	325	162	170	1520	1070	416	269	210	193	818
25	2200	290	320	160	173	1430	1180	395	260	211	188	857
26	2020	299	315	160	180	1330	1420	382	304	210	179	875
27	1820	305	315	160	190	1230	2130	372	445	207	171	873
28	1620	305	311	160	215	1070	2510	360	509	205	178	879
29	1430	302	300	160	---	940	2370	347	519	204	202	884
30	1240	299	275	160	---	888	2160	340	593	199	217	893
31	1080	---	260	158	---	884	---	373	---	194	210	---
TOTAL	24133	12850	9680	5828	4506	23710	24878	20565	10357	11812	6325	26605
MEAN	778	428	312	188	161	765	829	663	345	381	204	887
MAX	2200	973	437	250	215	1530	2510	1900	593	804	264	1790
MIN	211	287	260	158	152	180	357	340	260	194	171	206
CFSM	1.27	.70	.51	.31	.26	1.24	1.35	1.08	.56	.62	.33	1.44
IN.	1.46	.78	.59	.35	.27	1.43	1.50	1.24	.63	.71	.38	1.61
AC-FT	47870	25490	19200	11560	8940	47030	49350	40790	20540	23430	12550	52770

CAL YR 1984 TOTAL 204687 MEAN 559 MAX 4940 MIN 144 CFSM .91 IN 12.38 AC-FT 406000
WTR YR 1985 TOTAL 181249 MEAN 497 MAX 2510 MIN 152 CFSM .81 IN 10.96 AC-FT 359500

CROW RIVER BASIN

05278000 MIDDLE FORK CROW RIVER NEAR SPICER, MN

LOCATION.--Lat 45°15'45", long 94°48'10", in NE¼ sec.27, T.121 N., R.33 W., Kandiyohi County, Hydrologic Unit 07010204, on right bank 75 ft upstream from highway bridge, 1.5 mi downstream from Lake Calhoun, 3 mi downstream from Green Lake, and 6.8 mi northeast of Spicer.

DRAINAGE AREA.--179 mi^2, approximately.

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

REVISED RECORDS.--WSP 1508: 1949(M), 1950.

GAGE.--Water-stage recorder and concrete and steel sharp-crested V-notch weir. Datum of gage is 1,147.93 ft above National Geodetic Vertical Datum of 1929 (Kandiyohi County Highway Department bench mark). Prior to July 20, 1950, nonrecording gage at bridge 75 ft downstream at same datum.

REMARKS.--Estimated discharges: Nov. 15, Dec. 3-6, 9-13, 16-18, Dec. 20 to Jan 23, and Jan. 25 to Mar. 10. Records good except those for period of no gage-height record, Jan. 20-22, and periods with ice effect, Nov. 15, Dec. 3-6, 9-13, 16-18, Dec. 20 to Jan. 19, 23, and Jan. 25 to Mar. 10, which are fair.

AVERAGE DISCHARGE.--36 years, 60.7 ft^3/s, 4.61 in/yr; median of yearly mean discharges, 50 ft^3/s, 3.79 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 509 ft^3/s, June 22, 1983, gage height, 6.02 ft; maximum gage height, 6.67 ft, June 25, 1957; no flow Mar. 15-24, 1949, Feb. 26 to Mar. 26, 1960, Dec. 8, 1963, Feb. 10-21, 1965, Feb. 19-28, 1968, Jan. 11-30, 1975.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 322 ft^3/s, Apr. 24, gage height, 4.92 ft; maximum gage height, 5.02 ft, Mar. 4 (backwater from ice); minimum discharge, 52 ft^3/s, July 23,24, gage height, 2.94 ft.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	74	157	185	113	77	81	216	252	200	116	67	82
2	76	147	179	112	75	83	220	250	189	110	63	89
3	78	152	173	110	75	84	224	250	176	105	60	114
4	80	156	165	106	74	86	226	253	167	102	59	120
5	82	156	158	106	73	88	233	256	156	97	65	121
6	85	155	152	105	72	90	229	255	147	92	64	119
7	91	155	143	105	72	92	224	250	142	90	61	115
8	93	157	142	104	71	95	218	244	136	88	60	128
9	94	157	142	104	71	97	213	245	131	85	61	175
10	93	157	142	104	70	100	208	238	123	80	60	185
11	93	157	142	104	70	105	202	233	125	76	57	183
12	93	158	142	102	70	112	197	236	128	73	77	178
13	94	159	142	97	69	119	209	228	118	71	81	172
14	94	159	142	97	70	136	230	221	120	68	78	169
15	117	160	142	97	70	147	224	237	145	65	73	167
16	136	125	148	90	70	164	214	255	137	62	68	168
17	145	164	145	95	70	161	208	248	126	60	66	171
18	140	166	140	97	70	156	206	238	119	68	65	172
19	156	169	135	98	71	155	201	234	110	67	62	174
20	162	172	130	98	72	148	199	228	103	62	58	180
21	153	174	127	98	74	150	210	220	100	60	57	177
22	146	178	124	98	75	156	252	215	104	56	57	180
23	141	184	121	98	76	171	304	221	101	53	67	189
24	139	188	120	89	77	179	318	218	94	72	78	193
25	139	190	118	89	78	184	302	216	96	78	78	189
26	139	193	116	88	79	189	283	213	160	70	75	184
27	143	200	114	84	80	197	271	209	166	77	75	178
28	149	203	114	82	80	202	265	202	149	77	84	173
29	147	198	114	81	---	208	261	195	134	71	88	169
30	150	191	114	80	---	209	258	193	123	67	85	172
31	151	---	114	79	---	213	---	205	---	69	83	---
TOTAL	3673	5037	4285	3010	2051	4357	7025	7158	4025	2387	2132	4786
MEAN	118	168	138	97.1	73.3	141	234	231	134	77.0	68.8	160
MAX	162	203	185	113	80	213	318	256	200	116	88	193
MIN	74	125	114	79	69	81	197	193	94	53	57	82
CFSM	.66	.94	.77	.54	.41	.79	1.31	1.29	.75	.43	.38	.89
IN.	.76	1.05	.89	.63	.43	.91	1.46	1.49	.84	.50	.44	.99
AC-FT	7290	9990	8500	5970	4070	8640	13930	14200	7980	4730	4230	9490

CAL YR 1984 TOTAL 57969 MEAN 158 MAX 386 MIN 51 CFSM .88 IN 12.05 AC-FT 115000
WTR YR 1985 TOTAL 49926 MEAN 137 MAX 318 MIN 53 CFSM .77 IN 10.38 AC-FT 99030

CROW RIVER BASIN

05280000 CROW RIVER AT ROCKFORD, MN

LOCATION.--Lat 45°05'12", long 93°44'02", in sec.29, T.119 N., R.24 W., Hennepin County, Hydrologic Unit 07010204, on right bank at Rockford, 150 ft downstream from bridge on State Highway 55 and 1 mi downstream from confluence of North and South Forks.

DRAINAGE AREA.--2,520 mi^2, approximately.

PERIOD OF RECORD.--April to July 1906 (published as "near Dayton"), June 1909 to September 1917, April to November 1929, March 1930 to September 1931, April to November 1932, March to November 1933, March 1934 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1115: 1932. WSP 1508: 1933. WDR MN-77-2: 1972 (M)(m).

GAGE.--Water-stage recorder. Datum of gage is 893.08 ft above National Geodetic Vertical Datum of 1929. Apr. 13 to July 21, 1906, nonrecording gage at Berning Mill 14 mi downstream at different datum. June 4, 1909, to Sept. 30, 1917, nonrecording gage at site 600 ft downstream at different datum. Apr. 23, 1929, to Aug. 21, 1934, nonrecording gage at site 600 ft downstream at present datum.

REMARKS.--Estimated daily discharges: Dec. 6 to 18. Records good except those for period with ice effect, Dec. 6 to Mar. 18, which are fair.

AVERAGE DISCHARGE.--60 years (water years 1910-17, 1931, 1935-85), 706 ft^3/s, 3.80 in/yr; median of yearly mean discharges, 526 ft^3/s, 2.83 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,400 ft^3/s, Apr. 16, 1965, gage height, 19.27 ft, from floodmark; minimum, 1.8 ft^3/s, Nov. 15, 1936, gage height, 1.05 ft, caused by ice jam upstream.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 6,790 ft^3/s, Mar. 22, gage height, 10.90 ft; minimum daily discharge, 226 ft^3/s, Feb. 20, gage height, 2.88 ft.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	441	2400	1090	750	321	660	4100	5390	1890	3050	732	1500
2	426	2290	991	730	315	610	3920	5020	1860	3250	692	1540
3	486	2200	798	710	308	540	3830	4640	1800	3460	654	1770
4	605	2160	732	690	302	470	3800	4270	1800	3660	611	1880
5	522	2130	759	670	297	450	3780	3910	1820	3770	570	1970
6	426	2090	745	650	290	445	3650	3620	1850	3750	541	2000
7	396	2040	760	640	286	450	3440	3340	1860	3580	524	2010
8	408	2000	820	620	280	455	3280	3090	1830	3270	524	2110
9	423	1960	860	600	276	465	3080	2930	1740	2930	513	2320
10	422	1900	865	580	270	500	2900	2770	1630	2600	524	2460
11	420	1860	850	570	267	580	2740	2740	1570	2320	519	2600
12	421	1790	840	550	261	750	2610	2700	1550	2090	673	2720
13	422	1730	850	540	256	980	2480	2570	1530	1900	963	2810
14	426	1700	900	520	250	1300	2400	2450	1530	1730	1070	2950
15	545	1650	940	510	247	1700	2320	2380	1720	1610	1050	3130
16	830	1540	1000	490	241	2200	2230	2360	1920	1470	1030	3380
17	1260	1480	1180	480	238	3050	2150	2320	2070	1350	1020	3590
18	1440	1450	1200	470	233	3850	2080	2250	2200	1290	998	3720
19	1900	1380	1170	450	230	5360	2010	2210	2300	1210	963	3730
20	2140	1330	1150	440	226	6350	1960	2180	2380	1140	935	3650
21	2420	1300	1100	430	270	6670	1940	2180	2410	1070	915	3490
22	2680	1240	1050	420	350	6790	2110	2200	2420	1010	888	3400
23	2880	1240	1000	410	450	6670	2620	2210	2360	949	902	3310
24	2970	1250	950	390	558	6380	3110	2200	2220	935	908	3310
25	2970	1230	920	380	558	6000	3500	2130	2050	970	949	3280
26	2910	1210	890	370	558	5590	3850	2150	2060	977	984	3230
27	2870	1210	870	360	580	5230	4380	2070	2140	929	1000	3160
28	2770	1180	840	350	655	4910	5030	1970	2360	888	1050	3080
29	2670	1140	820	340	---	4690	5480	1870	2590	846	1160	3040
30	2570	1120	800	334	---	4460	5590	1820	2830	812	1380	3060
31	2470	---	770	327	---	4280	---	1900	---	772	1470	---
TOTAL	44539	49200	28510	15771	9373	92835	96370	85840	60290	59588	26712	84200
MEAN	1437	1640	920	509	335	2995	3212	2769	2010	1922	862	2807
MAX	2970	2400	1200	750	655	6790	5590	5390	2830	3770	1470	3730
MIN	396	1120	732	327	226	445	1940	1820	1530	772	513	1500
CFSM	.57	.65	.37	.20	.13	1.19	1.28	1.10	.80	.76	.34	1.11
IN.	.66	.73	.42	.23	.14	1.37	1.42	1.27	.89	.88	.39	1.24
AC-FT	88340	97590	56550	31280	18590	184100	191100	170300	119600	118200	52980	167000

CAL YR 1984 TOTAL 766071 MEAN 2093 MAX 7600 MIN 308 CFSM .83 IN 11.31 AC-FT 1520000
WTR YR 1985 TOTAL 653228 MEAN 1790 MAX 6790 MIN 226 CFSM .71 IN 9.64 AC-FT 1296000

05284000 MILLE LACS LAKE AT GARRISON, MN

LOCATION.--Lat 46°18'05", long 93°49'05", in SW¼SE¼ sec.12, T.44 N., R.28 W., Crow Wing County, Hydrologic Unit 07010207, at pumphouse of Minnesota Division of Game and Fish, 0.2 mi southwest of Borden Lake outlet and 0.8 mi northeast of Garrison.

PERIOD OF RECORD.--June 1931 to current year. Monthend records for the period October 1939 to September 1953 published in WSP 1278 (fragmentary 1940-41). Prior to October 1939, published as "at Wealthwood."

GAGE.--Water-stage recorder. Datum of gage is 1,240.40 ft above National Geodetic Vertical Datum of 1929. Gage readings have been reduced to elevations NGVD. Prior to Oct. 1, 1941, nonrecording gage at Wealthwood, 8.3 mi northeast of present site, at various datums; gage readings have been reduced to elevations, adjustment of 1912. October 1, 1941, to Sept. 30, 1958, water-stage recorder at datum 1,240.50 ft, adjustment of 1912. To convert these records to National Geodetic Vertical Datum of 1929, subtract 0.10 ft.

REMARKS.--Water level affected by fixed-crest spillway constructed in 1953 at outlet of Ogechie Lake, 2.7 mi downstream from outlet of Mille Lacs Lake, with crest at elevation 1,250.50 ft. Water level subject to fluctuation caused by change in direction and velocity of wind and by seiches.

EXTREMES FOR PERIOD OF RECORD.--Maximum elevation, 1,253.87 ft, Aug. 14, 1972, affected by wind action and seiche action; maximum daily, 1,253.43 ft, Aug. 22, 1972; minimum observed, 1,245.74 ft, Oct. 16-19, 1936.

EXTREMES FOR CURRENT YEAR.--Maximum elevation, 1,252.48 ft, Aug. 12, affected by wind action and seiche action; maximum daily, 1,252.22 ft, July 6; minimum, 1,250.90 ft,Oct. 17, affected by wind action and seiche action; minimum daily, 1,251.12 ft, Oct. 3.

MONTHEND ELEVATION, IN FEET NGVD, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

Oct. 31 ..... 1,251.51	Feb. 28 ..... 1,251.34	June 30 ..... 1,252.18
Nov. 30 ..... 1,251.31	Mar. 27 ..... 1,251.47	July 31 ..... 1,252.11
Dec. 31 ..... 1,251.37	Apr. 30 ..... 1,252.00	Aug. 31 ..... 1,251.98
Jan. 31 ..... 1,251.33	May 31 ..... 1,252.01	Sept.30 ..... 1,251.80

NOTE.--Elevations other than those shown are available.

RUM RIVER BASIN

05286000 RUM RIVER NEAR ST. FRANCIS, MN

LOCATION--Lat 45°19'40", long 93°22'20", in SE¼ sec.19, T.33 N., R.24 W., Anoka County, Hydrologic Unit 07010207, on left bank at upstream side of highway bridge, 4 mi south of St. Francis and 15.8 mi upstream from mouth.

DRAINAGE AREA.--1,360 mi^2, approximately.

PERIOD OF RECORD.-- May to November 1929, March 1930 to September 1931, April to November 1932, March 1933 to current year.

REVISED RECORDS.--WSP 1308: 1930(M), 1932(M).

GAGE.--Water-stage recorder. Datum of gage is 860.74 ft above National Geodetic Vertical Datum of 1929 (levels by Anoka County Highway Department). Prior to Nov. 9, 1933, nonrecording gage at site 50 ft downstream at same datum.

REMARKS.--Estimated daily discharges: Nov. 21,23, Dec. 4-17,20 to Mar. 19. Records good except those for periods with ice effect, Nov.21,23, Dec. 4-17,20 to Mar. 19, which are fair. Occasional regulation by Ogechie (also controls Mille Lacs Lake) and Onamia Lakes.

AVERAGE DISCHARGE.--53 years (water years 1931, 1934-85), 622 ft^3/s, 6.21 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,100 ft^3/s, Apr. 20, 1965, Apr. 13, 1969; maximum gage height, 11.63 ft, Apr. 13, 1969; minimum discharge, 29 ft^3/s, Aug. 18, 1934, gage height, 1.91 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 6,510 ft^3/s, Apr. 29,30, gage height, 8.89 ft; minimum daily discharge, 304 ft^3/s, Feb. 2-20; minimum gage height, 2.98 ft, Oct. 12,13,14.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	855	2010	567	540	305	450	2420	5780	1030	1880	627	631
2	733	1690	519	510	304	420	2360	4900	1060	2180	605	630
3	654	1460	507	490	304	380	2220	4060	1090	2470	587	725
4	592	1330	500	470	304	360	2050	3350	1110	2660	574	803
5	531	1200	490	450	304	340	1910	2770	1100	2660	567	897
6	484	1120	490	430	304	338	1830	2270	1050	2400	564	1010
7	461	1090	490	420	304	333	1760	1890	994	1950	559	1080
8	461	1040	500	410	304	330	1670	1630	939	1510	555	1170
9	461	992	520	405	304	345	1570	1460	884	1230	550	1360
10	455	934	540	400	304	380	1460	1310	856	1060	615	1470
11	444	898	540	390	304	430	1350	1240	853	942	580	1630
12	450	862	530	380	304	510	1260	1230	854	867	613	1730
13	444	828	530	370	304	600	1190	1200	845	809	710	1800
14	433	793	530	365	304	740	1140	1180	845	765	733	1910
15	467	773	540	360	304	860	1130	1190	855	725	752	2000
16	561	759	560	355	304	920	1140	1220	848	700	773	1990
17	780	726	920	350	304	1020	1140	1280	823	679	807	1850
18	1040	706	1270	345	304	1400	1160	1330	812	689	795	1640
19	1360	654	1640	340	304	1700	1180	1370	796	689	757	1440
20	1650	629	1250	340	304	2030	1200	1400	772	680	714	1320
21	1900	620	1050	335	310	2430	1210	1370	748	674	668	1290
22	2250	592	950	330	315	2860	1320	1260	724	671	631	1330
23	2910	585	860	330	318	3210	1590	1120	699	636	614	1370
24	4000	598	810	325	320	3300	2010	1020	676	651	598	1410
25	4940	579	760	320	325	3200	2280	957	715	683	582	1420
26	5110	567	720	316	345	3030	2640	932	993	656	581	1450
27	4720	573	680	314	370	2830	3700	966	1270	646	596	1500
28	4150	585	640	312	420	2650	5440	997	1390	656	599	1570
29	3520	579	610	310	---	2510	6380	995	1520	652	600	1640
30	2950	579	580	308	---	2440	6370	978	1650	644	622	1710
31	2440	---	560	306	---	2440	---	1010	---	643	634	---
TOTAL	52206	26351	21653	11626	8804	44786	64080	53665	28801	34757	19762	41776
MEAN	1684	878	698	375	314	1445	2136	1731	960	1121	637	1393
MAX	5110	2010	1640	540	420	3300	6380	5780	1650	2660	807	2000
MIN	433	567	490	306	304	330	1130	932	676	636	550	630
CFSM	1.24	.65	.51	.28	.23	1.06	1.57	1.27	.71	.82	.47	1.02
IN.	1.43	.72	.59	.32	.24	1.23	1.75	1.47	.79	.95	.54	1.14
AC-FT	103600	52270	42950	23060	17460	88830	127100	106400	57130	68940	39200	82860

CAL YR 1984 TOTAL 448506 MEAN 1225 MAX 8030 MIN 282 CFSM .90 IN 12.27 AC-FT 889600
WTR YR 1985 TOTAL 408267 MEAN 1119 MAX 6380 MIN 304 CFSM .82 IN 11.17 AC-FT 809800

ELM CREEK BASIN

05287890 ELM CREEK NEAR CHAMPLIN, MN

LOCATION.--Lat 45°09'48", long 93°26'11", in NE¼NW¼ sec.35, T.120 N., R.22 W., Hennepin County, Hydrologic Unit 07010206, on left bank, 33 ft downstream from bridge on Elm Creek Road, 2.5 mi southwest of Champlin.

DRAINAGE AREA.--84.9 mi^2.

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

GAGE.--Water-stage recorder. Datum of gage is 850.71 ft above National Geodetic Vertical Datum of 1929. Prior to March 15, 1979, nonrecording gage at present site and datum.

REMARKS.-- Estimated daily discharges; Nov. 20, Dec. 3, 13, 16-18, 22, 29, Jan. 8, 11-15, 17-19, Jan. 20 to Feb. 18, 26, 27, and Mar. 2, 8-10, 12. Records good except those for period of no gage-height record, Jan. 20 to Feb. 2, and periods with ice effect, Nov. 20, Dec. 3, 13, 16-18, 22, 29, Jan. 8, 11-15, 17-19, Feb. 3-18, 26, 27, and Mar. 2, 8-10, 12, which are fair.

AVERAGE DISCHARGE.--7 years, 33.4 ft^3/s, 5.34 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 509 ft^3/s, Mar. 18, 1985, gage height, 9.50 ft; minimum daily, 1.3 ft^3/s, Feb. 5-20, 1982; minimum gage height, 2.86 ft, Feb. 24, 1980.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 509 ft^3/s, Mar. 18, gage height, 9.50 ft; minimum discharge, 3.4 ft^3/s, Aug. 9, gage height, 3.57 ft; minimum gage height, 3.45 ft, Feb. 20.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10	67	11	14	3.9	29	148	161	72	26	5.7	32
2	8.3	58	11	13	3.8	39	132	129	72	24	4.9	31
3	7.4	56	11	12	3.8	51	139	111	67	24	4.5	76
4	6.7	53	11	12	3.8	69	148	94	66	21	4.2	103
5	5.9	49	10	11	3.8	61	145	79	64	20	4.2	95
6	5.7	46	9.8	9.4	3.8	43	142	68	60	18	4.2	87
7	6.7	43	9.7	8.5	3.8	29	136	55	54	16	4.1	86
8	10	39	9.2	8.0	3.8	19	127	44	48	14	3.7	96
9	10	38	8.5	7.6	3.8	18	117	42	40	13	5.6	130
10	8.7	36	8.4	7.2	3.8	22	105	52	33	11	8.3	153
11	7.8	33	8.5	7.0	3.8	33	94	58	33	9.4	7.0	139
12	8.3	31	8.6	6.8	3.8	40	83	75	45	8.3	25	131
13	8.6	30	8.0	6.7	3.8	54	73	76	41	7.6	61	127
14	8.4	29	7.2	6.6	3.8	83	66	76	39	6.8	61	121
15	15	26	7.3	6.5	3.8	174	62	78	42	6.4	52	114
16	27	21	22	6.5	3.9	286	56	76	40	6.0	44	105
17	79	21	57	6.3	3.9	414	53	70	36	6.4	44	97
18	93	19	53	6.2	4.0	465	52	62	34	6.8	42	88
19	111	18	44	6.0	4.1	421	48	54	32	6.5	38	78
20	127	17	41	5.9	4.0	399	45	46	27	6.2	35	72
21	131	15	41	5.7	8.3	366	45	38	27	5.3	31	64
22	142	15	40	5.5	8.9	341	58	32	27	4.8	24	66
23	149	14	38	5.3	13	309	98	34	27	4.4	26	77
24	148	13	34	5.2	14	286	157	35	24	7.3	23	105
25	140	13	30	5.1	13	256	208	32	22	10	22	108
26	127	13	27	5.0	14	227	258	31	26	9.4	18	106
27	116	13	24	4.8	17	211	268	27	32	8.3	16	109
28	104	12	20	4.6	20	191	248	22	31	7.6	17	112
29	93	11	18	4.5	---	180	217	21	27	7.2	32	118
30	82	11	16	4.2	---	160	190	29	26	6.8	38	140
31	72	---	15	4.0	---	154	---	64	---	6.1	35	---
TOTAL	1868.5	860	659.2	221.1	185.2	5430	3718	1871	1214	334.6	740.4	2966
MEAN	60.3	28.7	21.3	7.13	6.61	175	124	60.4	40.5	10.8	23.9	98.9
MAX	149	67	57	14	20	465	268	161	72	26	61	153
MIN	5.7	11	7.2	4.0	3.8	18	45	21	22	4.4	3.7	31
CFSM	.71	.34	.25	.08	.08	2.06	1.46	.71	.48	.13	.28	1.17
IN.	.82	.38	.29	.10	.08	2.38	1.63	.82	.53	.15	.32	1.30
AC-FT	3710	1710	1310	439	367	10770	7370	3710	2410	664	1470	5880

CAL YR 1984	TOTAL 20010.9	MEAN 54.7	MAX 317	MIN 2.8	CFSM .64	IN 8.77	AC-FT 39690		
WTR YR 1985	TOTAL 20068.0	MEAN 55.0	MAX 465	MIN 3.7	CFSM .65	IN 8.79	AC-FT 39800		

MISSISSIPPI RIVER MAIN STEM

05288500 MISSISSIPPI RIVER NEAR ANOKA, MN

LOCATION.--Lat 45°07'36", long 93°17'48", in SW¼ sec.12, T.119 N., R.21 W., Hennepin County, Hydrologic Unit 07010206, on right bank 0.4 mi downstream from Coon Creek, 1.3 mi downstream from Coon Rapids dam at Coon Rapids, 6.5 mi downstream from Anoka, and at mile 864.8 upstream from Ohio River.

DRAINAGE AREA.--19,100 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1931 to current year. Prior to October 1931 published as "at Coon Rapids, near Anoka."

GAGE.--Water-stage recorder. Datum of gage is 804.53 ft above National Geodetic Vertical Datum of 1929. Prior to June 14, 1932, at site 1.2 mi upstream at different datum.

REMARKS.--No estimated daily discharges. Records good. Flow slightly regulated by six reservoirs on headwaters; total usable capacity, 1,640,600 acre-ft. Diurnal regulation caused by dam above station.

AVERAGE DISCHARGE.--54 years, 7,839 ft^3/s, 5.57 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 91,000 ft^3/s, Apr. 17, 1965, gage height, 19.53 ft; minimum, 529 ft^3/s, Aug. 29, 1976, gage height, 0.04 ft, result of regulation.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 38,200 ft^3/s, Apr. 30, gage height, 10.96 ft; minimum discharge, 3,350 ft^3/s, Oct. 5, gage height, 2.01 ft.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5060	21600	9080	7620	5330	6220	20500	37200	17400	23800	14100	10400
2	3920	19000	8920	7630	5040	6330	19000	35400	17900	23800	13100	10900
3	3950	17700	7300	7630	5140	6290	18500	32700	18800	24000	12400	12900
4	4050	17400	5340	7620	5230	4810	18000	30500	19800	23800	11800	13300
5	3710	16100	4850	7620	4740	5450	17900	28400	20200	23200	11800	13500
6	3700	15400	4550	7330	4980	6270	17200	26400	20400	22900	12000	13900
7	4120	15500	3790	6860	4950	6050	16700	24800	19800	21900	10400	14300
8	4470	15100	5150	7000	4800	5750	15700	23500	19400	20100	9770	15100
9	4330	14500	6540	7080	4460	5700	14200	22500	18800	18500	10300	17500
10	4580	14100	8240	6760	4760	5860	13600	21300	17700	17800	9500	20300
11	4650	13100	8880	6880	5060	5770	13200	19900	17000	17400	9430	20100
12	4670	12700	8380	6470	4680	5860	13000	18300	17400	14500	10300	19400
13	5010	12500	7490	6060	4600	6670	12800	19200	17500	13500	11900	19200
14	4760	12000	7030	6290	4910	7580	12300	19900	17200	13800	12300	19000
15	5020	12500	7710	6630	5000	8940	12200	20900	16900	13000	12200	19100
16	7750	12000	9850	6440	4440	11300	11900	23100	17100	12500	12800	19100
17	10600	10800	9600	6540	4720	13800	11600	23900	17100	11900	13600	18900
18	13000	11000	9280	6700	5100	16200	10700	24700	16400	12100	12600	18500
19	15900	9610	8430	6030	4960	19400	10600	24800	16000	11900	12200	18000
20	20300	8700	8640	5130	4650	22500	11000	24800	15200	12800	11800	17100
21	22400	8140	9480	5580	5520	24800	11600	24400	14600	13100	11300	17300
22	24600	8460	9720	5890	6000	28200	12200	23300	14800	14100	11000	18600
23	26300	9500	8670	5900	6200	28400	15400	22800	14400	14700	11000	18000
24	27800	9220	8340	5900	6100	27800	19700	21900	13500	15100	10600	17000
25	29400	9250	8270	5840	5730	28300	23200	20700	13100	15900	10300	17100
26	30000	9670	8990	5400	6000	26800	27100	19400	15000	15700	9940	17200
27	29400	10300	9500	5450	6050	26400	30400	18900	17700	14900	9980	15500
28	27900	10700	8900	5350	6050	24800	34200	18100	19200	15800	10400	13800
29	26700	10500	8410	5320	---	23300	37200	17200	21100	15600	10100	16100
30	24600	10200	7320	5340	---	22200	38100	17300	23200	14600	10600	17200
31	23100	---	7340	5320	---	21200	---	17300	---	14400	10500	---
TOTAL	425750	377250	243990	197610	145200	458950	539700	723500	524600	517100	350020	498300
MEAN	13730	12580	7871	6375	5186	14800	17990	23340	17490	16680	11290	16610
MAX	30000	21600	9850	7630	6200	28400	38100	37200	23200	24000	14100	20300
MIN	3700	8140	3790	5130	4440	4810	10600	17200	13100	11900	9430	10400
CFSM	.72	.66	.41	.33	.27	.78	.94	1.22	.92	.87	.59	.87
IN.	.83	.73	.48	.38	.28	.89	1.05	1.41	1.02	1.01	.68	.97
AC-FT	844500	748300	484000	392000	288000	910300	1070000	1435000	1041000	1026000	694300	988400

CAL YR 1984	TOTAL	4483240	MEAN	12250	MAX	45600	MIN	2880	CFSM .64	IN 8.73	AC-FT	8893000
WTR YR 1985	TOTAL	5001970	MEAN	13700	MAX	38100	MIN	3700	CFSM .72	IN 9.74	AC-FT	9921000

MISSISSIPPI RIVER MAIN STEM

05288500 MISSISSIPPI RIVER NEAR ANOKA, MN--Continued

WATER-QUALITY RECORDS

LOCATION.--Sediment samples collected at Camden Avenue bridge, in Minneapolis, 7.0 mi downstream from gage. Tritium samples collected at gage near right bank. Prior to October 1, 1978, sediment samples collected at Lowry Avenue bridge.

DRAINAGE AREA.--19,600 mi^2, approximately.

PERIOD OF RECORD.--Water years 1963-67, 1975 to current year.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: October 1975 to current year.
SUSPENDED SEDIMENT DISCHARGE: August 1975 to current year.

REMARKS.--During the winter period, daily suspended-sediment load was estimated on the basis of water records and monthly sediment samples. Water temperature was obtained once-daily for most of the open water period and occasionally for the winter period.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURES (water years 1976-77, 1979-80, 1982-85): Maximum daily, 31.0°C, Aug. 25, 26, 1976, July 19, 1977; minimum daily, 0.0°C several days during winter period.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 210 mg/L, Apr. 3, 1982; minimum daily mean, 1 mg/L on several days in 1978, 1980, 1981, 1982, and 1984.
SEDIMENT LOADS: Maximum daily, 17,400 tons, Apr. 20, 1982; minimum daily, 3.9 tons, Feb. 2, 1981.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURES: Maximum daily, 27.0°C, July 7; minimum daily, 0.0°C several days during winter period.
SEDIMENT CONCENTRATION: Maximum daily mean, 117 mg/L, Oct. 23; minimum daily mean, 4 mg/L, Nov. 25.
SEDIMENT LOADS: Maximum daily, 10,500 tons, Apr. 30; minimum daily, 51 tons, Dec. 7.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13.0	---				---	5.0	16.0	19.0	24.0	25.0	21.0
2	13.0	---				---	7.0	17.0	17.0	23.0	24.0	19.0
3	16.0	3.0				---	6.0	16.0	18.0	---	23.0	21.0
4	15.0	3.0				---	6.0	---	18.0	---	22.0	22.0
5	15.0	3.0				---	5.0	---	19.0	---	24.0	22.0
6	13.0	5.0				---	5.0	18.0	20.0	25.0	25.0	24.0
7	14.0	5.0				---	6.0	19.0	20.0	27.0	26.0	23.0
8	14.0	6.0				---	6.0	19.0	21.0	26.0	25.0	23.0
9	15.0	4.0				---	7.0	21.0	20.0	26.0	22.0	19.0
10	16.0	3.0				6.0	10.0	22.0	---	26.0	22.0	18.0
11	---	3.0				---	11.0	21.0	---	26.0	23.0	19.0
12	---	2.0				3.0	12.0	18.0	---	26.0	22.0	19.0
13	---	4.0				4.0	10.0	19.0	---	26.0	22.0	18.0
14	---	5.0				4.0	10.0	18.0	---	25.0	22.0	16.0
15	---	1.0				5.0	13.0	16.0	18.0	---	22.0	18.0
16	---	2.0				4.0	10.0	16.0	21.0	25.0	21.0	18.0
17	13.0	2.0				4.0	14.0	17.0	19.0	25.0	22.0	19.0
18	11.0	1.0				4.0	17.0	18.0	19.0	25.0	21.0	21.0
19	10.0	---				4.0	18.0	19.0	21.0	25.0	19.0	23.0
20	8.0	---				2.0	17.0	18.0	21.0	24.0	19.0	19.0
21	8.0	---				5.0	19.0	19.0	22.0	25.0	20.0	16.0
22	7.0	---				5.0	18.0	18.0	20.0	25.0	19.0	17.0
23	8.0	2.0				4.0	15.0	18.0	22.0	25.0	20.0	14.0
24	9.0	4.0				3.0	15.0	22.0	23.0	24.0	19.0	13.0
25	8.0	4.0				3.0	14.0	21.0	24.0	24.0	21.0	13.0
26	10.0	4.0				6.0	12.0	20.0	23.0	25.0	22.0	14.0
27	11.0	2.0				6.0	12.0	19.0	21.0	25.0	20.0	14.0
28	8.0	---				4.0	15.0	21.0	22.0	25.0	20.0	14.0
29	8.0	1.0				4.0	16.0	19.0	21.0	24.0	19.0	10.0
30	6.0	.0				3.0	15.0	20.0	23.0	23.0	20.0	10.0
31	5.0	---				---	---	19.0	---	23.0	19.0	---
MEAN							11.5				21.5	18.0

WTR YR 1985 MAX 27.0 MIN .0

MISSISSIPPI RIVER MAIN STEM--Continued

05288500 MISSISSIPPI RIVER NEAR ANOKA, MN

SUSPENDED-SEDIMENT. WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	15	205	20	1170	9	221	5	103	5	72	6	101
2	11	116	18	923	8	193	5	103	5	68	6	103
3	11	117	16	765	7	138	5	103	5	69	6	102
4	11	120	13	611	6	87	5	103	5	71	6	78
5	13	130	12	522	5	65	5	103	5	64	6	88
6	15	150	11	457	5	61	5	99	5	67	6	102
7	15	167	11	460	5	51	5	93	5	67	6	98
8	16	193	10	408	5	70	5	94	5	65	6	93
9	18	210	10	391	5	88	5	96	5	60	7	108
10	20	247	9	343	5	111	5	91	5	64	11	174
11	20	251	9	318	5	120	5	93	5	68	11	171
12	22	277	8	274	5	113	5	87	5	63	9	142
13	22	298	8	270	5	101	5	82	5	62	14	252
14	22	283	7	227	5	95	5	85	5	66	15	307
15	19	258	7	236	5	104	5	90	5	67	19	459
16	21	439	6	194	5	133	5	87	5	60	33	1010
17	26	744	6	175	5	130	5	88	5	64	41	1530
18	32	1120	6	178	5	125	5	90	5	69	39	1710
19	40	1720	6	156	5	114	5	81	6	80	57	2990
20	48	2630	6	141	5	117	5	69	7	88	105	6380
21	69	4170	5	110	5	128	5	75	11	164	101	6760
22	95	6310	5	114	5	131	5	80	16	259	84	6400
23	117	8310	5	128	5	117	5	80	19	318	68	5210
24	109	8180	5	124	5	113	5	80	20	329	54	4050
25	70	5560	4	100	5	112	5	79	19	294	49	3740
26	46	3730	5	131	5	121	5	73	17	275	52	3760
27	68	5400	6	167	5	128	5	74	12	196	49	3490
28	94	7080	8	231	5	120	5	72	7	114	33	2210
29	64	4610	8	227	5	114	5	72	---	---	25	1570
30	32	2130	10	275	5	99	5	72	---	---	24	1440
31	23	1430	---	---	5	99	5	72	---	---	22	1260
TOTAL	---	66585	---	9826	---	3519	---	2669	---	3303	---	55888
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	21	1160	82	8240	66	3100	66	4240	24	914	26	730
2	19	975	66	6310	68	3290	51	3280	23	814	32	942
3	21	1050	47	4150	70	3550	45	2920	17	569	40	1390
4	21	1020	43	3540	70	3740	46	2960	14	446	47	1690
5	24	1160	41	3140	68	3710	47	2940	15	478	54	1970
6	21	975	39	2780	64	3530	49	3030	14	454	54	2030
7	21	947	34	2280	56	2990	64	3780	14	393	52	2010
8	15	636	31	1970	47	2460	76	4120	17	448	50	2040
9	12	460	33	2000	47	2390	58	2900	19	528	48	2270
10	14	514	42	2420	49	2340	43	2070	16	410	57	3120
11	16	570	36	1930	50	2300	40	1880	16	407	46	2500
12	18	632	29	1430	51	2400	40	1570	19	528	35	1830
13	21	726	29	1500	52	2460	40	1460	21	675	32	1660
14	22	731	31	1670	54	2510	41	1530	21	697	33	1690
15	18	593	33	1860	55	2510	42	1470	21	692	32	1650
16	17	546	39	2430	56	2590	43	1450	21	726	30	1550
17	37	1160	37	2390	67	3090	41	1320	21	771	26	1330
18	62	1790	32	2130	82	3630	37	1210	19	646	24	1200
19	49	1400	34	2280	87	3760	32	1030	17	560	23	1120
20	27	802	36	2410	88	3610	30	1040	17	542	22	1020
21	27	846	34	2240	86	3390	30	1060	16	488	21	981
22	35	1150	38	2390	85	3400	32	1220	16	475	21	1050
23	40	1660	35	2150	80	3110	37	1470	15	445	20	972
24	57	3030	32	1890	77	2810	35	1430	14	401	49	2250
25	77	4820	36	2010	73	2580	33	1420	13	362	18	831
26	83	6070	28	1470	70	2840	31	1310	12	322	16	743
27	78	6400	32	1630	66	3150	30	1210	13	350	14	586
28	83	7660	50	2440	84	4350	29	1240	14	393	14	522
29	87	8740	62	2880	84	4790	28	1180	16	436	15	652
30	102	10500	66	3080	75	4700	27	1060	19	544	16	743
31	---	---	66	3080	---	---	25	972	22	624	---	---
TOTAL	---	68723	---	82120	---	95080	---	59772	---	16538	---	43072

TOTAL LOAD FOR YEAR: 507095 TONS.

MISSISSIPPI RIVER MAIN STEM

05288500 MISSISSIPPI RIVER NEAR ANOKA, MN--Continued

RADIOCHEMICAL ANALYSES, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	TRITIUM IN WATER MOLECULES (TU) (07012)	TRITIUM WATER MOLECULES COUNT ERROR (TU) (07013)
OCT			
02...	1232	36.2	1.4

WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAMFLOW, INSTANTANEOUS (CFS) (00061)	TEMPERATURE (DEG C) (00010)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT				
02...	1232	3690	11.5	--
MAR				
20...	1120	21900	1.0	77
APR				
12...	1209	13400	11.0	--
JUL				
02...	1200	23900	22.5	--

PARTICLE-SIZE DISTRIBUTION OF SURFACE BED MATERIAL, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	NUMBER OF SAMPLING POINTS (00063)	BED MAT. SIEVE DIAM. % FINER THAN .125 MM (80165)	BED MAT. SIEVE DIAM. % FINER THAN .250 MM (80166)	BED MAT. SIEVE DIAM. % FINER THAN .500 MM (80167)	BED MAT. SIEVE DIAM. % FINER THAN 1.00 MM (80168)	BED MAT. SIEVE DIAM. % FINER THAN 2.00 MM (80169)	BED MAT. SIEVE DIAM. % FINER THAN 4.00 MM (80170)	BED MAT. SIEVE DIAM. % FINER THAN 8.00 MM (80171)	BED MAT. SIEVE DIAM. % FINER THAN 16.0 MM (80172)
APR										
12...	1209	3	0	3	43	84	96	99	100	--
JUL										
02...	1200	3	<1	2	37	81	95	98	99	100

MISSISSIPPI RIVER MAIN STEM

05288550 MISSISSIPPI RIVER AT FRIDLEY, MN

LOCATION.--Lat 45°06'12", long 93°16'37", in SW¼NE¼ sec.10, T.30 N., R.24 W., Anoka County, Hydrologic Unit 07010206, on left bank at St. Paul Pumping Station in Fridley, 0.9 mi upstream from Rice Creek, and 3.4 mi downstream from Coon Rapids Dam, and at mile 862.8 upstream from Ohio River.

PERIOD OF RECORD.--Water years 1975 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: November 1974 to current year.
pH: November 1974 to current year.
WATER TEMPERATURES: November 1974 to current year.
DISSOLVED OXYGEN: November 1974 to current year.

INSTRUMENTATION.--Water-quality monitor since November 1974.

REMARKS.--Extremes are published for years with 80 percent or more daily record.

COOPERATION.--Water-quality monitor is operated by the Metropolitan Waste Control Commission, St. Paul, MN. Monitor data is furnished by the Commission.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE (water year 1981, 1983-85): Maximum, 473 microsiemens Sept. 30, 1981; minimum, 202 microsiemens Nov. 12, 17, 1982.
pH (water year 1981-85): Maximum, 8.7 units Apr. 16, 18-20, 1981; minimum, 6.8 units June 17, 1984.
WATER TEMPERATURES: (water year 1981-85): Maximum, 29.5°C July 6, 1981; Aug. 7, 1983; minimum, 0.0°C several days during winter period.
DISSOLVED OXYGEN (water year 1981-85): Maximum, 17.6 mg/L Mar. 7, 8, 1981; minimum, 2.9 mg/L July 27, 1981.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum, 448 microsiemens Feb. 21; minimum, 210 microsiemens Aug. 12.
pH: Maximum, 8.5 units June 24-25; minimum, 7.3 units Oct. 18, 21.
WATER TEMPERATURES: Maximum, 25.1°C July 9; minimum, 0.0°C several days during winter period.
DISSOLVED OXYGEN: Maximum, 15.9 mg/L Nov. 16; minimum, 6.7 mg/L July 2, Sep. 4.

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	350	339	347	300	297	298	318	315	316	333	318	319
2	365	346	350	298	295	295	316	315	315	327	318	323
3	360	349	354	300	295	297	323	316	319	327	320	323
4	365	354	358	301	298	299	326	321	323	368	322	348
5	373	349	366	302	298	300	327	325	325	372	367	369
6	379	371	374	309	301	305	336	331	334	372	371	371
7	378	358	373	313	308	309	334	331	332	373	371	371
8	376	375	375	313	310	311	336	333	334	374	371	370
9	375	368	370	316	311	313	336	334	335	372	367	370
10	378	367	372	316	313	314	334	327	329	371	367	370
11	383	375	379	314	310	312	327	318	321	371	369	370
12	383	380	381	314	311	312	319	317	318	371	364	368
13	388	382	384	314	310	312	323	318	320	---	---	---
14	386	382	384	318	314	316	324	321	322	---	---	---
15	385	360	376	318	310	314	333	319	321	371	364	365
16	375	308	362	323	302	314	331	311	317	365	363	364
17	383	340	347	320	314	315	319	311	313	369	363	364
18	357	345	356	316	314	315	318	314	316	367	358	365
19	342	332	335	315	313	313	318	317	317	366	360	362
20	333	322	326	318	314	316	318	317	317	367	360	364
21	327	316	322	325	318	319	317	311	314	367	363	364
22	314	310	312	322	318	320	312	309	310	367	363	365
23	315	306	310	322	318	319	310	308	309	367	364	365
24	309	303	305	321	314	317	313	310	310	367	365	366
25	303	297	299	323	318	320	314	311	312	367	356	362
26	297	293	294	329	327	328	317	313	315	366	358	361
27	302	296	298	329	325	327	332	317	319	363	360	362
28	301	294	298	321	317	318	347	324	328	361	360	361
29	301	297	299	318	316	317	325	318	319	361	359	360
30	302	300	301	318	316	316	321	318	318	363	358	359
31	301	298	298	---	---	---	321	319	320	363	359	360
MONTH	388	293	342	329	295	312	347	308	319	---	---	---

MISSISSIPPI RIVER MAIN STEM

05288550 MISSISSIPPI RIVER AT FRIDLEY, MN

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	363	360	362	385	376	381	258	256	256	281	274	277
2	364	360	362	379	373	375	269	258	264	287	279	282
3	363	360	362	---	---	---	272	268	270	291	286	287
4	364	362	363	371	367	369	278	272	274	295	290	292
5	364	361	363	374	370	371	280	277	278	295	293	294
6	365	363	363	371	367	369	282	279	280	298	293	294
7	366	360	364	382	368	373	283	279	281	301	295	297
8	367	363	365	380	374	376	284	281	282	304	298	300
9	367	363	365	382	375	376	284	258	268	307	288	303
10	367	362	365	381	375	377	264	260	262	314	306	310
11	367	360	364	379	373	375	270	264	267	315	302	313
12	378	363	371	374	333	352	273	268	270	317	313	315
13	378	375	376	339	333	336	277	273	275	315	310	312
14	378	373	375	---	---	---	279	276	278	312	294	304
15	379	374	376	---	---	---	281	277	278	311	302	307
16	382	375	378	---	---	---	300	279	290	312	302	306
17	399	377	382	318	304	310	300	276	298	303	298	300
18	396	387	391	304	299	301	303	299	301	307	301	303
19	401	379	389	302	256	275	311	303	307	308	305	306
20	421	380	397	---	---	---	317	280	313	311	303	305
21	448	409	429	255	251	254	319	317	318	314	303	308
22	408	386	392	255	251	252	319	318	318	314	311	313
23	394	380	383	260	249	250	318	311	315	314	306	312
24	382	379	379	---	---	---	311	308	309	321	308	316
25	440	373	377	248	245	246	309	306	307	323	319	320
26	377	373	375	252	245	248	306	297	301	323	320	321
27	378	373	375	253	249	251	297	283	290	322	318	319
28	382	376	379	255	253	254	283	276	278	322	319	320
29	---	---	---	257	253	255	277	274	275	321	316	318
30	---	---	---	258	256	256	277	274	275	320	308	316
31	---	---	---	258	251	256	---	---	---	320	313	316
MONTH	448	360	375	---	---	---	319	256	285	323	274	306

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	320	316	318	302	296	298	264	230	232	260	247	257
2	316	313	314	304	294	295	239	234	235	260	245	257
3	316	310	313	295	289	291	241	234	237	255	220	248
4	316	313	314	292	289	290	240	237	238	259	254	256
5	316	311	313	295	291	292	243	237	240	263	256	258
6	315	312	313	299	294	296	253	240	247	---	---	---
7	317	312	314	305	298	300	256	251	253	---	---	---
8	321	316	318	308	304	305	259	255	256	264	239	255
9	320	318	318	306	286	295	256	227	251	255	239	246
10	320	316	317	298	284	286	254	244	248	239	230	234
11	317	271	290	285	281	282	257	254	255	240	235	238
12	276	268	272	292	282	286	257	210	240	242	238	240
13	276	271	273	305	289	293	---	---	---	242	236	239
14	277	274	275	293	281	285	253	249	251	237	232	235
15	313	274	278	284	274	277	256	251	253	237	232	234
16	287	271	283	286	278	281	256	249	252	239	236	237
17	286	279	281	286	279	283	255	249	251	246	237	241
18	287	279	284	286	265	281	252	245	248	259	245	250
19	294	283	288	287	281	284	254	243	244	260	234	257
20	298	292	294	287	280	283	245	240	242	262	256	257
21	306	298	300	284	279	282	254	241	242	256	245	252
22	305	298	301	---	---	---	249	235	241	249	241	244
23	313	302	307	279	276	278	246	235	242	245	231	238
24	313	306	309	277	253	269	247	240	244	236	230	232
25	323	310	317	272	268	269	252	241	247	236	232	234
26	325	312	319	271	267	269	255	251	252	249	231	234
27	312	301	304	268	265	267	255	234	253	238	230	234
28	304	300	302	268	264	266	256	240	250	245	235	238
29	305	300	302	269	264	264	249	231	245	237	225	230
30	305	300	302	268	228	245	253	249	250	226	220	222
31	---	---	---	231	228	229	256	246	253	---	---	---
MONTH	325	268	301	---	---	---	---	---	---	---	---	---

MISSISSIPPI RIVER MAIN STEM

05288550 MISSISSIPPI RIVER AT FRIDLEY, MN

PH (STANDARD UNITS), WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	8.1	7.8	7.9	7.9	7.9	7.9	8.2	8.2	8.2	7.8	7.7	7.8
2	8.2	7.9	8.0	8.0	7.9	7.9	8.2	8.2	8.2	7.8	7.8	7.8
3	8.4	8.0	8.1	8.1	8.0	8.0	8.2	8.2	8.2	7.8	7.8	7.8
4	8.4	8.1	8.2	8.0	8.0	8.0	8.2	8.1	8.1	7.8	7.8	7.8
5	8.4	7.8	8.2	8.0	8.0	8.0	8.1	8.1	8.1	7.8	7.8	7.8
6	8.4	8.1	8.2	8.1	8.0	8.0	8.1	7.8	7.9	7.8	7.8	7.8
7	8.2	8.0	8.1	8.1	8.1	8.1	8.1	7.9	8.0	7.8	7.7	7.8
8	7.8	7.6	7.7	8.1	8.0	8.1	8.0	8.0	8.0	7.7	7.7	7.7
9	7.9	7.7	7.8	8.1	8.0	8.1	8.0	8.0	8.0	7.8	7.7	7.7
10	8.0	7.7	7.8	8.1	8.1	8.1	8.0	7.9	8.0	7.8	7.8	7.8
11	8.0	7.8	7.9	8.1	8.1	8.1	8.0	8.0	8.0	7.8	7.7	7.7
12	7.9	7.8	7.9	8.1	8.1	8.1	8.0	8.0	8.0	7.8	7.8	7.8
13	8.0	7.8	7.9	8.2	8.1	8.1	8.0	7.9	8.0	---	---	---
14	7.9	7.8	7.9	8.2	8.1	8.2	8.0	8.0	8.0	---	---	---
15	7.9	7.7	7.8	8.1	8.1	8.1	8.1	8.0	8.0	7.8	7.8	7.8
16	7.7	7.6	7.6	8.1	7.8	7.9	8.0	7.9	8.0	7.8	7.8	7.8
17	---	---	---	8.1	7.9	8.0	8.0	7.9	7.9	7.8	7.8	7.8
18	7.5	7.3	7.3	8.1	8.1	8.1	7.9	7.9	7.9	7.8	7.8	7.8
19	7.5	7.5	7.5	8.1	8.1	8.1	7.9	7.8	7.8	7.8	7.7	7.7
20	7.5	7.4	7.4	8.1	8.1	8.1	7.8	7.8	7.8	7.8	7.7	7.8
21	7.5	7.3	7.4	8.2	8.1	8.1	7.8	7.7	7.8	7.8	7.8	7.8
22	7.4	7.4	7.4	8.2	8.2	8.2	7.7	7.7	7.7	7.8	7.8	7.8
23	7.5	7.4	7.4	8.2	8.1	8.2	7.7	7.6	7.6	7.8	7.8	7.8
24	7.4	7.4	7.4	8.2	8.2	8.2	7.6	7.6	7.6	7.8	7.8	7.8
25	7.4	7.4	7.4	8.2	8.2	8.2	7.6	7.6	7.6	7.8	7.7	7.7
26	7.4	7.4	7.4	8.2	8.2	8.2	7.6	7.6	7.6	7.8	7.7	7.8
27	7.4	7.4	7.4	8.2	8.2	8.2	7.7	7.6	7.6	7.8	7.8	7.8
28	7.4	7.4	7.4	8.2	8.2	8.2	7.8	7.7	7.7	7.8	7.8	7.8
29	7.5	7.4	7.4	8.2	8.2	8.2	7.8	7.8	7.8	7.8	7.8	7.8
30	7.8	7.4	7.6	8.2	8.2	8.2	7.8	7.8	7.8	7.8	7.8	7.8
31	7.9	7.8	7.9	---	---	---	7.8	7.8	7.8	7.9	7.8	7.8
MONTH	---	---	---	8.2	7.8	8.1	8.2	7.6	7.9	---	---	---

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	7.8	7.8	7.8	8.1	8.0	8.0	7.9	7.8	7.8	7.9	7.8	7.8
2	7.8	7.8	7.8	8.0	8.0	8.0	7.9	7.9	7.9	8.0	7.8	7.9
3	7.8	7.8	7.8	---	---	---	7.9	7.9	7.9	8.0	7.9	7.9
4	7.9	7.8	7.8	8.1	8.0	8.1	7.9	7.9	7.9	8.0	8.0	8.0
5	7.9	7.8	7.9	8.0	7.9	8.0	8.0	7.9	7.9	8.0	7.9	8.0
6	7.9	7.8	7.8	8.1	7.9	8.0	7.9	7.9	7.9	8.0	7.9	8.0
7	7.8	7.8	7.8	8.1	8.0	8.0	7.9	7.9	7.9	8.0	7.9	8.0
8	7.9	7.8	7.8	8.0	8.0	8.0	8.0	7.9	7.9	8.1	8.0	8.0
9	7.9	7.8	7.9	8.0	8.0	8.0	8.1	7.9	8.0	8.1	8.0	8.0
10	7.9	7.9	7.9	8.1	8.0	8.0	8.2	8.1	8.1	8.1	7.9	8.0
11	7.9	7.8	7.9	8.1	8.0	8.0	8.2	8.1	8.1	8.0	8.0	8.0
12	7.9	7.9	7.9	8.1	8.0	8.0	8.1	8.1	8.1	8.0	7.9	8.0
13	7.9	7.9	7.9	8.1	8.0	8.1	8.1	8.1	8.1	8.1	7.9	8.0
14	7.9	7.9	7.9	---	---	---	8.1	8.1	8.1	8.1	7.9	8.0
15	7.9	7.9	7.9	---	---	---	8.1	8.1	8.1	8.0	8.0	8.0
16	7.9	7.9	7.9	---	---	---	8.3	8.1	8.1	8.0	8.0	8.0
17	7.9	7.9	7.9	7.9	7.8	7.9	8.3	8.1	8.3	8.0	7.9	8.0
18	7.9	7.9	7.9	7.9	7.8	7.8	8.3	8.2	8.2	8.1	8.0	8.0
19	7.9	7.9	7.9	7.8	7.8	7.8	8.4	8.3	8.3	8.1	8.0	8.1
20	8.0	7.9	7.9	---	---	---	8.3	8.1	8.3	8.1	8.0	8.1
21	8.0	7.9	7.9	7.8	7.7	7.8	8.4	8.3	8.4	8.2	8.0	8.1
22	7.9	7.9	7.9	7.8	7.8	7.8	8.4	8.2	8.3	8.2	8.0	8.1
23	8.0	7.9	7.9	7.8	7.8	7.8	8.2	8.1	8.1	8.1	8.0	8.1
24	8.0	7.9	8.0	---	---	---	8.1	8.0	8.0	8.2	8.0	8.1
25	8.0	8.0	8.0	7.8	7.7	7.8	8.0	8.0	8.0	8.2	8.1	8.1
26	8.1	8.0	8.0	7.9	7.8	7.8	8.1	8.0	8.1	8.1	8.0	8.1
27	8.0	8.0	8.0	7.9	7.8	7.8	8.1	8.0	8.0	8.1	8.0	8.1
28	8.1	8.0	8.1	7.9	7.8	7.9	8.0	7.9	7.9	8.1	8.0	8.1
29	---	---	---	7.9	7.8	7.8	7.9	7.8	7.8	8.1	8.0	8.1
30	---	---	---	7.9	7.8	7.8	7.8	7.8	7.8	8.2	8.0	8.1
31	---	---	---	7.9	7.8	7.9	---	---	---	8.1	8.0	8.1
MONTH	8.1	7.8	7.9	---	---	---	8.4	7.8	8.0	8.2	7.8	8.0

MISSISSIPPI RIVER MAIN STEM

05288550 MISSISSIPPI RIVER AT FRIDLEY, MN

PH (STANDARD UNITS), WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	8.1	8.1	8.1	8.0	7.9	7.9	8.1	7.9	8.0	8.2	8.0	8.1
2	8.1	8.0	8.1	8.0	7.9	7.9	8.2	8.0	8.1	8.2	8.1	8.1
3	8.2	8.0	8.1	7.9	7.8	7.9	8.3	8.0	8.1	8.1	7.9	8.0
4	8.1	8.0	8.1	7.8	7.8	7.8	8.2	8.0	8.1	8.1	8.0	8.0
5	8.1	8.0	8.1	7.8	7.8	7.8	8.3	8.0	8.1	8.1	7.9	8.0
6	8.1	8.0	8.1	7.9	7.8	7.8	8.2	8.0	8.1	---	---	---
7	8.2	8.0	8.0	7.9	7.8	7.8	8.3	8.1	8.2	---	---	---
8	8.1	8.0	8.0	7.9	7.8	7.8	8.2	8.1	8.1	8.1	7.9	8.0
9	8.1	8.0	8.0	8.0	7.8	7.9	8.1	7.9	8.1	8.0	7.9	7.9
10	8.1	8.0	8.0	8.0	7.8	7.9	8.1	7.8	8.0	7.9	7.8	7.8
11	8.1	8.0	8.0	8.0	7.8	7.9	8.3	8.1	8.2	7.9	7.8	7.8
12	8.2	8.0	8.1	8.1	7.9	8.0	8.2	8.0	8.1	8.0	7.8	7.9
13	8.1	8.0	8.1	8.0	7.8	8.0	---	---	---	7.9	7.8	7.9
14	8.1	8.1	8.1	8.0	7.9	7.9	8.2	8.1	8.1	8.0	7.8	7.9
15	8.1	8.0	8.1	8.0	7.8	7.9	8.2	8.1	8.1	8.0	7.8	7.9
16	8.2	8.0	8.1	8.1	7.9	8.0	8.2	8.1	8.1	8.0	7.9	8.0
17	8.1	8.1	8.1	8.1	7.9	8.0	8.2	8.0	8.1	7.9	7.9	7.9
18	8.2	8.1	8.1	8.0	7.9	8.0	8.2	8.1	8.1	8.0	7.9	7.9
19	8.3	8.1	8.2	8.1	7.9	8.0	8.2	8.1	8.1	8.0	7.9	8.0
20	8.4	8.2	8.3	8.1	7.9	8.1	8.1	8.0	8.1	8.0	7.9	8.0
21	8.3	8.2	8.3	8.2	8.0	8.1	8.2	8.0	8.1	8.0	7.9	8.0
22	8.4	8.2	8.3	---	---	---	8.1	7.8	8.1	8.0	7.9	7.9
23	8.4	8.3	8.3	8.3	8.0	8.2	8.1	7.9	8.1	7.9	7.9	7.9
24	8.5	8.3	8.4	8.2	7.9	8.0	8.1	7.8	8.1	7.9	7.9	7.9
25	8.5	8.2	8.3	8.1	7.9	8.0	8.2	8.0	8.1	7.9	7.9	7.9
26	8.3	8.1	8.2	8.1	7.9	8.0	8.2	8.1	8.2	8.0	7.9	7.9
27	8.1	7.9	8.0	8.1	7.9	8.0	8.2	7.4	8.1	8.0	7.9	8.0
28	8.0	7.9	8.0	7.9	7.8	7.9	8.1	7.9	8.0	8.0	7.9	8.0
29	8.0	7.9	7.9	8.0	7.8	7.9	8.1	8.0	8.0	8.0	7.9	8.0
30	8.0	7.9	8.0	8.0	7.9	7.9	8.2	8.0	8.1	8.0	7.9	8.0
31	---	---	---	8.1	7.8	8.0	8.2	7.8	8.1	---	---	---
MONTH	8.5	7.9	8.1	---	---	---	---	---	---	---	---	---

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	10.6	8.1	9.4	1.5	0.0	0.9	0.3	0.0	0.1	0.1	0.0	0.0
2	9.9	8.5	9.3	1.5	0.1	1.0	0.0	0.0	0.0	---	---	---
3	10.7	8.4	9.2	1.7	0.8	1.3	0.0	0.0	0.0	---	---	---
4	11.0	8.8	9.7	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.3
5	11.2	9.0	10.3	1.1	0.5	0.8	0.0	0.0	0.0	1.0	0.1	0.4
6	11.1	10.3	10.7	2.0	1.1	1.7	4.6	0.2	3.1	1.2	1.0	1.1
7	11.5	10.7	11.0	2.8	1.6	2.2	3.7	0.9	1.7	1.3	1.1	1.2
8	12.5	12.3	12.4	3.5	2.6	3.0	0.9	0.8	0.8	1.4	0.1	0.7
9	11.2	10.2	10.4	3.2	2.8	3.0	0.8	0.6	0.7	0.3	0.0	0.1
10	11.5	10.1	10.8	2.9	1.9	2.4	0.7	0.5	0.6	1.1	0.0	0.0
11	12.2	11.0	11.7	1.9	1.1	1.4	0.6	0.0	0.3	0.1	0.0	0.0
12	12.9	11.9	12.4	1.3	0.6	1.0	0.2	0.0	0.0	0.1	0.0	0.1
13	14.0	12.4	13.0	1.7	0.6	1.1	0.0	0.0	0.0	---	---	---
14	13.3	12.9	13.1	2.7	1.7	2.2	0.0	0.0	0.0	---	---	---
15	13.1	11.7	12.7	2.7	0.6	1.8	0.0	0.0	0.0	0.1	0.0	0.0
16	11.7	8.6	10.5	4.9	0.0	0.3	0.2	0.0	0.0	0.0	0.0	0.0
17	---	---	---	3.0	0.3	2.2	0.0	0.0	0.0	0.0	0.0	0.0
18	9.7	7.2	9.4	---	---	---	0.0	0.0	0.0	0.3	0.0	0.1
19	7.0	5.7	6.3	3.6	3.3	3.5	0.1	0.0	0.0	0.2	0.0	0.0
20	5.7	4.7	5.0	0.3	0.1	0.2	0.1	0.0	0.0	0.2	0.0	0.0
21	4.9	4.0	4.5	1.9	0.1	0.2	0.0	0.0	0.0	0.1	0.0	0.0
22	3.6	3.1	3.3	0.7	0.2	0.4	0.0	0.0	0.0	0.3	0.0	0.1
23	4.2	2.9	3.9	1.2	0.4	0.8	0.1	0.0	0.0	0.0	0.0	0.0
24	4.1	3.5	3.9	1.9	0.7	1.3	0.1	0.0	0.0	0.0	0.0	0.0
25	4.0	3.9	4.0	2.7	1.9	2.2	0.0	0.0	0.0	0.0	0.0	0.0
26	4.6	3.6	4.3	3.6	3.1	3.4	0.1	0.0	0.0	0.1	0.0	0.0
27	5.7	4.6	5.1	3.3	1.8	2.6	0.1	0.0	0.1	0.0	0.0	0.0
28	5.5	4.3	4.7	1.7	0.6	1.0	0.3	0.0	0.3	0.0	0.0	0.0
29	4.2	3.5	3.8	0.6	0.3	0.5	0.1	0.0	0.0	0.0	0.0	0.0
30	3.9	2.6	3.4	0.5	0.3	0.4	0.1	0.0	0.0	0.0	0.0	0.0
31	2.6	1.5	1.9	---	---	---	0.0	0.0	0.0	0.0	0.0	0.0
MONTH	---	---	---	---	---	---	4.6	0.0	0.2	---	---	---

MISSISSIPPI RIVER MAIN STEM

05288550 MISSISSIPPI RIVER AT FRIDLEY, MN

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	0.0	0.0	0.0	3.1	0.0	2.2	3.3	2.5	2.9	15.2	13.7	14.4
2	0.0	0.0	0.0	1.7	0.8	1.1	4.0	2.8	3.4	15.9	14.3	15.0
3	0.1	0.0	0.0	---	---	---	4.9	4.0	4.5	16.4	15.3	15.8
4	0.0	0.0	0.0	0.0	0.0	0.0	6.0	4.9	5.3	16.8	15.5	16.1
5	0.0	0.0	0.0	0.0	0.0	0.0	6.1	5.9	6.0	16.9	16.0	16.3
6	0.1	0.0	0.0	0.1	0.0	0.0	6.3	6.0	6.1	16.9	15.3	16.1
7	0.2	0.0	0.1	2.2	0.1	1.2	6.3	6.1	6.2	17.2	16.0	16.7
8	0.2	0.1	0.1	2.9	1.3	2.0	6.4	6.2	6.3	17.9	16.4	17.1
9	0.2	0.0	0.1	3.4	1.6	2.3	6.3	4.4	5.2	19.1	16.8	18.3
10	0.3	0.0	0.2	3.3	1.8	2.5	5.3	4.4	4.9	20.4	19.1	19.6
11	0.2	0.0	0.2	2.5	1.4	2.1	6.8	5.3	6.1	20.4	19.8	20.2
12	0.2	0.0	0.0	1.9	0.3	1.3	7.8	6.7	7.2	19.8	18.2	19.2
13	0.0	0.0	0.0	2.7	1.0	1.7	8.4	7.8	8.0	18.6	17.1	17.9
14	0.0	0.0	0.0	---	---	---	8.6	8.2	8.4	18.4	17.0	17.6
15	0.2	0.0	0.1	---	---	---	8.3	8.0	8.2	17.0	16.2	16.6
16	0.4	0.0	0.3	---	---	---	10.5	8.3	9.3	16.3	15.6	16.0
17	0.5	0.0	0.4	1.0	0.0	0.6	10.6	8.4	10.2	16.6	14.8	15.6
18	2.5	0.4	1.5	0.5	0.0	0.2	11.1	10.0	10.4	18.0	16.1	16.9
19	2.6	0.0	1.1	2.3	0.0	1.2	13.4	11.2	12.1	18.5	17.2	17.9
20	0.5	0.0	0.2	---	---	---	15.3	8.3	14.2	18.4	17.1	17.8
21	0.0	0.0	0.0	2.7	1.3	2.2	16.6	15.2	16.0	18.6	17.0	17.8
22	0.0	0.0	0.0	2.8	1.5	2.3	17.2	16.5	16.8	18.5	17.6	18.0
23	2.1	0.0	0.0	2.7	2.1	2.4	17.2	15.0	16.2	18.4	17.2	17.8
24	0.0	0.0	0.0	---	---	---	15.0	13.5	14.0	19.9	17.6	18.5
25	0.1	0.0	0.0	2.2	1.6	1.8	13.6	13.1	13.3	20.0	19.6	19.9
26	0.5	0.0	0.2	3.8	1.8	2.5	13.2	11.9	12.4	20.1	19.0	19.6
27	0.7	0.0	0.3	4.2	3.6	3.9	11.9	11.3	11.8	19.7	18.5	19.1
28	2.3	0.0	1.2	4.4	3.8	4.1	12.8	11.1	11.9	19.8	19.1	19.4
29	---	---	---	3.8	3.4	3.6	14.0	12.0	12.9	19.3	17.8	18.6
30	---	---	---	3.6	3.0	3.5	14.7	13.4	14.2	19.1	17.6	18.3
31	---	---	---	3.8	3.3	3.4	---	---	---	19.1	18.0	18.6
MONTH	2.6	0.0	0.2	---	---	---	17.2	2.5	9.5	20.4	13.7	17.6

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	18.9	17.6	18.2	21.6	20.5	21.0	23.2	21.6	22.3	19.2	18.2	18.6
2	17.5	16.7	17.0	21.9	21.2	21.6	23.1	22.0	22.6	19.2	18.1	18.7
3	17.3	16.3	16.8	22.2	21.3	21.8	23.4	21.9	22.6	19.7	18.2	18.9
4	17.1	16.8	16.9	22.2	21.8	22.0	23.1	21.7	22.1	19.8	19.3	19.6
5	18.0	16.7	17.2	22.4	21.4	21.9	23.3	21.8	22.4	20.2	19.0	19.6
6	18.4	17.6	18.0	23.2	22.0	22.6	23.7	22.5	23.1	---	---	---
7	19.3	17.3	18.6	24.2	22.9	23.5	23.7	22.6	23.3	---	---	---
8	21.1	19.3	20.1	24.6	24.1	24.3	23.8	22.4	23.0	21.1	19.7	20.5
9	20.9	20.1	20.6	25.1	24.0	24.5	22.4	21.4	22.0	20.3	18.1	19.1
10	20.6	19.4	20.1	24.8	23.1	24.2	21.4	20.4	21.1	18.1	17.1	17.5
11	19.4	17.0	18.3	24.4	23.4	23.9	21.8	20.9	21.3	17.7	16.8	17.2
12	17.8	16.2	17.0	24.4	23.0	23.7	23.8	19.8	20.5	17.3	16.4	16.9
13	18.4	16.4	17.5	24.8	23.6	24.2	---	---	---	16.7	15.8	16.2
14	18.2	16.9	17.7	24.5	23.4	23.9	21.4	20.0	20.6	17.8	15.4	16.0
15	17.9	16.8	17.4	24.2	22.4	23.0	21.4	20.0	20.8	16.4	15.5	16.0
16	19.2	17.8	18.3	24.0	22.3	23.0	21.4	20.5	21.0	16.2	15.6	15.9
17	18.8	17.4	18.1	24.0	22.9	23.4	21.4	20.3	20.9	17.4	16.0	16.5
18	18.2	16.9	17.6	23.8	22.6	23.3	21.1	19.4	20.0	19.3	17.4	18.1
19	19.0	17.4	18.2	24.5	23.5	24.0	20.8	18.2	18.5	19.9	16.2	19.5
20	19.5	18.1	18.9	24.7	23.4	24.2	18.3	17.5	17.9	20.3	17.8	18.9
21	20.0	18.9	19.4	24.7	23.7	24.3	18.2	17.6	18.1	17.8	15.9	16.7
22	20.1	18.5	19.3	---	---	---	18.2	17.8	18.0	17.5	15.3	15.6
23	20.8	19.3	20.1	23.8	22.6	23.3	18.7	17.6	18.1	15.6	13.1	14.6
24	21.0	19.6	20.3	23.3	22.0	22.6	18.8	17.0	18.4	13.1	12.1	12.6
25	22.4	20.3	21.2	23.4	22.0	22.6	18.9	17.5	18.2	12.4	11.8	12.0
26	22.6	21.7	22.2	23.9	22.4	22.9	19.6	18.1	19.2	12.1	11.3	11.9
27	21.7	20.0	20.7	23.5	22.8	23.2	19.5	18.0	19.3	12.0	10.9	11.6
28	20.5	19.2	19.8	23.4	22.8	23.0	19.4	18.4	18.9	12.0	11.1	11.4
29	20.2	18.9	19.6	23.6	22.4	22.9	18.4	18.1	18.2	11.1	10.1	10.6
30	20.9	19.4	20.1	23.0	21.9	22.4	18.2	17.6	17.9	10.2	9.5	9.7
31	---	---	---	22.3	21.1	21.7	18.4	17.8	18.2	---	---	---
MONTH	22.6	16.2	18.8	---	---	---	---	---	---	---	---	---

MISSISSIPPI RIVER MAIN STEM

05288550 MISSISSIPPI RIVER AT FRIDLEY, MN

OXYGEN, DISSOLVED (DO), MG/L, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	13.3	11.2	12.1	14.5	13.8	14.2	14.7	14.5	14.6	13.7	13.4	13.6
2	14.2	10.9	12.3	14.9	14.5	14.7	15.0	14.7	14.8	13.6	10.6	12.0
3	14.4	11.6	12.5	15.0	14.6	14.8	15.3	15.0	15.2	12.8	10.6	12.1
4	15.1	11.4	12.7	14.7	14.5	14.6	15.2	14.7	15.0	13.0	12.3	12.6
5	14.5	11.3	12.4	14.9	14.7	14.8	14.7	14.6	14.6	12.5	11.9	12.3
6	13.5	10.9	11.9	14.9	13.7	14.2	14.5	9.6	11.3	12.7	11.7	12.3
7	12.0	9.2	10.9	13.7	13.3	13.6	13.5	10.7	13.0	12.7	11.8	12.3
8	---	---	---	13.5	13.2	13.4	13.5	13.0	13.2	12.8	12.1	12.4
9	13.3	9.2	11.3	13.4	13.3	13.4	13.2	12.5	13.0	13.0	12.2	12.7
10	13.2	9.9	11.1	13.6	13.3	13.4	13.5	12.7	13.3	12.8	12.1	12.6
11	13.4	11.4	12.3	14.0	13.6	13.8	13.7	12.5	13.3	13.0	12.5	12.7
12	13.0	11.4	12.0	14.1	13.9	14.0	13.7	13.6	13.7	13.1	12.2	12.6
13	13.2	11.1	11.8	14.1	13.8	14.0	14.2	13.7	14.0	---	---	---
14	12.0	10.9	11.3	13.8	13.3	13.6	14.2	14.1	14.2	---	---	---
15	11.4	8.3	10.9	13.8	13.3	13.5	14.2	14.0	14.1	13.0	12.2	12.8
16	10.4	7.1	8.1	15.9	10.8	14.3	14.0	13.6	13.8	13.0	12.4	12.7
17	---	---	---	---	---	---	13.9	13.7	13.9	13.3	12.2	12.8
18	---	---	---	---	---	---	14.1	13.9	14.0	13.7	12.2	12.8
19	13.6	13.1	13.3	---	---	---	13.9	13.7	13.8	13.3	12.4	13.1
20	13.5	13.3	13.4	---	---	---	13.7	13.6	13.7	13.6	12.7	13.1
21	13.6	13.1	13.5	---	---	---	13.9	13.5	13.7	13.5	12.9	13.1
22	15.5	13.7	15.1	14.2	13.9	14.1	14.0	13.8	13.9	13.1	12.2	13.0
23	15.6	13.1	14.2	14.2	13.9	14.0	13.9	13.7	13.7	13.1	12.7	12.9
24	13.2	13.0	13.1	14.1	13.7	13.9	13.8	13.7	13.8	13.2	12.6	12.9
25	13.3	12.9	13.2	13.8	13.5	13.7	13.8	13.7	13.8	13.3	12.7	13.0
26	13.2	12.8	13.0	13.4	13.2	13.2	13.8	13.7	13.8	13.0	12.4	12.6
27	12.9	12.4	12.6	14.1	13.1	13.7	13.7	13.4	13.6	12.9	12.4	12.6
28	13.3	12.8	13.2	14.5	14.2	14.4	13.5	13.3	13.4	13.8	12.8	13.2
29	13.8	13.5	13.6	14.7	14.5	14.6	13.7	13.4	13.5	13.4	13.2	13.3
30	13.7	13.5	13.6	14.6	14.5	14.6	13.7	13.6	13.7	13.2	12.8	13.0
31	13.9	13.7	13.8	---	---	---	13.7	13.7	13.7	13.3	12.6	13.1
MONTH	---	---	---	---	---	---	15.3	9.6	13.8	---	---	---

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	13.2	12.9	13.0	---	---	---	14.4	13.6	14.1	10.1	9.7	9.9
2	13.2	12.9	13.1	15.1	14.3	14.9	14.4	12.8	13.5	10.3	9.3	9.8
3	13.2	12.8	13.0	---	---	---	12.8	12.2	12.5	9.8	9.2	9.6
4	13.1	12.6	13.0	15.0	14.7	14.9	14.2	12.0	12.2	9.2	8.7	9.1
5	13.1	12.8	13.0	15.0	14.2	14.8	12.1	11.9	12.0	9.8	8.6	9.2
6	13.3	13.0	13.2	15.1	14.1	14.4	12.0	11.8	11.9	9.6	9.1	9.4
7	13.4	13.0	13.2	14.1	12.6	13.4	11.9	11.6	11.7	10.6	8.8	9.8
8	13.3	13.2	13.2	13.7	13.0	13.3	11.7	11.5	11.6	10.2	9.6	10.0
9	13.5	13.1	13.3	13.9	12.6	13.4	14.0	11.6	12.8	9.6	8.6	9.2
10	13.6	12.9	13.3	14.0	12.7	13.4	13.8	13.3	13.6	8.8	8.0	8.5
11	13.0	12.8	12.9	14.1	12.7	13.5	13.5	12.6	13.1	7.9	7.3	7.6
12	13.2	12.5	12.8	14.4	13.3	13.6	12.6	12.0	12.3	9.3	6.9	7.8
13	12.8	12.5	12.6	13.6	13.0	13.4	12.0	11.4	11.7	9.6	8.7	9.1
14	13.2	12.6	12.8	---	---	---	11.7	11.2	11.4	9.5	8.7	9.1
15	13.2	12.7	13.0	---	---	---	11.5	11.2	11.3	9.6	9.1	9.4
16	13.2	12.6	12.9	---	---	---	12.6	10.5	11.7	10.0	9.2	9.6
17	13.2	12.6	12.8	14.8	13.4	13.8	12.8	11.4	12.6	10.0	9.5	9.9
18	12.6	12.1	12.3	13.9	13.2	13.6	12.3	11.2	11.7	9.8	9.2	9.6
19	13.1	11.9	12.5	15.0	10.9	13.1	11.7	10.6	11.4	10.9	9.0	9.9
20	13.0	12.5	12.8	---	---	---	11.2	9.4	10.2	9.8	9.1	9.4
21	12.9	12.7	12.8	16.4	15.6	16.0	10.1	9.0	9.4	9.8	7.8	8.8
22	12.8	12.6	12.7	16.2	14.7	15.5	9.2	7.7	8.7	9.5	8.8	9.2
23	13.0	12.0	12.7	14.9	14.1	14.8	10.6	7.6	9.1	9.6	9.1	9.3
24	13.0	12.5	12.8	---	---	---	11.2	10.5	10.9	9.4	8.8	9.2
25	13.1	12.8	12.9	16.3	15.9	16.1	13.3	11.1	12.5	8.8	8.4	8.6
26	14.0	12.6	13.3	16.2	15.2	15.8	15.2	13.4	14.4	9.0	8.2	8.6
27	14.5	13.8	14.2	15.3	14.0	14.5	14.8	13.5	14.1	8.9	8.5	8.7
28	14.4	12.9	13.9	14.4	13.9	14.1	14.2	11.0	12.6	8.7	8.2	8.5
29	---	---	---	14.5	14.1	14.3	11.5	10.9	11.2	9.6	8.2	9.0
30	---	---	---	14.3	12.0	13.7	11.7	9.7	10.4	9.7	9.0	9.4
31	---	---	---	15.3	14.1	14.3	---	---	---	9.4	8.7	9.0
MONTH	14.5	11.9	13.0	---	---	---	15.2	7.6	11.9	10.9	6.9	9.2

MISSISSIPPI RIVER MAIN STEM

05288550 MISSISSIPPI RIVER AT FRIDLEY, MN

OXYGEN, DISSOLVED (DO), MG/L, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	9.2	8.7	8.9	7.8	7.0	7.4	9.1	7.8	8.7	9.6	8.5	8.8
2	10.9	8.9	9.9	9.1	6.7	8.0	8.4	7.9	8.2	9.3	8.6	8.8
3	10.8	10.2	10.6	8.9	8.4	8.6	8.3	7.5	7.8	8.6	7.2	7.7
4	10.6	9.3	9.9	9.0	8.1	8.5	8.2	7.3	7.6	9.5	6.7	8.4
5	9.7	9.2	9.5	9.0	8.4	8.6	7.8	7.1	7.5	9.4	8.9	9.1
6	9.7	8.7	9.3	8.6	8.0	8.3	9.6	6.8	8.2	---	---	---
7	9.4	8.5	9.1	9.0	7.6	8.3	9.7	8.2	8.7	---	---	---
8	9.0	8.5	8.8	8.2	7.6	7.9	9.4	7.9	8.6	9.6	8.3	9.0
9	9.3	8.4	8.9	9.0	7.2	8.1	8.9	8.1	8.5	9.1	8.3	8.8
10	9.2	8.9	9.0	8.9	8.0	8.3	9.3	8.3	8.7	9.8	8.2	9.1
11	9.5	8.5	9.2	9.2	7.7	8.3	10.1	8.4	9.1	9.8	9.3	9.5
12	9.7	9.4	9.6	8.8	8.0	8.4	9.0	8.3	8.6	10.1	9.1	9.6
13	9.8	7.4	9.5	8.4	7.3	7.8	---	---	---	9.8	9.2	9.6
14	9.4	9.0	9.2	8.9	7.2	8.1	9.3	8.3	8.6	9.3	8.3	9.0
15	9.2	8.6	9.1	9.1	8.0	8.7	10.6	8.1	9.4	10.5	8.5	9.6
16	9.5	8.8	9.1	9.3	8.2	8.6	10.0	9.4	9.7	10.0	9.5	9.7
17	9.2	8.5	8.9	8.6	7.9	8.2	9.5	8.9	9.3	10.0	9.5	9.7
18	9.0	8.4	8.7	8.6	7.6	8.1	10.7	8.5	9.7	9.8	9.2	9.5
19	8.9	8.4	8.6	8.7	7.9	8.2	10.6	10.0	10.3	9.3	8.7	9.0
20	9.6	8.3	8.9	8.2	7.2	7.8	10.2	9.1	9.7	9.2	8.6	8.9
21	9.0	8.4	8.7	8.5	6.8	7.7	9.6	8.9	9.2	9.2	8.5	8.8
22	9.3	8.3	8.6	---	---	---	9.9	8.5	9.3	8.5	7.5	8.2
23	9.9	7.8	8.9	9.4	8.5	9.0	9.6	9.2	9.4	8.7	7.0	7.6
24	9.8	8.5	9.0	8.6	8.0	8.3	10.1	8.7	9.2	10.4	7.1	9.1
25	9.8	8.0	8.8	9.2	8.0	8.6	10.4	9.0	9.7	10.4	10.1	10.3
26	9.1	7.8	8.3	9.0	8.3	8.6	10.1	8.8	9.6	10.8	10.0	10.4
27	8.7	8.4	8.5	8.3	7.7	8.1	9.5	8.6	9.2	10.5	10.1	10.4
28	8.8	8.3	8.6	8.9	7.3	8.2	9.7	8.7	9.1	10.2	10.0	10.1
29	8.4	8.2	8.3	9.2	8.4	8.7	9.5	9.1	9.3	10.9	10.2	10.5
30	8.2	7.8	8.0	9.4	8.5	8.8	9.7	9.0	9.3	11.0	10.6	10.8
31	---	---	---	9.2	8.8	9.0	9.2	8.6	8.9	---	---	---
MONTH	10.9	7.4	9.0	---	---	---	---	---	---	---	---	---

MINNESOTA RIVER BASIN

05291000 WHETSTONE RIVER NEAR BIG STONE CITY, SD

LOCATION.--Lat 45°17'32", long 96°29'14", in SE¼NW¼ sec.18, T.121 N., R.46 W., Grant County, Hydrologic Unit 07020001, on right bank 20 ft downstream from former highway bridge site, 1.5 mi west of Big Stone City, and 4.5 mi upstream from Big Stone Lake.

DRAINAGE AREA.--389 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1910 to November 1912 (no winter records), and March 1931 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 895: Drainage area. WSP 1308: 1932(M), 1935(M).

GAGE.--Water-stage recorder. Datum of gage is 996.96 ft adjustment of 1912. Mar. 8, 1910, to Nov. 30, 1912, nonrecording gage 2 mi downstream at different datum. Mar. 18, 1931, to May 3, 1939, nonrecording gage, at site 20 ft upstream at present datum. May 4, 1939, to Nov. 8, 1952, water-stage recorder at site 80 ft downstream at present datum.

REMARKS.--Estimated daily discharges: Nov. 1-3 and Nov. 10 to Mar. 19. Records good except those for periods with ice effect, Nov. 1-3 and Nov. 10 to Mar. 19, which are fair.

AVERAGE DISCHARGE.--54 years (water years 1932-85), 48.3 ft^3/s, 1.69 in/yr, 34,990 acre-ft/yr; median of yearly mean discharges, 35 ft^3/s, 1.22 in/yr, 25,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,870 ft^3/s, Apr. 8, 1969, gage height, 14.32 ft from floodmark; no flow at times in most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage known, about 26 ft in June 1919, present site and datum, from information by local resident, discharge 29,000 ft^3/s.

EXTREMES FOR CURRENT YEAR.--Peak discharge above 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. 19	1430	* 3,900	* 11.13	Apr. 25	0445	241	3.78

Minimum discharge, 2.7 ft^3/s, Aug. 22; minimum gage height, 1.01 ft, July 16.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.5	16	11	6.4	4.3	158	123	82	26	7.7	5.2	4.3
2	4.3	19	11	6.3	4.3	130	113	74	19	7.2	5.2	5.2
3	3.9	19	11	6.3	4.3	110	108	68	19	6.8	4.9	6.8
4	4.0	21	11	6.4	4.3	140	102	59	21	6.1	4.5	10
5	3.9	22	11	6.4	4.3	130	94	51	20	5.7	4.3	9.2
6	4.7	24	11	6.4	4.4	108	88	45	17	5.3	4.0	8.3
7	5.5	22	11	6.4	4.4	86	80	40	16	5.1	3.7	8.8
8	5.8	19	11	6.3	4.5	63	74	38	15	5.0	3.5	11
9	5.9	18	11	6.2	4.8	45	67	35	13	5.2	3.3	16
10	6.0	16	11	6.0	5.0	42	64	33	13	5.0	3.7	25
11	6.1	15	11	5.9	5.2	42	60	37	16	4.5	3.5	57
12	5.6	15	9.8	5.8	5.4	50	59	42	22	4.0	6.1	43
13	5.5	15	11	5.7	5.7	67	60	35	23	3.9	8.2	27
14	7.4	14	11	5.7	5.7	74	61	39	23	4.1	5.2	20
15	16	13	11	5.6	5.7	142	63	49	26	3.7	4.2	14
16	25	12	11	5.5	5.8	362	63	55	23	3.9	3.9	11
17	20	12	10	5.4	6.4	642	61	69	18	4.0	3.8	8.6
18	24	13	9.6	5.4	8.0	1680	57	72	15	5.2	3.4	6.6
19	99	13	9.2	5.3	14	3340	56	62	14	6.8	2.9	5.6
20	119	13	9.0	5.3	25	2280	54	50	13	5.6	2.9	5.5
21	121	13	9.0	5.2	50	1260	54	44	12	4.3	2.8	5.1
22	96	13	8.8	5.2	75	922	59	36	11	3.8	2.7	5.2
23	77	13	8.5	5.1	64	842	110	32	9.7	3.8	5.6	4.7
24	56	14	8.3	5.1	58	639	182	27	9.2	7.7	23	4.8
25	46	14	8.0	5.0	62	445	233	24	8.9	15	11	6.7
26	41	14	7.8	5.0	88	299	184	22	9.5	8.2	7.0	5.3
27	33	13	7.8	4.9	125	259	148	23	9.9	6.8	4.5	4.4
28	29	13	7.4	4.9	145	246	121	20	9.5	5.7	4.4	4.1
29	30	13	7.0	4.8	---	204	101	18	8.7	5.1	4.8	3.9
30	30	12	6.8	4.7	---	165	98	17	8.1	5.0	5.1	7.1
31	28	---	6.4	4.6	---	144	---	29	---	5.7	4.4	---
TOTAL	963.1	463	298.4	173.2	798.5	15116	2797	1327	468.5	175.9	161.7	354.2
MEAN	31.1	15.4	9.63	5.59	28.5	488	93.2	42.8	15.6	5.67	5.22	11.8
MAX	121	24	11	6.4	145	3340	233	82	26	15	23	57
MIN	3.9	12	6.4	4.6	4.3	42	54	17	8.1	3.7	2.7	3.9
CFSM	.08	.04	.03	.01	.07	1.25	.24	.11	.04	.02	.01	.03
IN.	.09	.04	.03	.02	.08	1.45	.27	.13	.04	.02	.02	.03
AC-FT	1910	918	592	344	1580	29980	5550	2630	929	349	321	703

CAL YR 1984	TOTAL	39206.2	MEAN	107	MAX	3610	MIN	3.3	CFSM	.28	IN	3.75	AC-FT	77770
WTR YR 1985	TOTAL	23096.5	MEAN	63.3	MAX	3340	MIN	2.7	CFSM	.16	IN	2.21	AC-FT	45810

MINNESOTA RIVER BASIN

05291000 WHETSTONE RIVER NEAR BIG STONE CITY, SD--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1960-62, 1967 to 69, 1974 to current year.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: October 1973 to September 1981, March to August 1982, March to August 1983, March to August 1984, March to August 1985.
SUSPENDED-SEDIMENT DISCHARGE: October 1973 to September 1981, March to August 1982, March to August 1983, March to August 1984, March to August 1985.

REMARKS.--Daily sediment concentrations were estimated on the basis of water records and daily sediment samples. Water temperature was obtained when sediment samples were collected.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: Maximum daily, 34.0°C July 7, 1974; minimum daily, 0.0°C many days during winter period.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 2,540 mg/L, Mar. 27, 1979; minimum daily mean, 0 mg/L, July 30, 31, Aug. 1-7, 24-26, 1976.
SEDIMENT LOADS: Maximum daily, 5,700 tons, Mar. 31, 1982; minimum daily, 0 ton, July 30,31, Aug. 1-7, 24-26, 1976.

EXTREMES FOR CURRENT PERIOD.--March to August 1985:
WATER TEMPERATURES: Maximum daily, 31.0°C, July 20,23; minimum daily, 0.0°C many days during winter period.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 402 mg/L, Mar. 19; minimum daily mean, 6 mg/L, Mar. 1-9.
SEDIMENT LOADS: Maximum daily, 3,630 tons, Mar. 19; minimum daily, 0.12 ton, Aug. 22.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1					---	---	4.0	21.0	---	---	---	---
2					---	---	13.0	22.0	---	---	---	---
3					---	---	11.0	21.0	---	---	---	---
4					---	---	9.0	19.0	19.0	---	---	---
5					---	---	10.0	17.0	22.0	---	---	---
6					---	---	9.0	---	22.0	---	---	---
7					---	---	8.0	---	---	---	---	---
8					---	---	9.0	21.0	28.0	29.0	---	---
9					---	3.0	13.0	---	26.0	29.0	24.0	---
10					---	3.0	---	---	---	---	20.0	---
11					---	4.0	16.0	---	---	---	25.0	---
12					---	---	15.0	19.0	22.0	30.0	23.0	17.0
13					.0	---	---	17.0	23.0	29.0	23.0	---
14					---	7.0	14.0	---	26.0	---	25.0	---
15					---	4.0	18.0	---	25.0	30.0	26.0	---
16					---	5.0	---	17.0	23.0	27.0	---	---
17					---	6.0	18.0	21.0	24.0	21.0	---	---
18					---	---	19.0	23.0	---	---	---	---
19					---	5.0	22.0	22.0	---	30.0	---	---
20					---	6.0	---	---	24.0	31.0	21.0	---
21					---	9.0	---	22.0	23.0	27.0	23.0	---
22					---	8.0	14.0	23.0	24.0	---	23.0	---
23					---	7.0	13.0	---	26.0	31.0	24.0	---
24					---	6.0	13.0	---	---	---	24.0	---
25					---	9.0	---	---	27.0	---	20.0	---
26					---	9.0	12.0	---	24.0	24.0	25.0	---
27					---	8.0	13.0	---	---	22.0	22.0	---
28					---	8.0	18.0	21.0	22.0	---	22.0	---
29					---	7.0	---	25.0	22.0	---	22.0	---
30					---	6.0	21.0	23.0	---	---	23.0	---
31					---	7.0	---	18.0	---	---	20.0	---
MAX						9.0	22.0	25.0	28.0	31.0	26.0	
MIN					.0		4.0	17.0	19.0	21.0	20.0	

WTR YR 1985 MAX 31.0 MIN .0

MINNESOTA RIVER BASIN

05291000 WHETSTONE RIVER NEAR BIG STONE CITY, SD--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1											6	2.6
2											6	2.1
3											6	1.8
4											6	2.3
5											6	2.1
6											6	1.7
7											6	1.4
8											6	1.0
9											6	.73
10											8	.91
11											9	1.0
12											12	1.6
13											16	2.9
14											20	4.0
15											56	21
16											132	129
17											170	295
18											280	1270
19											402	3630
20											293	1800
21											223	759
22											242	602
23											209	475
24											140	242
25											116	139
26											96	78
27											89	62
28											49	33
29											31	17
30											59	26
31											49	19
TOTAL											---	9623.14

	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER
1	44	15	128	28	90	6.3	94	2.0	26	.37	
2	52	16	68	14	70	3.6	95	1.8	26	.37	
3	78	23	65	12	60	3.1	95	1.7	26	.34	
4	92	25	118	19	56	3.2	96	1.6	26	.32	
5	71	18	144	20	60	3.2	98	1.5	26	.30	
6	55	13	145	18	80	3.7	103	1.5	26	.28	
7	42	9.1	145	16	84	3.6	100	1.4	26	.26	
8	22	4.4	144	15	72	2.9	94	1.3	26	.25	
9	111	20	145	14	90	3.2	96	1.3	32	.29	
10	138	24	148	13	93	3.3	87	1.2	39	.39	
11	82	13	155	15	57	2.5	50	.61	40	.38	
12	200	32	173	20	42	2.5	28	.30	37	.61	
13	196	32	211	20	59	3.7	24	.25	47	1.0	
14	129	21	207	22	83	5.2	24	.27	30	.42	
15	112	19	187	25	98	6.9	26	.26	48	.54	
16	97	16	160	24	116	7.2	30	.32	32	.34	
17	72	12	104	19	72	3.5	32	.35	32	.33	
18	65	10	131	25	28	1.1	35	.49	31	.28	
19	39	5.9	144	24	19	.72	31	.57	31	.24	
20	36	5.2	138	19	52	1.8	30	.45	36	.28	
21	68	9.9	134	16	52	1.7	33	.38	19	.14	
22	94	15	91	8.8	38	1.1	30	.31	17	.12	
23	163	48	64	5.5	24	.63	28	.29	56	.85	
24	186	91	60	4.4	58	1.4	93	1.9	33	2.0	
25	137	86	57	3.7	123	3.0	74	3.0	28	.83	
26	135	67	53	3.1	103	2.6	43	.95	14	.26	
27	168	67	50	3.1	87	2.3	29	.53	19	.23	
28	166	54	34	1.8	77	2.0	26	.40	14	.17	
29	158	43	43	2.1	89	2.1	26	.36	18	.23	
30	165	44	95	4.4	93	2.0	26	.35	13	.18	
31	---	---	115	9.0	---	---	26	.40	15	.18	
TOTAL	---	858.5	---	443.9	---	90.05	---	28.04	---	12.78	

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	TEMPER-ATURE (DEG C) (00010)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SED. SUSP. FALL DIAM. % FINER THAN .002 MM (70337)	SED. SUSP. FALL DIAM. % FINER THAN .004 MM (70338)	SED. SUSP. FALL DIAM. % FINER THAN .016 MM (70340)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)	SED. SUSP. SIEVE DIAM. % FINER THAN .125 MM (70332)
MAR									
19...	1620	3900	5.0	431	56	66	81	99	100

MINNESOTA RIVER BASIN

05291500 BIG STONE LAKE AT ORTONVILLE, MN

LOCATION.--Lat 45°18'18", long 96°26'57", in NW¼SW¼ sec.9, T.121 N., R.46 W., Big Stone County, Hydrologic Unit 07020001, at powerplant intake at west edge of Ortonville, 0.5 mi north of concrete dam at outlet, 0.5 mi southwest of Ortonville.

PERIOD OF RECORD.--March 1937 to current year.

GAGE.--Nonrecording gage read once a day. Datum of gage is 957.69 ft above National Geodetic Vertical Datum of 1929. Prior to Sept. 17, 1947, nonrecording gage at site 0.5 mi south at same datum. Sept. 18, 1947, to June 30, 1963, water-stage recorder at site 0.5 mi south at same datum. Sept. 21, 1959, to June 30, 1963, supplementary nonrecording gage read once daily, at present site and datum.

REMARKS.--Natural lake with concrete dam at outlet. Fixed crest of dam is at 5.95 ft, with one 5 ft and two 2.5 ft gates with lowest sill at 0.71 ft.

Silt barrier dam 700 ft upstream in outlet channel of lake completed July 7, 1958; crest at 5.9 ft. Supplementary nonrecording gage readings used for stages below crest of silt barrier to June 30, 1963. Water level subject to fluctuation caused by wind action.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 12.73 ft, Apr. 17, 1952; minimum observed, 3.53 ft, Mar. 2, 1957 (strong upstream wind in channel). Minimum observations of 3.10 ft, Mar. 2, 1940, and 2.20 ft, Nov. 20, 1940, at spillway site are the result of blockage of channel to spillway by ice and snow and do not represent lake elevations.

EXTREMES FOR CURRENT YEAR.--Maximum gage height observed, 9.30 ft, Mar. 21, 22, 23; minimum observed, 5.90 ft, May 4 (35 mph wind blowing upstream in channel).

GAGE HEIGHT, IN FEET, OCTOBER 1984 TO SEPTEMBER 1985

Oct. 31 ..... 6.60	Feb. 28 ..... 7.30	June 30 ..... 7.00
Nov. 30 ..... 6.95	Mar. 31 ..... 8.54	July 31 ..... 6.75
Dec. 30 ..... 7.15	Apr. 30 ..... 7.00	Aug. 31 ..... 6.60
Jan. 31 ..... 7.25	May 31 ..... 7.30	Sept. 30 ..... 6.90

NOTE.--Gage-height record other than that shown above is available in the District office.

MINNESOTA RIVER BASIN

05292000 MINNESOTA RIVER AT ORTONVILLE, MN

LOCATION.--Lat 45°17'44", long 96°26'38", in NE¼NW¼ sec.16, T.121 N., R.46 W., Big Stone County, Hydrologic Unit 07020001, on left bank 400 ft downstream from bridge on U.S. Highway 12 and 1,300 ft downstream from dam at outlet of Big Stone Lake, at Ortonville.

DRAINAGE AREA.--1,160 mi^2, approximately.

PERIOD OF RECORD.--February 1938 to current year.

REVISED RECORDS.--WSP 895: 1939. WSP 1508: 1942 (yearly mean).

GAGE.--Water-stage recorder. Datum of gage is 956.38 ft above National Geodetic Vertical Datum of 1929. Prior to Mar. 31, 1939, nonrecording gage on downstream side of dam 1,300 ft upstream at datum 1.31 ft higher.

REMARKS.--Estimated daily discharges: Oct. 31 to Nov. 2 and Dec. 17 to Mar. 17. Records good except those for periods with ice effect, Oct. 31 to Nov. 2 and Dec. 17 to Mar. 17, which are fair. Some regulation by Big Stone Lake (station 05291500).

AVERAGE DISCHARGE.--47 years, 107 ft^3/s, 77,520 acre-ft/yr; median of yearly mean discharges, 83 ft^3/s, 60,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,060 ft^3/s, Apr. 13, 1952, gage height, 12.92 ft; no flow Dec. 13, 1940.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,940 ft^3/s, Mar. 21, gage height, 8.62 ft; minimum, 0.10 ft^3/s, Sept. 26, 27, gage height, 0.96 ft.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.0	.52	.47	2.3	11	4.6	969	81	53	26	2.0	.43
2	1.9	.31	.55	2.3	12	5.0	930	79	53	28	1.6	1.1
3	2.3	.40	.52	2.3	13	9.8	892	77	53	30	1.5	1.3
4	1.5	.47	.52	2.5	13	31	681	76	54	29	1.7	1.3
5	2.1	.49	.60	2.5	14	32	409	76	53	23	1.8	.86
6	3.5	.49	.71	2.8	14	35	395	75	53	23	2.0	.60
7	2.5	.50	.65	3.0	14	37	383	73	54	24	1.8	.52
8	2.5	.91	.83	3.0	14	36	456	73	52	25	2.0	1.5
9	2.5	2.2	.92	3.0	14	68	490	72	46	26	2.1	1.4
10	2.2	3.3	1.2	3.4	14	130	413	71	45	26	2.1	.93
11	2.4	2.7	1.3	3.8	14	112	354	72	34	14	1.8	.88
12	2.5	2.9	1.2	4.1	14	115	343	67	18	5.7	3.5	.64
13	2.0	3.7	1.3	4.6	15	114	341	43	17	4.9	1.5	.38
14	13	4.6	1.3	5.0	13	70	262	38	23	4.7	1.1	.37
15	17	16	1.2	5.5	12	167	156	33	40	4.6	.95	.34
16	1.4	6.1	2.0	5.5	16	288	304	26	35	4.0	.86	.34
17	.43	5.4	1.6	6.0	14	309	440	23	34	2.4	.77	.47
18	6.2	4.8	1.6	6.0	14	608	436	36	13	1.9	.79	.54
19	69	4.0	1.6	6.6	15	1160	430	25	8.3	1.6	.71	.66
20	3.0	3.7	1.8	6.6	18	1470	428	14	8.2	1.5	.67	.70
21	.71	3.9	1.8	7.2	15	1700	421	11	14	1.7	.74	.58
22	.58	6.2	1.9	7.7	5.0	1810	432	8.6	15	1.7	.74	.80
23	.56	6.7	1.9	8.4	4.2	1620	447	8.0	15	1.6	1.8	.72
24	.54	8.6	1.9	9.1	4.6	1480	439	7.0	17	4.3	.81	.43
25	.61	12	1.9	9.5	9.8	1410	446	7.2	24	2.2	.65	.34
26	.57	12	2.1	10	7.7	1260	441	7.0	33	2.0	.58	.25
27	1.2	19	2.1	10	3.4	1190	433	5.0	26	1.7	.49	.18
28	1.4	.91	2.1	10	4.2	1150	426	11	25	1.8	.63	.26
29	.68	.40	2.3	10	---	1110	295	51	24	1.8	.55	.33
30	.92	.47	2.3	11	---	1060	84	52	24	2.1	.54	.24
31	.63	---	2.3	11	---	1020	---	47	---	2.5	.43	---
TOTAL	147.33	133.67	44.47	184.7	331.9	19611.4	13376	1344.8	963.5	328.7	39.21	19.39
MEAN	4.75	4.46	1.43	5.96	11.9	633	446	43.4	32.1	10.6	1.26	.65
MAX	69	19	2.3	11	18	1810	969	81	54	30	3.5	1.5
MIN	.43	.31	.47	2.3	3.4	4.6	84	5.0	8.2	1.5	.43	.18
CFSM	.004	.004	.001	.005	.01	.55	.38	.04	.03	.009	.001	.001
IN.	.00	.00	.00	.01	.01	.63	.43	.04	.03	.01	.00	.00
AC-FT	292	265	88	366	658	38900	26530	2670	1910	652	78	38

CAL YR 1984 TOTAL 68257.71 MEAN 186 MAX 1060 MIN .14 CFSM .16 IN 2.19 AC-FT 135400
WTR YR 1985 TOTAL 36525.07 MEAN 100 MAX 1810 MIN .18 CFSM .09 IN 1.17 AC-FT 72450

MINNESOTA RIVER BASIN

05293000 YELLOW BANK RIVER NEAR ODESSA, MN

LOCATION.--Lat 45°13'35", long 96°21'12", in SE¼SE¼ sec.1, T.120 N., R.46 W., Lac qui Parle County, Hydrologic Unit 07020001, on left bank 150 ft downstream from highway bridge, 2.5 mi southwest of Odessa, and 4.5 mi upstream from mouth.

DRAINAGE AREA.--398 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1939 to current year.

REVISED RECORDS.--WSP 1388: 1947(M), 1950.

GAGE.--Water-stage recorder. Datum of gage is 953.34 ft above National Geodetic Vertical Datum of 1929 (U.S. Army Corps of Engineers bench mark). Prior to Aug. 28, 1940, nonrecording gage at site 150 ft upstream at same datum.

REMARKS.--Estimated daily discharges: Nov. 2, 3, 5, 11, 12, 15, 17-19, Nov. 30 to Mar. 18. Records good except those for periods of ice effect, Nov. 2, 3, 5, 11, 12, 15, 17-19, and Nov. 30 to Mar. 18, which are fair.

AVERAGE DISCHARGE.--46 years, 57.4 ft^3/s, 1.96 in/yr, 41,590 acre-ft/yr; median of yearly mean discharges, 48 ft^3/s, 1.64 in/yr, 34,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,970 ft^3/s, Apr. 9, 1969, gage height, 19.07 ft, from floodmark; no flow at times in several years.

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)
Oct. 21	0715	682	6.09	Sept. 5	1430	602	6.24
Mar. 20	0745	*2,620	*11.86	Sept. 11	0845	942	7.84
Apr. 25	1230	414	5.23				

Minimum discharge, 1.2 ft^3/s, Oct. 5, 6, gage height, 1.89 ft.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.9	60	22	15	7.9	130	235	129	38	11	14	53
2	1.6	58	22	15	7.7	110	198	111	34	10	12	90
3	1.5	61	20	15	7.6	108	170	99	31	9.1	11	340
4	1.9	52	19	15	7.4	105	151	87	29	7.9	11	410
5	1.3	50	19	15	7.5	110	136	77	26	6.9	10	582
6	1.8	49	19	15	7.5	108	128	68	24	6.4	9.2	489
7	2.0	45	20	15	7.5	105	114	60	22	6.1	7.6	336
8	1.9	44	22	14	7.6	94	101	56	21	5.6	6.7	246
9	1.9	45	23	13	7.7	85	91	51	18	5.1	5.8	380
10	1.9	39	23	13	7.8	77	81	45	17	4.7	5.4	679
11	1.9	35	22	13	7.8	75	76	43	19	4.4	4.7	910
12	3.0	33	22	12	7.9	80	71	44	21	4.3	5.1	670
13	3.0	31	21	12	8.0	100	67	44	22	3.9	6.7	472
14	5.1	31	21	12	8.3	165	66	55	24	3.9	7.0	357
15	22	31	22	12	9.5	495	66	64	25	3.7	6.7	292
16	31	29	21	12	12	995	65	77	23	3.5	8.5	248
17	46	33	20	12	12	1270	63	87	21	3.4	7.2	218
18	56	34	20	11	11	2040	61	98	21	4.4	6.1	195
19	182	32	19	10	11	1780	59	97	18	10	5.1	177
20	401	24	19	9.7	15	2470	56	82	16	16	6.4	159
21	639	24	19	9.6	48	1980	55	67	14	47	11	137
22	451	23	19	9.6	75	1360	60	59	13	55	8.2	123
23	307	23	19	9.5	82	1260	89	51	11	53	11	108
24	228	23	18	9.5	70	1130	192	47	10	46	11	100
25	183	22	18	9.4	110	975	389	43	9.4	66	11	92
26	153	22	18	9.3	150	730	328	40	9.6	57	9.8	82
27	132	21	17	9.0	130	567	256	38	11	38	10	73
28	110	21	17	8.6	145	477	207	35	11	27	11	65
29	95	21	16	8.6	---	396	168	33	11	20	34	60
30	82	24	16	8.3	---	325	144	32	11	16	75	59
31	73	---	15	8.1	---	274	---	39	---	14	97	---
TOTAL	3221.7	1040	608	360.2	988.7	19976	3943	1958	581.0	569.3	445.2	8202
MEAN	104	34.7	19.6	11.6	35.3	644	131	63.2	19.4	18.4	14.4	273
MAX	639	61	23	15	150	2470	389	129	38	66	97	910
MIN	1.3	21	15	8.1	7.4	75	55	32	9.4	3.4	4.7	53
CFSM	.26	.09	.05	.03	.09	1.62	.33	.16	.05	.05	.04	.69
IN.	.30	.10	.06	.03	.09	1.87	.37	.18	.05	.05	.04	.77
AC-FT	6390	2060	1210	714	1960	39620	7820	3880	1150	1130	883	16270

CAL YR 1984 TOTAL 45957.6 MEAN 126 MAX 2870 MIN 1.1 CFSM .32 IN 4.30 AC-FT 91160
WTR YR 1985 TOTAL 41893.1 MEAN 115 MAX 2470 MIN 1.3 CFSM .29 IN 3.92 AC-FT 83090

05293000 YELLOW BANK RIVER NEAR ODESSA, MN--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1961-62, 1974 to 1981, March to August 1982, March to August 1983, March to August 1984, March to August 1985.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: October 1973 to September 1981, March to August 1982, March to August 1983, March to August 1984, March to August 1985.
SUSPENDED-SEDIMENT DISCHARGE: October 1973 to September 1981, March to August 1982, March to August 1983, March to August 1984, March to August 1985.

REMARKS.--Daily sediment concentrations were estimated on the basis of water records and daily sediment samples. Water temperture was obtained when sediment samples were collected.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: Maximum daily, 29.0°C, July 10, 1974, July 17, 1975; minimum daily, 0.0°C on many days during winter periods.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 884 mg/L, June 16, 1984; minimum daily mean, no flow for several days during 1976, 1977, 1980.
SEDIMENT LOADS: Maximum daily, 4,880 tons, Apr. 13, 1979; minimum daily, no flow for several days during 1976, 1977, 1980.

EXTREMES FOR CURRENT PERIOD.--March to August 1985:
WATER TEMPERATURES: Maximum daily, 28.0°C, July 7; minimum daily, 0.0°C on several days during winter period.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 495 mg/L, Mar. 20; minimum daily mean, 6 mg/L, Mar. 9-11.
SEDIMENT LOADS: Maximum daily, 3,300 tons, Mar. 20; minimum daily, 0.73 ton, July 4.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1			---			2.0	4.0	15.0	17.0	21.0	20.0	---
2			---			1.0	5.0	15.0	15.0	22.0	21.0	---
3			---			---	7.0	17.0	13.0	22.0	21.0	---
4			---			---	9.0	18.0	14.0	23.0	23.0	---
5			---			---	7.0	15.0	14.0	23.0	22.0	---
6			---			---	5.0	14.0	17.0	23.0	22.5	---
7			---			---	7.0	15.0	19.0	28.0	20.0	---
8			---			.0	5.0	16.0	21.0	24.0	23.0	---
9			---			---	4.0	19.0	25.0	25.0	25.0	---
10			.0			---	7.0	21.0	19.0	21.0	18.0	---
11			---			---	9.0	21.0	17.0	23.0	18.0	---
12			---			---	11.0	19.0	16.0	22.0	20.0	17.0
13			---			---	10.0	15.0	17.0	25.0	20.0	---
14			---			---	8.0	15.0	17.0	23.0	18.0	---
15			---			2.0	11.0	14.0	20.0	20.0	19.0	---
16			---			2.0	11.0	13.0	21.0	21.0	20.0	---
17			---			3.0	10.0	14.0	19.0	22.0	20.0	---
18			---			3.0	13.0	---	17.0	22.5	18.0	---
19			---			2.0	15.0	---	18.0	22.0	17.0	---
20			---			6.0	17.0	20.0	18.0	22.0	16.0	---
21			---			4.0	21.0	15.0	21.5	23.0	18.0	---
22			---			5.0	16.0	18.0	18.5	21.0	20.0	---
23			---			5.0	13.0	19.0	22.0	22.0	20.0	---
24			---			5.0	11.0	19.0	27.0	24.0	19.0	---
25			---			4.0	11.0	21.0	24.0	22.0	18.0	---
26			---			7.0	10.0	20.0	21.0	23.0	21.0	---
27			---			7.0	10.0	18.0	20.0	22.0	21.0	---
28			---			5.0	17.0	19.0	18.5	26.0	20.0	---
29			---			5.0	15.0	19.0	18.0	21.0	20.5	---
30			---			3.0	17.0	20.0	22.0	20.0	20.0	---
31			---			3.0	---	18.0	---	19.5	21.0	---
MEAN							10.5		19.0	22.5	20.0	
MAX						7.0	21.0	21.0	27.0	28.0	25.0	
MIN			.0			.0	4.0	13.0	13.0	19.5	16.0	

WTR YR 1985 MAX 28.0 MIN .0

MINNESOTA RIVER BASIN

05293000 YELLOW BANK RIVER NEAR ODESSA, MN--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1											24	8.4
2											10	3.0
3											9	2.6
4											9	2.6
5											9	2.7
6											8	2.3
7											7	2.0
8											7	1.8
9											6	1.4
10											6	1.2
11											6	1.2
12											10	2.2
13											20	5.4
14											50	22
15											95	127
16											125	336
17											278	953
18											323	1780
19											348	1670
20											495	3300
21											494	2640
22											474	1740
23											438	1490
24											318	970
25											321	845
26											278	548
27											233	357
28											196	252
29											168	180
30											107	94
31											87	64
TOTAL											---	17404.8

	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER
1	84	53	110	38	208	21	49	1.5	92	3.5	
2	60	32	97	29	167	15	39	1.1	68	2.2	
3	52	24	127	34	108	9.0	72	1.8	127	3.8	
4	51	21	156	37	88	6.9	34	.73	105	3.1	
5	79	29	119	25	86	6.0	64	1.2	68	1.8	
6	63	22	92	17	123	8.0	67	1.2	85	2.1	
7	50	15	78	13	113	6.7	54	.89	174	3.6	
8	36	9.8	75	11	60	3.4	76	1.1	231	4.2	
9	67	16	95	13	41	2.0	60	.83	92	1.4	
10	151	33	76	9.2	81	3.7	64	.81	141	2.1	
11	163	33	71	8.2	113	5.8	112	1.3	128	1.6	
12	172	33	38	4.5	102	5.8	153	1.8	126	1.7	
13	198	36	50	5.9	39	2.3	93	.98	107	1.9	
14	159	28	60	8.9	32	2.1	85	.90	114	2.2	
15	174	31	71	12	65	4.4	117	1.2	110	2.0	
16	89	16	82	17	32	2.0	80	.76	90	2.1	
17	86	15	84	20	46	2.6	116	1.1	92	1.8	
18	64	11	84	22	77	4.4	116	1.4	83	1.4	
19	76	12	59	15	57	2.8	112	3.0	117	1.6	
20	65	9.8	37	8.2	57	2.5	75	3.2	133	2.3	
21	81	12	57	10	65	2.5	68	8.6	110	3.3	
22	76	12	58	9.2	63	2.2	88	13	136	3.0	
23	110	26	85	12	40	1.2	70	10	171	5.1	
24	267	138	87	11	40	1.1	109	14	59	1.8	
25	323	339	62	7.2	58	1.5	105	19	52	1.5	
26	261	231	73	7.9	102	2.6	74	11	89	2.4	
27	239	165	78	8.0	105	3.1	70	7.2	107	2.9	
28	132	74	70	6.6	37	1.1	48	3.5	49	1.5	
29	158	72	106	9.4	82	2.4	55	3.0	80	7.3	
30	113	44	96	8.3	82	2.4	67	2.9	60	12	
31	---	---	201	21	---	---	56	2.1	80	21	
TOTAL	---	1592.6	---	458.5	---	136.5	---	121.10	---	108.2	

SUSPENDED SEDIMENT SIZE ANALYSIS, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	TEMPER-ATURE (DEG C) (00010)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
MAR					
20...	1535	2450	6.0	548	83

MINNESOTA RIVER BASIN

05294000 POMME DE TERRE RIVER AT APPLETON, MN

LOCATION.--Lat 45°12'10", long 96°01'20", in SW¼NW¼ sec.14, T.120 N., R.43 W., Swift County, Hydrologic Unit 07020002, on left bank 60 ft upstream from bridge on U.S. Highway 59 and State Highway 119 at Appleton and 8 mi upstream from mouth.

DRAINAGE AREA.--905 mi^2, approximately.

PERIOD OF RECORD.--March 1931 to September 1935 (no winter records), October 1935 to current year. Prior to October 1953, published as "near Appleton."

REVISED RECORDS.--WSP 1308: 1931(M), 1937(M).

GAGE.--Water-stage recorder and concrete control. Datum of gage is 978.00 ft above National Geodetic Vertical Datum of 1929. Prior to Dec. 22, 1952, nonrecording gage at site 4 mi upstream at datum 25.17 ft higher.

REMARKS.--Estimated daily discharges: Nov. 1, 2, 17-23, Nov. 30 to Dec. 8, Dec. 12 to Mar. 14, and May 27. Records good except those for period of no gage-height record, May 27, and periods with ice effect, Nov. 1, 2, 17-23, Nov. 30 to Dec. 8, and Dec. 12 to Mar. 14, which are fair. Flow affected by lakes above station. Occasional regulation at low flow by old milldam 500 ft upstream.

AVERAGE DISCHARGE.--50 years (water years 1936-85), 109 ft^3/s, 1.64 in/yr, 78,970 acre-ft/yr; median of yearly mean discharge, 93 ft^3/s, 1.40 in/yr, 67,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,520 ft^3/s, Apr. 11, 1969, gage height, 13.78 ft; maximum gage height, 14.58 ft, Apr. 9, 1969 (backwater from ice); no flow for several periods.

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)
Oct. 21	1815	1,600	8.10	June 4	1700	842	6.78
Mar. 19	0015	*1,980	*8.87	June 14	0845	627	6.38
Apr. 26	0645	517	6.21	Sept.10	0200	271	5.60
May 19	1000	445	6.04				

Minimum discharge, 55 ft^3/s, Oct. 5, gage height, 4.68 ft.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	68	635	220	96	60	140	737	380	434	254	124	123
2	66	530	140	96	60	143	688	360	622	243	121	156
3	63	482	85	96	60	142	627	340	764	235	123	190
4	60	505	110	96	60	126	583	316	825	228	116	217
5	58	514	120	96	60	103	539	302	820	220	114	209
6	60	467	125	96	60	83	506	292	754	210	114	218
7	61	445	130	95	60	80	475	278	666	199	115	203
8	64	429	154	94	60	91	445	264	576	190	117	207
9	66	414	174	94	60	94	414	254	498	181	124	237
10	68	395	186	94	60	98	384	257	456	171	119	259
11	69	373	181	94	60	103	364	246	437	161	116	234
12	70	346	172	94	60	110	344	250	447	154	127	211
13	67	340	150	94	60	128	328	328	531	147	150	195
14	84	335	145	93	60	190	324	384	610	141	153	182
15	233	326	148	93	60	352	313	392	555	138	138	172
16	474	280	154	93	62	522	302	392	469	132	129	163
17	631	225	154	92	62	924	288	414	416	129	120	154
18	688	205	140	88	64	1520	282	427	387	138	113	152
19	710	210	134	83	66	1670	271	436	380	135	110	149
20	940	205	132	79	75	1540	264	427	374	128	104	149
21	1500	210	129	76	84	1390	274	418	353	122	100	145
22	1450	255	126	76	111	1310	299	400	338	116	96	142
23	1220	260	120	76	120	1300	360	388	326	111	119	136
24	1070	262	116	76	125	1320	445	376	311	128	149	136
25	979	261	115	70	125	1360	500	372	301	136	138	136
26	924	268	112	70	131	1260	512	372	297	141	125	132
27	880	264	110	73	135	1130	500	340	300	128	116	126
28	847	256	108	76	138	1040	465	316	290	123	138	124
29	808	243	104	76	---	946	422	312	280	120	151	121
30	764	235	100	71	---	852	404	302	270	121	141	124
31	715	---	98	66	---	786	---	316	---	124	131	---
TOTAL	15757	10175	4192	2662	2198	20853	12659	10651	14087	4904	3851	5102
MEAN	508	339	135	85.9	78.5	673	422	344	470	158	124	170
MAX	1500	635	220	96	138	1670	737	436	825	254	153	259
MIN	58	205	85	66	60	80	264	246	270	111	96	121
CFSM	.56	.38	.15	.10	.09	.74	.47	.38	.52	.18	.14	.19
IN.	.65	.42	.17	.11	.09	.86	.52	.44	.58	.20	.16	.21
AC-FT	31250	20180	8310	5280	4360	41360	25110	21130	27940	9730	7640	10120

CAL YR 1984	TOTAL	89732	MEAN 245	MAX 1500	MIN 11	CFSM .27	IN 3.69	AC-FT	178000	
WTR YR 1985	TOTAL	107091	MEAN 293	MAX 1670	MIN 58	CFSM .32	IN 4.40	AC-FT	212400	

MINNESOTA RIVER BASIN

05300000 LAC QUI PARLE RIVER NEAR LAC QUI PARLE, MN

LOCATION.--Lat 44°59'42, long 95°55'09" in SW¼SW¼ sec.27, T.118 N., R.42 W., Lac qui Parle County, Hydrologic Unit 07020003, on right bank 40 ft downstream from highway bridge and 0.5 mi southwest of village of Lac qui Parle.

DRAINAGE AREA.--983 mi^2.

PERIOD OF RECORD.--April 1910 to November 1914; March 1931 to current year (winter records incomplete prior to 1934). Published as "at Lac qui Parle," 1910-14.

REVISED RECORDS.--WSP 1308: 1912(M), 1935(M).

GAGE.--Water-stage recorder. Datum of gage is 951.98 ft above National Geodetic Vertical Datum of 1929 (Minnesota Department of Transportation benchmark). Apr. 27, 1910, to Nov. 15, 1914, nonrecording gage at site 2 mi downstream at different datum. Mar. 17, 1931, to Mar. 9, 1937, non recording gage at site 40 ft upstream at present datum.

REMARKS.--Estimated daily discharges: Nov. 15-24, Dec. 1 to Mar. 19, Aug. 29, 31 and Sept. 1, 2. Records good except those for periods of no gage-height record, Jan. 20 to Feb. 14, Aug. 29, 31, and Sept. 1, 2, and periods with ice effect, Nov. 15-24 Dec. 1 to Jan. 19, and Feb. 15 to Mar. 19, which are fair.

AVERAGE DISCHARGE.--54 years (water years 1913, 1932, 1934-85), 129 ft^3/s, 1.78 in/yr, 93,460 acre-ft/yr; median of yearly mean discharges, 110 ft^3/s, 1.52 in/yr, 79,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 17,100 ft^3/s, Apr. 10, 1969, gage height, 18.94 ft, from floodmark; maximum gage height, 19.37 ft, Apr. 9, 1965, from floodmark (backwater from ice); no flow at times in several years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,860 ft^3/s, Mar. 20, gage height, 12.08 ft; minimum discharge, 3.0 ft^3/s, July 17, gage height, 0.14 ft.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	42	421	128	53	14	448	1300	480	120	55	53	167
2	37	353	115	51	12	410	1160	461	128	52	44	169
3	30	337	111	49	11	277	1020	437	147	49	35	259
4	23	327	108	48	10	193	899	414	160	42	30	364
5	21	320	105	47	9.6	186	808	389	151	31	26	367
6	22	297	102	47	9.1	183	724	363	140	24	22	359
7	21	288	100	46	8.8	174	650	333	129	19	18	308
8	18	278	98	45	8.6	153	589	307	125	16	15	700
9	20	263	97	45	8.2	139	536	282	117	13	14	1260
10	30	248	96	44	8.0	126	494	257	108	9.8	10	1350
11	47	235	94	43	7.8	128	455	230	103	7.9	9.3	1460
12	49	230	93	42	7.7	174	424	212	103	7.1	12	1290
13	53	228	91	41	7.6	351	395	199	105	6.4	18	1000
14	56	228	87	40	7.6	616	370	189	113	6.7	21	826
15	108	225	85	39	7.5	1110	344	185	122	5.6	17	784
16	178	218	84	38	7.5	1930	323	204	120	4.6	17	714
17	298	205	82	37	8.4	2250	306	259	117	3.4	25	634
18	434	183	81	32	11	2840	288	302	108	22	34	571
19	968	153	80	22	12	4160	276	308	98	139	29	492
20	1180	147	78	20	22	4700	261	277	88	178	23	421
21	1530	151	77	20	70	4320	248	239	81	155	21	386
22	1710	176	76	19	93	3880	236	203	73	117	19	340
23	1630	176	74	19	119	3470	267	180	65	95	22	300
24	1360	183	72	18	149	3330	371	167	57	95	25	277
25	1080	190	70	18	298	3050	565	153	50	112	20	254
26	906	193	68	17	503	2760	804	145	44	93	18	228
27	795	192	66	17	418	2420	834	135	44	79	24	212
28	695	183	64	16	388	2050	707	129	53	78	31	200
29	602	169	62	16	---	1790	605	124	59	68	98	181
30	531	149	60	15	---	1590	535	122	59	60	162	171
31	472	---	56	15	---	1440	---	120	---	60	164	---
TOTAL	14946	6946	2660	1019	2236.4	50648	16794	7805	2987	1703.5	1076.3	16044
MEAN	482	232	85.8	32.9	79.9	1634	560	252	99.6	55.0	34.7	535
MAX	1710	421	128	53	503	4700	1300	480	160	178	164	1460
MIN	18	147	56	15	7.5	126	236	120	44	3.4	9.3	167
CFSM	.49	.24	.09	.03	.08	1.66	.57	.26	.10	.06	.04	.54
IN.	.57	.26	.10	.04	.08	1.92	.64	.30	.11	.06	.04	.61
AC-FT	29650	13780	5280	2020	4440	100500	33310	15480	5920	3380	2130	31820

CAL YR 1984 TOTAL 166213.01 MEAN 454 MAX 3430 MIN .00 CFSM .46 IN 6.29 AC-FT 329700
WTR YR 1985 TOTAL 124865.20 MEAN 342 MAX 4700 MIN 3.4 CFSM .35 IN 4.73 AC-FT 247700

MINNESOTA RIVER BASIN

05301000 MINNESOTA RIVER NEAR LAC QUI PARLE, MN

LOCATION.--Lat 45°01'17", long 95°52'05", in NW¼NE¼ sec.24, T.118 N., R.42 W., Chippewa County, Hydrologic Unit 07020004, on left bank 200 ft downstream from dam at Lac qui Parle Outlet, 2.4 mi northeast of village of Lac qui Parle, and 3.5 mi west of Watson.

DRAINAGE AREA.--4,050 mi^2, approximately.

PERIOD OF RECORD.--October 1942 to current year.

GAGE.--Water-stage recorder. Datum of gage is 900.00 ft above National Geodetic Vertical Datum of 1929 (levels by Corps of Engineers). Prior to Nov. 10, 1944, at datum 0.20 ft lower.

REMARKS.--Estimated daily discharges: Dec. 3, 4, Jan. 9-12, 19-23, 25, 26, 30, 31, Feb. 1-5, 8, 9, 13-17, and Sept. 19, 29, 30. Records good. Part of flow from 2,050 mi^2, of Chippewa River basin at times diverted into Minnesota River above station. Some regulation by Big Stone Lake since Apr. 17, 1937, Lac qui Parle since January 1938, Marsh Lake since Nov. 1, 1939, and Odessa Dam since May 1974.

AVERAGE DISCHARGE.--43 years, 655 ft^3/s, 474,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 29,400 ft^3/s, Apr. 12, 1969, gage height, 39.75 ft; no flow Nov. 17, 1942, Sept. 29, 1947, Oct. 19 to Nov. 18, 1951, Nov. 24, 1952, Dec. 9-11, 1976, Feb. 28 to Mar. 5, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 9,360 ft^3/s, Mar. 25, 26, gage height, 35.86 ft; minimum recorded discharge, 21 ft^3/s, Aug. 13, 14, gage height, 20.20 ft, due to regulation (gage height and discharge was observed to be lower on Aug. 13, but actual values are unknown).

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	311	3420	1680	984	295	724	6500	1980	1260	1230	203	358
2	156	3190	1680	914	295	856	5920	1710	1210	1200	274	361
3	172	3130	1650	780	295	866	5390	1590	1260	1100	348	449
4	173	3090	1600	690	290	964	4960	1610	1380	789	344	605
5	296	3030	1540	642	285	990	4110	1660	1370	767	339	691
6	549	2950	1190	625	280	1070	3260	1660	1340	766	335	907
7	545	2880	1120	592	281	1060	3050	1650	1390	762	333	1180
8	536	2810	1070	558	280	1150	3300	1600	1480	757	331	1220
9	518	2750	998	555	278	1210	3330	1410	1450	657	327	1290
10	568	2710	1040	555	275	1180	3010	1260	1370	464	325	1470
11	730	2590	1160	550	276	1060	2670	1350	1360	572	323	1500
12	560	2480	1160	545	295	708	2580	1430	1380	430	359	1440
13	106	2370	1170	542	290	678	2560	1280	1410	194	254	1520
14	120	2310	1140	537	290	987	2470	1280	1440	195	281	1510
15	163	2390	1100	541	285	1330	2330	1430	1440	243	343	1410
16	535	2220	1110	438	285	2030	2050	1500	1410	294	403	1460
17	1330	2130	1130	379	282	2920	1910	1460	1440	300	398	1480
18	1660	2050	1190	375	281	3480	1880	1480	1420	444	395	1440
19	2030	1970	1190	400	308	4480	1820	1520	1390	759	392	1420
20	2090	1900	1140	410	391	6070	1780	1540	1310	894	392	1380
21	2390	1810	1140	410	392	7550	1720	1510	1380	894	388	1290
22	2990	1780	1180	400	415	8460	1780	1450	1450	890	384	1250
23	3420	1740	1160	350	444	8930	2040	1410	1360	793	380	1280
24	3660	1730	1140	315	446	9200	2190	1420	1270	607	376	1150
25	3650	1710	1190	310	446	9360	2390	1410	1200	394	375	1060
26	3700	1730	1180	305	443	9280	2570	1410	1320	889	374	990
27	3810	1760	1190	298	450	9060	2650	1380	1420	1110	372	1060
28	3810	1740	1090	272	502	8660	2670	1330	1360	1120	372	1240
29	3650	1720	992	247	---	8230	2660	1290	1300	838	363	1200
30	3660	1710	1000	280	---	7690	2490	1270	1260	197	361	1170
31	3390	---	1010	300	---	7110	---	1340	---	200	362	---
TOTAL	51278	69800	37330	15099	9375	127343	88040	45620	40830	20749	10806	34781
MEAN	1654	2327	1204	487	335	4108	2935	1472	1361	669	349	1159
MAX	3810	3420	1680	984	502	9360	6500	1980	1480	1230	403	1520
MIN	106	1710	992	247	275	678	1720	1260	1200	194	203	358
CFSM	.41	.58	.30	.12	.08	1.01	.73	.36	.34	.17	.09	.29
IN.	.47	.64	.34	.14	.09	1.17	.81	.42	.38	.19	.10	.32
AC-FT	101700	138400	74040	29950	18600	252600	174600	90490	80990	41160	21430	68990

CAL YR 1984 TOTAL 651253 MEAN 1779 MAX 7700 MIN 11 CFSM .44 IN 5.98 AC-FT 1292000
WTR YR 1985 TOTAL 551051 MEAN 1510 MAX 9360 MIN 106 CFSM .37 IN 5.06 AC-FT 1093000

MINNESOTA RIVER BASIN

05304500 CHIPPEWA RIVER NEAR MILAN, MN

LOCATION.--Lat 45°06'39", long 95°47'57", in SE¼SE¼ sec.16, T.119 N., R.41 W., Chippewa County, Hydrologic Unit 07020005, on right bank 800 ft upstream from bridge on State Highway 40, 2.0 mi upstream from small tributary, and 5.5 mi east of Milan.
DRAINAGE AREA.--1,870 mi^2, approximately.
PERIOD OF RECORD.--March 1937 to current year.
REVISED RECORDS.--WSP 1145: Drainage area.
GAGE.--Water-stage recorder. Datum of gage is 959.69 ft above National Geodetic Vertical Datum of 1929. Prior to June 15, 1942, nonrecording gage on bridge 800 ft downstream at same datum.
REMARKS.--Estimated daily discharges: Nov. 15-22, Dec. 1 to Mar. 19. Records good except those for period of no gage-height record, Feb. 1-13, and periods with ice effect, Nov. 15-22, Dec. 1 to Jan. 31, and Feb. 14 to Mar. 19, which are fair. Flow regulated by several small lakes upstream from gage.
AVERAGE DISCHARGE.--48 years, 294 ft^3/s, 2.14 in/yr, 213,000 acre-ft/yr; median of yearly mean discharges, 229 ft^3/s, 1.66 in/yr, 166,000 acre-ft/yr.
EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,400 ft^3/s, Apr. 9, 1969, gage height, 15.45 ft; no flow at times during 1940.
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)
Oct. 20	1800	5,380	10.19
Mar. 17	0720	*5,950	a*11.00
Mar. 19	1700	5,610	10.47
Apr. 24	0245	2,670	6.73
May 17	1900	1,600	4.95
June 4	0715	1,260	4.37
June 13	1300	1,280	4.44
Sept. 4	0200	1,050	4.06
Sept. 10	0415	2,510	6.56

a Backwater from ice.

Minimum daily discharge, 165 ft^3/s, Feb. 11-16; minimum gage height, 2.14 ft, Aug. 11.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	410	1910	918	410	175	400	1910	1610	1090	604	222	303
2	385	1710	858	390	170	430	1830	1520	1120	568	215	328
3	354	1680	835	380	170	430	1770	1440	1220	538	209	804
4	329	1640	820	375	170	420	1720	1370	1260	505	201	985
5	315	1590	790	370	170	375	1670	1300	1220	472	194	822
6	309	1560	780	370	168	325	1610	1240	1160	444	190	756
7	329	1560	770	365	168	350	1560	1180	1080	420	186	685
8	358	1550	770	345	168	385	1510	1130	1020	397	190	743
9	381	1540	765	330	168	410	1460	1090	956	381	188	2000
10	373	1500	755	325	168	435	1420	1060	896	364	184	2450
11	377	1470	750	315	165	540	1380	1030	890	347	182	2060
12	373	1430	750	310	165	830	1330	1160	1030	329	198	1770
13	366	1410	730	300	165	1400	1320	1200	1240	314	234	1540
14	370	1410	710	295	165	1850	1300	1180	1130	303	271	1370
15	880	1340	690	285	165	2220	1290	1280	1040	291	243	1260
16	2720	1200	680	280	165	4290	1250	1480	1010	278	225	1160
17	2980	1240	660	275	170	5170	1230	1590	962	271	214	1080
18	2830	1170	640	270	175	4030	1210	1590	929	289	205	995
19	4310	1130	620	260	175	5080	1190	1550	902	290	199	905
20	5280	1120	585	255	190	4940	1170	1490	863	279	194	822
21	5310	1060	575	250	245	4290	1180	1420	809	261	191	747
22	4990	1070	560	240	300	3800	1280	1370	766	246	188	700
23	4520	1040	540	230	265	3380	2140	1380	720	235	202	658
24	4070	1050	525	225	260	3470	2570	1370	678	241	244	630
25	3580	1050	500	215	300	3100	2200	1300	651	245	275	611
26	3210	1060	475	210	350	2720	1990	1250	640	248	262	577
27	2910	1050	460	200	325	2510	1900	1220	670	239	243	554
28	2630	1030	455	195	340	2360	1850	1170	691	237	255	535
29	2380	990	450	190	---	2280	1790	1140	671	230	368	513
30	2200	978	445	180	---	2140	1700	1100	639	221	357	501
31	2050	---	435	175	---	2010	---	1080	---	225	324	---
TOTAL	61879	39538	20296	8815	5780	66370	47730	40290	27953	10312	7053	28864
MEAN	1996	1318	655	284	206	2141	1591	1300	932	333	228	962
MAX	5310	1910	918	410	350	5170	2570	1610	1260	604	368	2450
MIN	309	978	435	175	165	325	1170	1030	639	221	182	303
CFSM	1.07	.71	.35	.15	.11	1.15	.85	.70	.50	.18	.12	.51
IN.	1.23	.79	.40	.18	.11	1.32	.95	.80	.56	.21	.14	.57
AC-FT	122700	78420	40260	17480	11460	131600	94670	79920	55440	20450	13990	57250

CAL YR 1984 TOTAL 363569 MEAN 993 MAX 5310 MIN 120 CFSM .53 IN 7.23 AC-FT 721100
WTR YR 1985 TOTAL 364880 MEAN 1000 MAX 5310 MIN 165 CFSM .54 IN 7.26 AC-FT 723700

MINNESOTA RIVER BASIN

05311000 MINNESOTA RIVER AT MONTEVIDEO, MN

LOCATION.--Lat 44°56'00", long 95°44'00", in NW¼NW¼ sec.19, T.117 N., R.40 W., Yellow Medicine County, Hydrologic Unit 07020004, on right bank 100 ft upstream from bridge on U.S. Highway 212, at Montevideo, and 400 ft downstream from Chippewa River.

DRAINAGE AREA.--6,180 mi^2, approximately.

PERIOD OF RECORD.--July 1909 to September 1917, October 1917 to September 1929 (no winter records), October 1929 to current year. Prior to October 1939, published as "near Montevideo." Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1035: 1919(M). WSP 1085: 1935-36. WSP 1508: 1912, 1925(M), 1929(M).

GAGE.--Water-stage recorder. Datum of gage is 909.12 ft above National Geodetic Vertical Datum of 1929. July 22, 1909, to Feb. 4, 1932, nonrecording gage at bridge 600 ft downstream at present datum. Feb. 5, 1932, to Nov. 26, 1934, nonrecording gage at bridge 100 ft downstream at present datum.

REMARKS.--Estimated daily discharges: Dec. 3 to Mar. 14. Records good except those for periods with ice effect, Dec. 3 to Jan. 1, Jan. 7 to Mar. 14, and periods of no gage-height record, Jan. 2-6, which are fair. Flow regulated by Big stone Lake since April 17, 1937, Lac qui Parle since January 1938, and Marsh Lake since Nov. 1, 1939.

AVERAGE DISCHARGE.--64 years (water years 1910-17, 1930-85), 716 ft^3/s, 518,700 acre-ft/yr; median of yearly mean discharges, 574 ft^3/s, 416,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 35,100 ft^3/s, Apr. 12, 1969, gage height, 21.68 ft, from high-water mark; no flow for several days in 1933-34, 1936.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 11,510 ft^3/s, Mar. 26, gage height, 16.09 ft; minimum, 192 ft^3/s, Aug. 2, gage height, 2.49 ft, result of regulation.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	639	4810	1800	1180	340	740	7820	3360	1940	1740	257	424
2	281	4700	1750	1170	348	920	7300	2950	1900	1700	243	474
3	250	4580	1770	996	354	980	6820	2480	1870	1580	380	496
4	258	4450	1730	975	358	1060	6440	2360	2000	1270	403	638
5	270	4340	1670	753	362	1070	6060	2410	2010	1150	400	874
6	650	4230	1400	730	368	1140	5220	2390	2000	1140	367	1270
7	748	4120	1210	724	368	1130	4590	2390	1970	1140	366	1750
8	748	4010	1250	650	368	1220	4300	2350	2030	1130	375	2000
9	744	3910	1280	650	374	1250	4300	2240	2030	1100	377	2150
10	738	3810	1300	648	380	1220	4340	2030	1950	833	376	2330
11	915	3700	1330	620	380	1130	4090	2060	1920	812	376	2530
12	949	3580	1330	618	385	920	3760	2120	1930	835	376	2360
13	410	3460	1350	613	428	910	3510	2110	1970	461	332	2340
14	225	3350	1310	612	468	1450	3390	2010	2040	412	313	2400
15	304	3280	1300	548	447	2060	3250	2170	2030	417	323	2210
16	445	3190	1290	525	460	3040	2950	2310	1980	455	398	2220
17	1630	3040	1270	512	485	4000	2680	2320	1970	475	422	2200
18	2310	2890	1350	465	515	4680	2550	2320	1980	544	414	2200
19	2960	2740	1340	340	510	5570	2460	2340	1950	767	412	2090
20	3580	2590	1320	430	600	7250	2380	2330	1880	950	412	2240
21	3990	2510	1300	430	735	8950	2390	2280	1840	958	414	2250
22	4290	2290	1300	425	730	9850	2460	2220	1950	942	417	2150
23	4480	2280	1300	420	830	10500	3290	2160	1890	896	427	2100
24	4600	2020	1270	410	840	10800	3470	2140	1810	782	415	2010
25	4730	1880	1200	390	820	10900	3510	2130	1720	486	414	1890
26	4740	1840	1200	380	700	11000	3550	2100	1750	696	414	1810
27	4860	1840	1200	370	670	10600	3610	2070	1870	1040	415	1740
28	4930	1850	1200	365	650	10200	3690	2020	1870	1080	438	1920
29	4930	1820	1200	360	---	9640	3730	1970	1830	1030	429	1870
30	4950	1810	1190	340	---	9060	3720	1950	1780	426	426	1840
31	4940	---	1190	335	---	8440	---	1960	---	267	425	---
TOTAL	70494	94920	41900	17984	14273	151680	121630	70050	57660	27514	11956	54776
MEAN	2274	3164	1352	580	510	4893	4054	2260	1922	888	386	1826
MAX	4950	4810	1800	1180	840	11000	7820	3360	2040	1740	438	2530
MIN	225	1810	1190	335	340	740	2380	1950	1720	267	243	424
CFSM	.37	.51	.22	.09	.08	.79	.66	.37	.31	.14	.06	.30
IN.	.42	.57	.25	.11	.09	.91	.73	.42	.35	.17	.07	.33
AC-FT	139800	188300	83110	35670	28310	300900	241300	138900	114400	54570	23710	108600

CAL YR 1984 TOTAL 827618 MEAN 2261 MAX 8340 MIN 150 CFSM .37 IN 4.98 AC-FT 1642000
WTR YR 1985 TOTAL 734837 MEAN 2013 MAX 11000 MIN 225 CFSM .33 IN 4.42 AC-FT 1458000

MINNESOTA RIVER BASIN

05311400 SOUTH BRANCH YELLOW MEDICINE RIVER AT MINNEOTA, MN

LOCATION.--Lat 44°33'50", long 95°59'50", in SE¼ sec.26, T.113 N., R.43 W., Lyon County, Hydrologic Unit 07020004, on downstream side of bridge on State Highway 68, 0.5 mi northwest of Minneota and 6 mi upstream from mouth.

DRAINAGE AREA.--111 mi^2, approximately.

PERIOD OF RECORD.--April 1960 to September 1981 and October 1982 to current year. Monthly and daily discharge for the period Apr. 1, 1960, to June 30, 1960, published in WSP 1914. Operated as high-flow partial-record station October 1981 to September 1982.

CAGE.--Nonrecording gage and crest-stage gage. Datum of gage is 1,150.00 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Nov. 15-16, Dec. 1 to Mar. 20. Records good except those for period with ice effect, Nov. 15-16, Dec. 1 to Mar. 5, and Mar. 7-20, and period of no gage-height record, Mar. 6, which are fair.

AVERAGE DISCHARGE.--24 years (water years 1961-1981, 1983-1985), 26.6 ft^3/s, 3.25 in/yr, 19,270 acre-ft/yr; median of yearly mean discharges, 18 ft^3/s, 2.20 in/yr, 13,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,430 ft^3/s, Apr. 8, 1969, gage height, 13.41 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharge above base of 82 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct. 20	0600	373	6.66	May 31	1800	317	6.00
Mar 15	2100	795	*a10.07	Sept. 5	0800	191	5.23
Apr. 23	1315	*1,510	9.59	Sept. 9	1600	336	6.10

a Backwater from ice.

Minimum daily discharge, 1.5 ft^3/s, Feb. 17: minimum gage height, 2.66 ft, July 23.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.5	35	14	11	3.1	22	48	107	237	14	6.4	12
2	7.2	22	12	11	2.9	22	41	90	165	12	5.9	45
3	6.8	32	10	11	2.8	23	45	75	97	11	5.4	112
4	6.2	28	11	11	2.7	35	40	62	75	9.7	5.2	114
5	7.0	25	13	10	2.6	39	36	55	64	8.3	4.9	177
6	7.0	25	14	9.5	2.5	43	33	50	52	7.2	4.9	145
7	8.8	25	15	9.0	2.4	45	31	47	46	6.2	4.6	116
8	8.3	23	21	8.0	2.3	60	28	44	40	5.2	4.6	113
9	8.8	23	20	6.8	2.3	90	27	38	33	4.9	4.5	268
10	14	21	19	6.8	2.2	100	26	35	29	4.7	4.7	200
11	17	20	18	6.8	2.1	120	25	32	34	3.9	4.7	140
12	19	19	17	6.5	2.0	300	25	30	34	4.1	7.1	106
13	18	19	15	6.2	1.9	600	25	28	31	4.5	8.5	88
14	16	18	14	5.9	1.8	719	25	30	29	5.0	7.9	85
15	34	12	16	5.3	1.7	722	25	43	32	4.9	8.1	77
16	78	9.5	23	5.1	1.6	652	24	57	26	4.7	7.2	65
17	104	12	30	4.9	1.5	496	23	70	22	4.5	7.2	57
18	146	13	25	4.7	1.6	335	23	59	20	5.0	6.8	50
19	248	14	21	4.6	1.6	259	22	48	19	4.9	6.4	42
20	327	13	18	4.6	1.8	210	23	38	17	4.2	6.0	36
21	217	14	17	4.5	4.3	200	41	33	15	3.9	6.2	32
22	156	16	16	4.5	8.0	188	457	32	14	3.8	6.4	31
23	117	13	16	4.5	37	171	1240	29	12	3.7	11	30
24	93	15	16	4.3	34	170	942	29	10	6.3	12	28
25	75	15	16	4.1	30	156	565	26	9.8	11	11	27
26	66	16	16	3.9	27	128	348	28	17	13	10	25
27	57	15	16	3.8	25	107	251	37	23	10	9.4	23
28	51	15	16	3.6	22	92	192	37	20	8.1	10	22
29	47	14	16	3.5	---	82	150	40	18	7.3	12	22
30	42	14	12	3.4	---	66	124	98	18	5.7	12	25
31	37	---	11	3.3	---	55	---	264	---	6.8	13	---
TOTAL	2046.6	555.5	514	192.1	230.7	6307	4905	1691	1258.8	208.5	234.0	2313
MEAN	66.0	18.5	16.6	6.20	8.24	203	164	54.5	42.0	6.73	7.55	77.1
MAX	327	35	30	11	37	722	1240	264	237	14	13	268
MIN	6.2	9.5	10	3.3	1.5	22	22	26	9.8	3.7	4.5	12
CFSM	.60	.17	.15	.06	.07	1.83	1.48	.49	.38	.06	.07	.70
IN.	.69	.19	.17	.06	.08	2.11	1.64	.57	.42	.07	.08	.78
AC-FT	4060	1100	1020	381	458	12510	9730	3350	2500	414	464	4590

CAL YR 1984	TOTAL 37106.4	MEAN 101	MAX 1410	MIN 1.0	CFSM .91	IN 12.44	AC-FT 73600
WTR YR 1985	TOTAL 20456.2	MEAN 56.0	MAX 1240	MIN 1.5	CFSM .51	IN 6.86	AC-FT 40570

MINNESOTA RIVER BASIN

05313500 YELLOW MEDICINE RIVER NEAR GRANITE FALLS, MN

LOCATION.--Lat 44°43'18", long 95°31'07", in SW¼ sec.35, T.115 N., R.39 W., Yellow Medicine County, Hydrologic Unit 07020004, on right bank 50 ft downstream from highway bridge, 6 mi upstream from mouth, and 8 mi south of town of Granite Falls.
DRAINAGE AREA.--653 mi^2.
PERIOD OF RECORD.--March 1931 to September 1935 (no winter records), October 1935 to September 1938, October 1939 to current year. Monthly discharge only for some periods, published in WSP 1308.
REVISED RECORDS.--WSP 1508: 1931, 1934(M), 1937(M), 1946(M), 1950(M).
GAGE.--Water-stage recorder. Datum of gage is 960.64 ft above National Geodetic Vertical Datum of 1929. Mar. 16, 1931, to June 13, 1938, nonrecording gage, on bridge 50 ft upstream at present datum. Oct. 12, 1939, to Nov. 30, 1952, nonrecording gage 500 ft downstream at present datum.
REMARKS.--Estimated daily discharges: Nov. 17 to Mar. 16. Records good except those for period with ice effect, Nov. 17 to Mar. 16, which are fair.
AVERAGE DISCHARGE.--49 years (water years 1936-38, 1940-85), 117 ft^3/s, 2.43 in/yr, 84,770 acre-ft/yr; median of yearly mean discharges, 79 ft^3/s, 1.64 in/yr, 57,200 acre-ft/yr.
EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 17,200 ft^3/s, Apr. 10, 1969, gage height, 14.90 ft; no flow at times in 1931, 1933, 1948, 1959.
EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1919 reached a stage of 17.5 ft, from information by local residents, discharge, 25,200 ft^3/s.
EXTREMES FOR CURRENT YEAR.--Peak discharge 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)
Oct. 22	0600	1,110	5.05	May 18	0900	326	3.56
Mar. 17	2000	* 3,170	* 7.40	June 02	1300	784	4.47
Apr. 25	1845	1,850	5.96	Sept.10	2400	748	4.41

Minimum daily discharge, 9.8 ft^3/s, Feb. 18; minimum gage height, 2.41 ft, Feb. 16, 17, 19.

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

MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	32	238	74	71	16	129	375	599	600	148	42	87
2	27	206	58	68	15	135	342	568	766	130	35	120
3	23	195	42	63	15	93	315	497	706	114	34	301
4	20	188	76	58	15	65	297	434	595	95	32	369
5	17	181	92	53	14	58	280	375	481	80	36	471
6	17	169	92	49	14	42	266	324	405	69	36	471
7	16	160	85	45	14	39	248	285	348	63	35	490
8	16	153	74	43	13	53	227	267	301	59	32	490
9	19	145	71	43	13	53	212	243	258	52	34	585
10	21	137	73	41	12	60	202	220	233	49	30	689
11	30	130	78	40	12	203	192	205	212	42	30	720
12	30	123	87	36	12	424	184	197	209	38	35	591
13	41	117	104	31	12	785	183	175	251	36	42	481
14	44	116	95	30	12	1170	181	166	258	37	38	405
15	59	113	89	30	12	1570	182	181	255	35	39	352
16	92	102	104	30	10	2220	187	228	240	33	48	320
17	258	107	103	28	10	3110	181	297	222	33	45	293
18	357	92	111	27	9.8	3090	177	339	188	38	41	258
19	447	91	123	27	10	2560	172	326	171	38	35	240
20	602	79	120	27	12	2020	168	274	148	35	33	212
21	953	87	108	24	18	1650	186	247	136	34	30	192
22	1080	92	97	21	13	1320	223	216	120	31	29	181
23	909	93	91	20	13	1110	588	195	103	30	32	171
24	720	100	89	18	14	1010	1320	181	90	38	33	162
25	588	95	92	19	115	980	1790	178	83	36	33	158
26	495	94	92	18	169	881	1760	171	90	39	48	152
27	436	94	88	17	112	732	1420	155	100	43	55	142
28	380	94	73	16	101	625	1070	185	142	55	60	133
29	336	93	64	16	---	543	858	226	168	49	76	126
30	297	84	65	16	---	473	706	222	155	48	76	139
31	264	---	72	16	---	425	---	447	---	46	76	---
TOTAL	8626	3768	2682	1041	807.8	27628	14492	8623	8034	1673	1280	9501
MEAN	278	126	86.5	33.6	28.9	891	483	278	268	54.0	41.3	317
MAX	1080	238	123	71	169	3110	1790	599	766	148	76	720
MIN	16	79	42	16	9.8	39	168	155	83	30	29	87
CFSM	.43	.19	.13	.05	.04	1.36	.74	.43	.41	.08	.06	.49
IN.	.49	.21	.15	.06	.05	1.57	.83	.49	.46	.10	.07	.54
AC-FT	17110	7470	5320	2060	1600	54800	28740	17100	15940	3320	2540	18850

CAL YR 1984 TOTAL 187532.0 MEAN 512 MAX 5020 MIN 11 CFSM .78 IN 10.68 AC-FT 372000
WTR YR 1985 TOTAL 88155.8 MEAN 242 MAX 3110 MIN 9.8 CFSM .37 IN 5.02 AC-FT 174900

MINNESOTA RIVER BASIN

05315000 REDWOOD RIVER NEAR MARSHALL, MN

LOCATION.--Lat 44°25'49", long 95°50'43", in SE¼SW¼ sec.12, T.111 N., R.42 W., Lyon County, Hydrologic Unit 07020006, on right bank 2.0 mi upstream from Redwood River diversion structure on southwest edge of town of Marshall, MN. Prior to Apr. 10, 1980, at site 5 mi downstream.

DRAINAGE AREA.--303 mi^2.

PERIOD OF RECORD.--March 1940 to current year. Monthly discharge only for some periods, published in WSP 1308.

GAGE.--Water-stage recorder. Datum of gage is 1,188.23 ft above National Geodetic Vertical Datum of 1929. March 1940 to April 9, 1980, nonrecording gage 5.0 mi downstream from present site at datum 43.35 ft lower (crest-stage gage added June 12, 1968). Since March 1964, nonrecording gage and crest-stage gage on diversion channel 1.5 mi downstream at datum 1,100.00 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Nov. 29 to Mar. 15 and Sept. 7-16. Records poor. Water diverted at medium and high stages into diversion channel 2.0 mi below station. Diversion began Mar. 18, 1964. Unknown amount of natural diversion into Cottonwood River basin occurs at extremely high stages 0.8 mi below station.

AVERAGE DISCHARGE.--45 years, 53.7 ft^3/s, 2.41 in/yr, 38,910 acre-ft/yr; median of yearly mean discharges, 41.1 ft^3/s, 1.84 in/yr, 29,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--River only, maximum discharge, 5,370 ft^3/s, June 17, 1957, gage height, 10.14 ft; maximum gage height, 11.05 ft, Apr. 6, 1951, from floodmark; no flow at times.

Diversion only, maximum discharge, 4,440 ft^3/s, Apr. 10, 1969, gage height, 78.45 ft; no flow on many days.

Combined flow, maximum discharge, 5,590 ft^3/s, Apr. 10, 1969; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,540 ft^3/s, Mar. 15, gage height, 13.24 ft; minimum daily, 6.4 ft^3/s, Feb. 3, 4; minimum gage height, 6.15 ft, Feb. 3, 4.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	60	24	14	6.8	69	158	331	420	99	15	42
2	11	47	23	14	6.5	78	167	320	281	83	14	47
3	10	65	21	14	6.4	80	168	287	220	82	13	76
4	10	57	20	13	6.4	79	165	243	200	80	12	78
5	12	54	20	13	6.5	79	158	214	189	74	10	256
6	16	51	21	13	6.6	78	150	195	173	67	9.7	313
7	18	50	22	13	6.7	78	138	178	157	64	9.0	322
8	18	48	22	13	6.8	80	130	162	138	54	9.0	350
9	19	47	21	13	6.9	82	127	150	122	47	12	500
10	17	45	20	13	6.9	85	119	135	107	42	14	385
11	19	33	19	12	7.0	214	105	120	105	37	18	340
12	18	38	17	12	7.0	425	100	113	119	37	43	280
13	17	41	16	12	7.1	592	100	109	110	37	62	250
14	20	48	16	12	7.2	750	99	104	105	41	42	230
15	42	48	16	12	7.5	1200	95	146	99	48	33	205
16	72	38	16	12	7.8	1210	92	195	91	33	27	197
17	69	37	15	11	8.2	975	88	188	92	22	29	185
18	66	33	15	11	9.0	756	88	166	89	27	30	168
19	101	39	15	10	10	583	87	152	81	26	29	158
20	132	46	15	9.4	12	468	89	141	74	24	24	152
21	129	51	15	8.8	15	400	100	127	72	22	23	140
22	108	40	15	8.7	19	354	171	115	69	20	27	139
23	100	36	15	8.6	23	324	784	112	65	18	39	135
24	99	37	15	8.4	28	307	912	105	59	30	40	130
25	96	37	15	8.4	35	276	713	97	67	29	31	127
26	91	36	15	8.0	41	251	539	95	177	23	28	118
27	87	35	14	7.7	50	235	468	91	173	22	34	113
28	85	32	14	7.6	60	220	406	82	142	20	36	108
29	78	29	14	7.4	---	209	370	103	126	19	45	109
30	74	26	14	7.2	---	188	347	139	113	17	52	118
31	67	---	14	7.0	---	173	---	346	---	16	46	---
TOTAL	1714	1284	534	334.2	420.3	10898	7233	5061	4035	1260	855.7	5771
MEAN	55.3	42.8	17.2	10.8	15.0	352	241	163	135	40.6	27.6	192
MAX	132	65	24	14	60	1210	912	346	420	99	62	500
MIN	10	26	14	7.0	6.4	69	87	82	59	16	9.0	42
CFSM	.18	.14	.06	.04	.05	1.16	.80	.54	.45	.13	.09	.63
IN.	.21	.16	.07	.04	.05	1.34	.89	.62	.50	.15	.11	.71
AC-FT	3400	2550	1060	663	834	21620	14350	10040	8000	2500	1700	11450

CAL YR 1984	TOTAL	69126.9	MEAN 189	MAX 1600	MIN 6.3	CFSM .62	IN 8.49	AC-FT	137100	
WTR YR 1985	TOTAL	39400.2	MEAN 108	MAX 1210	MIN 6.4	CFSM .36	IN 4.84	AC-FT	78150	

MINNESOTA RIVER BASIN

05316500 REDWOOD RIVER NEAR REDWOOD FALLS, MN

LOCATION.--Lat 44°31'25", long 95°10'20", in SE¼NE¼ sec.9, T.112 N., R.36 W., Redwood County, Hydrologic Unit 07020006, on right bank 4 ft upstream from highway bridge, 3 mi west of town of Redwood Falls, and 8.5 mi upstream from mouth.
DRAINAGE AREA.--697 mi^2.
PERIOD OF RECORD.--July 1909 to September 1914 (no winter records except 1911-12). August 1930 to September 1935 (no winter records), October 1935 to current year.
GAGE.--Water-stage recorder. Datum of gage is 972.33 ft above National Geodetic Vertical Datum of 1929. July 1909 to September 1914, nonrecording gage at bridge 20 ft downstream at datum 0.22 ft lower. August 1930 to Oct. 25, 1949, nonrecording gage, at bridge 20 ft downstream at present datum.
REMARKS.--Estimated daily discharges: Dec. 2 to Mar.20. Records good except those for periods of ice effect, Dec. 2 to Jan. 20, Jan. 24-28, Feb. 22-23, 25-26, and Feb. 28 to Mar. 1, which are fair, and periods of no gage-height record, Jan. 21-23, Jan. 29 to Feb. 21, 24, 27, and Mar. 2-20, which are poor. Natural discharge affected by unknown amount of interbasin flow between Yellow Medicine, Redwood, and Cottonwood River basins during extreme floods.
AVERAGE DISCHARGE.--51 years (water years 1912, 1936-85), 120 ft^3/s, 2.34 in/yr, 86,940 acre-ft/yr; median of yearly mean discharges, 80 ft^3/s, 1.56 in/yr, 58,000 acre-ft/yr.
EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 19,700 ft^3/s, June 18, 1957, gage height, 15.92 ft, from floodmark; no flow for several days in January 1940 and for part of each day Aug. 19, 20, 1959.
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)
Oct. 19	2145	408	2.96	June 27	2000	650	3.51
Mar. 15	1845	*3,220	*13.83	Aug. 28	1145	1,830	5.34
Apr. 26	2345	1,540	4.88	Sept. 3	1230	596	3.48
June 3	1100	806	3.77	Sept. 8	0900	1,200	4.43

a Backwater from ice.

Minimum daily discharge, 12 ft^3/s, Jan. 20; minimum gage height, 1.57 ft, Oct. 5, 6.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24	171	62	37	15	146	380	819	613	297	36	176
2	22	136	55	35	15	140	384	728	723	250	33	246
3	21	145	44	34	15	138	365	647	786	215	29	552
4	23	153	50	33	14	135	356	578	691	186	25	495
5	19	140	56	32	14	128	331	516	548	157	24	485
6	22	132	60	30	14	124	308	464	463	135	22	596
7	23	128	62	31	14	120	281	416	411	117	21	715
8	31	124	63	30	14	116	258	379	374	102	21	1040
9	37	120	63	29	13	114	238	348	327	91	20	1050
10	37	115	58	27	13	110	229	315	283	84	19	878
11	39	108	58	26	13	230	219	283	262	75	17	819
12	41	102	57	25	13	500	207	260	257	70	33	741
13	39	95	55	27	13	1000	201	229	257	72	94	626
14	45	102	54	21	13	1500	202	228	256	72	94	540
15	125	101	54	19	13	3100	205	250	239	64	76	485
16	172	96	70	18	13	2600	202	342	219	65	60	444
17	235	99	74	17	14	2300	196	430	201	64	51	407
18	245	88	74	15	14	2000	193	442	181	62	41	366
19	364	70	72	14	15	1600	191	416	159	58	34	330
20	388	76	70	12	17	1400	186	375	143	54	32	297
21	375	81	69	13	18	1360	207	335	132	47	29	272
22	377	96	60	15	23	1120	555	302	119	41	28	271
23	338	91	56	16	27	948	1320	282	105	36	36	288
24	294	102	54	17	34	865	1340	259	97	43	65	307
25	271	93	50	14	42	759	1310	241	91	59	58	295
26	262	91	47	17	56	662	1460	220	495	70	52	274
27	247	91	44	17	68	590	1490	204	619	63	45	255
28	225	87	41	17	100	535	1290	194	587	54	544	236
29	209	75	39	16	---	497	1090	221	447	43	512	231
30	195	68	39	16	---	443	920	326	359	39	356	281
31	178	---	38	16	---	408	---	463	---	38	236	---
TOTAL	4923	3176	1748	686	647	25688	16114	11512	10444	2823	2743	13998
MEAN	159	106	56.4	22.1	23.1	829	537	371	348	91.1	88.5	467
MAX	388	171	74	37	100	3100	1490	819	786	297	544	1050
MIN	19	68	38	12	13	110	186	194	91	36	17	176
CFSM	.23	.15	.08	.03	.03	1.19	.77	.53	.50	.13	.13	.67
IN.	.26	.17	.09	.04	.03	1.37	.86	.61	.56	.15	.15	.75
AC-FT	9760	6300	3470	1360	1280	50950	31960	22830	20720	5600	5440	27770

CAL YR 1984 TOTAL 151888 MEAN 415 MAX 3700 MIN 10 CFSM .60 IN 8.11 AC-FT 301300
WTR YR 1985 TOTAL 94502 MEAN 259 MAX 3100 MIN 12 CFSM .37 IN 5.04 AC-FT 187400

MINNESOTA RIVER BASIN

05316900 DRY CREEK NEAR JEFFERS, MN

LOCATION.--Lat 44°07'21", long 94°12'13", in NE¼NE¼ sec.31, T.108 N., R.36 W., Cottonwood County, on right bank 17 ft upstream from culvert on County Road 10, 4.5 mi north of Jeffers.

DRAINAGE AREA.--3.13 mi^2.

PERIOD OF RECORD.--Annual maximum discharge, water years 1961-81. June 1982 to September 1985 (discontinued).

GAGE.--Water-stage recorder and crest-stage gage. Aug. 9, 1960, to Oct. 4, 1979, recording gage at present site and datum. Aug. 30, 1960, to present, crest-stage gage at same site and datum.

REMARKS.--Estimated daily discharges: Dec. 2 to Mar. 26. Records good except those for periods with ice effect, Dec. 2 to Jan. 15, 17, Mar. 13, and periods of no gage-height record, Jan. 16, 18 to Mar. 12, 14-26, which are poor.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 530 ft^3/s, June 12, 1984, gage height, 10.20 ft; maximum gage height, 10.64 ft, Apr. 6, 1965 (backwater from ice); no flow for several periods.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 128 ft^3/s, Apr. 23, gage height, 5.67 ft; no flow Jan. 19 to Feb. 16; minimum gage height, 3.63 ft, Dec. 25.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.26	.33	.21	.09	.00	2.3	1.2	3.6	2.3	.92	.31	.37
2	.26	.30	.20	.08	.00	2.5	3.2	3.0	2.1	.87	.26	.39
3	.26	.36	.19	.07	.00	2.4	3.0	2.8	2.0	.80	.26	.39
4	.26	.36	.18	.07	.00	2.3	2.0	2.7	2.0	.76	.26	.42
5	.26	.33	.18	.05	.00	2.0	1.8	2.5	1.9	.69	.26	3.7
6	.28	.32	.16	.05	.00	2.0	1.6	2.7	1.7	.66	.25	1.1
7	.43	.32	.15	.04	.00	2.0	1.5	2.4	1.7	.60	.23	.74
8	.35	.32	.17	.03	.00	2.0	1.4	2.4	1.6	.59	.21	.76
9	.32	.32	.21	.03	.00	2.0	1.4	2.5	1.4	.55	.21	.65
10	.32	.32	.21	.03	.00	2.0	1.4	2.4	1.4	.54	.23	.58
11	.32	.30	.20	.03	.00	2.0	1.5	7.0	1.6	.50	.23	.51
12	.28	.32	.18	.02	.00	2.0	1.5	4.9	1.5	.56	.48	.47
13	.28	.29	.16	.02	.00	2.0	1.5	3.6	1.4	.51	.34	.45
14	.38	.29	.14	.02	.00	1.9	1.5	10	1.3	.61	.25	.43
15	.70	.27	.15	.01	.00	1.8	1.5	17	1.3	.57	.23	.40
16	.57	.27	.17	.01	.00	1.6	1.5	14	1.3	.49	.23	.43
17	.85	.27	.18	.01	.05	1.4	1.6	6.2	1.2	.43	.49	.43
18	.61	.26	.19	.01	1.0	1.3	1.5	4.6	1.2	.40	.29	.41
19	.65	.26	.20	.00	1.5	1.2	1.5	3.7	1.1	.37	.26	.40
20	.55	.26	.19	.00	2.0	1.1	1.6	3.3	1.1	.35	.23	.45
21	.48	.26	.17	.00	2.0	1.1	1.8	3.0	1.0	.32	.23	.42
22	.44	.29	.15	.00	2.0	1.0	9.5	2.8	.98	.32	.37	.52
23	.41	.29	.14	.00	2.0	1.1	42	3.2	.90	.32	.68	.76
24	.41	.28	.14	.00	2.0	1.3	8.9	2.9	.89	.48	.38	.77
25	.40	.28	.14	.00	2.1	1.4	4.7	2.5	.84	.39	.33	.69
26	.40	.26	.13	.00	2.2	1.4	3.7	2.5	1.0	.35	.27	.63
27	.38	.26	.13	.00	2.0	1.3	3.3	2.3	1.5	.31	.28	.57
28	.34	.22	.12	.00	2.1	1.2	3.0	2.2	1.3	.29	.43	.54
29	.35	.21	.12	.00	---	1.2	2.8	3.4	1.1	.30	.71	.72
30	.33	.21	.10	.00	---	1.1	2.9	2.9	1.0	.31	.44	1.7
31	.32	---	.10	.00	---	1.0	---	2.5	---	.34	.38	---
TOTAL	12.45	8.63	5.06	.67	20.95	50.9	116.3	131.5	41.61	15.50	10.01	20.80
MEAN	.40	.29	.16	.022	.75	1.64	3.88	4.24	1.39	.50	.32	.69
MAX	.85	.36	.21	.09	2.2	2.5	42	17	2.3	.92	.71	3.7
MIN	.26	.21	.10	.00	.00	1.0	1.2	2.2	.84	.29	.21	.37
CFSM	.13	.09	.05	.007	.24	.52	1.24	1.36	.44	.16	.10	.22
IN.	.15	.10	.06	.01	.25	.60	1.38	1.56	.49	.18	.12	.25
AC-FT	25	17	10	1.3	42	101	231	261	83	31	20	41

CAL YR 1984 TOTAL 1116.71 MEAN 3.05 MAX 102 MIN .04 CFSM .97 IN 13.27 AC-FT 2210
WTR YR 1985 TOTAL 434.38 MEAN 1.19 MAX 42 MIN .00 CFSM .38 IN 5.16 AC-FT 862

MINNESOTA RIVER BASIN

05317000 COTTONWOOD RIVER NEAR NEW ULM, MN

LOCATION.--Lat 44°17'29", long 94°26'24", in SW¼NE¼ sec.33, T.110 N., R.30 W., Brown County, Hydrologic Unit 07020008, on left bank 600 ft upstream from highway bridge, 1.8 mi south of New Ulm, and 3.2 mi upstream from mouth.

DRAINAGE AREA.--1,280 mi^2, approximately.

PERIOD OF RECORD.--July 1909 to December 1913, March 1931 to March 1938, August 1938 to current year (winter records incomplete prior to 1936).

REVISED RECORDS.--WSP 355: 1912.

GAGE.--Water-stage recorder. Datum of gage is 796.83 ft above National Geodetic Vertical Datum of 1929. July 1, 1909, to Dec. 13, 1913, nonrecording gage at site 2.7 mi upstream at different datum. Mar. 15, 1931, to Mar. 31, 1938, nonrecording gage 2.2 mi upstream at datum 11.41 ft higher. Aug. 23, 1938, to June 25, 1948, nonrecording gage at present site and datum.

REMARKS.--Estimated daily discharges: Dec. 4 to Mar. 13. Records good except those for periods with ice effect, Dec. 4, 5, 7 to Mar. 13 and period of no gage-height record, Dec. 6, which are fair.

AVERAGE DISCHARGE.--51 years (water years 1912-13, 1936-37, 1939-85), 306 ft^3/s, 3.25 in/yr, 221,700 acre-ft/yr; median of yearly mean discharges, 226 ft^3/s, 2.40 in/yr, 164,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 28,700 ft^3/s, Apr. 10, 1969, gage height, 19.15 ft; maximum gage height, 20.86 ft, Apr. 8, 1965, from floodmark (backwater from ice); minimum discharge observed, 0.5 ft^3/s, Nov. 27, 1952; minimum gage height, 0.72 ft, Nov. 20, 1964.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,300 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 13	1145	Ice jam	*13.45	May 18	0230	1,530	6.66
Mar. 16	0515	*6,650	13.26	June 29	0900	2,200	7.86
Apr. 24	2015	4,530	11.67	Sept.10	1345	2,220	7.72

Minimum daily discharge, 52 ft^3/s, Feb. 14-16; minimum gage height, 1.78 ft, Aug. 11.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	80	268	166	79	57	222	595	1590	1160	1640	132	785
2	78	251	135	75	57	185	596	1600	1160	1290	127	588
3	76	232	103	72	56	240	743	1440	1090	1010	122	482
4	74	244	148	70	56	313	836	1300	1000	815	116	446
5	73	241	170	69	56	222	828	1120	893	679	113	478
6	76	234	160	68	55	138	755	986	788	577	109	915
7	77	230	150	67	55	116	691	862	717	489	105	1700
8	83	226	148	67	54	100	608	764	680	423	100	1660
9	99	224	143	66	54	94	542	689	614	372	99	1720
10	102	219	143	66	54	110	498	632	549	329	102	2170
11	103	213	147	66	53	300	475	598	506	298	97	1940
12	100	204	150	65	53	700	455	652	497	271	144	1430
13	97	205	147	65	53	3500	439	779	476	254	180	1090
14	105	205	147	64	52	5410	424	718	474	244	172	875
15	135	202	160	64	52	6340	419	756	542	234	164	745
16	157	195	180	63	52	6570	419	1070	637	223	178	661
17	293	180	173	63	54	5860	414	1410	525	218	189	599
18	396	190	168	62	58	4270	413	1500	471	216	170	548
19	495	170	160	62	62	3290	404	1340	429	203	160	504
20	566	166	145	62	67	2530	392	1180	394	187	151	482
21	594	142	130	61	75	1980	421	1020	367	173	143	460
22	576	198	120	61	85	1650	606	879	346	162	135	453
23	518	212	110	60	92	1400	2130	807	319	153	145	484
24	459	209	100	60	138	1250	4150	765	292	176	153	528
25	413	189	92	60	186	1120	4350	752	271	168	188	611
26	378	191	88	59	250	1010	3620	753	265	161	227	638
27	357	194	84	59	203	1010	2840	712	808	157	219	609
28	336	186	85	58	186	903	2280	644	1940	153	214	572
29	311	181	89	58	---	826	1910	611	2170	147	343	549
30	294	181	90	58	---	754	1680	654	1990	143	977	566
31	277	---	86	57	---	695	---	899	---	142	1100	---
TOTAL	7778	6182	4117	1986	2325	53108	34933	29482	22370	11707	6574	25288
MEAN	251	206	133	64.1	83.0	1713	1164	951	746	378	212	843
MAX	594	268	180	79	250	6570	4350	1600	2170	1640	1100	2170
MIN	73	142	84	57	52	94	392	598	265	142	97	446
CFSM	.20	.16	.10	.05	.07	1.34	.91	.74	.58	.30	.17	.66
IN.	.23	.18	.12	.06	.07	1.54	1.02	.86	.65	.34	.19	.73
AC-FT	15430	12260	8170	3940	4610	105300	69290	58480	44370	23220	13040	50160

CAL YR 1984	TOTAL	344734	MEAN 942	MAX 9830	MIN 73	CFSM .74	IN 10.02	AC-FT	683800	
WTR YR 1985	TOTAL	205850	MEAN 564	MAX 6570	MIN 52	CFSM .44	IN 5.98	AC-FT	408300	

05317200 LITTLE COTTONWOOD RIVER NEAR COURTLAND, MN

LOCATION.--Lat 44°14'47", long 94°20'19", in SW¼NE¼ sec.17, T.109 N., R.29 W., Blue Earth County, Hydrologic Unit 07020007, on right bank 30 ft downstream from bridge on State Highway 68, 0.7 mi above mouth, 1.5 mi south of Courtland.

DRAINAGE AREA.--230 mi^2, approximately.

PERIOD OF RECORD.--October 1973 to current year. September 1969 to September 1973, operated as a low-flow station only.

GAGE.--Water-stage recorder. Datum of gage is 788.25 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Dec. 4-6, 18-24, 31, Jan. 1, 2, 12, 16, 19-22, Jan. 23 to Mar. 10, and July 12-16. Records good except those for periods with ice effect, Dec. 4, 5, 18-22, Jan. 16, 19, 22, and periods of no gage-height record, Dec. 6, 23, 24, 31, Jan. 1, 2, 12, 20, 21, Jan.23 to Mar. 10, and July 12-16, which are fair.

AVERAGE DISCHARGE.--12 years, 55.7 ft^3/s, 3.29 in/yr, 40,350 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,340 ft^3/s, Mar. 16, 1985, gage height, 8.96 ft; minimum discharge, 0.01 ft^3/s, Sept. 17, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 180 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 16	1130	*1,340	*8.96	Apr. 27	1000	401	5.41
Apr. 3	0845	190	4.07	May 14	2215	186	4.04

Minimum daily discharge, 3.3 ft^3/s, Feb. 16; minimum gage height, 1.94 ft, Aug. 11, 12, but may have been lower during periods of no gage height record.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	33	18	11	4.6	14	90	259	120	53	11	72
2	11	27	13	10	4.5	13	122	215	118	49	9.7	63
3	11	27	14	10	4.4	11	182	191	112	45	9.3	53
4	10	33	14	9.8	4.3	10	169	177	105	38	8.8	45
5	10	30	14	9.1	4.2	9.3	164	162	96	34	8.2	50
6	9.9	29	13	9.0	4.1	8.5	160	157	88	31	7.9	59
7	12	29	13	8.8	4.0	7.7	152	145	81	26	7.6	65
8	12	28	14	8.7	3.9	7.1	140	134	81	23	7.1	75
9	13	27	16	8.4	3.8	6.7	129	125	69	21	6.4	78
10	14	28	17	8.5	3.8	25	119	115	62	19	6.1	74
11	13	31	19	8.4	3.7	151	109	107	59	17	5.9	69
12	12	25	20	8.3	3.6	340	101	103	64	16	12	62
13	12	25	19	8.1	3.6	437	93	94	63	16	20	52
14	13	23	18	7.6	3.5	440	90	114	62	16	22	43
15	18	23	18	7.1	3.4	644	89	156	98	15	31	36
16	24	19	29	7.0	3.3	1110	84	166	69	15	24	30
17	30	22	25	6.8	3.4	639	82	160	70	15	19	27
18	51	20	24	6.6	3.6	472	79	158	69	14	16	25
19	81	19	22	6.2	3.9	391	76	161	60	13	14	23
20	74	19	21	6.0	4.2	324	70	160	53	12	14	22
21	70	23	19	5.8	4.8	273	77	155	49	11	14	22
22	70	23	18	5.6	5.7	231	150	147	43	9.8	12	26
23	65	23	16	5.5	6.6	204	243	139	38	8.7	16	31
24	58	24	15	5.4	7.5	189	260	132	34	11	22	39
25	52	25	14	5.3	8.9	169	285	127	30	14	30	45
26	47	24	13	5.2	11	158	372	134	29	13	31	51
27	44	23	13	5.1	11	161	393	144	36	12	26	52
28	41	22	14	5.0	12	158	341	143	38	12	25	49
29	38	21	14	4.8	---	150	291	136	47	10	62	50
30	36	20	13	4.7	---	133	258	133	54	9.6	49	58
31	33	---	12	4.7	---	122	---	124	---	11	66	---
TOTAL	995.9	745	522	222.5	145.3	7008.3	4970	4573	1997	610.1	613.0	1446
MEAN	32.1	24.8	16.8	7.18	5.19	226	166	148	66.6	19.7	19.8	48.2
MAX	81	33	29	11	12	1110	393	259	120	53	66	78
MIN	9.9	19	12	4.7	3.3	6.7	70	94	29	8.7	5.9	22
CFSM	.14	.11	.07	.03	.02	.98	.72	.64	.29	.09	.09	.21
IN.	.16	.12	.08	.04	.02	1.13	.80	.74	.32	.10	.10	.23
AC-FT	1980	1480	1040	441	288	13900	9860	9070	3960	1210	1220	2870

CAL YR 1984 TOTAL 37571.9 MEAN 103 MAX 717 MIN 8.4 CFSM .45 IN 6.08 AC-FT 74520
WTR YR 1985 TOTAL 23848.1 MEAN 65.3 MAX 1110 MIN 3.3 CFSM .28 IN 3.86 AC-FT 47300

05319500 WATONWAN RIVER NEAR GARDEN CITY, MN

LOCATION.--Lat 44°02'47", long 94°11'43", in SW¼NE¼ sec.28, T.107 N., R.28 W., Blue Earth County, Hydrologic Unit 07020010, on left bank 25 ft downstream from bridge on County Highway 13, 1.5 miles west of Garden City, 7.3 mi upstream from mouth, and 9.2 mi downstream from Perch Creek.

DRAINAGE AREA.-- 812 mi^2.

PERIOD OF RECORD.--March 1940 to September 1945, 1953, 1960, 1961, 1969, one or more discharge measurements each year, September 1976 to current year.

REVISED RECORDS.--WDR MN-78-2: 1977.

GAGE.--Water-stage recorder. Datum of gage is 905.05 ft above National Geodetic Vertical Datum of 1929. Prior to September 30, 1945, nonrecording gage at site 200 ft upstream and at datum 0.17 ft higher.

REMARKS.--Estimated daily discharge: Nov. 20, 22, 23, Dec. 4-12, Dec. 14 to Mar. 14 and Sept. 25-30. Records good except those for period of no gage-height record, Sept. 25-29, and periods with ice effect, Nov. 20, 22, 23, Dec. 4-12, and Dec. 14 to Mar. 14, which are fair.

AVERAGE DISCHARGE.--14 years (water years 1941-45, 1977-85), 338 ft^3/s, 5.65 in/yr, 244,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,620 ft^3/s, May 21, 1944, gage height 9.84 ft, datum then in use; minimum daily, 1.9 ft^3/s, Jan. 20 to Feb. 8, 1977; minimum gage height, 0.27 ft, July 23, 1940, datum then in use.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Apr. 7, 1965, reached a stage of 18.89 ft at datum 0.17 ft higher, from floodmarks, discharge, 19,000 ft^3/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 900 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 15	2030	*3,590	*8.16	Apr. 26	1830	2,610	6.85

Minimum discharge, 19 ft^3/s, Aug. 8, gage height, 0.69 ft.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	37	134	123	58	35	70	464	1410	439	208	44	211
2	36	134	117	56	35	65	492	1170	419	198	41	179
3	34	128	82	53	35	61	755	993	384	181	39	161
4	32	128	97	52	35	59	959	860	345	162	37	148
5	31	128	100	50	35	56	1060	757	327	146	30	161
6	31	123	97	48	35	54	995	687	308	133	26	210
7	32	123	92	47	35	52	863	619	286	122	21	288
8	31	119	92	45	34	52	726	564	277	106	20	302
9	30	123	97	44	34	58	628	513	258	99	20	353
10	30	150	104	42	34	150	572	480	242	91	23	433
11	34	161	114	42	34	400	555	448	228	83	21	381
12	30	159	118	41	34	1130	513	431	251	79	35	337
13	30	156	116	40	34	1620	480	413	251	74	61	301
14	33	165	110	40	33	2280	463	410	233	70	64	268
15	64	172	110	39	33	3160	447	505	234	70	58	240
16	101	174	185	39	33	3210	438	649	254	77	57	223
17	136	170	165	39	34	2690	427	735	314	92	49	195
18	160	165	145	38	40	2270	415	743	306	87	45	170
19	203	163	130	38	48	1760	410	710	286	79	41	180
20	256	153	120	38	62	1380	389	658	250	70	35	209
21	235	145	105	38	80	1150	390	584	215	64	33	222
22	217	143	95	37	76	980	551	511	177	60	37	248
23	201	143	87	37	73	845	1200	465	173	55	59	293
24	183	141	78	37	69	787	1800	481	161	54	79	348
25	172	143	73	37	65	707	2250	567	158	56	90	407
26	165	143	70	36	62	634	2510	603	149	56	84	463
27	161	145	66	36	59	649	2480	523	156	51	74	387
28	154	141	68	36	64	676	2140	452	175	47	68	338
29	150	136	65	36	---	692	1720	414	201	41	117	341
30	143	134	63	36	---	633	1370	413	217	42	261	381
31	139	---	60	36	---	576	---	427	---	43	267	---
TOTAL	3291	4342	3144	1291	1280	28906	28462	19195	7674	2796	1936	8378
MEAN	106	145	101	41.6	45.7	932	949	619	256	90.2	62.5	279
MAX	256	174	185	58	80	3210	2510	1410	439	208	267	463
MIN	30	119	60	36	33	52	389	410	149	41	20	148
CFSM	.13	.18	.12	.05	.06	1.15	1.17	.76	.32	.11	.08	.34
IN.	.15	.20	.14	.06	.06	1.32	1.30	.88	.35	.13	.09	.38
AC-FT	6530	8610	6240	2560	2540	57340	56450	38070	15220	5550	3840	16620

CAL YR 1984 TOTAL 201061 MEAN 549 MAX 4300 MIN 30 CFSM .68 IN 9.21 AC-FT 398800
WTR YR 1985 TOTAL 110695 MEAN 303 MAX 3210 MIN 20 CFSM .37 IN 5.07 AC-FT 219600

05320000 BLUE EARTH RIVER NEAR RAPIDAN, MN

LOCATION.--Lat 44°05'44", long 94°06'33", in SE¼SE¼ sec.6, T.107 N., R.27 W., Blue Earth County, Hydrologic Unit 07020009, on left bank 0.2 mi downstream from powerplant reactivated in 1984, operated by Rapidan Redevelopment Limited Partnership, 2 mi west of Rapidan, 3.5 mi downstream from Watonwan River, and 7.8 mi upstream from Le Sueur River.

DRAINAGE AREA.--2,430 mi^2, approximately.

PERIOD OF RECORD.--July 1909 to November 1910 (published as "at Rapidan Mills," no winter records), October 1939 to September 1945, July 1949 to current year.

REVISED RECORDS.--WSP 895: Drainage area. WSP 1508: 1910.

GAGE.--Water-stage recorder. Datum of gage is 807.83 ft above National Geodetic Vertical Datum of 1929. July 20, 1909, to Apr. 28, 1910, nonrecording gage at site 0.2 mi upstream at different datum. Apr. 29 to Nov. 12, 1910, nonrecording gage at site 800 ft upstream at different datum. Oct. 4 to Nov. 14, 1939, nonrecording gage at present site and datum.

REMARKS.--Estimated daily discharges: Feb. 5-8 and Mar. 5, 6. Records good except those for periods with ice effect, which are fair.

AVERAGE DISCHARGE.--42 years (water years 1940-45, 1950-85), 918 ft^3/s, 5.13 in/yr, 665,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 43,100 ft^3/s, Apr. 9, 1965, gage height, 21.36 ft, from floodmark; minimum, 6.9 ft^3/s, Oct. 12, 1955, gage height, 1.04 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 11,100 ft^3/s, Mar. 17, gage height, 9.38 ft; minimum, 13 ft^3/s, Jan. 31, gage height, 1.14 ft, due to regulation.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	71	225	458	465	256	360	1520	3460	1100	658	111	826
2	64	234	144	410	130	311	1450	3100	1130	617	107	631
3	64	238	159	338	127	279	1690	2810	1150	564	97	532
4	64	187	208	275	351	213	2280	2500	1280	417	97	483
5	63	229	175	306	114	195	3010	2220	989	584	94	421
6	62	247	199	285	102	203	3560	2040	775	341	91	555
7	62	238	155	221	102	181	3880	1920	622	320	91	804
8	61	191	261	268	102	149	3780	1760	830	501	81	1340
9	95	220	130	238	94	115	3010	1580	582	389	146	1240
10	91	285	134	221	91	128	2370	1500	744	216	73	1220
11	76	295	310	191	94	251	2230	1410	661	216	74	1010
12	74	356	229	251	100	1970	2010	1250	693	216	107	1010
13	74	577	261	194	102	4020	1870	1240	729	212	141	856
14	74	617	238	377	102	5460	1650	1210	850	199	114	798
15	76	679	234	179	108	7370	1680	1270	1340	191	127	401
16	83	519	285	134	105	7940	1600	1440	1340	171	114	745
17	114	686	476	148	94	6320	1730	1630	1520	315	90	517
18	144	238	417	191	89	4810	1380	1670	1550	187	91	538
19	389	429	458	305	91	4280	1410	1660	1350	179	82	552
20	464	395	412	97	100	3800	1430	1650	1210	155	62	363
21	501	300	658	220	134	3380	1320	1510	1140	152	60	163
22	494	271	632	203	178	2980	1700	1330	932	131	122	326
23	384	330	614	91	165	2720	3080	1290	836	132	134	415
24	351	435	554	102	185	2340	4560	1240	811	140	167	454
25	325	406	343	127	167	2200	5170	1310	744	140	178	485
26	330	330	586	105	308	1960	5420	1330	651	142	418	661
27	290	378	325	105	285	1940	5030	1250	610	139	187	780
28	234	452	379	105	299	1870	4540	1060	551	136	256	624
29	256	395	399	124	---	1940	4080	1020	638	127	152	723
30	310	315	355	102	---	1860	3600	1130	644	132	450	1040
31	252	---	388	252	---	1690	---	874	---	111	824	---
TOTAL	5992	10697	10576	6630	4175	73235	82040	50664	28002	8130	4938	20513
MEAN	193	357	341	214	149	2362	2735	1634	933	262	159	684
MAX	501	686	658	465	351	7940	5420	3460	1550	658	824	1340
MIN	61	187	130	91	89	115	1320	874	551	111	60	163
CFSM	.08	.15	.14	.09	.06	.97	1.13	.67	.38	.11	.07	.28
IN.	.09	.16	.16	.10	.06	1.12	1.26	.78	.43	.12	.08	.31
AC-FT	11890	21220	20980	13150	8280	145300	162700	100500	55540	16130	9790	40690

CAL YR 1984 TOTAL 695287 MEAN 1900 MAX 9450 MIN 61 CFSM .78 IN 10.64 AC-FT 1379000
WTR YR 1985 TOTAL 305592 MEAN 837 MAX 7940 MIN 60 CFSM .34 IN 4.68 AC-FT 606100

05320500 LE SUEUR RIVER NEAR RAPIDAN, MN

LOCATION.--Lat 44°06'40", long 94°02'28", in SW¼ sec.35, T.108 N., R.27 W., Blue Earth County, Hydrologic Unit 07020011, on right bank 600 ft downstream from highway bridge, 1.8 mi northeast of Rapidan, and 2.3 mi upstream from mouth.

DRAINAGE AREA.--1,100 mi^2, approximately.

PERIOD OF RECORD.--October 1939 to September 1945, July 1949 to current year.

GAGE.--Water-stage recorder. Datum of gage is 775.76 ft above National Geodetic Vertical Datum of 1929. Prior to Nov. 15, 1939, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Nov. 19-22, Dec. 2 to Mar. 14. Records good except those for periods with ice effect, Nov. 19-22, Dec. 2-31, Jan 4-18, Jan. 21 to Mar. 16, and periods of no gage-height record, Dec. 4-10 and Jan. 1-3, 19, 20, which are fair.

AVERAGE DISCHARGE.--42 years (water years 1940-45, 1950-85), 466 ft^3/s, 5.75 in/yr, 337,620 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 24,700 ft^3/s, Apr. 8, 1965, gage height, 22.10 ft, from floodmark; maximum gage height, 22.72 ft, May 22, 1960, from floodmark; minimum daily discharge, 1.6 ft^3/s, Feb. 9-25, 1959; minimum gage height, 0.65 ft, Sept. 7-13, 1976.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,300 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 13	2130	Ice jam	*a9.24	Apr. 6	1900	1,870	4.78
Mar. 15	1900	*5,810	8.83	Apr. 23	1315	1,910	4.77

a Backwater from ice.

Minimum discharge, 18 ft^3/s, Aug. 11, gage height, 0.89 ft.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	40	236	248	160	58	400	900	834	176	123	34	116
2	40	220	240	155	56	385	857	766	218	110	29	106
3	40	211	235	150	55	305	1250	691	201	103	27	93
4	40	208	225	145	55	285	1540	626	181	96	25	83
5	40	214	210	140	54	300	1770	569	166	86	22	84
6	40	206	200	140	54	250	1800	553	155	80	21	86
7	40	203	190	135	54	225	1710	511	146	71	20	85
8	40	201	185	130	54	230	1510	471	139	63	20	152
9	40	207	175	130	54	285	1290	427	128	59	19	220
10	40	371	170	126	54	380	1150	412	122	55	21	164
11	40	499	166	125	54	830	1030	388	125	49	19	165
12	34	550	170	124	54	1700	927	361	145	46	39	169
13	37	605	180	123	54	2860	881	329	171	47	52	144
14	38	580	190	122	52	4540	863	331	290	46	39	119
15	112	546	200	122	51	5400	853	339	547	44	36	101
16	193	507	220	120	50	4700	843	346	549	42	37	88
17	339	484	260	115	55	3260	827	346	482	40	42	80
18	459	461	260	100	70	2550	786	331	437	39	36	72
19	734	440	250	105	80	2130	779	311	388	38	29	69
20	623	420	240	100	105	1800	752	295	344	33	27	80
21	498	390	230	95	290	1590	757	287	310	30	26	68
22	415	360	220	90	390	1390	1210	266	273	28	37	76
23	351	348	210	86	425	1220	1790	249	234	27	56	100
24	303	333	200	83	485	1130	1710	233	207	33	59	155
25	267	306	195	81	500	1020	1510	228	175	56	64	157
26	246	299	190	78	465	944	1350	220	157	47	77	205
27	242	284	185	74	330	942	1240	208	158	39	63	216
28	334	280	180	70	355	1010	1100	205	148	37	53	200
29	304	273	175	66	---	1070	990	204	141	37	57	191
30	265	262	170	63	---	1050	911	189	135	33	57	247
31	246	---	165	61	---	1010	---	180	---	42	91	---
TOTAL	6480	10504	6334	3414	4413	45191	34886	11706	7048	1679	1234	3891
MEAN	209	350	204	110	158	1458	1163	378	235	54.2	39.8	130
MAX	734	605	260	160	500	5400	1800	834	549	123	91	247
MIN	34	201	165	61	50	225	752	180	122	27	19	68
CFSM	.19	.32	.19	.10	.14	1.33	1.06	.34	.21	.05	.04	.12
IN.	.22	.36	.21	.12	.15	1.53	1.18	.40	.24	.06	.04	.13
AC-FT	12850	20830	12560	6770	8750	89640	69200	23220	13980	3330	2450	7720

CAL YR 1984 TOTAL 339426 MEAN 927 MAX 6130 MIN 29 CFSM .84 IN 11.48 AC-FT 673300
WTR YR 1985 TOTAL 136780 MEAN 375 MAX 5400 MIN 19 CFSM .34 IN 4.63 AC-FT 271300

05325000 MINNESOTA RIVER AT MANKATO, MN

LOCATION.--Lat 44°09'58", long 94°00'57", in NW¼NE¼ sec.13, T.108 N., R.27 W., Nicollet County, Hydrologic Unit 07020007, on left bank 12 ft downstream from bridge on U.S. Highway 169 in North Mankato, 1.1 mi downstream from Blue Earth River and at mile 107.1 upstream from Mississippi River.

DRAINAGE AREA.--14,900 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1903 to current year (no winter records 1904, 1906-10, 1918-29). Monthly discharge only for some periods, published in WSP 1308. Published as "near Mankato": 1903-21.

REVISED RECORDS.--WSP 875: 1917. WSP 955: Drainage area. WSP 1085: 1929. WSP 1238: 1903, 1908, 1919. WSP 1508: 1916(M), 1918(M), 1926(M), 1928, 1930, 1932(M), 1938(M). WDR-MN-76-1: 1881(M).

GAGE.--Water-stage recorder. Datum of gage is 747.92 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 19, 1921, nonrecording gage, at site 1.1 mi upstream at datum 6.4 ft higher. Mar. 15, 1922, to Nov. 30, 1924, nonrecording gage, and Dec. 1, 1924 to May 24, 1971, recorder at site 0.5 mi downstream at present datum. May 25, 1971 to Aug. 14, 1977, recorder at site 0.2 mi downstream at present datum. Aug. 14, 1977 to July 27, 1978, nonrecording gage at present site and datum.

REMARKS.--Estimated daily discharges: Dec.1, 2, 5 to Mar. 13, and Apr. 13-23. Records good except for periods with ice effect, Dec. 1, 2, 5 to Mar. 13, period when orfice was loose, Mar. 14-18, and period of no gage-height record, Apr. 13-23, which are fair.

AVERAGE DISCHARGE.--64 years (water years 1905, 1911-17, 1930-85), 2,922 ft^3/s, 2.66 in/yr, 2,117,000 acre-ft/yr; median of yearly mean discharges, 2,550 ft^3/s, 2.32 in/yr, 1,850,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 94,100 ft^3/s, Apr. 10, 1965, gage height, 29.09 ft; minimum observed, 26 ft^3/s, Aug. 4, 1934.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since Apr. 26, 1881, 29.9 ft, present site and datum, from floodmark, discharge, 110,000 ft^3/s.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 29,700 ft^3/s, Mar. 17, gage height, 20.20 ft; minimum daily, 740 ft^3/s, Feb. 12-15; minimum gage height, 3.70 ft, Aug. 10, 11.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	989	6500	3320	2400	970	1750	16000	16300	5750	6380	1640	3690
2	1030	6410	3110	2300	940	1840	15500	15300	6030	6210	1540	3170
3	1160	6370	2770	2250	900	1980	15800	14100	6170	5810	1260	2740
4	1210	6330	2370	2200	890	2100	16000	12900	6550	5250	1040	2540
5	1190	6320	2700	2150	870	2050	16700	11800	6200	4860	920	3480
6	1050	6360	2800	2100	850	1950	16800	11000	6120	4220	856	3890
7	903	6310	3000	2010	830	1820	16500	10200	5950	3680	816	4590
8	824	6180	3100	2000	800	1740	15700	9320	5700	3380	833	5820
9	791	6170	3150	1950	780	1700	14200	8530	5640	3130	872	5900
10	928	6230	3150	1900	760	1850	12700	7940	5330	2700	843	6020
11	1140	6170	3200	1850	750	2500	11700	7450	5080	2510	800	6270
12	1220	6070	3250	1820	740	6600	10800	7030	5140	2380	1010	6230
13	1260	6170	3300	1780	740	12500	10000	6770	5040	2230	1120	6110
14	1330	6130	3300	1720	740	14800	9300	6560	5060	2060	1130	6010
15	1630	6040	3300	1680	740	18300	8800	6630	5990	1980	1200	5960
16	1750	5700	3300	1620	750	25000	8400	6920	6210	1860	1290	6410
17	1890	5670	3300	1590	760	28800	8100	7300	6310	1770	1310	6250
18	2290	5250	3300	1500	780	27300	7800	7570	6220	1570	1190	6110
19	3400	5060	3250	1450	880	25500	7600	7670	5850	1450	1070	5840
20	4190	4870	3150	1350	1000	23500	7700	7550	5480	1410	1020	5480
21	4680	4580	3000	1320	1400	21900	9000	7420	5240	1390	986	5000
22	5090	4390	2950	1300	1600	20300	10500	6970	4840	1360	1000	4840
23	5300	4300	2900	1250	1600	18800	11700	6830	4570	1420	1090	4710
24	5430	4380	2850	1200	1600	17200	13400	6640	4240	1600	1090	4560
25	5620	4270	2800	1170	1600	16000	15400	6490	4140	1710	1150	4450
26	5900	4110	2700	1140	1650	15200	17100	6420	3860	1690	1340	4670
27	6230	3960	2650	1100	1700	15300	18500	6160	3900	1680	1300	4740
28	6480	3860	2550	1070	1720	15600	19000	5900	4980	1580	1310	4520
29	6600	3670	2530	1040	---	16200	18400	5590	5920	1430	1430	4430
30	6670	3430	2500	1010	---	16400	17300	5600	6300	1460	1920	4640
31	6590	---	2450	990	---	16400	---	5530	---	1620	3290	---
TOTAL	94765	161260	92000	50210	29340	392880	396400	258390	163810	81780	37666	149070
MEAN	3057	5375	2968	1620	1048	12670	13210	8335	5460	2638	1215	4969
MAX	6670	6500	3320	2400	1720	28800	19000	16300	6550	6380	3290	6410
MIN	791	3430	2370	990	740	1700	7600	5530	3860	1360	800	2540
CFSM	.21	.36	.20	.11	.07	.85	.89	.56	.37	.18	.08	.33
IN.	.24	.40	.23	.13	.07	.98	.99	.65	.41	.20	.09	.37
AC-FT	188000	319900	182500	99590	58200	779300	786300	512500	324900	162200	74710	295700

CAL YR 1984 TOTAL 3172681 MEAN 8669 MAX 39900 MIN 760 CFSM .58 IN 7.92 AC-FT 6293000
WTR YR 1985 TOTAL 1907571 MEAN 5226 MAX 28800 MIN 740 CFSM .35 IN 4.76 AC-FT 3784000

MINNESOTA RIVER BASIN

05325000 MINNESOTA RIVER AT MANKATO, MN--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1963-66, 1968 to current year.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: October 1967 to September 30, 1981, October 1982 to current year.
SUSPENDED-SEDIMENT DISCHARGE: October 1967 to current year.

REMARKS.--During the winter period, daily suspended-sediment samples were collected monthly and daily sediment load was estimated on the basis of water records and these sediment samples. Water temperature was obtained once-daily during open water period and occasionally for the winter period. Temperature records are considered fair.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: Maximum daily, 30.5°C, July 15, 1980; minimum daily, 0.0°C on many days each year.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 2,850 mg/L, Aug. 7, 1968; minimum daily mean, 13 mg/L, Nov. 24, 1974, Feb. 18, 19, 1979.
SEDIMENT LOADS: Maximum daily, 247,000 tons, Apr. 9, 1969; minimum daily, 5.2 tons, Nov. 6, 1976.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURES: Maximum daily, 26.5°C, July 28; minimum daily, 0.0°C on many days during winter period.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 607 mg/L, Apr. 27; minimum daily mean, 42 mg/L, Aug. 23.
SEDIMENT LOADS: Maximum daily, 30,300 tons, Apr. 27; minimum daily, 112 tons, Feb. 12-15, Aug. 5.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15.0	4.0		---	---	---	4.0		---	24.0	21.5	19.5
2	15.0	---		---	---	---	7.0		---	21.5	22.0	18.0
3	15.0	4.0		---	---	---	8.0		---	22.0	22.0	20.0
4	16.0	5.0		---	---	---	7.0		---	23.5	22.0	20.0
5	15.0	6.0		---	---	---	7.0		---	23.0	22.5	20.5
6	15.0	---		---	---	---	---		---	23.0	23.0	21.0
7	15.0	8.0		.5	---	---	---		---	24.5	22.5	22.0
8	15.0	---		---	---	---	6.0		---	25.0	23.5	23.0
9	15.0	6.0		---	---	---	---		---	24.5	23.5	20.0
10	16.0	---		---	---	---	8.0		---	24.0	19.5	20.0
11	17.0	---		---	---	---	11.0		---	24.0	19.0	18.0
12	20.0	---		---	---	---	---		---	24.5	22.0	17.0
13	19.0	---		---	---	---	10.0		---	25.0	19.5	15.5
14	18.0	5.0		---	---	---	11.0		---	24.0	20.0	16.0
15	10.0	---		---	.0	2.0	13.0		---	24.5	19.5	15.5
16	15.0	10.0		---	---	---	12.0		---	23.0	21.0	17.0
17	10.0	6.0		---	---	---	14.0		---	23.0	21.5	18.0
18	15.0	---		---	---	2.0	---		---	23.0	19.5	18.5
19	18.0	---		---	---	---	---		20.0	24.5	19.0	20.0
20	11.0	---		---	---	---	---		22.0	24.0	18.0	17.0
21	10.0	---		---	---	---	---		21.0	22.5	19.0	17.0
22	16.0	6.0		---	---	---	---		18.5	22.0	20.0	17.0
23	---	---		---	---	---	---		22.5	22.5	20.0	15.0
24	10.0	---		---	---	---	14.0		20.0	23.0	20.0	13.0
25	9.0	---		---	---	---	12.5		25.5	22.5	22.5	12.5
26	10.0	---		---	---	---	---		23.5	23.0	19.5	11.5
27	9.0	---		---	---	---	---		22.0	24.0	19.0	11.5
28	10.0	---		---	---	---	---		20.5	26.5	20.5	11.0
29	---	---		---	---	---	---		20.0	22.5	20.5	10.5
30	10.0	---		---	---	---	---		19.5	22.5	19.5	9.0
31	16.0	---		---	---	---	---		---	21.0	21.0	---
MAX										26.5	23.5	23.0
MIN										21.0	18.0	9.0

WTR YR 1985 MAX 26.5 MIN .0

MINNESOTA RIVER BASIN

05325000 MINNESOTA RIVER AT MANKATO, MN--Continued

SUSPENDED-SEDIMENT WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	66	176	267	4690	56	502	56	363	56	147	---	601
2	67	186	238	4120	56	470	56	348	56	142	---	660
3	68	213	217	3730	56	419	56	340	56	136	---	757
4	70	229	201	3440	56	358	56	333	56	135	---	845
5	72	231	194	3310	56	408	56	325	56	132	---	808
6	74	210	190	3260	56	423	56	318	56	129	---	736
7	75	183	185	3150	56	454	56	304	56	125	---	647
8	79	176	182	3040	56	469	56	302	56	121	---	595
9	82	175	180	3000	56	476	56	295	56	118	---	569
10	87	218	180	3030	56	476	56	287	56	115	---	667
11	93	286	180	3000	56	484	56	280	56	113	---	1170
12	99	326	180	2950	56	491	56	275	56	112	---	5420
13	106	361	180	3000	56	499	56	269	56	112	---	11100
14	114	409	180	2980	56	499	56	260	56	112	---	13400
15	127	559	179	2920	56	499	56	254	56	112	---	17000
16	140	661	172	2650	56	499	56	245	56	113	---	24100
17	145	740	165	2530	56	499	56	240	56	115	---	28200
18	158	977	158	2240	56	499	56	227	56	118	---	26600
19	238	2180	152	2080	56	491	56	219	56	133	319	22000
20	320	3620	144	1890	56	476	56	204	56	151	280	17800
21	362	4570	135	1670	56	454	56	200	---	396	251	14800
22	375	5150	127	1510	56	446	56	197	---	508	250	13700
23	370	5290	119	1380	56	438	56	189	---	508	250	12700
24	365	5350	111	1310	56	431	56	181	---	508	242	11200
25	362	5490	103	1190	56	423	56	177	---	508	225	9720
26	358	5700	95	1050	56	408	56	172	---	538	202	8290
27	355	5970	87	930	56	401	56	166	---	569	171	7060
28	351	6140	79	823	56	386	56	162	---	582	152	6400
29	345	6150	71	704	56	383	56	157	---	---	160	7000
30	328	5910	63	583	56	378	56	153	---	---	164	7260
31	302	5370	---	---	56	370	56	150	---	---	158	7000
TOTAL	---	73206	---	72160	---	13909	---	7592	---	6608	---	278805
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	150	6480	14900		---	4650	291	5010	115	509	304	3030
2	157	6570	13900		---	4900	262	4390	109	453	223	1910
3	163	6950	12700		---	5030	267	4190	100	340	150	1110
4	168	7260	11500		---	5380	281	3980	68	191	160	1100
5	167	7530	10400		---	5060	291	3820	45	112	272	2560
6	166	7530	9610		---	4980	298	3400	57	132	342	3590
7	165	7350	8830		---	4830	299	2970	77	170	319	3950
8	164	6950	7980		---	4600	301	2750	79	178	287	4510
9	163	6250	7230		---	4550	298	2520	69	162	279	4440
10	160	5490	6670		---	4270	295	2150	70	159	305	4960
11	159	5020	6210		---	4050	270	1830	73	158	290	4910
12	158	4610	5820		---	4100	209	1340	76	207	245	4120
13	157	4240	5580		---	4010	207	1250	74	224	215	3550
14	157	3940	5390		---	4030	223	1240	74	226	198	3210
15	156	3710	5450		---	4860	223	1190	74	240	190	3060
16	153	3470	5720		---	5070	220	1100	77	268	193	3340
17	150	3280	6070		---	5160	209	999	67	237	178	3000
18	147	3100	6320		310	5210	182	771	51	164	166	2740
19	143	2930	6420		302	4770	156	611	49	142	184	2900
20	138	2870	6300		282	4170	156	594	50	138	259	3830
21	134	3260	6180		260	3680	156	585	49	130	290	3920
22	130	3690	5760		246	3210	152	558	46	124	294	3840
23	141	4450	5640		251	3100	148	567	42	124	284	3610
24	230	8320	5460		251	2870	143	618	44	129	228	2810
25	392	16300	5320		260	2910	138	637	44	137	239	2870
26	558	25800	5260		280	2920	130	593	46	166	272	3430
27	607	30300	5020		300	3160	118	535	46	161	277	3550
28	350	18000	4780		446	6000	105	448	55	195	285	3480
29	205	10200	4500		440	7030	79	305	69	266	282	3370
30	---	16000	4510		350	5950	90	355	120	622	227	2840
31	---	---	4450		---	---	117	512	315	2800	---	---
TOTAL	---	241850	219880		---	134510	---	51818	---	9264	---	99540

TOTAL LOAD FOR YEAR: 1209142 TONS

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SED. SUSP. FALL DIAM. % FINER THAN .002 MM (70337)	SED. SUSP. FALL DIAM. % FINER THAN .004 MM (70338)	SED. SUSP. FALL DIAM. % FINER THAN .008 MM (70339)	SED. SUSP. FALL DIAM. % FINER THAN .016 MM (70340)	SED. SUSP. FALL DIAM. % FINER THAN .062 MM (70342)	SED. SUSP. FALL DIAM. % FINER THAN .125 MM (70343)	SED. SUSP. FALL DIAM. % FINER THAN .250 MM (70344)	SED. SUSP. FALL DIAM. % FINER THAN .500 MM (70345)	SED. SUSP. FALL DIAM. % FINER THAN 1.00 MM (70346)
MAR 14...	1251	14200	38	46	51	58	76	88	97	99	100

PARTICLE-SIZE DISTRIBUTION OF SURFACE BED MATERIAL, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	NUMBER OF SAM-PLING POINTS (00063)	BED MAT. SIEVE DIAM. % FINER THAN .125 MM (80165)	BED MAT. SIEVE DIAM. % FINER THAN .250 MM (80166)	BED MAT. SIEVE DIAM. % FINER THAN .500 MM (80167)	BED MAT. SIEVE DIAM. % FINER THAN 1.00 MM (80168)	BED MAT. SIEVE DIAM. % FINER THAN 2.00 MM (80169)	BED MAT. SIEVE DIAM. % FINER THAN 4.00 MM (80170)	BED MAT. SIEVE DIAM. % FINER THAN 8.00 MM (80171)	BED MAT. SIEVE DIAM. % FINER THAN 16.0 MM (80172)	BED MAT. SIEVE DIAM. % FINER THAN 32.0 MM (80173)
APR 29...	1455	3	<1	4	43	68	77	84	92	97	100
SEP 10...	1655	3	<1	4	26	56	79	93	98	100	--

MINNESOTA RIVER BASIN

05327000 HIGH ISLAND CREEK NEAR HENDERSON, MN

LOCATION.--Lat 44°34'19", long 93°55'18", in NE¼NW¼ sec.26, T.113 N., R.26 W., Sibley County, Hydrologic Unit 07020012, on left bank 20 ft downstream from bridge on County Road 6, 1.6 mi upstream from mouth, and 3.1 mi north of Henderson.

DRAINAGE AREA.--237 mi^2.

PERIOD OF RECORD.--October 1973 to current year. May 1970 to September 1973, operated as a low-flow station only.

GAGE.--Water-stage recorder. Datum of gage is 728.56 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Dec. 13, 17-30, Jan. 2 to Feb. 2, 6-8, 12, and May 3-28. Records good except those for periods of no gage-height record, Jan. 2-17 and May 3-28, and periods with ice effect, Dec. 13, 17-30, Jan. 18 to Feb. 2, 6-8, 12, which are fair.

AVERAGE DISCHARGE.--12 years, 87.2 ft^3/s, 5.00 in/yr, 63,180 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,760 ft^3/s, Aug. 25, 1981, gage height, 9.09 ft; minimum discharge, 0.20 ft^3/s, Jan. 4, 1981, result of freezeup.

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)
Oct. 19	1415	858	5.62	Apr. 3	0200	584	4.48
Mar. 15	2115	804	5.60	Apr. 23	1845	*1,020	*6.35
Mar. 18	2100	735	5.55	June 15	0015	594	4.63

Minimum discharge, 3.7 ft^3/s, Aug. 11, gage height, 0.77 ft.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.1	198	62	33	5.0	56	319	395	135	177	35	59
2	4.6	159	42	31	4.9	43	352	352	125	193	31	67
3	4.5	163	30	29	4.8	123	501	331	122	192	27	101
4	4.5	169	60	27	4.6	148	373	309	110	176	20	100
5	4.3	154	51	25	4.5	48	317	279	104	150	14	100
6	6.9	144	43	23	4.4	18	289	252	95	127	9.2	97
7	6.8	138	39	21	4.4	18	266	219	84	103	6.6	95
8	7.6	132	40	20	4.3	21	239	196	73	84	4.8	87
9	7.7	128	42	18	4.3	26	208	189	63	68	4.3	86
10	7.2	121	46	17	4.3	51	186	170	56	59	4.2	83
11	8.4	112	47	16	4.3	169	164	187	67	48	3.8	78
12	11	109	48	14	4.3	223	156	184	99	41	21	73
13	11	106	44	13	4.3	363	148	154	101	35	34	66
14	18	106	39	12	4.3	448	135	159	159	29	31	58
15	101	99	41	12	4.3	545	127	199	517	25	31	52
16	199	60	151	11	4.3	627	123	250	350	21	31	44
17	304	92	191	10	4.3	499	111	245	268	18	32	37
18	261	75	130	9.5	4.8	638	108	245	223	17	29	31
19	787	78	105	9.0	6.0	674	105	243	193	14	25	28
20	591	76	92	8.4	9.4	701	100	260	164	12	20	30
21	443	77	83	7.9	87	696	110	264	144	9.4	18	26
22	393	79	76	7.5	55	649	210	256	128	8.0	17	31
23	369	70	70	7.2	34	579	818	239	97	6.3	17	44
24	354	70	65	6.8	30	522	733	217	77	19	17	58
25	331	68	57	6.5	34	470	501	194	66	27	15	55
26	307	68	50	6.2	42	436	464	175	63	17	13	55
27	292	68	44	6.0	34	464	495	152	132	34	11	70
28	271	65	43	5.8	40	446	505	121	180	52	12	87
29	255	65	47	5.6	---	468	480	103	151	52	44	105
30	234	67	42	5.4	---	400	426	115	158	47	41	143
31	214	---	38	5.2	---	352	---	165	---	41	47	---
TOTAL	5813.6	3116	1958	429.0	451.8	10921	9069	6819	4304	1901.7	665.9	2046
MEAN	188	104	63.2	13.8	16.1	352	302	220	143	61.3	21.5	68.2
MAX	787	198	191	33	87	701	818	395	517	193	47	143
MIN	4.3	60	30	5.2	4.3	18	100	103	56	6.3	3.8	26
CFSM	.79	.44	.27	.06	.07	1.49	1.27	.93	.60	.26	.09	.29
IN.	.91	.49	.31	.07	.07	1.71	1.42	1.07	.68	.30	.10	.32
AC-FT	11530	6180	3880	851	896	21660	17990	13530	8540	3770	1320	4060

CAL YR 1984 TOTAL 72420.1 MEAN 198 MAX 983 MIN 4.3 CFSM .84 IN 11.37 AC-FT 143600
WTR YR 1985 TOTAL 47495.0 MEAN 130 MAX 818 MIN 3.8 CFSM .55 IN 7.45 AC-FT 94210

MINNESOTA RIVER BASIN

05330000 MINNESOTA RIVER NEAR JORDAN, MN

LOCATION.--Lat 44°41'35", long 93°38'30", in NW¼SW¼ sec.7, T.114 N., R.23 W., Carver County, Hydrologic Unit 07020012, on pier at center downstream side of bridge, 1.5 mi northwest of Jordan, and at mile 39.4 upstream from Mississippi River.

DRAINAGE AREA.--16,200 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1934 to current year. Prior to Oct. 1, 1966, published as "near Carver, Minn".

REVISED RECORDS.--WSP 955: Drainage area. WSP 1508: 1935.

GAGE.--Water-stage recorder. Datum of gage is 690.00 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 1, 1966, water-stage recorder 2.8 mi downstream with auxiliary nonrecording gage at present site and present datum.

REMARKS.--Estimated daily discharges: Dec. 4 to Mar. 15. Records good except for periods of no gage-height record, Dec. 4 -7, and periods with ice effect, Dec. 8 to Mar. 15, which are fair.

AVERAGE DISCHARGE.--51 years, 3,680 ft^3/s, 3.08 in/yr, 2,666,000 acre-ft/yr; median of yearly mean discharges, 3,230 ft^3/s, 2.71 in/yr, 2,343,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 117,000 ft^3/s, Apr. 11, 1965; maximum gage height, 35.07 ft, Apr. 12, 1965 (backwater from Mississippi River); minimum discharge, 79 ft^3/s, Nov. 17, 1955; minimum gage height, 2.66 ft, Nov. 22, 1935.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 32,300 ft^3/s, Mar.20, gage height, 25.05 ft; minimum daily, 925 ft^3/s, Feb. 16-18; minimum gage height, 5.28 ft, Aug. 10.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1140	7410	3940	2750	1250	2150	18600	20200	6210	7540	1820	3160
2	1140	7250	3850	2700	1200	2300	18500	19800	6240	7910	1890	3920
3	1130	7130	3590	2600	1190	2600	18500	19100	6460	7970	1870	3820
4	1180	7080	3450	2550	1170	2600	18600	18500	6640	7680	1690	3440
5	1280	6990	3400	2500	1140	2500	18600	17800	6880	7100	1480	3130
6	1320	6920	3350	2400	1100	2400	18400	17100	6800	6460	1330	3620
7	1320	6910	3300	2350	1060	2300	18400	16100	6590	5850	1230	4090
8	1240	6890	3400	2300	1030	2200	18300	14500	6400	5090	1170	4660
9	1140	6770	3550	2230	1000	2150	18100	12800	6030	4570	1160	5670
10	1090	6710	3600	2150	980	2100	17800	11200	5930	4270	1150	6210
11	1090	6730	3700	2100	960	3000	16900	9930	5580	3830	1170	6300
12	1230	6700	3800	2050	950	5020	15600	9090	5570	3430	1210	6500
13	1370	6640	3850	2000	940	7830	14200	8360	5590	3210	1360	6550
14	1420	6660	3900	1950	930	10600	12800	7880	5610	3000	1530	6490
15	1550	6660	3870	1900	930	13900	11500	7720	6170	2760	1520	6360
16	2170	6510	3860	1850	925	18300	10600	7900	7150	2550	1490	6390
17	2920	6310	3850	1800	925	23200	9940	8500	7400	2380	1570	6530
18	3340	6160	3830	1700	925	28700	9530	8880	7290	2150	1620	6650
19	4450	5920	3820	1650	926	31600	9130	9040	7090	2020	1570	6500
20	6330	5590	3700	1600	950	31900	8670	8990	6650	1740	1460	6350
21	6790	5460	3600	1550	1200	30500	8420	8840	6150	1580	1360	6010
22	6720	5270	3500	1500	1800	29000	8800	8590	5790	1490	1320	5670
23	6700	5060	3400	1450	2000	27200	11100	8180	5330	1450	1320	5450
24	6750	4950	3300	1400	1950	25300	14200	7870	4950	1510	1370	5490
25	6790	4940	3250	1370	1900	23100	16000	7540	4640	1830	1390	5460
26	6890	4920	3150	1330	1900	21300	16700	7280	4550	2060	1390	5330
27	7050	4800	3050	1300	1950	20200	17500	7070	4540	2020	1430	5360
28	7210	4360	3050	1290	2000	19300	18300	6750	4810	2000	1670	5450
29	7360	4270	3000	1280	---	18800	19100	6440	5590	1930	1770	5420
30	7460	4140	2900	1270	---	18600	20000	6160	6740	1800	2000	5450
31	7440	---	2850	1250	---	18600	---	6270	---	1720	2130	---
TOTAL	115010	182110	108660	58120	35181	449250	452790	334380	181370	110900	46440	161430
MEAN	3710	6070	3505	1875	1256	14490	15090	10790	6046	3577	1498	5381
MAX	7460	7410	3940	2750	2000	31900	20000	20200	7400	7970	2130	6650
MIN	1090	4140	2850	1250	925	2100	8420	6160	4540	1450	1150	3130
CFSM	.23	.38	.22	.12	.08	.89	.93	.67	.37	.22	.09	.33
IN.	.26	.42	.25	.13	.08	1.03	1.04	.77	.42	.25	.11	.37
AC-FT	228100	361200	215500	115300	69780	891100	898100	663200	359700	220000	92110	320200

CAL YR 1984 TOTAL 3530596 MEAN 9646 MAX 44800 MIN 996 CFSM .60 IN 8.11 AC-FT 7003000
WTR YR 1985 TOTAL 2235641 MEAN 6125 MAX 31900 MIN 925 CFSM .38 IN 5.13 AC-FT 4434000

05330000 MINNESOTA RIVER NEAR JORDAN, MN--Continued
(National stream-quality accounting network station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1952, 1963-69, 1972 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: July 1973 to current year.
pH: January 1974 to current year.
WATER TEMPERATURES: July 1973 to current year.
DISSOLVED OXYGEN: July 1973 to current year.

INSTRUMENTATION.--Water-quality monitor since July 1973.

REMARKS.--Extremes are for years with 80 percent or more daily record. Letter K indicates non-ideal colony count. Letter E indicates estimated value. Water is pumped to a monitor that is inside a heated shelter; therefore, water temperature during the winter period may be affected.

COOPERATION.--Water-quality monitor is operated by the Metropolitan Waste Control Commission, St. Paul, MN. Monitor data is furnished by the Commission.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE (water years 1978, 1980-85): Maximum, 1,290 microsiemens Oct. 13, 1982; minimum, 324 microsiemens June 3, 1980.
pH (water years 1978, 1980-82, 1984-85): Maximum, 8.9 units May 4, Sept. 15, 1982; minimum, 6.4 units Aug. 11, 1982.
WATER TEMPERATURES (water years 1978-85): Maximum, 30.0°C July 15, 1980; minimum, 0.0°C several days during winter period.
DISSOLVED OXYGEN (water years 1978-85): Maximum, 19.6 mg/L Oct. 19, 1978; minimum, 2.5 mg/L Sept. 5, 1978.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum, 1,251 microsiemens Sep. 12; minimum, 439 microsiemens Mar. 11.
pH: Maximum, 8.6 units Aug. 18, 20; minimum, 7.6 units Jan. 18-24.
WATER TEMPERATURES: Maximum, 27.3°C July 7; minimum, 0.0° several days during the winter period.
DISSOLVED OXYGEN: Maximum, 17.3 mg/L Mar. 14; minimum, 2.9 mg/L Aug. 1.

WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (90095)	PH (STAND-ARD UNITS) (00400)	PH LAB (STAND-ARD UNITS) (00403)	TEMPER-ATURE, AIR (DEG C) (00020)	TEMPER-ATURE (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	OXYGEN, DIS-SOLVED (MG/L) (00300)
OCT											
29...	1400	7570	955	866	8.1	8.0	8.0	8.5	45	741	10.6
JAN											
09...	1200	2230	1000	996	8.0	7.9	-8.0	0.5	4.0	749	12.4
APR											
25...	1230	16000	670	675	8.2	7.9	13.5	13.5	50	764	9.6
JUL											
29...	1030	1960	950	857	8.6	8.3	21.0	22.0	20	--	9.2

DATE	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	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)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY FIELD (MG/L AS CACO3) (00410)	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)
OCT											
29...	250	200	110	48	20	6.3	231	229	230	22	0.3
JAN											
09...	130	K47	120	55	27	5.9	323	327	190	33	0.3
APR											
25...	--	930	81	30	11	<0.1	216	209	88	21	0.3
JUL											
29...	K20	560	91	48	27	7.0	249	256	190	27	0.4

DATE	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	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)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT										
29...	21	674	5.60	0.10	2.0	0.26	0.17	0.14	--	--
JAN										
09...	22	650	4.20	0.25	1.1	0.18	0.12	0.11	--	--
APR										
25...	15	468	8.80	0.03	2.3	0.30	0.11	0.11	423	83
JUL										
29...	20	645	0.19	0.03	1.3	0.25	0.22	0.08	157	98

MINNESOTA RIVER BASIN

05330000 MINNESOTA RIVER NEAR JORDAN, MN--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	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)	LEAD, DISSOLVED (UG/L AS PB) (01049)
OCT 29...	1400	10	3	83	<0	<1	<1	<3	6	8	<1
JAN 09...	1200	10	2	86	<0.5	<1	<1	<3	1	8	2
APR 25...	1230	30	3	66	<0.5	1	<1	<3	2	7	<1
JUL 29...	1030	410	4	99	<0.5	<1	2	<3	5	1200	2

DATE	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...	41	4	<0.1	<10	6	3	<1	400	7	12
JAN 09...	45	45	<0.1	<10	2	2	<1	430	<6	6
APR 25...	27	2	0.2	<10	2	2	<1	250	<6	<3
JUL 29...	49	270	<0.1	<10	1	1	<1	390	<6	65

RADIOCHEMICAL ANALYSES, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	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 NATURAL DISSOLVED (UG/L AS U) (22703)
APR 25...	1230	12	9.5	6.3	8.5	5.5	7.3	0.13	9.4
JUL 29...	1030	8.6	2.2	14	2.2	8.7	1.9	--	--

SUSPENDED SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAMFLOW, INSTANTANEOUS (CFS) (00061)	TEMPERATURE (DEG C) (00010)	SEDIMENT, SUSPENDED (MG/L) (80154)	SED. SUSP. FALL DIAM. % FINER THAN .002 MM (70337)	SED. SUSP. FALL DIAM. % FINER THAN .004 MM (70338)
MAR 25...	1130	22700	5.0	166	46	48

DATE	SED. SUSP. FALL DIAM. % FINER THAN .008 MM (70339)	SED. SUSP. FALL DIAM. % FINER THAN .016 MM (70340)	SED. SUSP. FALL DIAM. % FINER THAN .062 MM (70342)	SED. SUSP. FALL DIAM. % FINER THAN .125 MM (70343)	SED. SUSP. FALL DIAM. % FINER THAN .250 MM (70344)	SED. SUSP. FALL DIAM. % FINER THAN .500 MM (70345)
MAR 25...	53	58	65	73	95	100

PARTICLE-SIZE DISTRIBUTION OF SURFACE BED MATERIAL, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	NUMBER OF SAMPLING POINTS (00063)	BED MAT. SIEVE DIAM. % FINER THAN .062 MM (80164)	BED MAT. SIEVE DIAM. % FINER THAN .125 MM (80165)	BED MAT. SIEVE DIAM. % FINER THAN .250 MM (80166)	BED MAT. SIEVE DIAM. % FINER THAN .500 MM (80167)
APR 25...	1230	3	0	1	31	65

DATE	BED MAT. SIEVE DIAM. % FINER THAN 1.00 MM (80168)	BED MAT. SIEVE DIAM. % FINER THAN 2.00 MM (80169)	BED MAT. SIEVE DIAM. % FINER THAN 4.00 MM (80170)	BED MAT. SIEVE DIAM. % FINER THAN 8.00 MM (80171)	BED MAT. SIEVE DIAM. % FINER THAN 16.0 MM (80172)	BED MAT. SIEVE DIAM. % FINER THAN 32.0 MM (80173)
APR 25...	75	81	85	88	93	100

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	856	802	835	810	799	803	830	800	820	1029	1010	1019
2	891	814	844	812	801	807	856	811	836	1035	1014	1024
3	869	789	828	803	762	783	869	811	845	1029	1003	1020
4	825	748	785	763	735	749	877	842	852	1005	961	985
5	800	749	773	740	727	733	943	877	916	970	942	959
6	800	756	771	728	717	722	973	941	954	974	936	956
7	781	739	761	723	710	717	979	883	925	970	936	959
8	800	770	786	786	703	751	897	869	882	966	938	951
9	815	793	805	803	783	795	872	843	856	976	942	959
10	803	764	787	809	798	804	909	843	875	1001	967	982
11	808	777	791	800	767	781	910	874	901	1072	1002	1016
12	828	796	817	787	776	781	876	851	860	1010	988	999
13	830	810	821	796	777	786	996	850	929	1031	996	1007
14	826	800	811	803	790	796	1020	996	1011	1038	1011	1021
15	838	807	820	796	772	784	1036	1012	1027	1028	999	1011
16	862	694	811	786	774	779	1033	910	973	1019	985	1003
17	691	594	642	783	761	773	916	850	888	1036	1008	1022
18	834	578	711	797	763	785	861	782	817	1040	1000	1019
19	830	691	776	803	757	782	860	793	823	1049	1019	1032
20	715	609	650	814	777	803	932	858	891	1046	1027	1037
21	831	634	773	817	779	806	935	913	922	1078	1036	1062
22	945	893	925	810	783	798	937	918	928	1073	1047	1062
23	1094	873	1032	868	779	828	941	902	922	1080	1039	1063
24	1130	1100	1120	871	844	857	956	925	936	1089	1052	1071
25	802	784	729	874	849	861	999	960	974	1085	1060	1075
26	858	834	850	886	852	867	1049	963	994	1063	1044	1053
27	849	809	825	878	850	863	1078	973	1023	1049	1030	1038
28	813	803	809	890	872	880	1050	1001	1028	1082	1042	1062
29	815	806	809	891	800	842	1044	961	993	1069	1047	1055
30	806	795	801	818	796	806	1037	967	1013	1062	1041	1051
31	801	794	796	---	---	---	1019	998	1007	1064	1049	1056
MONTH	1130	578	809	891	703	797	1078	782	923	1089	936	1020

MINNESOTA RIVER BASIN

05330000 MINNESOTA RIVER NEAR JORDAN, MN--Continued

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	1062	1047	1055	---	---	---	603	571	585	878	808	841
2	1087	1045	1061	683	604	640	626	602	611	910	764	831
3	1110	1083	1092	---	---	---	637	627	632	858	805	832
4	1121	1102	1111	592	573	580	642	543	587	900	858	880
5	1110	1053	1090	617	589	604	581	558	569	927	899	913
6	1087	1060	1070	648	602	613	596	581	588	932	926	928
7	1101	1064	1082	682	647	668	607	595	600	934	924	926
8	1105	1090	1096	701	661	685	609	605	606	930	921	924
9	1094	1064	1079	708	676	694	619	606	611	927	808	858
10	1121	1087	1108	665	582	626	643	619	629	833	811	825
11	1135	1110	1122	581	439	502	651	536	590	837	814	826
12	1140	1117	1127	---	---	---	573	551	561	819	806	813
13	1141	1118	1126	---	---	---	603	572	587	819	788	809
14	1131	1110	1121	---	---	---	621	602	610	809	782	794
15	1141	1118	1129	---	---	---	634	621	627	797	761	782
16	1137	1117	1123	---	---	---	646	633	640	765	713	744
17	1132	1116	1124	---	---	---	661	603	650	718	662	687
18	1147	1129	1136	---	---	---	686	658	669	730	710	720
19	1143	1122	1132	---	---	---	702	607	647	762	716	737
20	1131	1110	1123	---	---	---	634	619	628	841	756	801
21	1127	906	1059	---	---	---	646	633	638	868	833	852
22	902	686	830	---	---	---	642	625	631	910	868	889
23	678	592	625	---	---	---	637	509	587	---	---	---
24	710	604	664	---	---	---	533	477	498	933	912	920
25	671	604	630	513	464	489	624	534	591	942	906	920
26	625	602	613	566	514	540	646	623	638	929	883	905
27	801	611	696	605	567	585	674	644	657	903	878	891
28	772	740	755	618	501	543	703	674	686	878	843	861
29	---	---	---	528	511	517	749	702	723	860	840	853
30	---	---	---	557	527	541	806	747	782	846	811	823
31	---	---	---	571	556	564	---	---	---	835	806	820
MONTH	1147	592	999	---	---	---	806	477	621	---	---	---

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	818	777	801	710	662	674	830	697	758	863	750	818
2	849	800	829	858	717	764	804	777	788	901	740	834
3	873	818	844	944	860	889	830	727	813	750	571	633
4	902	869	885	989	943	952	854	801	831	761	580	664
5	930	900	917	1043	993	1020	849	752	812	885	766	828
6	938	825	892	1050	1011	1032	876	789	846	---	---	---
7	941	904	918	1046	972	1015	880	853	854	---	---	---
8	995	931	947	---	---	---	908	862	893	870	736	791
9	1018	967	984	---	---	---	920	894	905	1013	875	971
10	1031	930	983	---	---	---	900	865	883	1052	943	975
11	975	940	963	---	---	---	891	876	881	1215	1052	1137
12	951	857	912	---	---	---	880	841	863	1251	876	1061
13	990	801	860	---	---	---	866	803	842	875	791	821
14	867	795	828	---	---	---	887	773	818	852	800	825
15	838	571	747	---	---	---	777	619	712	881	844	857
16	711	657	683	886	862	873	828	645	765	887	853	869
17	672	650	654	882	847	866	866	824	838	904	883	896
18	767	664	714	928	846	892	860	828	846	942	888	908
19	768	735	749	935	907	922	844	780	810	954	927	944
20	786	675	768	930	861	909	863	793	825	992	936	964
21	826	777	804	887	829	859	878	822	858	1011	952	985
22	839	816	828	---	---	---	856	810	818	1007	954	985
23	844	827	837	871	844	858	862	823	846	990	947	971
24	872	810	841	858	795	835	927	846	879	951	905	921
25	853	783	823	886	798	836	968	881	935	910	847	884
26	822	781	804	875	791	840	893	813	864	915	850	887
27	880	777	818	856	712	798	864	827	843	913	836	879
28	818	680	772	819	718	779	876	837	853	930	863	885
29	798	678	729	738	683	714	864	751	817	933	898	915
30	784	614	696	755	711	726	824	738	786	966	932	943
31	---	---	---	797	708	763	799	740	768	---	---	---
MONTH	1031	571	827	---	---	---	968	619	833	---	---	---

MINNESOTA RIVER BASIN

05330000 MINNESOTA RIVER NEAR JORDAN, MN--Continued

PH (STANDARD UNITS), WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	8.4	8.2	8.3	8.3	8.2	8.2	8.3	8.3	8.3	7.9	7.9	7.9
2	8.4	8.2	8.3	8.3	8.2	8.2	8.3	8.3	8.3	7.9	7.9	7.9
3	8.4	8.2	8.3	8.3	8.2	8.3	8.3	8.3	8.3	7.9	7.9	7.9
4	8.4	8.2	8.3	8.3	8.3	8.3	8.3	8.3	8.3	7.9	7.9	7.9
5	8.3	8.1	8.2	8.3	8.3	8.3	8.3	8.2	8.2	7.9	7.9	7.9
6	8.2	8.1	8.2	8.3	8.3	8.3	8.3	8.1	8.2	7.9	7.9	7.9
7	8.1	8.0	8.1	8.3	8.2	8.3	8.3	8.2	8.2	7.9	7.8	7.9
8	8.1	8.0	8.0	8.3	8.2	8.2	8.2	8.2	8.2	7.8	7.8	7.8
9	8.1	8.0	8.0	8.3	8.2	8.2	8.2	8.2	8.2	7.8	7.8	7.8
10	8.1	7.9	8.0	8.3	8.2	8.3	8.2	8.2	8.2	7.8	7.8	7.8
11	8.2	7.9	8.0	8.3	8.3	8.3	8.2	8.2	8.2	7.8	7.8	7.8
12	8.2	8.0	8.1	8.3	8.3	8.3	8.2	8.2	8.2	7.8	7.7	7.8
13	8.2	8.1	8.1	8.3	8.3	8.3	8.2	8.2	8.2	7.8	7.8	7.8
14	8.2	8.1	8.1	8.3	8.3	8.3	8.2	8.2	8.2	7.7	7.7	7.7
15	8.1	8.1	8.1	8.3	8.3	8.3	8.2	8.1	8.2	7.7	7.7	7.7
16	8.1	8.1	8.1	8.4	8.3	8.3	8.2	8.1	8.1	7.7	7.7	7.7
17	8.1	8.1	8.1	8.4	8.3	8.3	8.1	8.1	8.1	7.8	7.7	7.7
18	8.3	8.0	8.2	8.4	8.3	8.3	8.1	8.1	8.1	7.7	7.6	7.7
19	8.3	8.2	8.3	8.4	8.4	8.4	8.1	8.1	8.1	7.6	7.6	7.6
20	8.2	8.2	8.2	8.4	8.4	8.4	8.1	8.1	8.1	7.6	7.6	7.6
21	8.1	8.1	8.1	8.4	8.3	8.3	8.1	8.1	8.1	7.6	7.6	7.6
22	8.3	8.3	8.3	8.3	8.3	8.3	8.1	8.1	8.1	7.6	7.6	7.6
23	8.2	8.2	8.2	8.3	8.3	8.3	8.1	8.0	8.0	7.6	7.6	7.6
24	8.2	8.2	8.2	8.3	8.3	8.3	8.0	7.9	8.0	7.9	7.6	7.7
25	8.1	8.1	8.1	8.3	8.2	8.3	8.0	7.9	8.0	7.8	7.8	7.8
26	8.2	8.2	8.2	8.1	8.1	8.1	8.0	7.9	7.9	7.8	7.8	7.8
27	8.2	8.2	8.2	8.1	8.1	8.1	8.0	7.9	8.0	7.8	7.8	7.8
28	8.2	8.2	8.2	8.3	8.2	8.2	8.0	8.0	8.0	7.8	7.7	7.8
29	8.2	8.2	8.2	8.3	8.2	8.3	8.0	8.0	8.0	7.8	7.8	7.8
30	8.3	8.2	8.2	8.3	8.3	8.3	8.0	7.9	8.0	7.8	7.7	7.7
31	8.3	8.3	8.3	---	---	---	8.0	7.9	8.0	7.8	7.7	7.8
MONTH	8.4	7.9	8.2	8.4	8.1	8.3	8.3	7.9	8.1	7.9	7.6	7.8

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	7.8	7.8	7.8	8.2	8.1	8.2	8.4	8.3	8.4	8.2	8.1	8.1
2	7.8	7.7	7.8	8.2	8.2	8.2	8.4	8.3	8.4	8.2	8.1	8.2
3	7.8	7.7	7.7	---	---	---	8.4	8.3	8.3	8.2	8.1	8.2
4	7.8	7.7	7.7	8.2	8.2	8.2	8.3	8.2	8.2	8.2	8.1	8.2
5	7.8	7.7	7.8	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.1	8.2
6	7.8	7.7	7.7	8.2	8.1	8.2	8.3	8.2	8.2	8.2	8.2	8.2
7	7.9	7.7	7.8	8.2	8.2	8.2	8.3	8.3	8.3	8.2	8.2	8.2
8	8.0	7.8	7.9	8.2	8.2	8.2	8.3	8.3	8.3	8.3	8.2	8.2
9	8.0	7.9	8.0	8.2	8.2	8.2	8.4	8.3	8.3	8.3	8.2	8.2
10	8.0	7.9	8.0	8.2	8.2	8.2	8.4	8.3	8.4	8.2	8.2	8.2
11	8.0	8.0	8.0	8.3	8.2	8.2	8.4	8.2	8.3	8.2	8.2	8.2
12	8.0	8.0	8.0	8.2	8.2	8.2	8.3	8.2	8.2	8.2	8.1	8.2
13	8.0	8.0	8.0	8.2	8.2	8.2	8.3	8.2	8.2	8.2	8.1	8.2
14	8.0	7.9	8.0	8.2	8.1	8.1	8.2	8.2	8.2	8.2	8.1	8.2
15	7.9	7.9	7.9	8.1	8.0	8.1	8.2	8.2	8.2	8.2	8.1	8.2
16	8.0	7.9	7.9	8.1	8.0	8.1	8.2	8.2	8.2	8.1	8.1	8.1
17	7.9	7.9	7.9	8.1	8.0	8.0	8.3	8.2	8.3	8.2	8.1	8.2
18	7.9	7.9	7.9	8.0	8.0	8.0	8.3	8.3	8.3	8.2	8.2	8.2
19	7.9	7.9	7.9	8.1	8.0	8.0	8.3	8.3	8.3	8.2	8.2	8.2
20	7.9	7.9	7.9	8.0	8.0	8.0	8.3	8.2	8.3	8.2	8.2	8.2
21	8.0	7.9	8.0	8.0	8.0	8.0	8.3	8.2	8.3	8.3	8.2	8.2
22	8.1	8.0	8.0	8.0	8.0	8.0	8.2	8.1	8.2	8.3	8.2	8.3
23	8.1	8.1	8.1	8.0	8.0	8.0	8.2	8.0	8.1	---	---	---
24	8.1	8.1	8.1	---	---	---	8.0	8.0	8.0	8.2	8.1	8.1
25	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.0	8.0	8.2	8.1	8.1
26	8.1	8.1	8.1	8.2	8.1	8.2	8.1	8.1	8.1	8.1	8.1	8.1
27	8.1	8.1	8.1	8.2	8.2	8.2	8.1	8.1	8.1	8.1	8.1	8.1
28	8.2	8.1	8.1	8.2	8.2	8.2	8.1	8.1	8.1	8.1	8.1	8.1
29	---	---	---	8.2	8.2	8.2	8.1	8.1	8.1	8.1	8.1	8.1
30	---	---	---	8.3	8.2	8.2	8.1	8.1	8.1	8.1	8.1	8.1
31	---	---	---	8.3	8.3	8.3	---	---	---	8.1	8.1	8.1
MONTH	8.2	7.7	7.9	---	---	---	8.4	8.0	8.2	---	---	---

MINNESOTA RIVER BASIN

05330000 MINNESOTA RIVER NEAR JORDAN, MN--Continued

PH (STANDARD UNITS), WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	8.1	8.1	8.1	8.0	7.9	8.0	8.5	8.1	8.3	8.0	7.9	8.0
2	8.2	8.1	8.1	8.0	8.0	8.0	8.5	8.3	8.4	8.1	7.9	7.9
3	8.2	8.1	8.2	8.1	8.0	8.0	8.5	8.3	8.4	8.0	7.8	7.8
4	8.2	8.2	8.2	8.1	8.1	8.1	8.3	8.2	8.2	7.9	7.8	7.9
5	8.2	8.1	8.2	8.1	8.1	8.1	8.4	8.1	8.2	8.0	7.9	7.9
6	8.1	8.1	8.1	8.1	8.1	8.1	8.3	7.9	8.1	---	---	---
7	8.2	8.1	8.1	8.2	8.1	8.1	8.3	7.9	7.9	---	---	---
8	8.1	8.1	8.1	---	---	---	8.2	7.8	8.1	8.0	7.8	8.0
9	8.1	8.1	8.1	---	---	---	8.1	8.0	8.0	8.0	7.9	8.0
10	8.1	8.1	8.1	---	---	---	8.3	8.0	8.1	8.0	8.0	8.0
11	8.1	8.1	8.1	---	---	---	8.3	8.1	8.2	8.1	8.0	8.1
12	8.1	8.1	8.1	---	---	---	8.1	8.1	8.1	8.1	7.9	8.1
13	8.1	8.1	8.1	---	---	---	8.3	8.0	8.1	8.1	8.1	8.1
14	8.1	8.1	8.1	---	---	---	8.4	8.2	8.3	8.1	8.1	8.1
15	8.1	7.9	8.1	---	---	---	8.4	8.2	8.3	8.1	8.1	8.1
16	8.1	8.0	8.1	8.2	8.1	8.1	8.4	8.3	8.3	8.1	8.1	8.1
17	8.1	8.1	8.1	8.2	8.1	8.1	8.4	8.2	8.3	8.1	8.1	8.1
18	8.1	8.1	8.1	8.2	8.1	8.1	8.6	8.3	8.4	8.1	8.0	8.1
19	8.2	8.1	8.1	8.3	8.1	8.2	8.5	8.3	8.4	8.1	8.0	8.0
20	8.2	8.0	8.1	8.4	8.1	8.3	8.6	8.1	8.5	8.1	8.0	8.0
21	8.2	8.1	8.1	8.4	8.2	8.3	8.5	8.3	8.4	8.1	8.1	8.1
22	8.2	8.1	8.2	---	---	---	8.5	8.2	8.3	8.1	8.1	8.1
23	8.2	8.1	8.2	8.3	8.1	8.2	8.4	8.2	8.2	8.1	8.1	8.1
24	8.2	8.1	8.2	8.1	8.0	8.0	8.4	8.1	8.2	8.2	8.1	8.2
25	8.2	8.1	8.1	8.3	8.0	8.1	8.5	8.3	8.4	8.2	8.2	8.2
26	8.1	8.1	8.1	8.4	8.2	8.3	8.4	8.2	8.3	8.3	8.1	8.2
27	8.1	8.0	8.0	8.4	8.2	8.3	8.4	8.1	8.2	8.3	8.2	8.2
28	8.2	8.1	8.1	8.3	8.2	8.3	8.3	8.2	8.2	8.3	8.2	8.3
29	8.2	8.1	8.1	8.4	8.2	8.3	8.2	8.0	8.1	8.3	8.3	8.3
30	8.1	8.0	8.0	8.3	8.2	8.2	8.3	8.0	8.1	8.3	8.3	8.3
31	---	---	---	8.3	8.1	8.2	8.2	8.1	8.1	---	---	---
MONTH	8.2	7.9	8.1	---	---	---	8.6	7.8	8.2	---	---	---

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	10.2	8.6	9.4	3.9	2.6	3.3	0.0	0.0	0.0	0.0	0.0	0.0
2	10.8	9.0	9.9	2.5	1.1	1.7	0.0	0.0	0.0	0.0	0.0	0.0
3	11.1	9.5	10.3	1.1	0.9	1.0	0.0	0.0	0.0	0.0	0.0	0.0
4	11.1	9.8	10.3	0.9	0.1	0.5	0.0	0.0	0.0	0.1	0.0	0.0
5	11.2	10.3	10.8	0.4	0.0	0.2	0.0	0.0	0.0	0.1	0.0	0.0
6	11.6	11.0	11.3	0.6	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0
7	11.8	11.4	11.7	1.0	0.3	0.7	0.1	0.0	0.0	0.0	0.0	0.0
8	11.9	11.8	11.8	1.5	0.8	1.1	0.0	0.0	0.0	0.0	0.0	0.0
9	12.2	11.7	11.9	1.6	1.2	1.4	0.0	0.0	0.0	0.0	0.0	0.0
10	12.8	11.7	12.2	1.5	0.9	1.3	0.0	0.0	0.0	0.0	0.0	0.0
11	13.2	12.3	12.7	0.9	0.3	0.6	0.0	0.0	0.0	0.0	0.0	0.0
12	14.0	12.9	13.4	0.3	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
13	14.7	13.7	14.1	0.4	0.0	0.3	0.0	0.0	0.0	0.1	0.0	0.0
14	14.5	14.2	14.3	1.4	0.4	1.0	0.1	0.0	0.0	0.0	0.0	0.0
15	14.6	13.7	14.3	1.4	0.6	1.1	0.1	0.0	0.0	0.0	0.0	0.0
16	13.7	11.5	12.6	0.7	0.1	0.3	0.2	0.0	0.1	0.0	0.0	0.0
17	11.4	10.0	10.5	0.3	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
18	11.8	9.3	10.7	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
19	11.4	10.2	10.9	0.0	0.0	0.0	0.2	0.0	0.1	0.0	0.0	0.0
20	10.0	9.4	9.6	---	---	---	0.1	0.0	0.0	0.0	0.0	0.0
21	9.5	9.0	9.3	0.3	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0
22	8.5	8.1	8.4	0.5	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0
23	8.4	8.0	8.2	0.7	0.0	0.4	0.0	0.0	0.0	0.1	0.0	0.0
24	8.8	7.7	8.3	1.2	0.4	0.8	0.0	0.0	0.0	0.0	0.0	0.0
25	5.7	5.5	5.6	1.7	1.1	1.4	0.0	0.0	0.0	0.0	0.0	0.0
26	6.0	5.5	5.9	2.7	1.9	2.3	0.0	0.0	0.0	0.0	0.0	0.0
27	7.0	6.0	6.5	2.8	2.7	2.7	0.0	0.0	0.0	0.0	0.0	0.0
28	6.7	6.2	6.5	2.2	1.8	1.9	0.0	0.0	0.0	0.0	0.0	0.0
29	6.2	5.7	5.9	1.8	0.3	0.9	0.0	0.0	0.0	0.0	0.0	0.0
30	5.9	4.8	5.6	0.3	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0
31	4.7	4.0	4.3	---	---	---	0.0	0.0	0.0	0.0	0.0	0.0
MONTH	14.7	4.0	9.9	---	---	---	0.2	0.0	0.0	0.1	0.0	0.0

05330000 MINNESOTA RIVER NEAR JORDAN, MN--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	0.0	0.0	0.0	0.0	0.0	0.0	3.4	2.2	2.7	15.5	14.4	14.9
2	0.0	0.0	0.0	0.0	0.0	0.0	4.2	3.1	3.5	16.5	15.1	15.7
3	0.0	0.0	0.0	---	---	---	5.6	4.2	4.8	17.1	16.3	16.6
4	0.0	0.0	0.0	0.0	0.0	0.0	6.4	5.5	6.0	17.5	16.6	16.9
5	0.1	0.0	0.0	0.0	0.0	0.0	6.6	6.1	6.4	17.6	17.2	17.4
6	0.0	0.0	0.0	0.0	0.0	0.0	6.9	6.2	6.5	17.5	16.8	17.2
7	0.0	0.0	0.0	0.0	0.0	0.0	6.9	6.4	6.7	17.7	17.0	17.4
8	0.2	0.0	0.0	0.0	0.0	0.0	6.8	6.1	6.3	18.2	17.3	17.7
9	0.3	0.1	0.2	0.0	0.0	0.0	6.5	5.5	6.0	19.2	18.2	18.7
10	0.5	0.2	0.3	0.0	0.0	0.0	7.7	6.4	6.9	20.2	19.2	19.7
11	0.5	0.1	0.3	0.2	0.0	0.0	8.6	6.8	7.9	20.6	20.0	20.2
12	0.5	0.0	0.2	0.0	0.0	0.0	10.5	8.6	9.4	20.4	19.6	20.1
13	0.4	0.0	0.2	0.0	0.0	0.0	10.9	10.5	10.7	19.6	19.0	19.3
14	0.3	0.0	0.1	0.0	0.0	0.0	10.9	10.7	10.8	19.0	18.0	18.3
15	0.1	0.0	0.0	0.0	0.0	0.0	11.3	10.5	10.9	18.0	17.2	17.5
16	0.4	0.0	0.2	0.6	0.0	0.2	11.2	10.5	10.8	17.2	16.2	16.8
17	0.4	0.1	0.2	1.1	0.3	0.6	11.9	10.5	11.2	16.3	15.5	15.9
18	0.4	0.0	0.2	1.6	0.7	1.1	13.5	11.9	12.7	16.8	15.7	16.2
19	0.4	0.0	0.1	2.7	1.4	2.0	15.3	13.5	14.4	17.8	16.6	17.2
20	0.5	0.1	0.3	3.9	2.6	3.2	16.9	15.3	16.1	18.1	17.4	17.7
21	0.4	0.0	0.1	4.6	3.6	4.1	18.0	16.7	17.3	18.3	17.4	17.8
22	0.0	0.0	0.0	5.3	4.3	4.8	18.0	17.6	17.7	18.8	17.9	18.3
23	0.0	0.0	0.0	5.3	5.1	5.2	17.6	15.3	16.8	19.8	18.5	19.2
24	0.0	0.0	0.0	---	---	---	15.2	13.9	14.3	20.6	19.5	20.0
25	0.0	0.0	0.0	4.5	4.1	4.2	13.9	13.1	13.5	21.0	19.9	20.4
26	0.0	0.0	0.0	5.2	3.9	4.4	13.0	11.9	12.4	21.1	20.7	20.8
27	0.0	0.0	0.0	5.5	5.1	5.3	11.9	11.3	11.6	21.4	20.2	20.7
28	0.0	0.0	0.0	5.5	5.2	5.3	13.0	11.5	12.1	21.7	20.8	21.2
29	---	---	---	5.2	4.7	4.9	14.4	12.8	13.4	21.5	21.0	21.2
30	---	---	---	4.7	4.2	4.4	15.0	14.2	14.6	21.9	20.7	21.3
31	---	---	---	4.4	2.7	3.5	---	---	---	21.6	20.8	21.2
MONTH	0.5	0.0	0.1	---	---	---	18.0	2.2	10.5	21.9	14.4	18.5

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	21.3	19.8	20.5	22.3	21.3	21.8	24.7	22.8	23.6	19.7	19.2	19.5
2	19.8	18.7	19.2	22.8	21.7	22.2	24.7	22.8	23.8	19.6	18.8	19.0
3	20.7	18.0	18.4	24.0	22.1	23.0	25.6	23.2	24.3	20.0	18.6	19.4
4	18.4	18.0	18.2	24.7	23.7	23.9	24.8	23.9	24.3	20.3	19.2	19.7
5	18.8	17.7	18.2	24.6	23.9	24.0	25.9	23.9	24.8	21.8	20.2	20.9
6	19.4	18.1	18.7	25.4	24.2	24.8	26.1	24.5	25.3	---	---	---
7	20.6	18.6	19.7	27.3	24.9	25.6	26.1	24.4	24.7	---	---	---
8	22.1	20.4	21.2	---	---	---	25.7	24.0	24.6	23.4	23.3	22.7
9	22.5	21.3	21.9	---	---	---	26.2	23.0	24.4	22.9	21.5	22.3
10	22.1	21.2	21.6	---	---	---	26.0	22.1	22.7	21.7	20.3	20.8
11	21.1	20.2	20.7	---	---	---	22.7	20.8	21.8	20.3	19.6	19.9
12	20.5	19.4	20.0	---	---	---	22.1	20.5	21.1	19.6	18.8	19.2
13	21.8	19.4	20.0	---	---	---	21.3	20.1	20.7	18.8	17.9	18.3
14	20.5	20.1	20.3	---	---	---	22.8	20.2	21.0	17.9	17.2	17.5
15	20.5	19.7	20.0	---	---	---	22.5	20.4	21.4	17.6	17.0	17.3
16	20.9	19.7	20.2	25.5	24.1	24.9	22.4	21.0	21.7	17.3	17.0	17.1
17	20.8	20.3	20.4	25.5	24.1	24.8	22.5	21.3	21.9	17.6	17.1	17.3
18	20.6	20.0	20.3	26.2	24.4	25.2	22.1	20.3	21.4	18.8	17.6	18.1
19	20.8	19.8	20.3	26.6	24.8	25.6	21.2	19.8	20.1	19.5	18.8	19.0
20	21.3	19.9	20.6	26.8	24.6	25.7	20.2	18.2	19.3	19.7	19.0	19.3
21	22.1	20.9	21.4	26.5	24.8	25.6	19.9	18.8	19.5	18.9	17.9	18.4
22	22.3	20.9	21.6	---	---	---	21.5	19.2	19.4	17.9	17.3	17.6
23	22.5	21.3	21.9	25.8	23.9	25.1	20.4	19.2	19.6	17.3	15.5	16.5
24	23.1	21.6	22.3	25.2	23.5	24.2	20.0	19.0	19.3	15.5	14.0	14.6
25	24.7	22.7	23.5	25.2	23.1	24.1	20.2	18.4	19.2	13.9	13.3	13.5
26	24.9	24.3	24.6	25.8	23.5	23.5	20.6	18.9	19.7	13.3	12.7	13.0
27	24.7	22.8	23.9	26.4	24.3	25.2	20.2	19.4	19.8	12.9	12.2	12.5
28	23.1	21.7	22.2	26.2	24.9	25.5	20.1	19.3	19.7	12.6	11.6	12.2
29	24.6	21.1	21.7	25.8	24.3	25.1	19.6	19.0	19.2	11.6	10.5	11.1
30	22.4	21.5	21.9	25.2	24.1	24.6	20.6	18.5	19.2	10.4	9.6	10.0
31	---	---	---	24.8	23.1	23.9	19.7	18.9	19.3	---	---	---
MONTH	24.9	17.7	20.8	---	---	---	26.2	18.2	21.5	---	---	---

MINNESOTA RIVER BASIN

05330000 MINNESOTA RIVER NEAR JORDAN, MN--Continued

OXYGEN, DISSOLVED (DO), MG/L, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	14.8	11.7	13.1	13.7	12.2	13.0	13.3	13.2	13.3	10.6	10.5	10.6
2	14.8	10.7	12.6	14.0	13.7	13.9	13.5	13.3	13.4	10.7	10.5	10.5
3	14.2	10.8	12.4	14.0	13.8	13.9	13.7	13.5	13.6	13.1	10.2	11.6
4	14.9	10.7	13.0	14.3	13.9	14.1	13.7	13.5	13.6	12.1	11.5	11.7
5	13.4	10.3	11.2	14.4	14.2	14.3	13.6	13.4	13.5	11.6	11.2	11.4
6	10.7	8.9	9.7	14.4	14.1	14.2	13.6	13.4	13.6	11.3	11.1	11.2
7	8.9	7.5	8.0	14.2	13.8	14.0	14.1	13.4	13.8	11.2	11.0	11.1
8	7.8	6.9	7.3	13.9	13.7	13.8	13.9	13.8	13.8	11.2	11.0	11.1
9	9.8	7.0	8.5	13.7	13.5	13.6	14.0	13.8	13.9	11.1	10.8	11.0
10	9.8	7.7	8.7	13.7	13.5	13.6	14.1	13.9	14.0	11.1	10.9	11.0
11	10.9	7.5	9.3	14.0	13.7	13.9	14.4	13.9	14.2	11.9	11.0	11.5
12	10.7	8.9	9.7	14.1	13.9	14.0	14.2	13.9	14.1	11.8	11.5	11.6
13	10.6	8.7	9.5	14.1	13.7	14.0	15.1	14.0	14.6	11.6	11.4	11.5
14	9.6	7.7	8.3	13.9	13.5	13.6	15.0	14.9	14.9	11.6	11.4	11.5
15	7.7	6.8	7.0	13.7	13.5	13.6	14.9	14.6	14.7	11.4	11.2	11.3
16	8.1	6.6	7.5	13.8	13.7	13.8	14.7	14.4	14.6	11.4	11.1	11.2
17	8.3	7.5	7.9	13.9	13.7	13.8	15.0	14.7	14.9	12.6	11.0	11.9
18	8.4	7.8	8.1	14.1	13.8	13.9	15.0	14.9	15.0	14.1	12.4	12.9
19	8.3	8.0	8.2	14.1	14.0	14.0	14.9	14.7	14.8	12.8	12.4	12.6
20	8.6	7.9	8.3	14.2	14.1	14.1	14.8	14.5	14.7	12.6	12.2	12.4
21	9.0	8.7	8.9	14.6	13.8	14.3	14.7	14.5	14.6	12.7	12.3	12.5
22	9.0	8.9	9.0	14.2	13.7	13.9	14.7	14.6	14.7	12.7	12.4	12.6
23	9.7	9.2	9.5	13.7	13.5	13.6	14.6	14.5	14.6	12.7	12.2	12.4
24	10.9	9.6	10.4	13.5	13.2	13.3	14.5	14.4	14.5	12.7	12.2	12.4
25	12.3	12.1	12.2	13.2	12.9	13.1	14.5	14.3	14.4	12.6	11.9	12.2
26	12.0	11.7	11.8	13.3	12.9	13.1	14.4	14.0	14.2	12.2	11.6	11.9
27	11.8	11.4	11.6	13.0	12.8	12.9	14.2	11.3	12.8	12.0	11.5	11.8
28	11.7	11.6	11.7	12.7	12.5	12.6	11.4	10.8	11.0	11.9	11.3	11.6
29	11.8	11.7	11.8	13.3	12.6	13.0	10.9	10.8	10.9	11.7	11.4	11.5
30	12.1	11.7	11.9	13.3	13.2	13.2	10.9	10.7	10.8	11.9	11.4	11.6
31	12.2	12.1	12.2	---	---	---	10.8	10.6	10.7	13.0	11.3	12.2
MONTH	14.9	6.6	10.0	14.6	12.2	13.7	15.1	10.6	13.7	14.1	10.2	11.7
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	13.2	12.4	12.8	---	---	---	12.7	12.4	12.6	10.4	10.0	10.2
2	13.3	12.6	12.9	14.7	14.4	14.5	12.7	12.6	12.7	10.3	8.7	9.4
3	13.3	12.7	13.0	---	---	---	12.7	12.4	12.5	9.0	8.5	8.7
4	13.2	12.7	12.9	14.4	14.3	14.3	12.8	12.1	12.6	8.7	8.2	8.4
5	13.2	12.5	12.9	14.6	14.3	14.4	12.7	12.5	12.7	8.3	7.9	8.0
6	12.8	12.2	12.5	14.5	14.1	14.3	12.7	12.5	12.6	8.0	7.7	7.9
7	12.6	11.3	12.0	14.3	14.1	14.2	12.9	12.6	12.7	8.7	7.9	8.2
8	11.9	11.1	11.6	14.3	14.1	14.2	13.2	12.8	13.0	8.3	8.0	8.1
9	12.0	11.3	11.7	14.2	14.0	14.1	13.5	13.1	13.3	8.1	7.6	7.9
10	11.7	11.2	11.5	14.2	13.8	14.0	13.5	13.2	13.4	8.3	7.5	8.0
11	11.7	11.2	11.5	15.3	14.1	14.5	13.4	12.5	12.8	7.8	7.4	7.6
12	11.7	11.1	11.4	16.3	15.1	15.7	12.6	12.1	12.2	7.4	7.1	7.2
13	11.7	11.2	11.4	17.1	16.2	16.6	12.1	11.1	11.5	7.4	7.0	7.2
14	11.6	11.1	11.4	17.3	15.3	16.2	11.1	10.0	10.8	7.8	7.1	7.6
15	11.6	10.8	11.2	16.5	15.4	16.1	10.4	9.2	10.2	7.7	7.5	7.6
16	11.4	10.8	11.2	16.3	16.1	16.2	9.6	9.3	9.5	7.6	7.4	7.5
17	11.5	11.0	11.2	16.2	16.0	16.1	11.1	9.3	9.5	9.3	7.5	8.8
18	11.5	11.1	11.3	16.0	15.9	16.0	9.4	9.0	9.2	9.5	9.2	9.3
19	11.5	10.9	11.3	15.9	15.6	15.8	10.5	8.9	9.8	9.4	9.0	9.2
20	11.4	10.9	11.2	15.6	15.1	15.3	10.2	9.5	9.8	9.3	8.9	9.1
21	12.3	11.1	11.6	15.1	12.1	13.5	9.6	9.1	9.3	9.5	8.9	9.3
22	13.3	12.2	12.8	12.1	11.9	12.0	9.2	8.3	8.7	9.4	8.9	9.2
23	13.4	13.1	13.2	11.9	11.7	11.8	8.6	8.2	8.4	9.2	8.0	8.6
24	13.2	12.8	13.0	---	---	---	9.4	8.6	9.0	8.2	7.7	8.0
25	13.0	12.7	12.8	12.0	11.7	11.8	9.6	9.0	9.3	7.9	7.4	7.7
26	13.0	12.6	12.8	12.1	12.0	12.1	9.7	9.3	9.4	7.6	7.0	7.3
27	14.1	12.7	13.5	12.1	11.8	12.0	10.0	9.6	9.8	7.5	6.8	7.0
28	14.2	13.7	14.0	11.8	11.7	11.8	10.3	9.9	10.1	7.5	7.1	7.3
29	---	---	---	11.9	11.7	11.7	10.9	10.1	10.6	7.4	7.0	7.2
30	---	---	---	12.1	11.8	12.0	10.7	10.3	10.4	7.0	6.7	6.9
31	---	---	---	12.4	12.1	12.2	---	---	---	7.8	6.5	7.3
MONTH	14.2	10.8	12.2	---	---	---	13.5	8.2	10.9	10.4	6.5	8.1

05330000 MINNESOTA RIVER NEAR JORDAN, MN--Continued

OXYGEN, DISSOLVED (DO), MG/L, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	7.8	7.6	7.7	7.2	7.0	7.1	9.9	2.9	9.5	8.0	6.5	7.2
2	8.1	7.7	7.8	7.9	7.1	7.6	10.2	8.2	9.1	8.0	6.0	6.2
3	8.3	8.0	8.1	7.8	7.4	7.6	10.3	8.3	9.1	7.8	5.9	7.2
4	8.7	8.1	8.5	7.4	7.2	7.3	8.7	6.4	7.1	7.3	6.7	7.1
5	8.5	8.2	8.4	7.2	6.5	6.8	8.8	5.9	7.2	7.4	6.4	6.7
6	8.4	7.9	8.1	6.1	5.8	6.0	9.0	5.7	7.5	---	---	---
7	8.2	7.7	8.0	---	---	---	8.9	6.7	7.5	---	---	---
8	7.7	7.1	7.5	---	---	---	9.0	5.1	7.7	---	---	---
9	7.4	6.9	7.1	---	---	---	8.2	6.7	7.3	---	---	---
10	7.4	6.9	7.1	---	---	---	9.0	6.6	7.5	7.0	5.9	6.6
11	7.2	6.8	7.0	---	---	---	8.7	7.3	8.0	7.1	6.9	7.0
12	7.3	6.8	7.0	---	---	---	7.9	6.7	7.1	7.3	7.3	7.2
13	8.5	6.9	7.6	---	---	---	8.8	6.5	7.6	7.9	7.3	7.7
14	8.6	8.2	8.4	---	---	---	8.4	6.9	7.6	8.6	7.8	8.2
15	8.3	7.3	7.8	---	---	---	8.1	6.4	7.3	8.4	8.0	8.2
16	8.4	7.7	8.1	7.5	6.6	7.1	10.6	6.8	8.7	8.1	7.7	7.9
17	8.0	7.8	7.8	7.4	5.8	6.4	10.4	8.2	9.1	8.5	7.5	8.1
18	8.2	7.8	8.0	8.2	5.8	7.1	10.1	7.1	8.9	8.1	7.7	7.9
19	8.2	7.9	8.0	8.9	6.6	7.5	8.6	7.3	7.9	8.4	7.3	7.7
20	8.1	7.7	7.9	8.5	6.4	7.4	---	---	---	8.0	7.8	7.8
21	8.1	7.5	7.8	7.3	5.7	6.4	---	---	---	7.8	7.6	7.7
22	7.7	7.4	7.5	---	---	---	12.1	8.3	10.0	7.6	7.2	7.4
23	7.8	7.4	7.6	7.5	5.9	6.8	10.9	6.7	8.9	7.2	7.0	7.1
24	8.0	7.4	7.6	---	---	---	10.3	8.7	9.5	7.5	7.0	7.3
25	7.7	7.3	7.5	9.8	3.6	6.9	12.5	8.8	10.5	7.7	7.3	7.4
26	7.3	6.3	6.7	9.7	8.1	8.9	12.2	9.4	10.9	8.0	7.4	7.6
27	7.0	6.6	6.3	8.9	7.3	7.9	11.3	8.4	10.3	9.2	7.7	8.7
28	7.8	6.8	7.0	---	---	---	9.8	6.7	8.2	9.0	8.6	8.8
29	7.6	6.8	7.0	---	---	---	9.0	6.0	7.6	9.0	8.7	8.8
30	7.2	6.5	6.9	---	---	---	12.2	7.7	8.8	9.4	8.8	8.9
31	---	---	---	---	---	---	9.5	7.7	8.6	---	---	---
MONTH	8.7	6.3	7.6	---	---	---	---	---	---	---	---	---

MISSISSIPPI RIVER MAIN STEM

05331000 MISSISSIPPI RIVER AT ST. PAUL, MN

LOCATION.--Lat 44°56'40", long 93°05'20", in SE¼NE¼ sec.6, T.28 N., R.22 W., Ramsey County, Hydrologic Unit 07010206, on left bank in St. Paul, 300 ft upstream from Robert Street Bridge, 6 mi downstream from Minnesota River, and at mile 839.3 upstream from Ohio River.

DRAINAGE AREA.--36,800 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--Water year 1867-69, 1872-92 (annual maximums), March 1892 to current year (prior to 1901, fragmentary during some winters). Records prior to March 1892, published in the 19th Annual Report, Part 4, have been found to be unreliable and should not be used. Monthly discharge only for some periods, published in WSP 1308. Gage-height records (winter records incomplete) collected at same site since 1866 are contained in reports of U.S. Weather Bureau, War Department and Mississippi River Commission.

REVISED RECORDS.--WSP 285: 1892-96. WSP 715: Drainage area. WSP 875: 1938. WSP 895: 1939. WSP 1308: 1867(M). WSP 1508: 1897, 1898(M), 1903(M), 1917-18(M), 1928(M), 1929. WRD MN-74: 1973.

GAGE.--Water-stage recorder. Datum of gage is 683.62 ft above National Geodetic Vertical Datum of 1929. Prior to Mar. 18, 1925, nonrecording gage at several sites within 300 ft of present site at present datum. Mar. 18, 1925, to Mar. 10, 1933, water-stage recorder and Mar. 11, 1933, to Sept. 14, 1939, non-recording gage, at present site and datum. Since September 1938, auxiliary water-stage recorder 5.6 mi downstream.

REMARKS.--No estimated daily discharges. Records good. Slight regulation except during extreme floods by reservoirs on headwaters and by power plants. Beginning July 20, 1938, sewage from Minneapolis and St. Paul, which formerly entered above station, was diverted to a sewage-disposal plant, thence to river below station. Figures of daily discharge do not include this diversion.

COOPERATION.--Records of Mississippi River at Twin City lock and dam computed and furnished by Ford Motor Co. Diversion through sewage disposal plant furnished by Metropolitan Waste Control Commission.

AVERAGE DISCHARGE (ADJUSTED FOR DIVERSION).--87 years (water years 1895, 1897, 1901-85), 11,020 ft^3/s, 4.07 in/yr; median of yearly mean discharges, 10,160 ft^3/s, 3.75 in/yr.

EXTREMES FOR PERIOD OF RECORD (1867-70, 1872-1985).--Maximum discharge, 171,000 ft^3/s, Apr. 16, 1965, gage height, 26.01 ft, from floodmark.

Maximum flood known since at least 1851, that of 1965. Flood of Apr. 11, 1870 reached a stage of 19.4 ft, discharge, 100,000 ft^3/s.

EXTREMES FOR PERIOD OF RECORD (1897,1917-85).--Minimum daily discharge, 632 ft^3/s, Aug. 26, 1934.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 55,600 ft^3/s, Mar. 23, gage height, 11.27 ft; minimum daily, 4,900 ft^3/s, Oct. 7.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6380	27600	14500	10700	6690	8040	42000	54900	26600	30000	16400	12400
2	6130	28000	13300	10600	6390	8270	40800	55400	25500	30500	16000	12500
3	4990	27000	13100	10500	6480	8510	39600	54500	25800	30900	14900	13700
4	5080	25600	9380	10500	6550	8700	39100	53200	27300	31100	14300	17000
5	5260	24000	8620	10400	6060	7540	38700	50600	27600	29800	13800	17300
6	4920	23800	8180	10000	6250	8180	37900	48300	27700	29000	13800	17100
7	4900	24200	7360	9480	6210	8900	37200	45300	27200	28000	13800	17200
8	5370	23700	8670	9620	6040	8570	36300	42400	26700	25700	12000	18400
9	5820	23000	10000	9550	5670	8160	35300	40100	25700	22900	12000	20000
10	5720	21700	11800	9180	5930	8010	33800	37100	24900	21500	11500	23500
11	5970	21300	12700	9220	6190	8120	33400	34700	24100	21400	11100	26600
12	5960	20700	12300	8490	5790	8000	32500	31600	24000	21700	12700	26200
13	5880	20900	11400	8290	5700	9400	31000	28900	23900	18500	13500	26700
14	6170	20800	11000	8500	5980	14900	28900	29600	24300	17100	13900	26300
15	5920	20200	11800	8780	6050	18700	26900	30100	24300	17200	13500	26000
16	6320	20000	14000	8540	5470	23500	25600	31500	24700	16200	13500	26200
17	9190	19000	13700	8590	5740	30500	24500	33100	25400	15400	14300	26400
18	12400	17400	13300	8700	6110	34800	22700	34200	24900	14600	15200	25900
19	16100	17500	12500	7970	5960	39300	21900	34800	24500	14600	14200	25400
20	20000	15800	12700	7020	5650	45600	21200	34900	22900	14200	13800	25100
21	28400	14600	12300	7360	6520	50700	21600	34600	21400	15000	13500	24000
22	29900	13900	13600	7620	6740	53500	22100	33500	21300	15200	12900	25300
23	31700	14000	12400	7600	6400	54700	25100	32800	20800	15900	12500	25400
24	33500	14800	12000	7450	6500	55100	31400	31600	19300	16400	12500	24500
25	35100	14400	11800	7420	7120	54600	36300	30000	17900	16700	12000	23700
26	36500	14400	12500	6920	8020	53400	41000	28400	16600	17400	11700	23600
27	37200	14800	12200	6940	7790	51400	45100	27400	20500	17300	11300	23000
28	35700	15300	12100	6820	8040	49100	48700	26400	23600	16800	11400	20100
29	34800	15300	11600	6760	---	46800	52000	25700	25200	18000	11900	19500
30	33100	15000	10500	6740	---	44600	53900	25900	28300	17700	11600	21800
31	31700	---	10500	6690	---	42900	---	27500	---	16700	12400	---
TOTAL	516080	588700	361810	262950	178040	872500	1026500	1129000	722900	633400	407900	660800
MEAN	16650	19620	11670	8482	6359	28150	34220	36420	24100	20430	13160	22030
MAX	37200	28000	14500	10700	8040	55100	53900	55400	28300	31100	16400	26700
MIN	4900	13900	7360	6690	5470	7540	21200	25700	16600	14200	11100	12400
CFSM	.45	.53	.32	.23	.17	.77	.93	.99	.66	.56	.36	.60
IN.	.52	.60	.37	.27	.18	.88	1.04	1.14	.73	.64	.41	.67
†	358	296	294	288	322	374	374	377	355	315	349	377
MEAN ‡	17008	19916	11964	8770	6681	28594	34594	36797	24455	20745	13509	22407
CFSM ‡	.46	.54	.33	.24	.18	.78	.94	1.00	.66	.56	.37	.61
IN. ‡	.53	.60	.37	.27	.19	.89	1.05	1.15	.74	.65	.42	.68

CAL YR 1984 TOTAL 8320450 MEAN 22730 MAX 70800 MIN 4220 MEAN ‡ 23,140 CFSM ‡ .63 IN ‡ 8.54
WTR YR 1985 TOTAL 7360580 MEAN 20170 MAX 55400 MIN 4900 MEAN ‡ 20,510 CFSM ‡ .56 IN ‡ 7.57

† Diversion equivalent in cubic feet per second, through sewage disposal plant.
‡ Adjusted for diversion.

05331000 MISSISSIPPI RIVER AT ST. PAUL, MN--Continued

WATER-QUALITY RECORDS

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

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: October 1956 to current year.

INSTRUMENTATION.--Temperature recorder since October 1956.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: Maximum 31.0°C July 24-28, 1964, July 31, 1975, July 19, 21, 1977; minimum, 0.0°C many days during winter periods.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURES: Maximum 25.0°C July 8-12, 14, 20-21; minimum, 0.0°C many days during winter period.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	12.5	11.5	12.0	5.5	4.5	5.0	1.5	1.0	1.0	---	---	---
2	12.5	12.0	12.0	4.5	3.0	3.5	1.0	.5	1.0	---	---	---
3	13.0	12.5	12.5	2.5	2.5	2.5	.5	.0	.0	---	---	---
4	13.5	12.5	13.0	3.0	2.5	2.5	.5	.0	.0	---	---	---
5	13.5	13.0	13.5	3.5	2.5	3.0	.5	.0	.0	---	---	---
6	14.0	13.5	13.5	3.0	2.5	2.5	1.5	1.5	1.5	---	---	---
7	14.0	13.5	13.5	3.5	2.5	3.0	1.5	1.5	1.5	---	---	---
8	13.5	13.5	13.5	4.0	3.5	4.0	1.5	1.5	1.5	---	---	---
9	14.0	13.5	14.0	4.5	4.0	4.0	1.5	1.0	1.5	---	---	---
10	15.0	14.5	14.5	4.0	3.0	3.5	1.0	.5	1.0	---	---	---
11	15.0	15.0	15.0	3.0	3.0	3.0	.5	.5	.5	.5	.5	.5
12	16.0	15.0	15.5	3.0	2.5	2.5	.5	.5	.5	.5	.5	.5
13	16.5	15.5	16.0	3.0	2.5	2.5	.5	.5	.5	.5	.5	.5
14	16.5	16.0	16.5	3.5	2.5	3.0	1.0	.5	1.0	.5	.5	.5
15	16.5	16.0	16.0	3.5	3.0	3.5	1.0	1.0	1.0	.5	.5	.5
16	16.0	14.0	15.5	3.0	1.5	2.5	1.0	.0	.0	.5	.5	.5
17	14.0	12.5	13.5	1.5	1.0	1.5	.5	.0	.0	.5	.5	.5
18	12.5	11.5	12.0	1.5	1.0	1.0	.5	.0	.0	.5	.0	.5
19	11.5	10.0	11.0	1.0	.5	.5	.0	.0	.0	.5	.5	.5
20	10.0	9.0	9.5	.5	.0	.5	.0	.0	.0	.5	.5	.5
21	9.0	8.5	8.5	.5	.0	.5	.0	.0	.0	.5	.5	.5
22	8.5	8.0	8.0	.5	.5	.5	.0	.0	.0	.5	.0	.5
23	8.0	7.5	8.0	.5	.0	.5	.0	.0	.0	.0	.0	.0
24	7.5	7.5	7.5	1.0	.0	.5	.0	.0	.0	1.0	1.0	1.0
25	7.5	7.5	7.5	2.0	1.0	1.5	---	---	---	1.0	1.0	1.0
26	8.0	7.0	7.5	3.0	2.0	2.5	---	---	---	1.0	1.0	1.0
27	10.0	7.5	8.5	3.0	2.5	3.0	---	---	---	1.0	1.0	1.0
28	8.5	8.0	8.5	2.5	2.0	2.0	---	---	---	1.0	1.0	1.0
29	8.0	7.5	7.5	2.0	1.0	1.5	---	---	---	1.0	1.0	1.0
30	7.5	6.5	7.0	1.5	1.0	1.0	---	---	---	1.5	1.0	1.0
31	6.5	5.5	6.0	---	---	---	---	---	---	1.5	1.0	1.5
MONTH	16.5	5.5	11.5	5.5	.0	2.5	---	---	---	---	---	---

MISSISSIPPI RIVER BASIN

05331000 MISSISSIPPI RIVER AT ST. PAUL, MN--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	1.5	1.5	1.5	2.0	1.5	2.0	3.0	2.0	2.5	15.5	15.0	15.5
2	1.5	1.0	1.5	2.0	1.5	2.0	4.5	3.0	4.0	16.0	15.5	16.0
3	1.5	1.0	1.5	2.0	1.0	1.5	5.5	4.5	5.0	17.0	16.0	17.0
4	1.5	1.0	1.5	1.0	1.0	1.0	6.5	6.0	6.0	17.5	17.0	17.0
5	1.5	1.0	1.5	1.5	.5	1.0	6.5	6.0	6.5	17.5	17.0	17.5
6	1.5	1.0	1.5	.5	.5	.5	7.0	6.5	6.5	17.5	17.0	17.0
7	1.5	1.5	1.5	.5	.5	.5	7.0	6.5	7.0	18.0	17.5	17.5
8	1.5	1.0	1.5	.5	.5	.5	7.0	6.5	7.0	18.5	18.0	18.0
9	1.5	1.0	1.5	3.0	1.0	2.0	7.0	6.5	6.5	19.5	18.5	19.0
10	1.0	1.0	1.0	3.5	2.0	2.5	8.0	6.5	7.0	21.0	19.5	20.5
11	1.5	1.0	1.0	4.0	3.0	3.5	9.0	8.0	8.5	20.5	19.5	20.0
12	1.5	1.0	1.0	4.0	3.0	3.5	11.0	9.0	10.0	20.0	19.0	19.5
13	1.5	1.0	1.0	3.5	2.5	3.0	11.0	10.5	11.0	19.0	18.5	18.5
14	1.5	1.0	1.0	3.0	2.5	3.0	11.0	10.0	10.5	18.5	18.0	18.5
15	1.5	1.0	1.0	2.5	2.0	2.5	11.5	10.0	10.5	18.0	17.0	17.5
16	1.5	1.0	1.0	2.5	2.0	2.0	11.5	11.0	11.5	16.5	16.0	16.0
17	1.5	1.0	1.0	2.5	1.5	2.0	11.5	10.5	11.0	16.0	15.5	16.0
18	1.0	.5	1.0	2.5	2.0	2.0	13.0	11.0	12.0	17.0	16.0	16.5
19	1.0	1.0	1.0	2.5	2.0	2.5	15.5	13.0	14.5	18.0	17.0	17.5
20	1.0	.5	1.0	3.0	2.5	2.5	17.0	15.5	16.0	18.0	17.5	18.0
21	1.0	.5	1.0	3.5	2.5	3.0	18.0	16.5	17.5	18.5	17.5	18.0
22	1.0	.5	.5	3.5	3.5	3.5	18.5	18.0	18.0	18.5	17.5	18.0
23	1.0	.5	.5	4.0	4.0	4.0	18.0	17.0	17.5	18.0	17.5	18.0
24	1.0	.5	1.0	4.0	3.5	3.5	17.0	15.0	16.0	19.0	17.5	18.0
25	1.0	.5	1.0	3.5	3.0	3.5	15.0	14.5	14.5	20.0	19.0	19.5
26	1.5	1.0	1.0	4.0	3.0	3.5	14.5	13.5	14.0	20.0	19.5	19.5
27	1.5	1.0	1.5	5.0	4.0	4.5	13.5	13.0	13.0	19.5	18.5	19.0
28	2.0	1.0	1.5	5.5	5.0	5.0	13.5	13.0	13.0	19.5	19.0	19.5
29	---	---	---	5.0	4.5	5.0	14.5	13.5	14.0	19.5	19.0	19.0
30	---	---	---	4.5	4.0	4.0	15.5	14.5	15.0	19.0	18.0	18.5
31	---	---	---	4.0	3.0	3.5	---	---	---	19.0	18.5	18.5
MONTH	2.0	.5	1.0	5.5	.5	2.5	18.5	2.0	11.0	21.0	15.0	18.0

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	19.0	18.0	18.5	22.5	21.0	21.5	23.0	22.0	22.5	19.0	18.5	19.0
2	18.0	17.0	17.5	22.5	21.5	22.0	23.0	22.5	23.0	19.0	19.0	19.0
3	17.0	16.5	17.0	23.0	22.0	22.5	23.5	22.5	23.0	19.5	19.0	19.5
4	17.5	17.0	17.0	23.0	22.5	22.5	23.0	22.5	22.5	20.5	19.5	20.0
5	18.0	16.5	17.0	23.0	22.0	22.5	23.0	22.0	22.5	20.5	20.0	20.5
6	18.5	17.5	18.0	23.5	22.5	23.0	24.0	23.0	23.5	22.0	20.5	21.0
7	19.0	18.0	18.5	24.5	23.5	24.0	24.0	23.0	23.5	22.5	21.5	21.5
8	20.5	18.5	19.5	25.0	24.5	24.5	24.0	23.5	23.5	22.0	21.0	21.5
9	20.5	20.0	20.5	25.0	24.5	25.0	23.5	22.5	23.0	21.0	19.5	20.5
10	20.5	20.0	20.0	25.0	24.5	25.0	22.5	22.0	22.0	19.5	18.5	19.0
11	20.0	19.0	19.0	25.0	24.5	25.0	22.0	21.5	21.5	18.5	18.0	18.0
12	19.0	18.0	18.5	25.0	24.0	24.5	22.0	20.5	21.0	18.5	18.0	18.0
13	19.5	18.5	19.0	24.5	24.0	24.5	21.0	20.5	20.5	17.5	17.0	17.5
14	19.0	18.5	19.0	25.0	24.5	24.5	21.5	20.5	21.0	17.0	16.5	17.0
15	18.5	18.0	18.5	24.5	23.5	24.0	21.5	21.0	21.5	17.0	16.5	17.0
16	19.5	18.5	19.0	24.0	23.0	23.5	22.0	21.0	21.5	17.5	17.0	17.0
17	19.5	19.0	19.0	24.0	23.5	23.5	21.5	21.0	21.5	17.5	17.0	17.5
18	19.0	18.5	18.5	24.0	23.0	23.5	21.5	20.5	21.0	19.5	17.5	18.5
19	19.5	18.5	19.0	24.5	23.5	24.0	20.5	19.5	19.5	20.5	19.0	20.0
20	20.0	19.5	19.5	25.0	24.0	24.5	19.0	18.5	19.0	20.5	19.5	20.0
21	20.5	20.0	20.0	25.0	24.0	24.5	19.0	18.5	18.5	19.0	17.0	18.0
22	20.5	19.5	20.0	24.5	23.5	24.0	19.0	18.5	18.5	17.0	16.0	16.5
23	21.0	20.0	20.5	24.0	23.5	23.5	19.0	18.5	19.0	16.0	15.0	15.5
24	21.5	21.0	21.5	23.5	22.5	23.0	19.0	19.0	19.0	15.0	13.0	14.0
25	22.5	21.5	22.0	23.5	22.5	23.0	19.5	18.5	19.0	13.0	12.5	12.5
26	23.5	22.5	23.0	23.5	23.0	23.5	20.0	19.0	19.5	12.5	12.0	12.5
27	23.5	21.5	22.5	23.5	23.0	23.5	20.5	20.0	20.0	12.5	12.0	12.0
28	21.5	20.5	21.0	23.5	23.0	23.5	20.0	19.5	20.0	12.0	11.5	12.0
29	21.0	20.5	21.0	23.5	23.0	23.0	19.5	19.0	19.0	11.5	10.5	11.0
30	21.5	20.5	21.0	23.5	23.0	23.0	19.0	18.5	18.5	10.5	10.0	10.0
31	---	---	---	23.0	22.0	22.5	18.5	18.0	18.5	---	---	---
MONTH	23.5	16.5	19.5	25.0	21.0	23.5	24.0	18.0	21.0	22.5	10.0	17.0

MISSISSIPPI RIVER MAIN STEM

05331005 MISSISSIPPI RIVER AT INDUSTRIAL MOLASSES, ST. PAUL, MN

LOCATION.--Lat 44°55'52", long 93°02'52", in NE¼NE¼ sec.9, T.28 N., R.22 W., Ramsey County, Hydrologic Unit 07010206, on left bank at molasses plant, 0.5 mi upstream from Metropolitan waste treatment plant, 2.0 mi downstream from Lafayette bridge and at mile 836.6 upstream from Ohio River.

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

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: March 1976 to current year.
pH: March 1976 to current year.
WATER TEMPERATURES: March 1976 to current year.
DISSOLVED OXYGEN: March 1976 to current year.

INSTRUMENTATION.--Water-quality monitor since March 1976.

REMARKS.--Extremes are published for years with 80 percent or more record, unless a new maximum or minimum was set.

COOPERATION.--Water-quality monitor is operated by the Metropolitan Waste Control Commission, St. Paul, MN. Monitor data is furnished by the Commission.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE (water years 1980-81, 1985): Maximum, 806 microsiemens Feb. 1, 1985; minimum, 230 microsiemens Mar. 24, 1980.
pH (water years 1980-82, 1985): Maximum, 9.0 units Feb. 7, 1985; minimum, 6.5 units Dec. 4, 1985.
WATER TEMPERATURES (water years 1980-81, 1985): Maximum, 29.5°C July 14, 1980; minimum, 0.1°C several days during winter period.
DISSOLVED OXYGEN (water years 1980-81, 1985): Maximum, 16.5 mg/L Nov. 19-20, 1985; minimum, 2.9 mg/L Aug. 17, 25, 1980.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum, 806 microsiemens Feb. 1; minimum, 267 microsiemens Mar. 25.
WATER TEMPERATURES: Maximum, 25.1°C July 9; minimum, 0.1°C on several days during winter period.

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	459	431	443	452	441	447	574	555	562	624	606	617
2	520	434	472	469	446	459	573	550	559	616	599	605
3	534	493	516	478	464	472	667	567	611	638	610	620
4	626	489	531	480	468	472	646	575	615	666	612	631
5	636	604	616	480	463	471	598	526	560	650	612	625
6	652	611	635	478	471	474	617	560	589	614	575	586
7	667	639	649	494	468	481	766	574	631	589	563	575
8	664	626	647	496	486	490	735	700	722	585	564	571
9	640	434	558	503	466	489	714	701	708	599	542	563
10	485	424	450	504	493	500	729	594	684	566	540	551
11	443	407	429	503	495	500	584	536	567	659	528	579
12	481	431	454	541	488	499	571	538	557	643	524	554
13	563	477	541	500	488	494	595	565	582	672	547	583
14	581	539	559	503	487	495	646	591	626	710	668	681
15	564	536	549	528	489	497	678	614	634	689	553	635
16	551	489	531	538	492	500	686	561	603	647	549	641
17	533	487	505	547	492	515	571	522	545	672	630	639
18	509	483	494	530	492	504	563	531	545	645	564	616
19	484	435	452	567	491	521	613	565	595	586	571	580
20	436	425	432	559	530	546	609	536	576	602	582	592
21	437	412	428	635	500	568	552	533	542	630	474	557
22	459	405	431	569	523	543	555	517	537	576	456	521
23	475	440	458	554	495	532	608	549	582	573	560	565
24	469	439	459	510	496	500	596	583	590	569	562	565
25	468	439	455	528	503	517	637	519	569	566	550	555
26	453	417	447	548	502	519	577	509	556	560	544	549
27	453	360	430	580	501	543	663	552	595	557	537	541
28	459	434	454	562	545	550	684	604	639	546	536	540
29	471	458	463	553	541	546	621	570	599	551	539	543
30	475	434	450	559	542	548	647	582	629	546	532	537
31	447	435	440	---	---	---	645	605	625	541	526	532
MONTH	667	360	496	635	441	506	766	509	597	710	456	582

MISSISSIPPI RIVER MAIN STEM

05331005 MISSISSIPPI RIVER AT INDUSTRIAL MOLASSES, ST. PAUL, MN

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	806	525	539	---	---	---	350	342	344	480	469	475
2	641	524	553	---	---	---	353	346	349	488	478	478
3	563	535	549	---	---	---	400	351	373	499	485	492
4	565	499	524	---	---	---	406	399	402	504	493	499
5	518	495	506	---	---	---	412	402	406	507	501	504
6	510	497	504	---	---	---	412	407	409	510	501	505
7	575	490	523	---	---	---	414	409	411	517	506	511
8	580	564	571	---	---	---	414	410	412	518	509	513
9	578	569	574	---	---	---	416	410	412	525	510	515
10	586	563	572	---	---	---	466	415	441	533	508	525
11	---	---	---	---	---	---	482	413	471	531	514	526
12	---	---	---	---	---	---	487	470	478	---	---	---
13	---	---	---	---	---	---	482	475	476	---	---	---
14	---	---	---	---	---	---	487	476	484	---	---	---
15	---	---	---	---	---	---	---	---	---	---	---	---
16	---	---	---	---	---	---	---	---	---	---	---	---
17	---	---	---	426	418	420	---	---	---	---	---	---
18	---	---	---	421	415	416	497	488	492	---	---	---
19	---	---	---	419	283	360	503	484	494	---	---	---
20	---	---	---	286	283	284	508	499	504	---	---	---
21	---	---	---	287	282	284	517	503	509	---	---	---
22	---	---	---	289	284	286	507	498	502	---	---	---
23	---	---	---	288	286	287	506	490	496	---	---	---
24	---	---	---	---	---	---	491	482	485	512	493	501
25	---	---	---	288	267	284	485	477	480	520	504	507
26	---	---	---	297	286	290	478	471	474	517	507	511
27	---	---	---	335	293	314	471	466	468	514	505	510
28	---	---	---	338	333	334	467	462	464	520	507	513
29	---	---	---	343	335	338	471	462	463	516	508	512
30	---	---	---	344	340	341	470	462	466	518	496	510
31	---	---	---	345	340	341	---	---	---	---	---	---

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	---	---	---	428	406	417	328	320	323	390	378	386
2	---	---	---	427	367	395	348	324	331	401	386	393
3	---	---	---	378	365	371	346	325	334	405	389	394
4	507	498	501	384	366	376	336	329	332	401	389	393
5	518	502	510	385	370	376	339	322	332	398	381	389
6	527	510	514	389	371	379	337	325	330	---	---	---
7	527	517	521	394	378	385	349	322	333	---	---	---
8	573	518	535	394	382	387	345	334	341	412	390	405
9	555	538	543	446	384	412	343	332	336	410	384	396
10	546	513	540	435	383	431	334	322	329	387	379	382
11	543	525	536	430	421	424	334	322	330	387	378	382
12	537	525	531	443	420	429	341	317	327	410	379	389
13	535	423	478	445	434	439	334	320	329	403	393	394
14	431	416	424	440	428	434	336	327	332	400	389	395
15	428	415	422	430	420	425	340	327	334	395	386	390
16	444	426	434	424	374	400	339	332	335	400	390	394
17	442	429	436	390	373	384	338	324	332	410	396	401
18	432	422	427	394	376	385	337	331	333	502	405	451
19	437	422	429	394	379	386	332	319	322	502	494	497
20	457	436	446	391	370	381	367	318	338	504	489	497
21	495	436	457	388	367	373	365	360	362	498	478	488
22	478	453	461	---	---	---	367	361	362	477	465	470
23	478	457	466	364	360	362	366	357	362	467	454	460
24	475	461	468	362	347	353	370	363	365	461	450	456
25	487	467	473	360	348	353	373	366	368	458	448	453
26	486	470	476	361	351	355	378	369	373	458	451	454
27	472	432	450	364	348	355	381	372	376	466	450	455
28	433	422	427	355	346	350	382	372	376	473	458	466
29	429	418	422	358	344	348	381	368	375	461	447	456
30	424	415	420	351	323	336	380	370	374	451	444	447
31	---	---	---	324	319	322	382	373	378	---	---	---
MONTH	---	---	---	---	---	---	382	317	345	---	---	---

MISSISSIPPI RIVER MAIN STEM

05331005 MISSISSIPPI RIVER AT INDUSTRIAL MOLASSES, ST. PAUL, MN

PH (STANDARD UNITS), WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	8.3	7.5	7.9	8.1	8.1	8.1	8.6	7.4	8.2	---	---	---
2	8.1	7.9	8.0	8.2	8.0	8.1	---	---	---	---	---	---
3	8.1	7.9	8.0	8.2	8.1	8.1	---	---	---	---	---	---
4	8.0	7.8	8.0	8.2	8.1	8.1	8.0	6.5	7.3	7.7	7.3	7.5
5	8.0	7.9	7.9	8.3	8.1	8.2	8.6	7.8	7.9	---	---	---
6	8.0	7.8	7.9	8.3	8.1	8.2	8.4	8.0	8.3	---	---	---
7	7.9	7.8	7.8	8.4	8.2	8.2	8.3	7.9	8.1	8.1	7.6	7.8
8	7.8	7.6	7.7	8.3	8.1	8.2	8.0	7.9	7.9	7.9	7.5	7.7
9	7.8	7.4	7.7	8.4	8.0	8.2	8.1	8.0	8.0	7.5	7.4	7.5
10	7.6	7.5	7.5	8.2	8.1	8.2	8.5	8.1	8.2	7.5	7.2	7.4
11	7.5	7.4	7.4	8.2	8.1	8.1	8.3	8.1	8.2	7.8	6.9	7.1
12	7.7	7.4	7.5	8.1	8.1	8.1	8.6	8.3	8.4	7.3	7.1	7.2
13	7.6	7.6	7.6	8.1	8.0	8.1	8.8	8.5	8.7	---	---	---
14	7.6	7.5	7.6	8.1	8.0	8.0	8.9	8.6	8.7	---	---	---
15	8.0	7.5	7.6	8.1	7.9	8.0	8.6	8.6	8.6	---	---	---
16	8.0	7.3	7.5	8.4	7.6	8.1	8.7	8.5	8.6	---	---	---
17	7.8	7.2	7.5	8.5	8.4	8.5	8.7	8.5	8.6	---	---	---
18	7.7	7.4	7.6	8.4	8.4	8.4	8.8	8.5	8.6	---	---	---
19	8.2	7.4	7.8	8.5	8.4	8.4	8.5	8.2	8.4	---	---	---
20	7.9	7.5	7.7	8.5	8.2	8.3	8.2	7.9	8.1	---	---	---
21	7.8	7.4	7.6	8.5	8.2	8.2	8.1	7.7	8.0	---	---	---
22	8.1	7.4	7.8	8.2	8.1	8.2	8.2	8.0	8.1	---	---	---
23	7.6	7.5	7.5	8.1	7.9	8.0	8.0	8.0	8.0	7.9	7.8	7.8
24	7.9	7.6	7.7	7.9	7.4	7.6	8.2	8.1	8.1	7.9	7.8	7.8
25	7.9	7.8	7.9	---	---	---	8.2	7.9	8.0	---	---	---
26	8.2	7.8	7.9	---	---	---	8.0	7.9	7.9	8.3	8.0	8.1
27	7.9	7.8	7.9	---	---	---	---	---	---	8.0	8.0	8.0
28	8.0	7.9	7.9	---	---	---	---	---	---	8.2	8.0	8.0
29	8.3	8.0	8.0	---	---	---	8.4	8.4	8.4	8.1	8.0	8.1
30	8.1	8.1	8.1	---	---	---	8.3	7.7	7.9	8.3	8.0	8.1
31	8.2	8.1	8.1	---	---	---	7.6	7.2	7.5	8.6	7.9	8.2
MONTH	8.3	7.2	7.8	---	---	---	---	---	---	---	---	---

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	8.2	7.9	8.1	---	---	---	---	---	---	7.8	7.8	7.8
2	---	---	---	---	---	---	---	---	---	7.8	7.7	7.7
3	8.5	8.0	8.3	---	---	---	---	---	---	7.7	7.7	7.7
4	8.3	8.2	8.2	---	---	---	---	---	---	7.8	7.7	7.7
5	---	---	---	---	---	---	---	---	---	7.8	7.7	7.7
6	---	---	---	---	---	---	---	---	---	7.8	7.7	7.8
7	9.0	7.7	8.5	---	---	---	---	---	---	7.8	7.8	7.8
8	7.8	7.5	7.6	---	---	---	---	---	---	7.8	7.8	7.8
9	---	---	---	---	---	---	---	---	---	7.8	7.8	7.8
10	8.4	8.0	8.3	---	---	---	---	---	---	7.8	7.7	7.8
11	---	---	---	---	---	---	8.0	7.9	8.0	7.8	7.7	7.8
12	---	---	---	---	---	---	8.1	7.9	8.0	---	---	---
13	---	---	---	---	---	---	8.0	7.4	8.0	---	---	---
14	---	---	---	---	---	---	8.0	7.7	7.9	---	---	---
15	---	---	---	---	---	---	---	---	---	---	---	---
16	---	---	---	---	---	---	---	---	---	---	---	---
17	---	---	---	---	---	---	---	---	---	---	---	---
18	---	---	---	---	---	---	8.0	8.0	8.0	---	---	---
19	---	---	---	7.8	6.8	7.1	8.1	8.0	8.0	---	---	---
20	---	---	---	7.5	7.4	7.4	8.1	8.0	8.1	---	---	---
21	---	---	---	7.4	7.2	7.3	8.1	8.1	8.1	---	---	---
22	---	---	---	8.1	7.0	7.2	8.1	7.9	8.0	---	---	---
23	---	---	---	---	---	---	8.1	7.9	7.9	---	---	---
24	---	---	---	---	---	---	7.9	7.8	7.9	8.0	7.7	7.9
25	---	---	---	---	---	---	7.9	7.8	7.8	8.1	8.0	8.0
26	---	---	---	7.7	7.5	7.6	7.9	7.8	7.8	8.1	8.0	8.0
27	---	---	---	8.0	7.6	7.7	7.8	7.8	7.8	8.1	8.0	8.0
28	---	---	---	7.7	7.5	7.6	7.8	7.8	7.8	8.1	8.0	8.0
29	---	---	---	7.9	7.2	7.6	7.8	3.4	6.1	8.1	8.0	8.0
30	---	---	---	7.8	7.5	7.6	7.8	7.6	7.7	8.1	8.0	8.0
31	---	---	---	---	---	---	---	---	---	---	---	---

05331005 MISSISSIPPI RIVER AT INDUSTRIAL MOLASSES, ST. PAUL, MN

PH (STANDARD UNITS), WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	---	---	---	8.0	7.8	7.9	8.1	8.0	8.0	8.0	7.8	7.9
2	---	---	---	8.0	7.9	7.9	8.1	7.9	8.1	7.9	7.9	7.9
3	---	---	---	8.0	7.9	7.9	8.1	8.0	8.1	7.9	7.8	7.9
4	8.0	7.9	8.0	7.9	7.9	7.9	8.1	8.0	8.0	7.9	7.8	7.8
5	8.0	8.0	8.0	7.9	7.8	7.9	8.1	8.0	8.0	7.9	7.8	7.8
6	8.1	7.9	7.9	7.9	7.9	7.9	8.1	8.0	8.0	---	---	---
7	8.0	7.9	8.0	8.0	7.9	7.9	8.1	7.9	8.0	---	---	---
8	7.9	7.8	7.9	8.3	7.9	7.9	8.1	8.0	8.0	7.9	7.8	7.9
9	7.9	7.9	7.9	8.0	7.9	7.9	8.0	7.8	7.9	7.9	7.8	7.9
10	8.0	7.9	8.0	8.0	7.9	7.9	7.9	7.8	7.8	7.9	7.8	7.9
11	8.0	7.9	7.9	8.0	7.9	7.9	7.8	7.7	7.8	8.0	7.8	7.8
12	7.9	7.9	7.9	8.0	7.9	7.9	8.0	7.7	7.8	7.9	7.8	7.8
13	8.0	7.9	7.9	7.9	7.9	7.9	7.9	7.8	7.8	7.9	7.8	7.8
14	8.0	7.8	7.9	7.9	7.9	7.9	7.9	7.8	7.9	7.9	7.9	7.9
15	7.9	7.9	7.9	7.9	7.9	7.9	8.0	7.9	7.9	7.9	7.9	7.9
16	7.9	7.8	7.9	8.1	7.9	7.9	8.0	7.9	7.9	7.9	7.9	7.9
17	8.1	7.8	7.9	8.0	7.9	7.9	7.9	7.8	7.9	7.9	7.9	7.9
18	8.0	7.9	8.0	7.9	7.9	7.9	8.0	7.8	7.9	7.9	7.8	7.9
19	8.1	8.0	8.0	8.1	7.9	7.9	8.1	7.9	8.0	7.9	7.8	7.9
20	8.1	8.0	8.0	8.0	7.9	7.9	8.1	8.0	8.0	7.9	7.8	7.9
21	8.4	8.0	8.0	7.9	7.9	7.9	8.1	8.0	8.0	7.9	7.9	7.9
22	8.1	8.0	8.0	---	---	---	8.0	7.8	8.0	7.9	7.9	7.9
23	8.1	7.9	8.0	8.1	8.1	8.1	8.0	7.9	8.0	7.9	7.9	7.9
24	8.1	8.0	8.1	8.0	7.8	7.9	8.1	7.9	7.9	7.9	7.9	7.9
25	8.2	8.1	8.2	8.0	7.8	7.9	8.0	7.9	7.9	7.9	7.9	7.9
26	8.2	8.1	8.1	8.0	7.9	7.9	8.1	7.9	8.0	8.1	7.9	7.9
27	8.1	8.0	8.0	8.0	7.9	8.0	8.1	8.0	8.0	8.0	7.9	7.9
28	8.1	8.0	8.0	7.9	7.9	7.9	8.0	7.7	7.9	8.0	7.9	8.0
29	8.0	7.9	8.0	8.0	7.9	7.9	7.9	7.7	7.8	8.0	7.9	7.9
30	7.9	7.9	7.9	8.0	7.9	8.0	8.1	7.8	7.9	8.0	7.9	8.0
31	---	---	---	8.0	8.0	8.0	8.0	7.9	7.9	---	---	---
MONTH	---	---	---	---	---	---	8.1	7.7	7.9	---	---	---

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	10.6	9.8	10.1	3.3	2.2	2.8	---	---	---	0.9	0.7	0.9
2	10.2	8.9	9.5	2.3	0.8	1.5	---	---	---	1.1	0.7	0.9
3	10.1	8.8	9.4	0.8	0.4	0.5	---	---	---	1.2	0.3	0.7
4	10.5	9.1	9.7	0.7	0.4	0.6	---	---	---	1.7	0.3	0.7
5	10.6	9.6	10.1	0.9	0.6	0.7	0.7	0.4	0.6	1.3	0.7	0.9
6	11.1	10.0	10.5	0.8	0.5	0.6	0.7	0.3	0.5	1.2	0.8	1.1
7	11.0	10.5	10.8	1.7	0.6	1.1	1.0	0.5	0.7	1.4	0.1	0.7
8	10.9	10.5	10.7	2.2	1.6	1.9	0.9	0.5	0.7	0.3	0.1	0.1
9	11.0	10.5	10.7	2.5	0.7	2.2	0.8	0.5	0.6	0.4	0.1	0.2
10	11.7	10.8	11.2	2.2	1.5	1.9	0.7	0.5	0.6	0.4	0.1	0.2
11	11.9	11.4	11.6	1.6	1.0	1.3	0.8	0.5	0.7	0.3	0.1	0.1
12	12.4	11.6	12.0	1.2	0.8	0.9	1.1	0.4	0.7	0.4	0.1	0.2
13	13.0	12.1	12.5	1.2	0.6	0.9	0.7	0.4	0.5	0.5	0.1	0.2
14	13.3	12.6	12.8	1.7	0.9	1.3	0.8	0.5	0.6	0.4	0.1	0.2
15	13.2	12.3	12.7	1.8	1.2	1.5	1.2	0.5	0.7	0.6	0.1	0.3
16	12.5	10.3	11.7	1.2	0.2	0.6	2.2	1.2	1.7	0.7	0.2	0.4
17	10.4	9.0	9.7	0.5	0.1	0.2	1.6	1.0	1.3	0.7	0.2	0.4
18	9.0	7.8	8.4	0.2	0.1	0.1	1.7	1.1	1.4	0.6	0.2	0.4
19	11.8	7.4	10.1	0.1	0.1	0.1	1.8	1.4	1.6	0.5	0.2	0.4
20	12.3	10.0	10.6	---	---	---	2.1	1.4	1.6	0.6	0.3	0.4
21	10.5	9.2	9.8	---	---	---	1.7	0.3	1.0	0.8	0.4	0.5
22	9.8	5.8	7.7	---	---	---	0.5	0.3	0.4	0.6	0.3	0.5
23	5.2	4.9	5.0	---	---	---	0.6	0.5	0.6	0.7	0.3	0.4
24	5.0	4.5	4.8	---	---	---	0.6	0.5	0.5	0.6	0.3	0.4
25	4.8	4.4	4.6	---	---	---	0.7	0.5	0.5	0.6	0.3	0.4
26	5.2	4.7	5.1	---	---	---	0.7	0.5	0.6	0.7	0.3	0.4
27	7.3	5.2	5.8	---	---	---	0.8	0.6	0.7	0.8	0.4	0.5
28	6.1	5.3	5.7	---	---	---	1.0	0.7	0.8	0.9	0.3	0.5
29	5.4	4.9	5.1	---	---	---	0.8	0.5	0.6	0.8	0.3	0.5
30	5.1	4.2	4.7	---	---	---	0.9	0.6	0.7	0.6	0.2	0.3
31	4.3	3.3	3.8	---	---	---	0.9	0.7	0.8	0.6	0.2	0.4
MONTH	13.3	3.3	8.9	---	---	---	---	---	---	1.7	0.1	0.5

MISSISSIPPI RIVER MAIN STEM

05331005 MISSISSIPPI RIVER AT INDUSTRIAL MOLASSES, ST. PAUL, MN

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	0.5	0.2	0.3	---	---	---	4.8	3.8	4.3	14.2	13.8	14.0
2	0.5	0.2	0.3	---	---	---	5.2	3.9	4.5	14.7	14.1	14.4
3	0.4	0.1	0.3	---	---	---	6.0	5.0	5.4	15.5	14.6	15.1
4	0.8	0.3	0.4	---	---	---	7.3	6.0	6.7	15.8	15.3	15.5
5	0.8	0.4	0.5	---	---	---	8.9	7.1	7.9	15.8	15.6	15.7
6	0.7	0.3	0.5	---	---	---	8.3	7.0	7.8	15.9	15.2	15.6
7	0.7	0.3	0.4	---	---	---	7.8	7.3	7.6	16.7	15.6	16.1
8	0.7	0.3	0.4	---	---	---	7.5	6.4	7.1	17.6	15.2	16.6
9	0.7	0.3	0.5	---	---	---	6.8	6.2	6.5	18.7	17.4	18.0
10	0.9	0.3	0.5	---	---	---	7.7	6.5	7.3	19.8	18.6	19.1
11	---	---	---	---	---	---	11.0	7.9	9.2	19.9	16.7	19.6
12	---	---	---	---	---	---	11.9	9.0	10.4	---	---	---
13	---	---	---	---	---	---	11.8	10.1	10.5	---	---	---
14	---	---	---	---	---	---	12.9	11.6	12.3	---	---	---
15	---	---	---	---	---	---	---	---	---	---	---	---
16	---	---	---	---	---	---	---	---	---	---	---	---
17	---	---	---	1.6	0.9	1.3	---	---	---	---	---	---
18	---	---	---	1.8	1.1	1.4	12.3	11.3	11.9	---	---	---
19	---	---	---	3.5	1.4	2.3	14.2	12.1	13.3	---	---	---
20	---	---	---	3.6	3.0	3.3	15.5	14.1	14.8	---	---	---
21	---	---	---	4.1	3.3	3.6	16.7	15.1	15.9	---	---	---
22	---	---	---	4.6	4.1	4.3	16.7	16.0	16.3	---	---	---
23	---	---	---	4.5	4.2	4.4	16.5	15.5	16.1	---	---	---
24	---	---	---	---	---	---	15.5	13.8	14.5	18.8	17.3	18.0
25	---	---	---	4.3	3.8	4.1	13.8	13.1	13.4	20.1	18.7	19.3
26	---	---	---	4.8	3.7	4.1	13.1	12.2	12.7	19.7	19.1	19.3
27	---	---	---	5.5	4.9	5.2	12.2	11.7	11.9	19.3	18.5	18.9
28	---	---	---	5.8	5.1	5.5	12.3	11.6	12.0	19.5	18.8	19.2
29	---	---	---	5.7	3.2	5.3	13.2	12.2	12.7	19.2	18.8	19.0
30	---	---	---	5.4	4.9	5.2	13.9	13.2	13.7	19.0	18.2	18.7
31	---	---	---	5.5	4.6	4.8	---	---	---	---	---	---

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	---	---	---	22.7	20.7	21.9	23.1	22.1	22.5	19.3	18.6	19.0
2	---	---	---	22.4	21.3	22.0	23.2	22.4	22.8	19.5	18.8	19.0
3	---	---	---	23.2	21.7	22.7	23.3	22.4	22.9	19.8	19.5	19.6
4	18.1	17.2	17.6	23.3	22.7	23.0	23.0	22.4	22.5	20.5	19.4	19.9
5	19.4	16.9	18.0	23.3	21.8	22.8	22.8	22.1	22.5	20.6	18.7	20.4
6	19.9	18.6	19.0	23.9	23.0	23.4	23.6	22.6	23.1	---	---	---
7	19.7	18.6	19.1	24.2	22.8	23.7	23.6	22.7	23.2	---	---	---
8	21.5	19.4	19.9	24.4	23.7	24.0	23.6	22.8	23.2	22.2	21.3	21.7
9	21.4	20.4	20.9	25.1	24.1	24.5	22.9	21.9	22.5	21.3	19.9	20.7
10	21.1	20.6	20.8	25.0	23.8	24.6	22.0	21.4	21.8	19.9	18.7	19.1
11	20.6	19.4	20.0	24.8	24.3	24.5	21.9	21.1	21.4	18.8	18.4	18.6
12	19.9	19.3	19.6	24.7	23.9	24.3	21.4	20.6	21.0	18.6	18.0	18.3
13	20.0	19.3	19.7	24.6	24.0	24.3	20.8	20.4	20.6	18.0	17.4	17.7
14	19.7	18.6	19.3	24.8	24.1	24.4	21.9	20.3	20.7	17.6	17.1	17.3
15	19.4	18.5	19.0	24.3	23.7	23.9	21.4	20.7	21.1	17.5	16.9	17.2
16	20.8	19.4	20.0	24.1	23.0	23.5	21.5	20.9	21.2	17.5	17.0	17.2
17	20.5	19.7	20.0	24.7	23.2	24.2	21.5	20.7	21.2	17.9	17.3	17.6
18	19.7	19.4	19.5	24.7	23.1	23.7	21.1	20.4	20.7	18.5	17.6	18.1
19	20.1	19.4	19.7	24.2	23.3	23.8	20.6	19.1	19.5	19.3	18.4	18.7
20	20.7	19.8	20.3	24.8	23.8	24.3	19.3	18.8	19.0	19.5	18.3	19.0
21	21.6	19.8	20.5	24.6	24.0	24.3	19.4	18.5	18.8	18.3	16.6	17.4
22	21.3	20.3	20.7	---	---	---	18.8	18.5	18.7	16.6	15.9	16.2
23	22.3	19.5	21.3	24.1	23.4	23.8	19.2	18.6	18.9	15.8	14.8	15.4
24	21.5	20.7	21.2	23.8	22.7	23.2	19.3	18.7	19.0	14.8	13.1	14.0
25	22.0	20.7	21.3	23.4	22.5	23.0	19.5	18.6	19.0	13.1	12.6	12.8
26	22.7	21.9	22.2	23.8	22.9	23.5	20.1	18.8	19.4	12.7	12.1	12.5
27	23.4	22.1	22.7	23.9	23.2	23.5	20.3	19.6	19.9	12.4	11.9	12.2
28	22.1	20.7	21.6	23.6	23.1	23.3	20.1	19.8	19.9	14.8	11.7	12.0
29	21.5	20.3	20.8	23.4	22.8	23.1	19.8	19.0	19.6	11.7	11.0	11.4
30	21.3	20.1	20.7	23.4	22.7	23.1	19.6	18.6	18.9	11.0	10.4	10.6
31	---	---	---	22.8	22.2	22.5	18.9	18.5	18.6	---	---	---
MONTH	---	---	---	---	---	---	23.6	18.5	20.8	---	---	---

MISSISSIPPI RIVER MAIN STEM

05331005 MISSISSIPPI RIVER AT INDUSTRIAL MOLASSES, ST. PAUL, MN

OXYGEN, DISSOLVED (DO), MG/L, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	14.1	12.1	13.0	12.9	12.6	12.7	14.9	14.5	14.7	12.5	12.2	12.3
2	13.8	10.9	12.5	13.9	12.8	13.2	15.4	14.7	15.0	12.5	12.0	12.2
3	11.1	9.2	10.2	13.9	13.3	13.6	15.1	14.6	14.9	13.7	11.9	12.6
4	8.9	7.1	8.3	13.5	13.1	13.3	15.0	14.7	14.9	14.4	12.1	13.7
5	8.6	7.8	8.2	14.5	13.2	13.7	14.9	14.5	14.6	14.2	13.8	14.0
6	8.2	7.6	7.9	14.2	13.8	14.0	14.8	14.4	14.6	13.7	13.4	13.6
7	7.7	6.7	7.1	14.0	13.4	13.7	16.1	14.2	15.0	13.9	12.9	13.3
8	6.8	5.8	6.4	13.7	13.2	13.5	16.2	15.8	15.9	13.0	12.2	12.8
9	11.2	5.2	8.0	13.7	13.0	13.3	15.9	15.6	15.7	12.4	11.9	12.1
10	9.9	8.9	9.4	13.3	13.1	13.1	16.2	15.7	15.8	12.1	11.6	11.8
11	9.5	8.7	9.1	13.3	13.1	13.2	15.9	14.7	15.4	13.7	11.5	12.4
12	10.0	8.2	8.9	13.2	13.0	13.1	14.7	14.4	14.5	13.7	13.0	13.3
13	9.7	8.8	9.2	13.2	12.5	12.8	14.5	14.2	14.4	13.2	12.6	13.0
14	9.1	8.2	8.7	12.6	11.6	12.0	15.2	14.0	14.6	12.6	12.4	12.5
15	9.9	7.4	8.4	13.9	11.2	12.4	14.9	14.1	14.7	14.5	11.7	13.6
16	9.3	8.3	8.8	14.3	13.7	14.0	14.1	12.4	13.2	14.0	13.5	13.8
17	9.2	7.6	8.2	14.4	14.0	14.2	13.1	12.6	12.9	13.5	12.6	13.3
18	8.5	6.8	7.8	14.9	14.3	14.6	12.9	12.2	12.5	13.1	12.9	13.0
19	9.9	7.4	8.2	16.5	14.8	15.5	12.3	11.7	12.0	13.0	12.5	12.8
20	---	---	---	16.5	14.5	15.6	11.7	11.5	11.6	12.6	12.3	12.5
21	---	---	---	14.5	14.2	14.4	14.4	11.4	13.1	15.4	12.0	13.3
22	---	---	---	14.5	13.9	14.1	14.2	14.0	14.1	15.9	13.4	14.4
23	13.2	12.9	13.1	14.0	13.6	13.7	14.1	13.7	13.9	13.5	13.1	13.4
24	13.4	12.4	12.9	13.7	13.1	13.4	13.6	13.5	13.5	13.1	12.7	13.0
25	12.8	11.9	12.3	13.4	13.0	13.2	13.5	13.2	13.4	12.9	12.7	12.8
26	13.5	11.7	13.1	12.9	12.4	12.7	14.2	13.1	13.6	12.9	12.3	12.7
27	13.2	10.8	12.1	14.6	12.1	13.4	14.1	13.5	13.8	12.6	12.2	12.5
28	11.1	9.3	10.2	15.1	14.5	14.8	13.5	12.5	13.1	12.5	12.0	12.2
29	12.6	8.8	10.2	15.1	14.4	14.7	13.5	12.7	12.9	13.1	12.0	12.5
30	13.0	11.7	12.2	15.3	14.4	14.8	13.5	12.5	12.8	13.1	12.7	12.9
31	13.0	12.6	12.8	---	---	---	12.8	12.4	12.6	12.9	12.5	12.7
MONTH	---	---	---	16.5	11.2	13.7	16.2	11.4	14.0	15.9	11.5	12.9

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	13.3	12.0	12.7	---	---	---	13.0	6.1	9.9	10.7	10.2	10.5
2	13.2	12.8	13.0	---	---	---	12.4	10.4	11.5	10.5	10.1	10.3
3	13.1	12.8	13.0	---	---	---	13.5	10.0	11.4	12.3	10.0	10.8
4	13.2	12.7	12.9	---	---	---	11.3	8.0	9.6	11.8	11.0	11.3
5	12.8	12.3	12.5	---	---	---	8.3	7.0	7.7	11.1	10.6	10.8
6	12.6	12.3	12.4	---	---	---	8.1	6.9	7.4	10.8	9.4	10.0
7	13.0	12.4	12.7	---	---	---	7.4	7.0	7.2	9.3	6.8	8.1
8	14.8	12.8	13.5	---	---	---	13.0	6.9	9.1	10.3	6.6	8.3
9	14.4	13.8	14.3	---	---	---	12.5	11.3	11.9	10.2	8.2	9.5
10	13.9	13.5	13.7	---	---	---	13.3	8.1	10.8	9.6	7.7	8.5
11	---	---	---	---	---	---	---	---	---	9.1	7.3	8.3
12	---	---	---	---	---	---	14.6	12.6	13.3	---	---	---
13	---	---	---	---	---	---	12.6	10.9	11.9	---	---	---
14	---	---	---	---	---	---	---	---	---	---	---	---
15	---	---	---	---	---	---	---	---	---	---	---	---
16	---	---	---	---	---	---	---	---	---	---	---	---
17	---	---	---	15.9	15.6	15.8	---	---	---	---	---	---
18	---	---	---	16.0	13.5	15.0	12.5	11.2	12.0	---	---	---
19	---	---	---	13.5	13.3	13.4	11.2	7.4	9.4	---	---	---
20	---	---	---	13.4	13.1	13.3	---	---	---	---	---	---
21	---	---	---	13.1	12.8	13.0	---	---	---	---	---	---
22	---	---	---	12.9	12.1	12.6	---	---	---	---	---	---
23	---	---	---	12.2	11.7	11.9	10.6	4.2	8.2	---	---	---
24	---	---	---	---	---	---	10.2	9.4	9.9	10.9	8.3	8.7
25	---	---	---	14.0	11.6	12.5	9.6	9.2	9.4	9.5	7.4	8.0
26	---	---	---	14.0	13.3	13.8	9.3	8.6	9.0	8.1	7.4	7.9
27	---	---	---	13.3	12.7	13.0	8.9	8.3	8.6	8.0	7.3	7.7
28	---	---	---	12.7	12.3	12.5	8.6	8.2	8.4	9.9	7.0	8.3
29	---	---	---	12.6	10.8	12.0	11.9	7.8	9.4	9.7	9.2	9.4
30	---	---	---	11.0	9.1	10.2	11.3	10.5	10.9	9.2	7.0	8.6
31	---	---	---	10.0	7.5	9.1	---	---	---	---	---	---

MISSISSIPPI RIVER MAIN STEM

05331005 MISSISSIPPI RIVER AT INDUSTRIAL MOLASSES, ST. PAUL, MN

OXYGEN, DISSOLVED (DO), MG/L, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	---	---	---	7.9	7.7	7.8	8.2	7.6	7.9	10.5	9.7	10.0
2	---	---	---	8.6	7.7	8.2	7.9	7.2	7.6	9.9	9.2	9.4
3	---	---	---	8.4	7.9	8.2	7.3	6.6	7.0	11.0	8.5	9.7
4	---	---	---	7.9	6.8	7.1	---	---	---	10.8	8.0	9.5
5	---	---	---	7.4	6.9	7.1	---	---	---	10.1	7.7	8.0
6	---	---	---	7.5	6.6	7.0	8.6	5.0	6.4	---	---	---
7	9.3	7.5	8.6	---	---	---	8.1	7.1	7.6	---	---	---
8	---	---	---	8.5	5.5	7.0	7.5	6.5	7.0	8.6	7.6	8.3
9	---	---	---	8.5	7.5	8.1	7.8	6.5	6.9	8.5	7.7	8.1
10	---	---	---	8.6	6.8	7.7	8.1	6.9	7.1	8.9	7.8	8.6
11	9.9	7.0	8.0	8.4	6.2	7.6	7.1	6.6	6.9	8.8	8.3	8.6
12	7.7	6.7	7.2	---	---	---	7.1	5.5	6.2	9.3	8.4	8.9
13	9.8	6.4	8.1	8.5	8.0	8.2	9.1	5.8	7.5	9.9	9.1	9.4
14	9.5	8.1	8.8	8.2	7.3	7.8	8.6	7.2	8.2	9.8	9.5	9.6
15	---	---	---	8.9	7.2	7.9	9.2	7.1	8.0	9.5	9.3	9.4
16	---	---	---	8.7	8.1	8.2	8.5	7.6	7.9	10.1	9.1	9.5
17	---	---	---	8.1	7.0	7.4	7.7	6.5	7.1	9.9	9.7	9.8
18	9.1	5.1	7.2	---	---	---	8.2	6.7	7.0	9.7	9.3	9.6
19	8.5	7.4	7.9	8.6	7.0	7.2	8.0	6.6	7.3	9.2	9.0	9.1
20	8.1	7.0	7.1	8.6	7.6	8.1	9.5	7.4	8.2	8.8	8.3	8.6
21	9.9	8.8	9.3	8.1	7.4	7.7	9.1	8.4	8.6	9.2	8.7	8.9
22	8.9	7.0	8.0	---	---	---	11.2	8.5	9.1	9.3	8.9	9.1
23	---	---	---	8.2	6.0	7.0	10.8	9.5	10.0	9.6	8.7	9.2
24	---	---	---	---	---	---	10.0	9.2	9.5	10.0	9.5	9.8
25	11.2	8.1	9.5	---	---	---	10.0	9.1	9.5	10.1	9.8	10.0
26	8.0	7.0	7.5	8.9	7.9	8.5	11.8	8.1	9.6	9.9	8.9	9.8
27	---	---	---	8.7	8.0	8.3	11.2	9.0	10.2	9.7	9.2	9.6
28	---	---	---	8.1	7.5	7.8	---	---	---	9.6	9.3	9.5
29	---	---	---	7.9	6.9	7.3	---	---	---	9.8	9.4	9.6
30	---	---	---	8.8	6.8	7.6	10.8	8.2	10.4	11.8	9.4	10.3
31	---	---	---	8.3	7.6	7.9	10.8	10.1	10.4	---	---	---

MISSISSIPPI RIVER MAIN STEM

05331545 MISSISSIPPI RIVER AT FIFTH STREET AT NEWPORT, MN

LOCATION.--Lat 44°51'37", long 93°00'24", in NE¼NE¼ sec.2, T.27 N., R.22 W., Washington County, Hydrologic Unit 07010206, on left bank at the end of Fifth Street, and at mile 830.6 upstream from Ohio River.

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

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: December 1978 to current year.
pH: December 1978 to current year.
WATER TEMPERATURES: December 1978 to current year.
DISSOLVED OXYGEN: December 1978 to current year.

INSTRUMENTATION.--Water-quality monitor since December 1978.

REMARKS.-Water is pumped to a monitor that is inside a heated shelter. Extremes are published for those years with 80 percent or more daily record.

COOPERATION.--Water-quality monitor is operated by the Metropolitan Waste Control Commission, St. Paul, Minn. Monitor data is furnished by the Commission.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE (water year 1981, 1983-85): Maximum, 821 microsiemens Nov. 15, 1982, minimum, 201 microsiemens Mar. 22, 1985.
pH (water year 1981, 1983-85): Maximum, 8.6 units Apr. 18, 1981, Sept. 17, 18, 1984; minimum, 7.2 Sept. 25, 1984.
WATER TEMPERATURES (water year 1981, 1983-85): Maximum, 27.5°C July 10, 1981; minimum, 0.0°C on many days during winter period.
DISSOLVED OXYGEN (water year 1981, 1983-85): Maximum, 15.7 mg/L Mar. 25, 1981; minimum, 3.4 mg/L June 6, 1984.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum, 814 microsiemens Nov. 30; minimum, 201 microsiemens Mar. 22.
pH: Maximum, 8.4 units Sep. 30; minimum, 7.5 units on several days.
WATER TEMPERATURES: Maximum, 23.8°C Aug. 7; minimum, 0.0°C several days during winter period.
DISSOLVED OXYGEN: Maximum, 14.6 mg/L Dec. 14; minimum, 5.8 mg/L May 12.

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	527	391	426	628	484	514	785	568	652	681	592	626
2	562	435	513	700	488	581	723	598	638	667	596	628
3	597	448	521	583	465	521	755	584	654	665	622	648
4	616	495	535	622	471	506	686	624	651	646	618	628
5	613	467	523	519	464	486	688	555	627	650	605	624
6	574	455	496	556	474	499	609	553	581	641	585	615
7	651	545	601	651	467	539	632	572	594	647	563	603
8	644	541	629	697	558	601	667	572	610	603	553	579
9	638	499	600	622	537	580	637	591	609	649	575	608
10	640	478	560	563	511	528	620	586	602	636	578	596
11	629	505	604	555	515	531	617	550	571	605	570	592
12	600	500	571	561	527	540	562	509	528	613	589	599
13	612	516	561	694	535	575	555	522	535	639	598	611
14	633	547	601	604	521	541	557	517	554	648	586	607
15	645	592	629	674	541	592	523	494	520	711	601	629
16	619	548	576	586	504	531	568	474	515	651	606	619
17	560	473	503	543	471	496	528	444	477	667	591	613
18	524	494	508	591	498	540	533	437	469	639	587	602
19	505	426	479	745	562	633	545	476	514	712	576	601
20	---	---	---	701	552	589	578	509	532	648	596	611
21	---	---	---	672	503	595	531	477	498	649	610	625
22	---	---	---	660	585	615	503	464	477	618	572	598
23	---	---	---	616	552	569	535	463	495	592	573	583
24	654	502	565	601	544	566	524	506	513	606	554	574
25	653	509	566	674	575	610	584	468	507	616	555	571
26	595	475	524	629	585	604	567	469	525	668	567	601
27	524	430	468	618	600	606	614	555	572	602	545	575
28	578	451	500	602	563	580	679	591	628	576	549	563
29	583	459	497	767	571	608	713	622	645	622	546	575
30	672	476	563	814	597	691	680	617	639	635	571	597
31	568	458	520	---	---	---	775	645	673	642	573	605
MONTH	---	---	---	814	464	565	785	437	567	712	545	603

MISSISSIPPI RIVER MAIN STEM

05331545 MISSISSIPPI RIVER AT FIFTH STREET AT NEWPORT, MN

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	646	556	576	---	---	---	529	426	473	477	350	402
2	678	592	610	568	512	534	598	380	476	508	408	442
3	723	602	649	---	---	---	492	391	421	518	445	485
4	663	603	628	603	494	534	493	411	442	576	494	523
5	694	609	637	600	485	525	458	384	412	610	500	557
6	653	613	628	525	483	505	517	408	451	524	409	453
7	730	602	639	521	479	497	553	449	472	578	445	514
8	775	618	708	585	495	546	478	452	463	598	529	568
9	800	639	704	684	573	613	580	420	480	595	529	562
10	812	674	754	672	621	642	455	390	425	579	476	531
11	786	659	708	725	582	640	452	414	430	578	494	540
12	712	605	641	716	620	656	496	416	442	592	512	549
13	651	624	636	703	546	626	514	452	482	587	392	503
14	655	615	633	549	421	475	494	415	449	570	433	499
15	677	619	639	470	281	347	505	426	454	559	477	507
16	650	608	627	318	239	261	493	429	454	530	490	508
17	680	611	651	---	---	---	541	455	495	519	448	498
18	712	658	681	---	---	---	586	443	520	569	443	469
19	758	663	702	243	209	225	616	490	536	523	416	469
20	780	634	654	247	218	227	628	565	590	533	480	506
21	---	---	---	268	218	230	646	550	587	488	421	470
22	---	---	---	378	201	294	601	528	561	526	419	485
23	775	489	572	337	309	319	606	480	535	554	436	506
24	682	459	565	---	---	---	542	460	490	563	468	501
25	---	---	---	447	329	376	519	447	473	565	509	534
26	---	---	---	463	351	390	576	408	442	650	524	559
27	---	---	---	436	357	389	475	391	425	633	502	533
28	---	---	---	454	351	395	494	356	389	609	514	546
29	---	---	---	475	389	431	401	339	365	615	520	561
30	---	---	---	541	445	474	435	341	409	605	481	535
31	---	---	---	514	411	451	---	---	---	543	445	497
MONTH	---	---	---	---	---	---	646	339	468	650	350	510

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	546	509	524	420	367	410	392	340	367	431	386	410
2	553	511	524	441	303	373	458	343	390	481	421	444
3	539	429	478	428	377	398	478	351	427	501	464	477
4	532	452	481	447	395	424	473	358	431	478	461	468
5	566	437	494	463	347	438	455	362	388	553	442	457
6	558	463	509	478	415	441	430	342	377	---	---	---
7	577	486	534	536	436	488	393	347	370	---	---	---
8	597	554	575	544	456	513	399	369	381	508	462	489
9	658	549	616	522	395	457	407	366	381	503	452	477
10	652	500	619	456	425	440	424	328	352	453	424	435
11	639	573	601	453	375	414	393	353	369	476	443	464
12	603	540	572	439	341	401	417	345	377	505	465	485
13	605	532	579	442	380	400	373	343	360	536	450	522
14	568	448	505	438	347	371	386	338	377	568	471	503
15	587	489	517	441	336	367	404	380	386	490	450	470
16	608	493	548	450	335	397	412	369	397	519	473	492
17	620	346	503	485	399	445	401	356	378	589	493	537
18	614	467	545	460	393	431	407	377	385	612	506	540
19	621	542	567	468	396	424	402	370	377	626	570	594
20	661	571	631	468	370	411	427	376	405	663	598	631
21	659	464	557	419	372	395	425	384	401	786	632	670
22	538	430	470	---	---	---	406	384	396	737	566	647
23	499	389	436	394	324	370	398	327	381	579	538	563
24	518	452	481	369	321	350	385	361	373	625	504	528
25	541	481	499	373	215	286	398	361	385	520	490	503
26	547	470	499	421	293	356	384	352	369	526	496	511
27	479	380	420	368	281	305	418	379	385	528	494	510
28	473	355	380	419	268	333	408	384	392	651	525	560
29	472	352	437	348	255	273	411	374	391	647	464	518
30	415	356	381	387	265	319	404	382	392	503	434	460
31	---	---	---	404	351	370	437	390	398	---	---	---
MONTH	661	346	509	---	---	---	478	327	385	---	---	---

MISSISSIPPI RIVER MAIN STEM

05331545 MISSISSIPPI RIVER AT FIFTH STREET AT NEWPORT, MN

PH (STANDARD UNITS), WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	8.1	8.1	8.1	8.1	8.0	8.1	8.0	7.9	8.0	7.9	7.8	7.9
2	8.1	8.0	8.0	8.2	8.1	8.1	8.0	7.9	7.9	7.8	7.8	7.8
3	8.0	7.9	7.9	8.3	8.2	8.2	8.1	7.9	8.0	7.9	7.8	7.8
4	8.0	7.9	8.0	8.2	8.2	8.2	8.1	7.9	8.0	7.8	7.8	7.8
5	8.1	7.9	8.0	8.3	8.1	8.2	8.0	7.9	8.0	7.9	7.8	7.8
6	8.1	8.0	8.0	8.3	8.2	8.2	7.9	7.9	7.9	7.9	7.9	7.9
7	8.0	7.9	7.9	8.2	8.1	8.2	8.0	7.8	7.9	7.9	7.8	7.9
8	8.0	7.6	7.9	8.2	8.1	8.1	8.0	7.9	7.9	7.9	7.8	7.8
9	8.0	7.8	7.9	8.1	8.1	8.1	7.9	7.8	7.9	7.8	7.8	7.8
10	7.9	7.8	7.8	8.2	8.1	8.1	8.0	7.8	7.9	7.8	7.8	7.8
11	7.8	7.7	7.7	8.2	8.1	8.2	8.0	7.9	8.0	7.9	7.8	7.8
12	8.0	7.6	7.7	8.2	8.1	8.2	7.9	7.8	7.9	7.8	7.7	7.8
13	7.9	7.8	7.8	8.2	8.2	8.2	7.9	7.8	7.9	7.8	7.7	7.8
14	7.8	7.7	7.7	8.2	8.2	8.2	8.1	7.8	7.9	7.8	7.8	7.8
15	7.7	7.6	7.7	8.2	8.2	8.2	8.1	8.1	8.1	7.8	7.7	7.8
16	7.6	7.5	7.6	8.3	8.2	8.3	8.0	7.9	7.9	7.8	7.8	7.8
17	7.8	7.5	7.6	8.3	8.2	8.2	7.9	7.8	7.9	7.8	7.7	7.7
18	7.8	7.7	7.8	8.3	8.2	8.3	8.0	7.8	7.9	7.8	7.7	7.8
19	8.2	7.7	8.0	8.3	8.0	8.1	7.9	7.9	7.9	7.7	7.5	7.6
20	8.2	8.1	8.1	8.0	7.9	8.0	7.9	7.9	7.9	7.7	7.5	7.6
21	8.2	8.1	8.2	8.2	8.0	8.0	7.9	7.8	7.8	7.8	7.6	7.7
22	8.2	8.1	8.2	8.0	8.0	8.0	7.8	7.7	7.8	7.7	7.7	7.7
23	8.2	8.2	8.2	8.0	7.9	8.0	7.8	7.8	7.8	7.7	7.7	7.7
24	8.2	8.2	8.2	8.1	7.9	8.0	7.9	7.8	7.8	7.7	7.7	7.7
25	8.2	8.1	8.2	8.0	8.0	8.0	7.8	7.8	7.8	7.7	7.6	7.7
26	8.1	8.0	8.0	8.1	8.0	8.1	7.9	7.8	7.8	7.7	7.6	7.7
27	8.1	7.9	8.0	8.0	8.0	8.0	7.9	7.9	7.9	7.7	7.7	7.7
28	8.0	8.0	8.0	7.9	7.9	7.9	7.9	7.8	7.9	7.7	7.6	7.7
29	8.1	8.0	8.0	7.9	7.8	7.9	7.9	7.8	7.8	7.7	7.6	7.7
30	8.1	8.0	8.0	8.0	7.8	7.9	7.9	7.8	7.9	7.7	7.6	7.6
31	8.1	8.0	8.0	---	---	---	7.9	7.8	7.8	7.6	7.5	7.5
MONTH	8.2	7.5	7.9	8.3	7.8	8.1	8.1	7.7	7.9	7.9	7.5	7.7

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	7.7	7.5	7.6	8.1	7.9	8.0	8.0	7.9	7.9	8.0	7.9	7.9
2	7.7	7.5	7.6	8.0	8.0	8.0	8.0	7.9	8.0	8.0	7.9	8.0
3	7.7	7.6	7.6	---	---	---	7.9	7.9	7.9	8.2	8.0	8.0
4	7.7	7.5	7.6	8.1	7.6	8.0	7.9	7.9	7.9	8.1	8.0	8.1
5	7.8	7.6	7.7	8.3	7.9	8.0	8.0	7.9	7.9	8.1	8.0	8.0
6	7.8	7.6	7.7	8.1	8.0	8.0	8.0	7.9	8.0	8.1	7.9	8.0
7	7.8	7.8	7.8	8.0	7.9	8.0	8.0	7.9	8.0	8.2	8.0	8.1
8	7.9	7.6	7.8	8.0	7.9	8.0	8.1	7.9	8.0	8.2	8.0	8.1
9	7.9	7.8	7.8	8.0	7.9	7.9	8.1	8.0	8.1	8.1	8.0	8.0
10	7.9	7.8	7.8	7.9	7.9	7.9	8.1	8.0	8.0	8.0	7.9	8.0
11	7.9	7.8	7.9	7.9	7.8	7.9	8.1	8.0	8.0	8.0	7.9	7.8
12	7.9	7.8	7.8	7.9	7.8	7.8	8.3	8.0	8.1	8.0	7.8	7.9
13	7.8	7.8	7.8	7.8	7.8	7.8	8.1	8.1	8.1	8.0	7.7	7.9
14	7.8	7.8	7.8	7.8	7.8	7.8	8.1	8.0	8.1	7.9	7.8	7.9
15	7.9	7.7	7.8	7.8	7.7	7.8	8.3	8.0	8.1	7.9	7.8	7.9
16	7.9	7.8	7.9	7.8	7.7	7.8	8.2	8.1	8.1	7.9	7.9	7.9
17	7.9	7.8	7.8	7.8	7.7	7.7	8.1	8.1	8.1	8.0	7.7	7.9
18	7.9	7.8	7.9	7.8	7.7	7.7	8.2	8.0	8.1	8.0	7.9	7.9
19	7.9	7.8	7.9	7.8	7.7	7.7	8.3	8.1	8.2	8.0	7.9	7.9
20	7.9	7.9	7.9	7.7	7.7	7.7	8.2	8.1	8.2	8.1	7.9	8.0
21	7.9	7.8	7.8	7.7	7.7	7.7	8.2	8.1	8.1	8.1	7.9	8.0
22	7.9	7.8	7.9	7.7	7.7	7.7	8.1	7.9	8.0	8.1	8.0	8.1
23	7.9	7.9	7.9	7.7	7.7	7.7	8.1	7.9	8.0	8.1	7.9	8.0
24	7.9	7.8	7.9	---	---	---	7.9	7.8	7.9	8.1	8.0	8.0
25	8.0	7.8	7.9	7.8	7.7	7.7	7.9	7.8	7.9	8.2	8.0	8.1
26	8.0	7.9	8.0	7.8	7.8	7.8	8.1	7.8	7.9	8.1	8.0	8.0
27	8.0	7.9	7.9	7.8	7.8	7.8	8.1	7.9	8.0	8.2	8.0	8.1
28	8.0	7.9	7.9	7.8	7.8	7.8	8.1	8.0	8.0	8.1	8.0	8.0
29	---	---	---	7.8	7.8	7.8	8.1	7.8	8.0	8.1	7.9	8.0
30	---	---	---	7.9	7.8	7.9	8.0	7.9	7.9	8.1	8.0	8.0
31	---	---	---	7.9	7.9	7.9	---	---	---	8.1	7.9	8.0
MONTH	8.0	7.5	7.8	---	---	---	8.3	7.8	8.0	8.2	7.7	8.0

MISSISSIPPI RIVER MAIN STEM

05331545 MISSISSIPPI RIVER AT FIFTH STREET AT NEWPORT, MN

PH (STANDARD UNITS), WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	8.0	8.0	8.0	8.2	8.1	8.2	8.2	7.9	8.1	8.1	7.9	8.0
2	8.0	8.0	8.0	8.2	7.9	8.1	8.3	7.9	8.1	8.0	7.8	7.9
3	8.1	8.0	8.0	8.0	7.8	7.9	8.3	8.1	8.2	8.1	7.9	8.0
4	8.1	8.0	8.1	8.0	7.9	8.0	8.2	8.1	8.1	8.0	7.8	7.9
5	8.2	8.1	8.1	8.1	7.9	8.0	8.3	8.1	8.2	8.0	7.9	7.9
6	8.2	8.1	8.1	8.1	7.9	8.0	8.3	8.1	8.2	---	---	---
7	8.2	8.1	8.1	8.1	7.9	8.0	8.3	7.9	8.1	---	---	---
8	8.1	8.1	8.1	8.1	7.9	8.0	8.2	8.1	8.2	8.1	7.9	8.0
9	8.1	8.0	8.1	8.1	7.9	8.0	8.2	8.0	8.1	8.0	7.9	7.9
10	8.1	8.0	8.0	8.1	7.8	8.0	8.0	7.8	7.9	7.9	7.7	7.8
11	8.1	8.0	8.0	8.0	7.8	8.0	8.1	7.7	7.9	7.9	7.8	7.8
12	8.1	7.9	8.0	8.1	7.9	8.0	8.0	7.9	8.0	8.0	7.7	7.9
13	8.1	8.0	8.0	8.1	7.9	8.0	8.0	7.8	7.9	8.1	7.8	8.0
14	8.1	8.0	8.0	8.1	7.8	8.0	8.0	7.8	7.9	8.1	7.9	8.0
15	8.1	7.9	8.0	8.1	7.9	8.0	8.1	7.8	8.0	8.1	8.0	8.0
16	8.1	8.0	8.0	8.1	7.8	8.0	8.1	7.9	8.0	8.2	8.0	8.1
17	8.1	7.7	8.0	8.1	7.9	8.0	8.1	7.9	8.1	8.1	8.1	8.1
18	8.1	8.0	8.1	8.1	7.9	8.0	8.1	7.9	8.0	8.1	8.0	8.1
19	8.2	8.1	8.1	8.0	7.9	7.9	8.1	8.0	8.0	8.1	8.0	8.0
20	8.2	8.1	8.2	8.1	7.8	7.9	8.1	7.9	8.0	8.0	7.9	8.0
21	8.2	8.1	8.2	8.0	7.8	7.9	8.1	7.9	8.1	8.0	7.9	7.9
22	8.3	8.1	8.2	---	---	---	8.1	8.1	8.1	8.0	7.8	7.9
23	8.2	8.1	8.2	8.3	8.0	8.2	8.2	7.9	8.1	8.1	7.9	8.0
24	8.3	8.1	8.2	8.3	8.0	8.1	8.1	8.0	8.0	8.1	7.9	8.0
25	8.3	8.2	8.2	8.1	7.9	8.0	8.2	7.8	8.0	8.1	7.8	8.0
26	8.3	8.2	8.2	8.1	7.8	8.0	8.3	8.0	8.1	8.1	7.8	8.1
27	8.2	8.1	8.1	8.2	7.9	8.1	8.2	8.1	8.1	8.2	8.1	8.2
28	8.3	8.0	8.0	8.1	8.0	8.1	8.1	7.9	8.0	8.2	8.2	8.2
29	8.2	7.9	8.1	8.1	8.0	8.0	7.9	7.8	7.9	8.3	8.2	8.2
30	8.2	8.1	8.1	8.1	7.9	8.0	8.0	7.8	7.8	8.4	8.2	8.3
31	---	---	---	8.2	7.9	8.1	8.1	7.7	7.9	---	---	---
MONTH	8.3	7.7	8.1	---	---	---	8.3	7.7	8.0	---	---	---

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	10.0	9.5	9.8	4.9	4.0	4.4	0.7	0.6	0.7	0.2	0.0	0.1
2	10.1	9.6	9.9	4.0	3.3	3.6	0.6	0.2	0.4	0.2	0.0	0.1
3	10.2	9.8	10.0	3.3	2.9	3.1	0.1	0.0	0.1	0.2	0.0	0.1
4	10.4	10.0	10.2	3.0	2.9	3.0	0.9	0.0	0.1	0.2	0.1	0.2
5	10.6	10.2	10.4	3.1	2.9	3.0	0.3	0.0	0.2	0.3	0.1	0.2
6	10.7	10.4	10.6	3.1	2.8	2.9	0.3	0.0	0.1	0.3	0.1	0.2
7	11.0	10.6	10.9	3.0	1.4	2.2	0.5	0.3	0.4	0.3	0.1	0.2
8	11.0	10.8	10.9	2.0	1.6	1.8	0.6	0.4	0.5	0.3	0.0	0.2
9	11.0	10.2	10.9	2.1	1.9	2.0	0.6	0.3	0.5	0.4	0.2	0.3
10	11.4	11.0	11.2	2.1	1.7	1.8	0.4	0.3	0.4	0.4	0.3	0.3
11	11.6	11.4	11.5	1.7	1.4	1.5	0.5	0.3	0.4	0.4	0.1	0.2
12	11.8	11.6	11.7	1.4	1.1	1.3	0.5	0.2	0.3	0.4	0.1	0.3
13	12.3	11.8	12.0	1.3	1.0	1.2	0.3	0.1	0.2	0.4	0.3	0.3
14	12.4	12.1	12.3	1.6	1.3	1.4	0.4	0.2	0.3	0.4	0.1	0.2
15	12.4	12.1	12.3	1.6	1.2	1.4	0.4	0.2	0.2	0.3	0.1	0.2
16	12.1	11.6	11.8	1.2	0.9	1.1	0.9	0.5	0.7	0.3	0.2	0.3
17	11.6	10.7	11.0	0.9	0.7	0.8	0.6	0.0	0.3	0.4	0.2	0.3
18	10.7	9.9	10.2	0.7	0.4	0.5	0.1	0.0	0.1	0.4	0.1	0.2
19	12.0	9.6	11.1	1.4	0.2	0.5	0.2	0.1	0.2	0.1	0.0	0.1
20	11.4	10.9	11.1	0.4	0.2	0.3	0.3	0.1	0.2	0.2	0.0	0.1
21	11.5	10.4	10.6	0.8	0.1	0.3	0.2	0.1	0.2	0.4	0.2	0.3
22	10.3	10.0	10.1	0.4	0.2	0.3	0.2	0.0	0.1	0.4	0.3	0.3
23	10.0	9.8	9.9	0.4	0.2	0.3	0.2	0.1	0.2	0.4	0.3	0.3
24	5.8	5.5	5.7	0.6	0.3	0.4	0.2	0.0	0.1	0.4	0.3	0.4
25	5.7	5.5	5.6	1.0	0.6	0.8	0.2	0.0	0.1	0.3	0.1	0.2
26	6.0	5.6	5.9	1.5	1.0	1.3	0.2	0.1	0.1	0.3	0.2	0.2
27	6.6	5.9	6.2	---	---	---	0.4	0.1	0.3	0.4	0.2	0.3
28	6.4	6.1	6.2	1.6	1.2	1.4	0.4	0.3	0.3	0.4	0.1	0.2
29	6.1	5.7	5.8	1.2	1.0	1.1	0.3	0.0	0.1	0.4	0.2	0.3
30	5.8	5.4	5.6	1.0	0.7	0.8	0.2	0.0	0.1	0.4	0.0	0.2
31	5.4	4.8	5.1	---	---	---	0.2	0.1	0.1	0.2	0.0	0.1
MONTH	12.4	4.8	9.6	---	---	---	0.9	0.0	0.3	0.4	0.0	0.2

MISSISSIPPI RIVER MAIN STEM

05331545 MISSISSIPPI RIVER AT FIFTH STREET AT NEWPORT, MN

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	0.3	0.1	0.2	0.7	0.2	0.5	3.9	3.6	3.7	13.7	13.3	13.5
2	0.3	0.1	0.2	0.5	0.2	0.4	4.3	3.7	4.0	14.0	13.5	13.7
3	0.3	0.0	0.2	---	---	---	4.9	4.2	4.5	14.5	13.8	14.1
4	0.3	0.0	0.2	0.0	0.0	0.0	5.4	4.8	5.1	14.8	14.3	14.5
5	0.4	0.1	0.3	0.2	0.0	0.1	5.5	5.2	5.3	14.8	14.5	14.6
6	0.3	0.0	0.2	0.1	0.0	0.0	5.7	5.3	5.5	14.7	14.3	14.5
7	0.1	0.0	0.0	0.2	0.0	0.1	5.7	5.4	5.6	17.5	14.2	16.0
8	0.1	0.0	0.0	0.5	0.0	0.3	5.7	5.3	5.5	17.8	17.1	17.4
9	0.2	0.0	0.1	0.9	0.3	0.5	5.7	5.2	5.5	18.3	17.5	17.9
10	0.3	0.1	0.2	1.2	0.8	1.0	6.1	5.3	5.7	18.9	18.2	18.5
11	0.2	0.0	0.1	1.3	1.0	1.2	6.8	6.0	6.4	19.0	18.8	18.8
12	0.3	0.0	0.1	1.5	1.0	1.2	7.6	6.7	7.1	18.9	18.4	18.7
13	0.2	0.0	0.1	1.4	1.1	1.3	7.8	7.6	7.6	18.5	18.1	18.3
14	0.1	0.0	0.1	1.3	1.1	1.2	7.9	7.6	7.7	18.1	17.9	18.0
15	0.1	0.0	0.1	1.2	0.9	1.1	8.3	7.5	7.8	17.9	17.3	17.5
16	0.3	0.1	0.2	1.2	0.8	1.0	8.1	7.9	8.0	17.3	16.7	17.0
17	0.4	0.1	0.2	1.1	0.6	0.9	11.4	7.7	9.5	17.0	16.5	16.8
18	0.3	0.0	0.2	1.2	0.7	1.0	12.3	7.9	11.6	17.5	16.7	17.1
19	0.4	0.0	0.2	1.4	0.9	1.1	13.3	12.2	12.8	18.0	17.2	17.6
20	0.5	0.1	0.3	1.5	1.1	1.3	14.2	13.3	13.7	18.0	17.4	17.7
21	0.6	0.3	0.5	1.7	1.2	1.4	14.9	14.0	14.5	18.1	17.4	17.8
22	0.4	0.1	0.3	4.3	0.9	3.2	15.0	14.8	14.9	18.2	17.6	17.9
23	0.2	0.1	0.2	4.3	4.1	4.1	15.0	14.6	14.9	18.1	17.7	17.9
24	0.3	0.1	0.2	---	---	---	14.6	13.6	14.1	18.4	17.5	17.9
25	0.3	0.1	0.2	4.0	3.8	3.9	13.6	12.9	13.2	19.0	18.3	18.7
26	0.2	0.0	0.1	4.2	3.8	4.0	14.9	12.5	12.7	19.0	18.6	18.8
27	0.2	0.0	0.2	4.8	4.2	4.6	12.5	12.1	12.2	18.7	18.4	18.6
28	0.5	0.1	0.3	4.9	4.7	4.8	12.9	11.9	12.2	18.8	18.4	18.6
29	---	---	---	4.8	4.6	4.7	13.0	12.3	12.6	18.7	18.4	18.5
30	---	---	---	4.6	4.3	4.4	13.5	12.9	13.3	18.7	18.3	18.5
31	---	---	---	4.3	3.8	4.0	---	---	---	18.6	18.2	18.4
MONTH	0.6	0.0	0.2	---	---	---	15.0	3.6	9.2	19.0	13.3	17.2

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	18.4	18.1	18.3	21.6	20.8	21.1	23.1	22.1	22.4	19.9	19.4	19.7
2	18.1	17.7	17.8	21.8	21.1	21.5	22.9	22.3	22.6	20.1	19.6	19.7
3	18.4	17.2	17.4	21.9	21.4	21.6	23.0	22.4	22.7	20.4	19.8	20.2
4	17.5	17.3	17.4	21.9	21.6	21.8	22.7	22.3	22.5	20.6	20.0	20.3
5	17.8	17.2	17.5	21.9	21.5	21.8	22.8	22.2	22.5	20.9	20.6	20.7
6	18.1	17.5	17.8	22.4	21.6	22.0	23.5	22.4	22.9	---	---	---
7	18.5	18.0	18.2	22.9	21.4	22.5	23.8	22.6	23.4	---	---	---
8	19.3	18.4	18.8	23.0	22.7	22.8	23.6	22.7	23.5	21.7	20.1	21.5
9	19.4	19.0	19.2	23.4	22.9	23.1	23.3	22.9	23.1	21.3	20.6	20.9
10	19.3	17.6	19.1	23.3	22.3	23.0	22.9	22.4	22.6	20.6	19.6	20.0
11	19.0	18.4	18.8	23.1	22.8	22.9	23.5	22.2	22.4	19.7	19.4	19.5
12	18.5	18.1	18.4	23.1	22.6	22.8	22.4	21.9	22.1	19.4	19.2	19.3
13	18.7	18.0	18.4	23.2	22.7	22.9	22.2	21.6	21.9	19.1	18.8	19.0
14	18.6	18.3	18.4	23.1	22.7	22.9	22.9	21.6	21.9	18.8	18.5	18.7
15	18.7	18.3	18.4	22.9	22.4	22.7	22.4	21.8	22.1	18.7	18.3	18.6
16	18.9	18.2	18.5	22.7	22.1	22.4	22.3	22.1	22.2	18.7	18.4	18.5
17	18.8	18.4	18.6	23.1	22.3	22.4	22.5	22.1	22.2	18.9	18.6	18.7
18	18.7	18.3	18.4	22.7	22.2	22.4	22.1	21.7	21.9	19.0	17.9	18.6
19	18.8	18.2	18.5	22.8	22.3	22.5	21.8	21.0	21.3	19.0	18.5	18.6
20	19.2	18.5	18.8	23.2	22.3	22.8	22.1	20.7	20.9	19.2	18.6	18.9
21	20.2	18.9	19.6	23.1	22.7	22.9	20.8	20.5	20.7	18.6	17.6	18.1
22	20.4	19.7	20.0	---	---	---	20.7	20.5	20.6	17.6	17.1	17.3
23	20.7	20.0	20.3	23.4	22.3	23.2	21.1	20.5	20.7	17.1	16.3	16.8
24	21.0	20.3	20.6	23.1	22.6	22.8	20.9	20.6	20.7	16.3	14.4	15.4
25	21.4	20.7	21.0	22.9	22.3	22.6	21.2	20.5	20.8	14.4	14.0	14.2
26	21.9	21.3	21.6	23.3	22.5	21.9	21.3	20.6	20.9	14.1	13.8	14.0
27	21.9	21.2	21.6	23.4	22.8	23.1	21.3	20.2	20.7	14.0	13.6	13.8
28	21.2	20.8	21.0	23.2	22.8	23.0	20.4	20.2	20.3	13.8	13.5	13.7
29	21.0	20.6	20.8	23.1	22.5	22.8	20.2	19.9	20.1	13.5	13.1	13.3
30	21.0	20.4	20.7	23.0	22.6	22.7	19.9	19.6	19.7	13.1	12.6	12.8
31	---	---	---	22.7	22.3	22.5	19.7	19.4	19.5	---	---	---
MONTH	21.9	17.2	19.1	---	---	---	23.8	19.4	21.7	---	---	---

MISSISSIPPI RIVER MAIN STEM

05331545 MISSISSIPPI RIVER AT FIFTH STREET AT NEWPORT, MN

OXYGEN, DISSOLVED (DO), MG/L, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	10.7	10.0	10.5	11.1	10.6	10.8	13.1	12.9	13.0	12.9	12.7	12.7
2	13.7	10.0	10.9	11.5	11.0	11.3	13.2	12.9	13.0	13.7	12.6	13.2
3	11.7	11.1	11.4	11.7	11.5	11.6	13.5	13.1	13.3	13.2	12.3	12.8
4	11.7	11.0	11.3	11.6	11.5	11.6	13.7	13.2	13.4	12.5	12.2	12.3
5	11.5	10.8	11.1	11.7	11.5	11.6	13.5	13.2	13.3	12.5	12.1	12.3
6	11.0	10.1	10.7	11.8	11.6	11.7	13.4	13.1	13.2	12.5	12.2	12.3
7	10.4	9.2	10.0	12.6	11.6	12.1	13.6	13.0	13.2	12.6	12.3	12.4
8	9.4	8.6	9.0	12.4	12.2	12.3	13.6	13.1	13.4	12.4	12.1	12.3
9	9.1	8.0	8.6	12.2	11.9	12.1	13.7	13.1	13.4	12.3	12.0	12.2
10	8.7	7.6	8.1	12.2	11.9	12.0	13.7	13.3	13.5	12.3	12.1	12.2
11	8.4	8.0	8.2	12.5	12.2	12.4	14.0	13.4	13.6	12.5	12.0	12.2
12	8.1	7.4	7.8	12.9	12.4	12.5	14.0	13.4	13.6	12.4	12.0	12.2
13	7.7	7.2	7.4	12.6	12.3	12.5	14.6	13.9	14.2	12.5	11.9	12.2
14	7.5	7.2	7.4	12.5	12.1	12.3	---	---	---	12.4	12.0	12.2
15	7.5	6.9	7.1	12.3	12.0	12.1	13.7	13.3	13.5	12.6	11.9	12.2
16	8.1	6.6	7.1	12.6	12.1	12.3	13.2	12.8	13.0	12.3	12.0	12.2
17	9.2	7.3	8.4	12.8	12.4	12.6	13.6	12.9	13.3	12.4	11.9	12.0
18	10.2	9.2	9.9	12.9	12.5	12.7	14.2	13.5	13.8	12.4	11.9	12.1
19	10.2	8.3	8.8	12.9	12.1	12.8	14.2	13.9	14.0	13.3	12.0	12.5
20	9.2	8.5	8.9	13.0	12.7	12.9	13.9	13.5	13.7	13.1	12.0	12.5
21	9.5	9.4	9.5	13.8	12.5	13.3	13.7	13.5	13.6	12.5	11.9	12.1
22	9.8	9.5	10.0	13.8	12.4	13.3	13.7	13.5	13.6	12.2	11.6	11.9
23	10.1	9.5	9.8	12.5	12.3	12.4	13.9	13.6	13.7	12.3	11.9	12.1
24	10.2	10.0	10.1	12.6	12.2	12.4	13.9	13.6	13.8	12.2	11.8	12.0
25	10.3	10.1	10.2	12.3	12.1	12.2	14.1	13.5	13.7	12.2	11.9	12.0
26	10.2	10.0	10.2	12.1	11.8	12.0	13.8	12.9	13.3	12.1	11.4	11.7
27	10.3	9.7	10.0	12.8	11.6	12.1	13.0	12.8	12.9	12.1	11.6	11.8
28	10.3	10.0	10.2	12.7	12.5	12.6	12.8	12.4	12.7	12.1	11.7	11.9
29	10.6	10.2	10.4	13.0	12.6	12.8	12.8	12.4	12.6	12.0	11.1	11.6
30	10.5	10.4	10.4	13.0	12.8	12.9	13.2	12.6	12.9	12.9	11.2	11.7
31	10.7	10.5	10.6	---	---	---	12.9	12.7	12.8	13.2	11.6	12.5
MONTH	13.7	6.6	9.5	13.8	10.6	12.3	---	---	---	13.7	11.1	12.2

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	12.5	11.6	11.9	---	---	---	13.6	13.2	13.4	11.1	10.7	10.8
2	12.5	11.9	12.1	13.2	12.9	13.1	13.4	13.0	13.2	11.1	10.6	10.8
3	12.3	11.2	11.8	---	---	---	13.0	12.9	13.0	11.1	10.7	10.9
4	12.9	11.5	12.0	13.5	13.2	13.4	12.9	12.6	12.7	10.8	10.1	10.4
5	13.0	11.6	12.3	13.6	13.4	13.4	12.7	12.5	12.6	10.1	9.8	10.0
6	12.2	11.3	11.9	13.8	13.3	13.5	12.7	12.5	12.6	10.2	9.8	10.0
7	12.1	11.5	11.9	13.9	13.5	13.7	12.8	12.5	12.6	11.0	8.8	9.4
8	12.0	11.6	11.8	13.9	13.2	13.6	13.0	12.6	12.8	9.0	8.6	8.8
9	12.2	11.5	11.7	13.7	13.4	13.6	13.0	12.0	12.5	8.8	8.3	8.5
10	12.4	11.9	12.1	13.5	12.9	13.2	12.1	11.8	12.0	8.3	7.8	8.0
11	13.0	12.4	12.7	13.3	12.7	13.1	12.0	11.7	11.8	7.7	6.0	6.9
12	12.5	11.3	11.6	13.0	12.5	12.8	11.9	11.4	11.7	6.1	5.8	6.0
13	11.7	11.2	11.4	13.0	12.5	12.8	11.4	11.0	11.2	6.6	5.9	6.3
14	11.7	11.4	11.5	13.0	12.7	12.9	11.2	10.8	11.0	6.5	6.2	6.3
15	11.7	11.5	11.6	13.2	12.8	13.0	11.3	10.8	11.0	6.7	5.9	6.3
16	11.7	11.2	11.4	13.3	13.0	13.2	11.8	10.7	10.8	8.4	6.4	7.2
17	11.7	11.2	11.4	13.4	13.1	13.2	11.4	10.5	10.9	8.7	8.3	8.5
18	11.8	11.2	11.5	13.6	13.4	13.5	11.3	10.9	11.1	8.6	8.3	8.5
19	11.7	11.3	11.6	13.6	13.4	13.5	10.9	10.5	10.7	8.7	8.2	8.4
20	11.7	11.3	11.5	13.6	13.4	13.5	10.5	9.9	10.2	8.8	8.2	8.5
21	11.6	10.6	10.9	13.5	13.4	13.5	10.2	9.4	9.7	9.0	8.4	8.6
22	12.2	10.7	11.6	13.6	13.4	13.5	9.4	8.4	8.8	8.8	8.4	8.6
23	12.2	11.9	12.1	13.6	13.4	13.5	8.6	8.3	8.5	8.5	8.0	8.3
24	12.3	11.9	12.1	---	---	---	9.3	8.5	8.9	8.7	8.3	8.5
25	12.5	11.9	12.2	13.8	13.5	13.6	9.8	9.2	9.5	8.5	8.1	8.3
26	12.9	12.3	12.6	13.8	13.6	13.7	10.3	9.3	10.0	8.1	7.8	8.0
27	12.9	12.5	12.7	13.6	13.0	13.3	10.8	10.2	10.5	8.7	7.9	8.3
28	13.5	12.6	13.1	12.9	12.7	12.9	11.0	10.7	10.8	8.4	8.1	8.2
29	---	---	---	13.0	12.7	12.9	11.1	10.7	10.9	8.4	8.0	8.2
30	---	---	---	13.2	13.0	13.1	10.9	10.7	10.8	8.5	8.1	8.3
31	---	---	---	13.2	13.1	13.2	---	---	---	8.5	7.7	8.2
MONTH	13.5	10.6	11.9	---	---	---	13.6	8.3	11.2	11.1	5.8	8.5

MISSISSIPPI RIVER MAIN STEM

05331545 MISSISSIPPI RIVER AT FIFTH STREET AT NEWPORT, MN

OXYGEN, DISSOLVED (DO), MG/L, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	8.5	8.1	8.4	8.7	7.8	8.4	7.6	7.1	7.4	8.0	7.4	7.7
2	8.9	8.3	8.5	8.5	7.8	8.1	7.6	7.2	7.4	7.8	7.4	7.6
3	9.2	8.2	9.1	8.2	7.7	8.0	7.7	7.0	7.4	7.6	7.0	7.3
4	9.2	9.0	9.1	8.1	7.7	7.9	7.5	6.9	7.1	8.1	7.1	7.6
5	9.7	8.9	9.2	8.4	7.6	8.0	8.0	6.8	7.4	8.1	7.7	7.9
6	9.3	9.0	9.1	8.7	7.7	8.2	8.4	7.0	7.9	---	---	---
7	9.2	8.8	9.0	8.5	7.8	8.2	8.4	7.4	8.0	---	---	---
8	8.9	8.5	8.7	8.1	7.4	7.7	8.0	7.4	7.7	8.0	7.2	7.7
9	8.8	8.3	8.5	7.8	7.1	7.5	7.4	7.0	7.3	7.8	7.3	7.6
10	8.5	8.1	8.3	8.6	7.1	7.5	7.6	6.4	7.1	8.4	7.0	7.9
11	8.3	8.0	8.1	8.2	7.5	7.8	8.0	7.1	7.4	8.4	7.2	8.1
12	8.8	7.4	8.3	8.4	7.3	7.7	7.5	6.6	7.2	8.5	7.0	8.2
13	8.8	8.5	8.7	7.7	7.3	7.4	7.5	6.3	6.9	9.0	7.5	8.4
14	8.7	7.9	8.4	7.8	7.1	7.4	7.8	7.3	7.5	9.1	7.5	8.8
15	8.4	7.8	8.1	8.2	7.4	7.8	7.9	7.5	7.7	9.0	7.5	8.4
16	8.7	8.1	8.2	8.2	7.4	7.9	7.9	7.5	7.7	9.1	7.0	8.1
17	8.3	7.7	8.0	8.1	7.2	7.8	7.9	7.3	7.7	8.8	7.0	8.0
18	8.5	8.0	8.2	7.5	7.0	7.2	8.5	7.5	8.0	8.7	7.2	8.4
19	8.7	8.3	8.5	7.5	7.0	7.3	8.2	6.6	6.9	---	---	---
20	8.5	8.2	8.4	7.9	7.1	7.4	8.8	6.6	7.7	8.0	6.4	7.4
21	8.4	8.0	8.2	7.6	7.1	7.4	8.8	8.3	8.5	---	---	---
22	8.6	7.9	8.2	---	---	---	8.5	8.1	8.4	---	---	---
23	8.7	7.6	8.3	9.1	8.1	8.7	8.2	7.8	8.0	---	---	---
24	8.7	8.1	8.4	8.7	7.1	8.0	8.7	8.0	8.1	---	---	---
25	8.7	8.2	8.4	8.4	7.1	7.8	8.5	7.9	8.2	---	---	---
26	8.3	7.7	7.9	8.8	7.8	8.5	8.9	8.3	8.6	---	---	---
27	7.9	7.4	7.7	8.8	8.0	8.4	8.6	7.9	8.4	10.1	8.9	9.5
28	8.6	7.7	8.1	8.7	8.3	8.5	7.9	6.7	7.5	10.1	9.5	9.9
29	8.6	7.9	8.3	8.8	8.2	8.5	7.4	6.9	7.2	10.2	8.0	9.7
30	8.7	8.2	8.4	8.5	7.2	7.9	7.8	7.2	7.5	---	---	---
31	---	---	---	7.5	6.9	7.2	7.9	7.5	7.7	---	---	---
MONTH	9.7	7.4	8.4	---	---	---	8.9	6.3	7.7	---	---	---

MISSISSIPPI RIVER MAIN STEM

05331560 MISSISSIPPI RIVER AT GREY CLOUD ISLAND NEAR COTTAGE GROVE, MN

WATER-QUALITY RECORDS

LOCATION.--Lat 44°48'13", long 93°00'43", in NW¼NE¼ sec.26, T.27 N., R.22 W., Washington County, Hydrologic Unit 07010206, on left bank at the J. L. Shiely Co. loading dock, and at mile 826.2 upstream from Ohio River.

PERIOD OF RECORD.--February 1977 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: September 1977 to current year.
pH: September 1977 to current year.
WATER TEMPERATURES: September 1977 to current year.
DISSOLVED OXYGEN: September 1977 to current year.

INSTRUMENTATION.--Water-quality monitor since September 1977.

REMARKS.--Water discharge computed on the basis of discharge for Mississippi River at St. Paul (station 05331000) adjusted for inflow and travel time. Extremes are published for years with 80 percent or more daily record.

COOPERATION.--Samples collected and water-quality monitor operated by the Metropolitan Waste Control Commission, St. Paul, MN. Monitor data is furnished by the Commission.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE (water year 1981-85): Maximum, 773 microsiemens Feb. 23, 1985; minimum, 243 microsiemens Mar. 19, 1985.
pH (water year 1981, 1984-85): Maximum, 8.7 units May 13, Sept. 6, 7, 9, 13, 1981, Mar. 16, 17, 1984; minimum, 7.0 units Aug. 15, 1985.
WATER TEMPERATURES (water year 1981-85): Maximum, 29.0°C Aug. 7, 1982; minimum, 0.0°C several days during winter period.
DISSOLVED OXYGEN (water year 1981-82, 1984-85): Maximum, 16.0 mg/L Jan. 18, 1985; minimum, 2.4 mg/L Aug. 19, 1984.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum, 773 microsiemens Feb. 23; minimum, 243 microsiemens Mar. 19.
pH: Maximum, 8.5 units Sep. 30; minimum, 7.0 units Aug. 15.
WATER TEMPERATURES: Maximum, 25.3°C July 9-10; minimum, 0.0°C several days during winter period.
DISSOLVED OXYGEN: Maximum, 16.0 mg/L Jan. 18; minimum, 3.4 mg/L Aug. 9.

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	528	498	510	500	477	490	---	---	---	646	624	637
2	531	512	518	---	---	---	621	564	594	639	618	630
3	540	511	523	---	---	---	659	605	624	635	630	632
4	564	539	550	---	---	---	669	647	661	644	634	639
5	564	543	552	---	---	---	672	565	632	653	636	645
6	554	543	547	568	529	532	601	560	586	646	622	639
7	579	541	554	570	561	565	610	584	597	622	603	611
8	581	569	575	569	563	565	609	589	596	610	602	605
9	581	561	565	584	567	579	---	---	---	---	---	---
10	576	557	560	589	582	586	607	599	604	612	604	609
11	577	561	567	600	589	595	608	581	590	606	592	597
12	568	551	555	612	600	607	584	560	575	600	590	595
13	561	545	553	612	608	610	592	561	576	597	585	592
14	577	555	563	620	608	612	605	580	593	612	585	595
15	583	558	572	626	612	619	---	---	---	628	605	617
16	574	523	548	623	607	611	---	---	---	605	584	592
17	539	484	497	633	612	617	584	554	577	593	581	584
18	512	496	504	637	613	626	585	568	577	599	578	586
19	507	465	478	636	618	622	593	574	578	597	581	593
20	527	456	465	647	636	640	608	598	605	616	581	600
21	493	438	447	667	616	653	604	582	589	622	582	598
22	---	---	---	689	644	652	582	567	570	623	589	600
23	---	---	---	655	636	648	590	564	575	587	574	576
24	---	---	---	650	616	630	595	593	593	574	562	566
25	---	---	---	636	626	632	594	580	588	585	562	571
26	425	420	422	---	---	---	630	579	590	594	577	584
27	423	416	420	---	---	---	608	594	600	596	576	585
28	438	420	433	630	612	621	665	601	637	581	567	573
29	447	438	442	614	605	608	716	667	676	579	571	575
30	467	446	458	618	603	610	---	---	---	592	570	579
31	476	465	469	---	---	---	648	630	637	606	576	590

MISSISSIPPI RIVER MAIN STEM

05331560 MISSISSIPPI RIVER AT GREY CLOUD ISLAND NEAR COTTAGE GROVE, MN

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	592	572	580	---	---	---	407	380	387	465	442	453
2	601	573	581	548	531	542	411	399	403	479	458	467
3	606	584	595	---	---	---	412	406	408	508	479	494
4	---	---	---	544	527	538	423	411	417	531	509	518
5	---	---	---	561	520	532	433	420	424	546	531	536
6	608	574	594	558	535	544	434	426	429	555	546	550
7	605	593	602	534	520	530	441	434	437	561	553	556
8	607	593	604	542	521	532	445	440	442	564	557	558
9	606	600	601	558	520	541	---	---	---	558	544	551
10	---	---	---	577	545	562	476	458	466	554	541	547
11	597	538	570	559	535	547	487	470	476	560	540	546
12	591	576	584	565	539	550	492	442	487	550	537	542
13	596	572	586	557	488	525	497	480	492	558	545	553
14	600	585	592	512	415	454	493	489	489	546	521	530
15	---	---	---	416	341	375	495	482	491	546	499	507
16	---	---	---	341	304	320	500	491	496	515	499	508
17	---	---	---	306	263	279	502	492	498	500	481	491
18	---	---	---	264	249	255	511	459	496	490	467	477
19	---	---	---	252	243	248	514	461	502	482	470	474
20	630	614	620	260	248	254	---	---	---	487	468	479
21	---	---	---	257	247	254	---	---	---	495	481	486
22	---	---	---	262	257	260	509	493	497	515	491	502
23	773	685	726	264	258	260	537	494	510	527	512	517
24	688	658	677	---	---	---	519	504	513	540	511	524
25	674	610	645	268	264	266	504	489	496	556	532	543
26	610	545	580	275	265	269	491	481	487	557	544	550
27	550	542	548	334	276	300	483	473	476	555	538	545
28	687	483	548	351	335	343	474	450	462	555	543	547
29	---	---	---	358	349	351	451	442	446	553	541	545
30	---	---	---	368	358	361	451	441	440	555	534	543
31	---	---	---	380	367	371	---	---	---	537	512	520
MONTH	---	---	---	---	---	---	---	---	---	564	442	521

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	529	515	522	415	406	410	---	---	---	458	445	448
2	528	520	524	427	403	410	373	364	370	487	457	467
3	552	506	512	415	403	408	---	---	---	500	479	489
4	519	505	512	429	411	417	---	---	---	481	438	460
5	519	512	514	438	423	427	---	---	---	438	413	424
6	529	497	512	438	426	432	---	---	---	---	---	---
7	528	508	523	438	428	434	---	---	---	---	---	---
8	533	515	524	446	435	440	391	375	385	483	456	466
9	536	523	528	442	433	437	404	376	382	478	452	468
10	537	522	527	443	431	439	---	---	---	451	418	430
11	540	523	535	439	418	433	---	---	---	446	429	441
12	539	510	522	435	416	426	---	---	---	477	444	456
13	525	517	521	450	435	445	389	365	378	502	477	490
14	530	515	519	448	427	440	399	386	395	504	483	491
15	531	512	520	427	415	421	405	341	393	488	466	472
16	540	512	530	437	415	424	405	390	399	485	471	476
17	541	521	531	440	422	431	406	381	393	498	481	487
18	535	469	505	438	414	421	399	384	394	529	496	510
19	488	473	480	426	412	413	402	393	396	539	528	533
20	510	488	501	---	---	---	402	390	396	555	519	536
21	531	496	510	409	380	393	403	384	396	557	549	551
22	530	526	528	---	---	---	404	391	394	552	519	533
23	534	518	525	379	367	373	407	392	398	520	497	511
24	539	525	534	375	357	368	399	386	390	511	496	503
25	547	505	532	360	347	352	418	400	403	519	508	512
26	527	509	520	371	360	365	414	399	406	550	510	517
27	510	456	477	375	360	366	419	408	414	520	508	513
28	456	426	436	376	353	361	420	408	414	563	520	540
29	534	415	428	---	---	---	426	408	416	567	525	544
30	415	403	412	362	344	356	426	398	419	526	497	506
31	---	---	---	---	---	---	445	420	431	---	---	---
MONTH	552	403	508	---	---	---	---	---	---	---	---	---

MISSISSIPPI RIVER MAIN STEM

05331560 MISSISSIPPI RIVER AT GREY CLOUD ISLAND NEAR COTTAGE GROVE, MN

PH (STANDARD UNITS), WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	7.9	7.9	7.9	7.7	7.7	7.7	---	---	---	7.7	7.7	7.7
2	7.9	7.9	7.9	---	---	---	7.9	7.8	7.9	7.7	7.6	7.7
3	7.9	7.8	7.9	---	---	---	7.9	7.9	7.9	7.7	7.6	7.6
4	8.0	7.9	8.0	---	---	---	7.9	7.9	7.9	7.7	7.6	7.6
5	8.0	8.0	8.0	---	---	---	7.9	7.9	7.9	7.7	7.6	7.6
6	8.0	8.0	8.0	7.9	7.8	7.8	7.9	7.8	7.8	7.7	7.6	7.6
7	8.1	8.0	8.0	7.8	7.8	7.8	7.8	7.6	7.7	7.7	7.6	7.6
8	8.0	8.0	8.0	7.8	7.7	7.7	7.8	7.8	7.8	7.7	7.6	7.6
9	8.0	7.9	8.0	7.7	7.7	7.7	---	---	---	---	---	---
10	8.0	8.0	8.0	7.8	7.7	7.7	7.8	7.7	7.8	7.6	7.6	7.6
11	8.0	8.0	8.0	7.8	7.7	7.8	7.8	7.8	7.8	7.6	7.6	7.6
12	8.0	7.9	8.0	7.8	7.8	7.8	7.8	7.8	7.8	7.6	7.6	7.6
13	7.9	7.9	7.9	7.8	7.8	7.8	7.8	7.8	7.8	7.6	7.6	7.6
14	8.0	7.9	7.9	7.8	7.8	7.8	8.0	7.8	7.9	7.7	7.6	7.6
15	8.0	7.9	7.9	8.1	7.8	7.8	---	---	---	7.7	7.6	7.6
16	8.0	7.9	7.9	7.9	7.8	7.9	---	---	---	7.6	7.6	7.6
17	7.9	7.8	7.8	7.9	7.8	7.8	7.8	7.8	7.8	7.6	7.6	7.6
18	7.9	7.8	7.8	7.9	7.8	7.9	7.8	7.8	7.8	7.6	7.6	7.6
19	7.9	7.7	7.8	7.9	7.8	7.9	7.9	7.8	7.8	7.6	7.4	7.5
20	7.9	7.8	7.8	7.9	7.8	7.9	7.9	7.8	7.9	7.5	7.1	7.3
21	7.8	7.8	7.8	7.9	7.8	7.9	7.9	7.8	7.8	7.5	7.5	7.5
22	---	---	---	8.3	7.9	7.9	7.8	7.8	7.8	7.7	7.5	7.6
23	---	---	---	8.1	7.9	8.0	7.8	7.8	7.8	7.8	7.7	7.7
24	---	---	---	7.9	7.9	7.9	7.8	7.8	7.8	7.7	7.7	7.7
25	---	---	---	7.9	7.8	7.9	7.8	7.8	7.8	7.8	7.7	7.7
26	7.8	7.7	7.7	---	---	---	7.8	7.7	7.7	7.8	7.7	7.7
27	7.7	7.6	7.7	---	---	---	7.7	7.7	7.7	7.7	7.7	7.7
28	7.7	7.6	7.7	7.9	7.8	7.9	7.7	7.6	7.7	7.7	7.7	7.7
29	7.7	7.6	7.6	7.9	7.8	7.9	8.0	7.7	7.7	7.7	7.7	7.7
30	7.7	7.6	7.7	7.9	7.8	7.9	---	---	---	7.8	7.7	7.7
31	7.7	7.6	7.7	---	---	---	7.7	7.7	7.7	7.7	7.7	7.7
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	7.7	7.7	7.7	8.1	7.7	7.8	8.1	8.0	8.0	7.8	7.8	7.8
2	7.7	7.7	7.7	7.8	7.8	7.8	8.1	7.9	7.9	7.8	7.8	7.8
3	7.7	7.7	7.7	---	---	---	7.9	7.8	7.9	7.9	7.8	7.8
4	---	---	---	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.8	7.9
5	---	---	---	7.9	7.9	7.9	7.9	7.8	7.9	7.9	7.8	7.8
6	7.7	7.7	7.7	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.8	7.8
7	7.8	7.7	7.7	7.9	7.9	7.9	7.9	7.9	7.9	8.1	7.8	8.0
8	7.8	7.7	7.7	7.9	7.8	7.9	8.0	7.9	8.0	8.0	8.0	8.0
9	7.7	7.7	7.7	7.9	7.8	7.9	---	---	---	8.0	7.9	8.0
10	---	---	---	7.9	7.8	7.8	8.1	8.0	8.0	8.0	7.8	8.0
11	7.8	7.7	7.7	7.8	7.8	7.8	8.1	8.0	8.0	8.0	7.8	7.9
12	7.8	7.7	7.7	7.8	7.8	7.8	8.1	7.9	8.1	7.8	7.8	7.8
13	7.8	7.7	7.7	7.8	7.8	7.8	8.1	8.0	8.1	8.0	7.8	7.8
14	7.8	7.7	7.7	7.8	7.8	7.8	8.1	8.0	8.0	8.0	7.9	7.9
15	---	---	---	7.8	7.8	7.8	8.1	8.0	8.0	7.9	7.8	7.9
16	---	---	---	7.8	7.8	7.8	8.1	8.0	8.1	7.9	7.9	7.9
17	---	---	---	7.8	7.8	7.8	8.1	8.0	8.0	8.0	7.9	7.9
18	---	---	---	7.8	7.8	7.8	8.0	7.8	8.0	8.0	7.9	8.0
19	---	---	---	7.8	7.7	7.8	8.0	7.8	7.9	8.0	7.9	8.0
20	7.8	7.8	7.8	7.8	7.7	7.8	---	---	---	8.0	8.0	8.0
21	7.8	7.7	7.7	7.8	7.7	7.8	---	---	---	8.1	8.0	8.0
22	7.8	7.7	7.7	7.9	7.7	7.8	8.0	7.9	7.9	8.1	8.1	8.1
23	7.8	7.7	7.7	7.8	7.7	7.8	7.9	7.8	7.8	8.1	8.0	8.0
24	7.8	7.7	7.7	---	---	---	7.8	7.8	7.8	8.1	8.0	8.0
25	7.8	7.7	7.8	7.8	7.8	7.8	7.8	7.7	7.7	8.1	8.0	8.0
26	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	8.1	8.0	8.1
27	7.8	7.8	7.8	7.9	7.8	7.8	7.8	7.8	7.8	8.1	8.1	8.1
28	---	---	---	7.9	7.9	7.9	7.8	7.8	7.8	8.1	8.0	8.1
29	---	---	---	7.9	7.9	7.9	7.8	7.8	7.8	8.1	7.9	8.0
30	---	---	---	8.0	7.9	8.0	7.8	7.8	7.8	7.9	7.9	7.9
31	---	---	---	8.0	8.0	8.0	---	---	---	7.9	7.8	7.9
MONTH	---	---	---	---	---	---	---	---	---	8.1	7.8	7.9

MISSISSIPPI RIVER MAIN STEM

05331560 MISSISSIPPI RIVER AT GREY CLOUD ISLAND NEAR COTTAGE GROVE, MN

PH (STANDARD UNITS), WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	7.9	7.9	7.9	7.9	7.9	7.9	---	---	---	8.0	7.8	7.9
2	8.0	7.9	7.9	8.1	7.9	8.0	8.2	8.0	8.1	7.9	7.8	7.9
3	8.0	7.9	8.0	8.0	8.0	8.0	---	---	---	7.9	7.8	7.8
4	8.0	7.9	8.0	8.1	8.0	8.0	---	---	---	7.8	7.7	7.8
5	8.0	8.0	8.0	8.1	8.0	8.0	---	---	---	7.7	7.7	7.7
6	8.0	7.9	7.9	8.1	8.0	8.0	---	---	---	---	---	---
7	8.0	7.9	7.9	8.1	8.0	8.0	---	---	---	---	---	---
8	7.9	7.9	7.9	8.1	8.0	8.0	8.1	8.0	8.0	7.9	7.8	7.8
9	8.0	7.9	7.9	8.1	7.9	8.0	8.2	8.0	8.1	7.9	7.8	7.9
10	7.9	7.9	7.9	8.1	7.9	8.0	---	---	---	7.9	7.7	7.9
11	7.9	7.9	7.9	8.0	8.0	8.0	---	---	---	7.9	7.8	7.9
12	7.9	7.8	7.9	8.0	7.9	8.0	---	---	---	7.9	7.8	7.9
13	7.9	7.9	7.9	8.0	7.9	8.0	8.0	7.9	7.9	8.0	7.9	7.9
14	7.9	7.9	7.9	8.0	7.9	8.0	8.1	7.7	8.0	8.0	8.0	8.0
15	7.9	7.8	7.9	8.0	7.9	8.0	8.0	7.0	8.0	8.0	8.0	8.0
16	7.9	7.9	7.9	8.0	7.9	8.0	8.1	8.0	8.1	8.0	8.0	8.0
17	7.9	7.9	7.9	8.0	7.9	8.0	8.1	8.0	8.1	8.0	8.0	8.0
18	8.0	7.9	7.9	8.0	7.9	7.9	8.2	8.0	8.1	8.0	8.0	8.0
19	8.0	7.9	8.0	8.0	7.9	7.9	8.1	8.1	8.1	8.0	8.0	8.0
20	8.0	8.0	8.0	---	---	---	8.1	7.9	8.0	8.0	7.9	8.0
21	8.0	8.0	8.0	8.1	8.0	8.0	8.1	7.9	8.0	8.1	8.0	8.0
22	8.1	8.0	8.0	---	---	---	8.1	7.9	8.0	8.1	8.0	8.1
23	8.1	8.0	8.0	8.1	8.0	8.1	7.9	7.8	7.9	8.1	8.1	8.1
24	8.1	8.1	8.1	8.1	7.9	8.0	8.0	7.8	7.9	8.3	8.1	8.2
25	8.2	8.0	8.1	7.9	7.8	7.9	7.9	7.8	7.8	8.4	8.3	8.3
26	8.1	8.1	8.1	8.0	7.9	7.9	7.9	7.8	7.9	8.4	8.3	8.4
27	8.1	8.0	8.0	8.0	7.7	7.9	7.9	7.8	7.9	8.4	8.1	8.4
28	8.0	7.9	8.0	8.0	7.9	7.9	7.9	7.7	7.8	8.4	8.4	8.4
29	8.1	7.9	8.0	---	---	---	7.8	7.7	7.7	8.4	8.4	8.4
30	8.1	7.9	7.9	8.1	7.9	7.9	7.8	7.7	7.7	8.5	8.4	8.4
31	---	---	---	---	---	---	7.9	7.8	7.8	---	---	---
MONTH	8.2	7.8	8.0	---	---	---	---	---	---	---	---	---

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	9.7	8.8	9.2	3.7	2.0	2.8	---	---	---	0.1	0.0	0.0
2	9.9	9.1	9.5	---	---	---	0.4	0.0	0.1	0.3	0.0	0.0
3	10.4	9.2	9.7	---	---	---	0.0	0.0	0.0	0.6	0.0	0.1
4	10.4	9.4	9.8	---	---	---	0.0	0.0	0.0	0.4	0.0	0.1
5	10.5	9.6	10.0	---	---	---	0.1	0.0	0.0	0.2	0.0	0.0
6	10.8	10.2	10.5	1.1	0.0	0.5	1.1	0.0	0.7	0.6	0.0	0.1
7	11.3	10.6	10.8	1.5	0.8	1.1	---	---	---	0.6	0.0	0.2
8	11.5	11.0	11.2	2.1	1.3	1.7	0.7	0.3	0.5	0.2	0.0	0.0
9	11.5	11.0	11.2	2.2	1.8	2.0	---	---	---	---	---	---
10	12.0	11.1	11.6	2.1	1.3	1.7	1.4	0.5	0.9	0.5	0.0	0.2
11	12.5	11.9	12.1	1.6	0.9	1.2	1.1	0.4	1.0	0.3	0.0	0.0
12	12.8	12.3	12.6	1.0	0.5	0.7	0.6	0.0	0.3	0.1	0.0	0.0
13	13.5	12.5	12.9	0.9	0.3	0.7	0.3	0.0	0.1	0.4	0.0	0.1
14	13.5	13.1	13.3	1.4	0.8	1.1	0.4	0.0	0.2	0.2	0.0	0.0
15	13.7	13.1	13.5	1.4	0.7	1.0	---	---	---	0.2	0.0	0.0
16	13.1	12.0	12.5	0.7	0.0	0.3	---	---	---	0.3	0.0	0.0
17	11.9	10.7	11.1	0.1	0.0	0.0	0.8	0.0	0.4	0.3	0.0	0.1
18	10.7	8.9	9.6	0.0	0.0	0.0	0.2	0.0	0.0	0.2	0.0	0.0
19	11.3	8.2	10.3	0.4	0.0	0.1	0.1	0.0	0.0	---	---	---
20	10.5	9.3	9.8	0.1	0.0	0.0	0.1	0.0	0.0	---	---	---
21	11.0	8.5	8.8	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.2
22	---	---	---	0.1	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.1
23	---	---	---	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0
24	---	---	---	0.3	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
25	---	---	---	1.0	0.1	0.5	0.0	0.0	0.0	0.2	0.0	0.0
26	5.6	5.0	5.3	---	---	---	0.0	0.0	0.0	0.3	0.0	0.1
27	6.6	5.4	6.0	---	---	---	0.1	0.0	0.0	0.3	0.1	0.2
28	6.2	5.5	5.8	2.1	1.4	1.7	0.6	0.0	0.0	0.3	0.0	0.1
29	5.5	4.9	5.2	1.5	1.0	1.2	0.0	0.0	0.0	0.3	0.1	0.2
30	5.2	4.4	4.7	1.1	0.5	0.7	---	---	---	0.3	0.0	0.1
31	4.4	3.7	4.0	---	---	---	0.0	0.0	0.0	0.2	0.0	0.0

MISSISSIPPI RIVER MAIN STEM

05331560 MISSISSIPPI RIVER AT GREY CLOUD ISLAND NEAR COTTAGE GROVE, MN

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	0.2	0.0	0.0	0.9	0.0	0.4	2.9	2.1	2.5	14.9	13.7	14.2
2	0.3	0.0	0.1	0.3	0.0	0.1	4.7	2.4	3.6	15.3	14.0	14.6
3	0.2	0.0	0.1	---	---	---	5.8	4.4	5.1	15.9	14.8	15.9
4	0.3	0.0	0.1	0.0	0.0	0.0	6.5	5.5	5.9	16.6	15.5	15.9
5	0.5	0.1	0.3	0.0	0.0	0.0	7.0	6.1	6.6	16.5	16.0	16.2
6	0.3	0.0	0.1	0.0	0.0	0.0	7.5	6.4	6.9	16.6	15.6	16.1
7	0.2	0.0	0.0	0.6	0.0	0.2	7.6	6.6	7.1	17.1	15.8	16.4
8	0.1	0.0	0.0	0.9	0.0	0.4	7.3	6.7	6.9	17.7	16.2	16.9
9	0.1	0.0	0.0	1.7	0.4	0.9	---	---	---	18.4	17.0	17.8
10	---	---	---	2.2	1.1	1.6	8.0	6.5	7.1	19.5	18.2	18.8
11	0.2	0.0	0.0	2.1	1.8	2.0	9.2	7.6	8.3	19.9	15.9	19.4
12	0.1	0.0	0.0	2.6	1.7	2.1	10.6	6.9	9.6	19.4	18.5	19.1
13	0.1	0.0	0.0	2.3	0.8	1.6	10.7	10.3	10.5	19.3	18.1	18.5
14	0.1	0.0	0.0	1.3	0.5	0.8	11.2	10.4	10.7	18.4	17.7	17.8
15	---	---	---	0.8	0.2	0.5	11.9	10.2	11.0	19.5	16.5	17.1
16	---	---	---	0.7	0.0	0.3	12.2	10.9	11.2	16.5	15.6	16.1
17	---	---	---	0.7	0.0	0.2	12.0	10.6	11.2	16.3	15.2	15.7
18	---	---	---	1.1	0.0	0.4	13.4	11.2	12.7	17.0	15.5	16.2
19	---	---	---	1.6	0.3	1.1	15.1	13.3	13.7	17.8	16.4	17.0
20	0.8	0.1	0.5	1.8	0.6	1.1	---	---	---	17.8	16.7	17.2
21	1.2	0.6	1.0	2.2	0.8	1.4	---	---	---	18.2	16.6	17.3
22	0.8	0.5	0.6	2.8	1.6	1.9	18.6	17.7	18.1	18.3	16.9	17.6
23	0.7	0.5	0.6	2.6	2.0	2.3	18.2	15.0	17.0	18.0	17.2	17.5
24	1.0	0.4	0.7	---	---	---	15.0	13.4	14.3	18.6	16.9	17.7
25	1.1	0.5	0.7	2.3	1.9	2.0	13.3	12.1	12.6	19.6	18.3	18.9
26	0.7	0.2	0.5	2.8	1.9	2.3	12.1	11.4	11.8	19.6	18.8	19.2
27	0.7	0.0	0.3	4.7	2.4	3.5	11.5	10.8	11.0	19.3	18.4	18.8
28	0.8	0.0	0.3	5.0	4.5	4.7	11.8	10.4	11.1	19.3	18.5	18.9
29	---	---	---	4.5	3.9	4.3	12.6	11.0	11.7	19.4	18.7	19.0
30	---	---	---	4.0	3.5	3.8	14.1	12.2	13.3	19.6	18.5	18.6
31	---	---	---	3.5	2.5	2.9	---	---	---	19.2	18.4	18.8
MONTH	---	---	---	---	---	---	---	---	---	19.9	13.7	17.4

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	---	---	---	22.3	20.9	21.5	---	---	---	20.3	18.9	19.3
2	---	---	---	22.6	21.5	22.0	23.2	22.0	22.7	20.0	19.2	19.4
3	---	---	---	22.8	21.8	22.4	---	---	---	20.4	19.2	20.0
4	---	---	---	22.8	22.2	22.5	---	---	---	20.6	19.5	20.0
5	---	---	---	22.9	22.1	22.5	---	---	---	21.4	20.4	20.9
6	22.3	17.1	20.2	23.7	22.3	22.9	---	---	---	---	---	---
7	22.9	22.0	22.2	24.5	23.2	23.7	---	---	---	---	---	---
8	24.2	22.6	23.3	24.6	24.0	24.2	24.3	23.7	24.0	22.7	22.0	22.3
9	24.6	23.6	24.0	25.3	24.3	24.7	23.7	23.1	23.3	21.9	20.8	21.4
10	24.0	23.5	23.9	25.3	23.5	24.5	---	---	---	20.8	19.3	20.0
11	23.7	19.4	22.7	25.1	24.0	24.4	---	---	---	21.9	18.9	19.2
12	19.8	18.9	19.3	25.0	23.8	24.3	---	---	---	19.2	18.4	18.8
13	20.1	18.5	19.3	---	---	---	21.9	20.8	21.5	18.4	17.7	18.0
14	19.7	19.2	19.3	24.7	22.7	24.0	22.7	20.7	21.3	18.0	17.1	17.6
15	19.7	19.1	19.3	24.3	23.6	24.0	22.3	19.1	21.6	17.6	16.6	17.1
16	20.2	18.9	19.5	23.9	22.2	23.2	22.0	21.5	21.7	17.6	16.8	17.2
17	20.0	19.4	19.7	22.2	21.5	21.8	22.3	21.4	21.8	18.0	17.4	17.7
18	19.8	19.1	19.4	23.2	21.3	21.6	21.7	20.9	21.3	19.4	17.8	18.5
19	20.1	19.0	19.5	24.8	22.8	23.5	21.1	19.8	20.2	20.2	19.2	19.5
20	20.7	19.3	20.0	---	---	---	19.9	19.2	19.5	20.4	19.5	20.1
21	21.0	20.3	20.5	25.2	24.4	24.7	19.1	18.9	19.1	19.5	17.9	18.7
22	21.3	19.9	20.6	---	---	---	19.1	18.7	19.0	17.9	17.1	17.5
23	21.8	20.6	21.1	---	---	---	19.8	18.8	19.2	17.1	15.6	16.4
24	22.4	21.0	21.6	24.0	23.2	23.4	19.7	19.0	19.2	15.6	14.1	15.0
25	22.2	20.4	21.8	24.0	22.6	23.3	20.1	18.3	19.3	14.1	13.2	13.6
26	22.7	21.7	22.2	24.3	22.9	23.6	20.3	19.1	19.7	13.5	12.8	13.2
27	22.6	21.8	22.4	24.4	23.3	23.6	20.6	19.7	20.2	17.0	12.4	12.8
28	21.8	20.9	21.3	24.2	23.0	23.5	20.6	19.0	20.2	12.7	12.2	12.4
29	21.9	20.5	21.0	---	---	---	22.6	19.9	20.2	12.2	11.5	11.9
30	21.5	20.2	20.9	23.5	22.2	23.0	20.2	18.7	19.5	11.5	10.6	11.0
31	---	---	---	---	---	---	19.4	18.8	19.1	---	---	---

MISSISSIPPI RIVER MAIN STEM

05331560 MISSISSIPPI RIVER AT GREY CLOUD ISLAND NEAR COTTAGE GROVE, MN

OXYGEN, DISSOLVED (DO), MG/L, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	10.8	10.5	10.6	12.4	11.8	12.2	---	---	---	11.6	11.0	11.3
2	11.0	9.8	10.7	---	---	---	13.8	13.0	13.6	11.2	10.0	10.6
3	11.0	10.4	10.7	---	---	---	14.2	13.5	13.8	10.6	9.7	10.1
4	11.2	10.1	10.6	---	---	---	14.1	13.3	13.8	12.5	9.5	10.2
5	11.0	10.7	10.8	---	---	---	13.8	13.0	13.5	12.0	10.3	11.1
6	10.8	10.2	10.4	13.4	11.9	12.7	---	---	---	10.6	8.6	9.6
7	10.2	9.3	9.8	12.4	11.9	12.1	---	---	---	11.6	8.3	9.6
8	9.3	8.2	8.7	13.8	12.1	12.9	11.7	11.0	11.5	13.0	10.5	11.7
9	9.1	7.9	8.3	13.7	12.7	13.2	---	---	---	---	---	---
10	8.6	7.5	7.9	13.0	12.6	12.7	13.0	10.5	11.5	12.3	11.9	12.2
11	8.3	7.7	8.0	13.1	12.7	12.9	---	---	---	13.5	11.7	12.5
12	8.9	7.8	8.2	14.0	12.6	13.2	14.1	13.4	13.7	13.4	12.9	13.1
13	8.7	8.3	8.5	14.0	13.0	13.5	14.3	13.6	14.0	13.2	12.7	12.9
14	8.5	8.1	8.4	14.3	12.7	13.5	14.1	13.0	13.4	13.1	12.1	12.8
15	8.7	7.4	8.3	14.3	13.6	14.0	---	---	---	13.8	11.9	12.8
16	7.4	6.1	6.8	14.1	13.4	13.7	---	---	---	13.8	13.2	13.5
17	9.2	6.4	8.5	13.6	13.2	13.4	12.1	11.4	11.7	13.4	12.9	13.1
18	11.1	9.2	10.6	13.3	13.0	13.2	12.5	11.8	12.1	16.0	12.6	14.1
19	11.2	7.8	9.1	14.2	13.1	13.6	13.3	12.1	12.4	---	---	---
20	8.6	7.8	8.2	14.1	13.7	13.9	13.0	12.7	12.8	---	---	---
21	9.2	8.5	8.7	14.3	13.3	14.1	12.8	12.5	12.6	15.7	14.8	15.2
22	---	---	---	14.5	13.9	14.0	12.7	12.6	12.7	15.0	12.4	14.0
23	---	---	---	14.3	13.8	14.0	12.8	12.6	12.7	13.8	11.9	12.9
24	---	---	---	14.2	13.8	14.1	12.8	12.5	12.6	13.6	12.4	12.8
25	---	---	---	13.8	13.5	13.7	12.7	12.4	12.6	13.8	11.1	12.9
26	9.8	9.5	9.6	---	---	---	12.9	12.3	12.7	13.7	12.1	12.7
27	9.8	9.1	9.5	---	---	---	12.8	12.5	12.6	12.3	11.6	11.9
28	9.9	9.4	9.6	13.0	12.6	12.8	12.6	12.1	12.3	12.1	11.5	11.8
29	9.5	9.4	9.5	13.3	12.7	13.0	13.4	12.1	12.4	11.6	11.1	11.3
30	9.8	9.4	9.6	13.8	13.0	13.4	---	---	---	13.6	11.1	11.6
31	11.8	9.7	10.7	---	---	---	12.4	11.3	11.7	12.3	11.5	12.0
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	12.2	11.6	11.9	---	---	---	12.8	12.4	12.6	10.7	9.7	10.3
2	12.8	11.6	11.8	13.2	12.9	13.0	12.6	12.2	12.4	10.6	9.6	10.1
3	11.6	10.4	11.3	---	---	---	12.3	11.9	12.1	10.3	9.4	10.0
4	---	---	---	14.3	13.0	13.8	12.0	11.2	11.6	9.9	9.1	9.5
5	---	---	---	14.3	14.1	14.2	12.2	11.2	11.7	9.6	8.3	9.3
6	12.0	10.8	11.2	14.2	13.0	13.8	12.6	12.0	12.3	9.5	8.2	8.9
7	11.3	11.0	11.1	13.6	13.2	13.4	12.8	12.0	12.5	9.5	9.1	9.4
8	11.6	11.2	11.4	13.3	12.7	13.0	13.4	11.9	12.1	9.4	8.1	9.1
9	11.4	11.2	11.3	13.2	12.7	13.0	12.5	11.2	11.8	8.9	8.1	8.5
10	---	---	---	12.9	12.2	12.5	12.3	11.8	12.0	8.8	7.4	8.4
11	11.5	11.2	11.3	12.7	12.2	12.5	12.5	11.2	12.0	9.4	7.8	8.3
12	11.6	11.1	11.3	12.5	11.9	12.1	12.0	10.7	11.1	8.1	7.6	7.9
13	12.4	11.3	11.9	13.6	11.5	12.7	11.3	10.7	11.0	8.5	7.5	7.8
14	12.1	12.0	12.0	13.2	13.1	13.2	11.2	10.7	10.9	8.7	8.0	8.2
15	---	---	---	13.9	12.9	13.3	10.9	9.9	10.3	8.1	7.0	7.7
16	---	---	---	13.8	13.1	13.4	11.0	9.8	10.4	8.1	7.5	7.9
17	---	---	---	13.2	12.6	12.9	11.9	9.7	10.5	9.6	8.0	8.5
18	---	---	---	12.9	12.6	12.8	11.7	10.7	11.5	9.3	8.8	9.0
19	---	---	---	12.8	12.2	12.3	11.3	10.1	11.1	8.9	8.4	8.7
20	12.3	12.0	12.1	12.7	11.9	12.3	---	---	---	8.9	8.2	8.6
21	12.3	10.8	11.2	15.4	11.3	13.2	---	---	---	8.8	8.2	8.5
22	11.3	10.8	11.0	15.1	14.5	14.7	8.6	7.8	8.2	8.6	8.2	8.5
23	11.3	11.1	11.2	15.1	14.8	14.9	8.3	7.2	7.6	8.3	7.8	8.0
24	11.4	11.1	11.3	---	---	---	9.5	7.4	8.2	8.9	7.8	8.4
25	12.1	11.0	11.5	15.0	13.1	14.4	9.0	8.4	8.7	8.5	7.8	8.1
26	12.4	11.7	12.0	14.8	14.3	14.6	9.8	7.9	9.4	7.8	7.5	7.6
27	12.4	11.9	12.2	15.0	11.6	13.6	10.8	9.7	10.5	8.4	7.3	7.9
28	13.4	12.0	12.7	12.2	11.5	11.9	11.1	10.4	10.8	8.1	7.6	7.9
29	---	---	---	12.2	11.9	12.1	11.2	10.2	10.9	8.0	7.4	7.7
30	---	---	---	12.7	11.9	12.3	10.9	10.0	10.5	8.2	7.4	7.7
31	---	---	---	12.7	12.5	12.7	---	---	---	8.9	7.1	7.8
MONTH	---	---	---	---	---	---	---	---	---	10.7	7.0	8.5

MISSISSIPPI RIVER MAIN STEM

05331560 MISSISSIPPI RIVER AT GREY CLOUD ISLAND NEAR COTTAGE GROVE, MN

OXYGEN, DISSOLVED (DO), MG/L, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	9.1	8.6	8.8	6.7	6.1	6.5	---	---	---	8.0	7.5	7.8
2	9.1	8.7	8.9	8.6	6.2	7.3	7.3	6.7	7.0	8.6	7.2	7.7
3	9.4	9.0	9.2	7.8	7.0	7.3	---	---	---	7.9	7.1	7.4
4	9.2	8.8	9.0	7.2	6.7	7.0	---	---	---	9.0	6.7	7.8
5	9.4	9.0	9.2	7.8	6.5	7.2	---	---	---	8.8	7.6	8.2
6	9.2	8.6	8.8	7.5	6.9	7.2	---	---	---	---	---	---
7	9.5	8.2	8.9	7.0	6.2	6.5	---	---	---	---	---	---
8	9.2	8.3	8.7	6.7	5.8	6.3	---	---	---	8.1	6.8	7.6
9	8.4	7.9	8.1	8.6	5.6	7.1	8.4	3.4	6.1	7.8	7.0	7.4
10	9.7	7.3	7.8	8.8	7.2	8.0	---	---	---	8.3	6.9	7.7
11	9.6	8.0	8.6	8.7	7.6	8.1	---	---	---	8.2	7.6	8.0
12	8.2	7.2	8.0	9.6	7.6	8.4	---	---	---	7.9	7.5	7.7
13	8.2	7.7	8.0	9.1	8.2	8.6	7.3	6.5	7.0	8.6	7.5	8.1
14	8.7	7.2	7.8	8.5	7.2	8.1	7.8	6.0	6.5	8.4	7.8	8.1
15	8.4	7.9	8.2	9.2	7.7	8.5	6.2	6.0	6.5	7.9	7.6	7.7
16	8.2	7.8	8.0	8.8	7.4	8.1	7.3	6.3	6.8	8.9	7.3	8.1
17	8.8	7.4	8.0	8.2	7.0	7.7	7.2	5.7	6.0	8.2	7.8	8.1
18	8.4	8.1	8.2	7.0	6.3	6.8	---	---	---	8.5	7.7	8.1
19	8.3	7.9	8.2	8.6	6.2	7.3	---	---	---	8.2	7.5	7.8
20	8.2	7.6	7.9	---	---	---	8.7	4.6	6.8	9.4	6.5	7.7
21	8.4	7.2	7.7	7.9	7.3	7.6	8.4	7.9	8.1	9.7	8.9	9.2
22	8.1	7.6	7.9	---	---	---	8.1	7.2	7.6	9.3	8.7	9.0
23	8.2	7.3	7.8	9.0	7.7	8.6	7.3	6.6	7.0	9.4	7.4	8.8
24	8.9	7.3	7.9	8.3	6.5	7.5	8.0	6.5	6.7	9.2	7.3	8.4
25	8.5	7.6	8.2	7.5	6.1	7.0	8.1	7.4	7.8	9.4	8.9	9.2
26	7.7	6.7	7.2	8.5	6.7	7.7	8.5	7.5	7.9	9.4	8.9	9.3
27	6.8	6.1	6.3	8.0	7.1	7.6	8.0	7.4	7.7	9.9	9.1	9.5
28	8.3	5.9	7.1	7.6	6.7	7.2	7.5	6.9	7.2	9.6	9.3	9.5
29	8.0	7.3	7.6	8.5	6.9	7.4	6.7	6.1	6.5	9.5	9.1	9.3
30	7.5	6.7	7.2	8.5	7.0	7.7	6.8	6.3	6.5	11.2	9.1	10.3
31	---	---	---	---	---	---	8.6	6.2	7.3	---	---	---
MONTH	9.7	5.9	8.1	---	---	---	---	---	---	---	---	---

MISSISSIPPI RIVER MAIN STEM

05331570 MISSISSIPPI RIVER AT NININGER, MN
(National stream-quality accounting network station)

WATER-QUALITY RECORDS

LOCATION.--Lat 44°46'22", long 92°54'07", in NW¼NE¼ sec.18, T.115 N., R.17 W., Dakota County, Hydrologic Unit 07010206, on right bank at the end of Jason Avenue, and at mile 817.8 (1,316 km) upstream from Ohio River.

DRAINAGE AREA.--37,000 mi^2 (95,800 km^2), approximately.

PERIOD OF RECORD.--January 1977 to current year.

REMARKS.--Water-discharge computed on the basis of discharge for Mississippi River at St. Paul (station 05331000) adjusted for inflow and travel time. Letter K indicates non-ideal colony count.

WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	DIS-CHARGE, IN CUBIC FEET PER SECOND (00060)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (90095)	PH (STAND-ARD UNITS) (00400)	PH LAB (STAND-ARD UNITS) (00403)	TEMPER-ATURE, AIR (DEG C) (00020)	TEMPER-ATURE (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	OXYGEN, DIS-SOLVED (MG/L) (00300)
OCT											
10...	0945	6280	570	571	8.0	7.7	14.0	17.0	6.5	750	6.9
JAN											
10...	1150	10000	630	668	8.0	7.6	-4.5	0.5	2.0	750	13.0
APR											
09...	1130	3740	500	495	8.2	7.9	3.0	6.5	10	777	12.2
JUL											
26...	1100	17400	190	369	8.2	7.4	25.0	24.0	3.5	772	6.8

DATE	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	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)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY FIELD (MG/L AS CACO3) (00410)	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)
OCT											
10...	--	40	57	25	23	4.1	200	185	60	32	0.2
JAN											
10...	K970	97	71	29	21	4.0	237	226	68	28	0.3
APR											
09...	110	85	59	21	9.7	4.1	163	161	63	15	0.2
JUL											
26...	660	K12	44	16	10	2.4	153	150	28	13	0.3

DATE	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	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)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT										
10...	9.4	351	0.38	0.96	2.1	0.31	0.19	0.17	--	--
JAN										
10...	14	445	2.40	1.10	1.9	0.19	0.18	0.16	--	--
APR										
09...	11	357	1.40	0.19	0.9	0.04	0.01	<0.01	63	99
JUL										
26...	9.8	257	0.54	0.13	1.2	0.20	0.12	0.12	98	98

05331570 MISSISSIPPI RIVER AT NININGER, MN--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	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)	LEAD, DISSOLVED (UG/L AS PB) (01049)
OCT											
10...	0945	<10	2	60	<0.5	<1	<1	<3	6	9	<1
JAN											
10...	1150	10	2	64	<0.5	<1	2	<3	2	25	2
APR											
09...	1130	20	1	50	0.6	<1	<1	3	2	46	3
JUL											
26...	1100	<10	2	50	1	<1	3	<3	4	23	2

DATE	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										
10...	12	32	0.7	<10	6	<1	<1	170	<6	8
JAN										
10...	16	48	0.2	<10	1	<1	<1	190	<6	16
APR										
09...	12	16	0.1	<10	2	1	<1	160	<6	25
JUL										
26...	18	14	0.4	<10	6	<1	<1	110	<6	18

MISSISSIPPI RIVER MAIN STEM

05331578 MISSISSIPPI RIVER AT LOCK AND DAM 2 AT HASTINGS, MN

LOCATION.--Lat 44°45'37", long 92°52'02", in SE¼SW¼ sec.16, T.115 N., R.17 W., Dakota County, Hydrologic Unit 07010206, in old lock house at lock and dam and at mile 815.2 upstream from Ohio River.

PERIOD OF RECORD.--Water years 1975 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1974 to current year.
pH: October 1974 to current year.
WATER TEMPERATURES: October 1974 to current year.
DISSOLVED OXYGEN: October 1974 to current year.

INSTRUMENTATION.--Water-quality monitor since October 1974.

REMARKS.--Water discharge computed on the basis of discharge for Mississippi River at St. Paul (station 05331000) adjusted for inflow and travel time. Extremes are published for those years with 80 percent or more daily record, unless a new maximum or minimum was set.

COOPERATION.--Samples collected and water-quality monitor operated by the Metropolitan Waste Control Commission, St. Paul, MN. Monitor data is furnished by the Commission.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE (water years 1980, 1982, 1985): Maximum, 799 microsiemens June 27, July 6, 20, 1980; minimum, 310 microsiemens Mar. 21, 1985.
pH (water years 1980, 1982): Maximum, 8.9 units Aug. 1, 1980; minimum, 6.7 units Jan. 23, 27, 1982.
WATER TEMPERATURES (water years 1980, 1983-84): Maximum, 32.5°C July 10, 1980; minimum, 0.0°C several days during winter period.
DISSOLVED OXYGEN (water years 1980, 1982): Maximum, 19.2 mg/L Oct. 16, 1979; minimum, 1.7 mg/L June 4, 1980.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURES: Maximum, 29.0°C July 23; minimum, 0.0°C several days during winter.

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	490	484	486	451	439	446	483	478	481	---	---	---
2	487	477	481	440	434	437	478	473	475	---	---	---
3	509	476	494	452	436	444	483	475	479	---	---	---
4	511	504	507	453	450	451	488	483	486	---	---	---
5	513	506	509	453	449	451	493	487	491	---	---	---
6	525	511	516	453	448	451	506	493	501	---	---	---
7	525	517	522	458	449	454	506	499	504	---	---	---
8	528	519	524	463	455	458	503	498	501	---	---	---
9	537	526	530	461	455	458	499	494	496	---	---	---
10	546	537	540	458	453	456	500	495	496	---	---	---
11	550	544	546	462	453	456	503	500	501	---	---	---
12	554	548	550	465	456	460	520	500	513	---	---	---
13	569	552	547	469	460	464	519	511	515	---	---	---
14	557	549	552	473	466	469	512	509	510	---	---	---
15	551	548	527	470	457	464	512	508	510	---	---	---
16	545	527	536	461	449	455	513	508	511	---	---	---
17	528	518	522	465	456	461	520	513	516	---	---	---
18	537	499	507	461	456	459	520	514	518	606	601	603
19	498	478	488	460	454	457	---	---	---	614	441	544
20	478	465	470	459	455	456	---	---	---	548	368	410
21	468	451	461	485	457	469	---	---	---	420	369	399
22	452	439	445	492	484	488	---	---	---	423	416	420
23	438	434	437	501	489	494	---	---	---	---	---	---
24	439	431	435	502	495	498	---	---	---	---	---	---
25	439	435	437	500	493	497	---	---	---	---	---	---
26	443	435	439	499	494	496	---	---	---	---	---	---
27	446	437	441	504	499	501	---	---	---	---	---	---
28	441	434	438	496	491	493	---	---	---	---	---	---
29	450	443	446	492	489	491	---	---	---	---	---	---
30	451	444	447	489	483	486	---	---	---	---	---	---
31	451	444	446	---	---	---	---	---	---	---	---	---
MONTH	569	431	491	504	434	467	---	---	---	---	---	---

MISSISSIPPI RIVER MAIN STEM

05331578 MISSISSIPPI RIVER AT LOCK AND DAM 2 AT HASTINGS, MN

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	FEBRUARY MAX	FEBRUARY MIN	FEBRUARY MEAN	MARCH MAX	MARCH MIN	MARCH MEAN	APRIL MAX	APRIL MIN	APRIL MEAN	MAY MAX	MAY MIN	MAY MEAN
1				---	---	---				---	---	---
2				---	---	---				495	479	482
3				---	---	---				---	---	---
4				---	---	---				---	---	---
5				---	---	---				---	---	---
6				---	---	---				---	---	---
7				---	---	---				---	---	---
8				---	---	---				---	---	---
9				---	---	---				---	---	---
10				---	---	---				---	---	---
11				---	---	---				---	---	---
12				---	---	---				---	---	---
13				---	---	---				---	---	---
14				---	---	---				---	---	---
15				---	---	---				---	---	---
16				---	---	---				---	---	---
17				---	---	---				---	---	---
18				---	---	---				---	---	---
19				---	---	---				---	---	---
20				316	312	314				---	---	---
21				328	310	314				---	---	---
22				326	318	315				---	---	---
23				---	---	---				---	---	---
24				---	---	---				---	---	---
25				---	---	---				---	---	---
26				334	323	329				---	---	---
27				---	---	---				---	---	---
28				---	---	---				---	---	---
29				---	---	---				---	---	---
30				---	---	---				---	---	---
31				---	---	---				---	---	---

DAY	JUNE MAX	JUNE MIN	JUNE MEAN	JULY MAX	JULY MIN	JULY MEAN	AUGUST MAX	AUGUST MIN	AUGUST MEAN	SEPTEMBER MAX	SEPTEMBER MIN	SEPTEMBER MEAN
1				---	---	---	439	369	374	409	393	403
2				---	---	---	---	---	---	415	399	408
3				---	---	---	382	350	370	437	399	423
4				---	---	---	380	372	375	447	420	425
5				---	---	---	398	375	379	---	---	---
6				---	---	---	439	386	390	---	---	---
7				---	---	---	405	386	389	---	---	---
8				---	---	---	---	---	---	462	439	445
9				---	---	---	388	371	385	462	449	456
10				---	---	---	---	---	---	475	443	457
11				---	---	---	---	---	---	447	430	440
12				---	---	---	---	---	---	439	432	439
13				---	---	---	---	---	---	451	434	443
14				---	---	---	---	---	---	464	449	456
15				---	---	---	---	---	---	473	444	449
16				---	---	---	---	---	---	444	438	440
17				---	---	---	---	---	---	449	440	444
18				---	---	---	---	---	---	475	449	455
19				---	---	---	---	---	---	488	471	475
20				---	---	---	---	---	---	496	479	485
21				---	---	---	---	---	---	482	474	478
22				---	---	---	---	---	---	485	479	481
23				497	492	495	377	371	366	485	448	466
24				495	479	484	394	371	376	470	438	450
25				480	472	475	399	374	385	454	435	439
26				472	351	420	407	380	387	473	410	445
27				367	356	359	421	384	386	459	435	440
28				364	356	361	395	386	391	438	429	434
29				389	353	374	409	394	399	445	429	436
30				356	347	349	409	381	400	466	423	435
31				377	344	357	401	393	397	---	---	---

MISSISSIPPI RIVER MAIN STEM

05331578 MISSISSIPPI RIVER AT LOCK AND DAM 2 AT HASTINGS, MN

PH (STANDARD UNITS), WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	7.9	7.8	7.9	8.4	8.0	8.1	7.9	7.8	7.9	---	---	---
2	7.9	7.9	7.9	---	---	---	8.4	7.8	8.0	---	---	---
3	8.3	7.9	8.1	---	---	---	8.0	7.6	7.7	---	---	---
4	8.3	7.9	8.1	---	---	---	8.4	7.5	7.9	---	---	---
5	7.9	7.8	7.9	---	---	---	8.3	8.0	8.1	---	---	---
6	7.8	7.7	7.8	---	---	---	8.0	7.5	7.8	---	---	---
7	7.8	7.7	7.7	---	---	---	7.4	7.2	7.3	---	---	---
8	7.8	7.7	7.7	---	---	---	7.3	7.2	7.3	---	---	---
9	8.1	7.7	7.9	---	---	---	7.5	7.3	7.4	---	---	---
10	8.2	7.9	8.1	8.1	7.9	8.0	7.6	7.2	7.4	---	---	---
11	8.0	7.8	7.9	8.0	7.9	7.9	7.2	7.1	7.1	---	---	---
12	7.8	7.7	7.7	7.9	7.8	7.9	7.9	7.1	7.6	---	---	---
13	7.7	7.6	7.6	8.0	7.3	7.9	7.8	7.8	7.8	---	---	---
14	7.6	7.6	7.6	8.5	8.0	8.2	7.8	7.7	7.7	---	---	---
15	7.6	7.5	7.5	8.6	8.2	8.4	7.8	7.6	7.7	---	---	---
16	8.2	8.0	8.2	8.2	7.3	7.9	7.7	7.5	7.6	---	---	---
17	8.6	7.9	8.1	7.8	7.7	7.7	7.7	7.7	7.7	---	---	---
18	7.8	7.2	7.6	7.7	7.6	7.7	7.7	7.6	7.6	8.4	7.9	8.2
19	8.1	7.3	7.7	7.7	7.6	7.7	---	---	---	---	---	---
20	8.1	7.8	8.0	7.6	7.6	7.6	---	---	---	---	---	---
21	7.9	7.7	7.8	8.1	7.5	7.7	---	---	---	---	---	---
22	7.9	7.6	7.8	8.3	8.2	8.2	---	---	---	---	---	---
23	7.8	7.4	7.6	8.2	8.1	8.2	---	---	---	---	---	---
24	8.2	7.4	7.8	8.2	8.1	8.2	---	---	---	---	---	---
25	8.1	8.0	8.0	8.2	7.9	8.0	---	---	---	---	---	---
26	8.0	7.9	8.0	8.2	8.0	8.1	---	---	---	---	---	---
27	8.1	7.9	7.9	8.2	7.9	8.1	---	---	---	---	---	---
28	8.3	8.1	8.2	8.0	7.8	7.9	---	---	---	---	---	---
29	8.3	8.0	8.1	8.3	7.8	8.0	---	---	---	---	---	---
30	8.2	8.0	8.1	8.0	7.8	7.9	---	---	---	---	---	---
31	8.2	8.0	8.1	---	---	---	---	---	---	---	---	---
MONTH	8.6	7.2	7.9	---	---	---	---	---	---	---	---	---

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1				---	---	---	---	---	---	8.0	7.6	7.7
2				---	---	---	---	---	---	8.1	7.6	7.8
3				---	---	---	8.3	8.0	8.2	---	---	---
4				---	---	---	---	---	---	7.8	7.5	7.3
5				---	---	---	---	---	---	---	---	---
6				---	---	---	---	---	---	---	---	---
7				---	---	---	---	---	---	---	---	---
8				---	---	---	---	---	---	8.3	7.2	7.6
9				---	---	---	---	---	---	---	---	---
10				---	---	---	---	---	---	---	---	---
11				---	---	---	---	---	---	---	---	---
12				---	---	---	---	---	---	8.0	7.8	7.9
13				---	---	---	---	---	---	8.0	7.9	8.0
14				---	---	---	---	---	---	8.0	7.9	8.0
15				---	---	---	---	---	---	8.0	7.9	7.9
16				---	---	---	---	---	---	8.0	7.9	7.9
17				---	---	---	---	---	---	7.9	7.9	7.9
18				---	---	---	---	---	---	8.0	7.9	8.0
19				---	---	---	---	---	---	8.0	7.9	7.9
20				---	---	---	---	---	---	8.0	7.6	7.9
21				---	---	---	---	---	---	8.0	7.9	8.0
22				---	---	---	---	---	---	8.0	7.9	7.9
23				---	---	---	7.6	7.4	7.5	8.0	7.9	8.0
24				---	---	---	8.0	7.4	7.6	8.0	7.9	7.9
25				---	---	---	8.1	7.6	7.9	8.1	7.9	8.0
26				---	---	---	8.1	7.4	7.6	8.0	7.8	7.9
27				8.4	8.0	8.1	7.8	7.1	7.6	8.0	7.8	7.9
28				8.2	8.0	8.0	8.0	7.4	7.7	8.0	7.9	7.9
29				8.4	7.7	8.0	7.7	7.3	7.5	8.0	7.9	7.9
30				8.4	8.0	8.2	8.2	7.5	7.8	8.0	7.8	7.8
31				8.4	8.0	8.2	7.8	7.3	7.4	---	---	---

MISSISSIPPI RIVER MAIN STEM

05331578 MISSISSIPPI RIVER AT LOCK AND DAM 2 AT HASTINGS, MN

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	10.2	9.5	9.8	3.3	0.5	2.2	0.7	0.0	0.3	---	---	---
2	10.4	9.4	9.9	---	---	---	1.4	0.8	1.2	---	---	---
3	10.2	8.6	9.5	---	---	---	1.5	1.3	1.4	---	---	---
4	9.8	9.1	9.4	---	---	---	1.4	1.1	1.2	---	---	---
5	9.8	9.4	9.6	---	---	---	1.2	0.2	0.6	---	---	---
6	10.0	9.7	9.8	---	---	---	0.4	0.1	0.2	---	---	---
7	10.4	9.9	10.2	---	---	---	0.5	0.2	0.4	---	---	---
8	11.0	10.3	10.6	2.1	1.4	1.7	0.7	0.4	0.5	---	---	---
9	11.1	10.8	10.9	1.8	1.3	1.6	0.6	0.5	0.5	---	---	---
10	11.6	10.9	11.1	1.3	0.6	1.0	0.5	0.4	0.4	---	---	---
11	11.8	11.3	11.6	1.0	0.1	0.5	0.5	0.3	0.4	---	---	---
12	12.2	11.7	11.9	0.8	0.2	0.5	0.5	0.3	0.4	---	---	---
13	12.7	12.1	12.3	1.0	0.1	0.5	0.5	0.3	0.4	---	---	---
14	12.7	12.4	12.5	1.8	0.8	1.3	0.4	0.3	0.3	---	---	---
15	12.5	12.4	12.4	1.6	0.0	0.9	0.3	0.2	0.3	---	---	---
16	12.2	10.1	11.1	2.0	0.6	1.3	0.4	0.3	0.3	---	---	---
17	10.0	8.8	9.3	1.2	0.0	0.4	0.3	0.2	0.2	---	---	---
18	9.2	8.6	8.8	1.6	0.4	0.9	0.4	0.0	0.2	0.0	0.0	0.0
19	8.8	6.4	7.6	2.0	1.3	1.7	---	---	---	---	---	---
20	6.4	5.6	6.0	2.0	1.6	1.8	---	---	---	---	---	---
21	5.9	5.0	5.5	2.3	0.4	1.4	---	---	---	0.1	0.0	0.0
22	4.9	4.0	4.4	0.9	0.5	0.7	---	---	---	---	---	---
23	4.4	3.7	4.1	1.4	0.6	0.9	---	---	---	---	---	---
24	4.8	3.4	4.2	1.9	0.9	1.3	---	---	---	---	---	---
25	4.7	4.3	4.5	2.3	1.6	1.9	---	---	---	---	---	---
26	5.6	4.2	4.9	3.1	2.3	2.6	---	---	---	---	---	---
27	6.7	5.6	6.1	3.2	3.6	3.1	---	---	---	---	---	---
28	5.8	4.2	4.7	0.5	0.2	0.4	---	---	---	---	---	---
29	4.8	4.0	4.5	0.5	0.0	0.3	---	---	---	---	---	---
30	4.9	3.2	4.1	0.3	0.0	0.2	---	---	---	---	---	---
31	3.3	2.4	2.9	---	---	---	---	---	---	---	---	---
MONTH	12.7	2.4	8.2	---	---	---	---	---	---	---	---	---

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1				---	---	---						
2				---	---	---						
3				---	---	---						
4				---	---	---						
5				---	---	---						
6				---	---	---						
7				---	---	---						
8				---	---	---						
9				---	---	---						
10				---	---	---						
11				---	---	---						
12				---	---	---						
13				---	---	---						
14				---	---	---						
15				---	---	---						
16				---	---	---						
17				---	---	---						
18				---	---	---						
19				---	---	---						
20				3.7	2.5	3.5						
21				4.0	2.3	3.2						
22				4.9	3.1	4.2						
23				---	---	---						
24				---	---	---						
25				---	---	---						
26				5.5	3.5	4.6						
27				---	---	---						
28				---	---	---						
29				---	---	---						
30				---	---	---						
31				---	---	---						

MISSISSIPPI RIVER MAIN STEM

05331578 MISSISSIPPI RIVER AT LOCK AND DAM 2 AT HASTINGS, MN

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1				---	---	---	25.4	23.0	24.0	20.8	19.7	20.1
2				---	---	---	---	---	---	20.4	19.5	19.8
3				---	---	---	24.9	23.4	24.0	21.8	19.9	20.8
4				---	---	---	24.9	23.3	23.7	22.1	20.9	21.1
5				---	---	---	25.0	23.1	23.4	---	---	---
6				---	---	---	25.5	24.1	24.4	---	---	---
7				---	---	---	25.1	22.7	24.3	---	---	---
8				---	---	---	---	---	---	23.0	22.2	22.5
9				---	---	---	23.3	22.2	22.6	22.3	20.1	21.2
10				---	---	---	---	---	---	20.1	19.1	19.6
11				---	---	---	---	---	---	19.4	18.5	19.0
12				---	---	---	---	---	---	18.7	17.6	18.3
13				---	---	---	---	---	---	17.8	16.7	17.4
14				---	---	---	---	---	---	17.6	16.4	16.9
15				---	---	---	---	---	---	17.1	15.9	16.5
16				---	---	---	---	---	---	16.9	16.1	16.5
17				---	---	---	---	---	---	17.5	16.8	17.1
18				---	---	---	---	---	---	19.3	17.3	18.0
19				---	---	---	---	---	---	19.9	19.0	19.2
20				---	---	---	---	---	---	20.2	17.5	18.6
21				---	---	---	---	---	---	17.4	16.6	17.0
22				---	---	---	---	---	---	16.6	16.2	16.4
23				24.8	23.6	24.3	19.1	18.0	18.5	16.3	13.4	15.2
24				24.4	22.7	23.2	19.1	18.1	18.4	13.3	12.4	12.8
25				24.3	23.3	22.8	19.9	17.4	18.6	12.6	11.9	12.2
26				24.9	23.1	23.6	21.3	18.5	20.0	12.5	11.1	11.6
27				25.5	22.3	22.6	---	---	---	12.9	11.1	11.9
28				24.6	23.8	24.1	20.8	18.2	20.3	11.9	10.4	11.2
29				24.5	23.3	23.4	20.8	20.4	20.6	10.4	9.6	10.1
30				23.9	22.7	23.2	20.5	18.5	20.1	9.9	8.9	9.7
31				24.0	22.0	22.6	20.2	19.1	19.6	---	---	---

OXYGEN, DISSOLVED (DO), MG/L, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	---	---	---	13.8	12.1	13.1	14.0	13.5	13.7	---	---	---
2	---	---	---	14.2	13.5	13.9	14.3	13.4	13.8	---	---	---
3	11.0	10.0	10.6	14.5	13.8	14.1	14.9	13.7	14.4	---	---	---
4	11.7	10.6	11.0	14.4	13.7	14.0	15.2	14.6	14.9	---	---	---
5	11.1	10.4	10.8	15.0	14.1	14.3	15.6	14.8	15.2	---	---	---
6	10.6	10.1	10.4	14.9	14.1	14.4	15.7	15.0	15.3	---	---	---
7	10.6	9.9	10.3	14.6	12.7	13.6	15.5	14.8	15.1	---	---	---
8	10.5	9.4	9.7	13.6	12.7	13.2	15.5	14.8	15.1	---	---	---
9	9.6	8.8	9.3	13.9	13.5	13.7	15.3	14.7	15.0	---	---	---
10	9.2	8.2	8.7	14.1	13.7	13.9	15.0	14.4	14.7	---	---	---
11	8.6	8.2	8.4	13.9	13.3	13.6	15.3	14.3	14.8	---	---	---
12	8.3	7.8	8.1	13.9	13.2	13.4	15.5	14.4	14.9	---	---	---
13	7.8	7.2	7.5	13.8	13.2	13.5	15.9	14.7	15.3	---	---	---
14	7.3	6.8	7.1	13.3	12.6	13.1	15.8	14.8	15.2	---	---	---
15	7.2	6.8	6.9	13.3	12.8	13.0	15.1	14.1	14.7	---	---	---
16	7.3	6.9	7.1	14.2	13.2	13.6	14.7	14.0	14.2	---	---	---
17	9.5	7.3	8.1	14.0	13.4	13.6	15.0	14.1	14.4	---	---	---
18	8.1	7.2	7.8	14.3	13.3	13.8	14.3	13.9	14.1	13.1	12.8	12.9
19	9.6	8.3	8.9	14.7	14.0	14.4	---	---	---	---	---	---
20	9.7	9.2	9.4	15.0	14.3	14.6	---	---	---	14.0	11.1	12.0
21	9.6	8.7	9.3	15.0	14.4	14.7	---	---	---	15.4	14.0	14.8
22	9.9	8.9	9.4	14.9	14.4	14.6	---	---	---	14.7	13.8	14.3
23	9.8	9.5	9.7	14.7	14.3	14.4	---	---	---	---	---	---
24	12.3	9.5	11.0	14.4	14.0	14.2	---	---	---	---	---	---
25	12.2	11.6	11.9	14.7	14.0	14.3	---	---	---	---	---	---
26	12.2	10.9	11.6	14.8	13.8	14.2	---	---	---	---	---	---
27	12.0	10.8	11.5	14.4	13.6	13.9	---	---	---	---	---	---
28	12.2	11.0	11.7	14.0	13.4	13.7	---	---	---	---	---	---
29	11.6	10.9	11.3	14.1	13.4	13.7	---	---	---	---	---	---
30	12.3	11.1	11.6	13.9	13.4	13.7	---	---	---	---	---	---
31	12.9	11.4	12.2	---	---	---	---	---	---	---	---	---
MONTH	---	---	---	15.0	12.1	13.9	---	---	---	---	---	---

MISSISSIPPI RIVER MAIN STEM

05331578 MISSISSIPPI RIVER AT LOCK AND DAM 2 AT HASTINGS, MN

OXYGEN, DISSOLVED (DO), MG/L, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1				---	---	---				---	---	---
2				---	---	---				10.6	9.0	9.8
3				---	---	---				---	---	---
4				---	---	---				---	---	---
5				---	---	---				---	---	---
6				---	---	---				---	---	---
7				---	---	---				---	---	---
8				---	---	---				---	---	---
9				---	---	---				---	---	---
10				---	---	---				---	---	---
11				---	---	---				---	---	---
12				---	---	---				---	---	---
13				---	---	---				---	---	---
14				---	---	---				---	---	---
15				---	---	---				---	---	---
16				---	---	---				---	---	---
17				---	---	---				---	---	---
18				---	---	---				---	---	---
19				---	---	---				---	---	---
20				12.0	11.9	12.0				---	---	---
21				12.1	11.8	11.9				---	---	---
22				12.0	11.4	11.8				---	---	---
23				---	---	---				---	---	---
24				---	---	---				---	---	---
25				---	---	---				---	---	---
26				12.4	12.0	12.1				---	---	---
27				---	---	---				---	---	---
28				---	---	---				---	---	---
29				---	---	---				---	---	---
30				---	---	---				---	---	---
31				---	---	---				---	---	---

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1				---	---	---	8.0	7.2	7.5	6.1	5.5	5.9
2				---	---	---	---	---	---	---	---	---
3				---	---	---	8.5	7.7	8.1	---	---	---
4				---	---	---	8.4	7.0	7.5	8.3	5.7	7.0
5				---	---	---	9.2	6.3	7.1	---	---	---
6				---	---	---	7.9	6.9	7.0	---	---	---
7				---	---	---	8.0	6.7	7.0	---	---	---
8				---	---	---	---	---	---	8.8	6.5	7.7
9				---	---	---	6.9	5.8	6.6	8.4	7.7	8.0
10				---	---	---	---	---	---	8.8	7.7	8.2
11				---	---	---	---	---	---	9.5	8.2	8.4
12				---	---	---	---	---	---	8.4	8.0	8.3
13				---	---	---	---	---	---	9.3	8.2	8.6
14				---	---	---	---	---	---	9.2	8.5	8.8
15				---	---	---	---	---	---	9.2	8.6	9.0
16				---	---	---	---	---	---	9.1	8.5	8.8
17				---	---	---	---	---	---	8.8	8.2	8.5
18				---	---	---	---	---	---	8.8	8.0	8.2
19				---	---	---	---	---	---	7.9	7.6	7.8
20				---	---	---	---	---	---	8.3	7.2	7.5
21				---	---	---	---	---	---	7.5	7.1	7.3
22				---	---	---	---	---	---	7.8	7.2	7.4
23				---	---	---	8.5	7.7	8.0	9.0	7.7	8.4
24				---	---	---	8.2	7.4	7.7	9.8	8.6	8.7
25				---	---	---	9.1	7.4	8.2	9.3	8.5	8.8
26				---	---	---	10.5	7.9	8.9	10.7	9.1	9.5
27				8.5	7.5	7.9	9.7	6.0	8.6	10.8	9.4	9.6
28				8.3	7.1	7.5	8.7	7.1	7.7	10.1	9.7	9.9
29				7.7	6.6	7.5	7.0	6.6	6.8	10.5	10.1	10.3
30				7.4	6.4	6.8	6.8	5.7	6.2	11.5	10.4	10.7
31				7.9	6.2	6.9	6.7	5.8	6.1	---	---	---

ST. CROIX RIVER BASIN

05336700 KETTLE RIVER BELOW SANDSTONE, MN

LOCATION.--Lat 46°06'20", long 92°51'50", in NW¼SW¼ sec.22, T.42 N., R.20 W., Pine County, Hydrologic Unit 07030003, on Sandstone Federal Correctional Institution property, on left bank about 900 ft downstream from abandoned powerplant dam, 1.8 mi south of Sandstone.

DRAINAGE AREA.--863 mi^2.

PERIOD OF RECORD.--October 1967 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 931.50 ft above National Geodetic Vertical Datum of 1929. (Minnesota Department of Transportation bench mark).

REMARKS.--Estimated daily discharges: Oct. 21 to Nov. 20, Dec. 6, Dec. 17 to Feb. 19, Mar. 3, 5, 6, and Apr. 27 to May 13. Records good except those for periods of no gage-height record, Oct. 21 to Nov. 20 and Apr. 27 to May 13, and periods with ice effect, Dec. 6, Dec. 17 to Feb. 19, and Mar. 3, 5, 6, which are fair.

AVERAGE DISCHARGE.--18 years, 732 ft^3/s, 11.52 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 17,200 ft^3/s, July 23, 1972, gage height, 15.38 ft; minimum, 25 ft^3/s, Nov. 11, 12, 1977, gage height, 3.37 ft, result of freezeup.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in April 1965 reached a stage of 12.96 ft, from flood marks, discharge, 13,400 ft^3/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,600 ft^3/s and maximum (*)

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct. 20	2200	7,810	10.17	June 28	2330	3,760	7.68
Apr. 25	0215	*8,800	*10.75	Sept. 4	0745	5,620	8.85

Minimum daily discharge, 144 ft^3/s, Feb. 1-15; minimum gage height, 4.15 ft, Feb. 20, 21.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	533	1700	350	193	144	202	952	2500	3230	2010	294	245
2	471	1550	308	182	144	215	992	2200	3230	1560	264	259
3	422	1400	308	177	144	230	1190	1900	2730	1240	241	1620
4	378	1280	293	170	144	235	1900	1680	2250	1030	223	5310
5	344	1170	283	166	144	240	2020	1500	1820	980	224	4010
6	316	1090	280	162	144	230	1850	1330	1450	876	242	2960
7	309	1000	264	160	144	218	1650	1180	1170	761	238	2230
8	317	920	262	158	144	210	1430	1110	971	640	224	1660
9	323	860	255	156	144	206	1230	1070	839	552	201	1300
10	324	804	249	155	144	210	1110	1020	698	502	193	1250
11	322	745	246	154	144	226	998	1000	632	444	182	1090
12	312	700	238	153	144	234	957	1100	585	394	253	913
13	309	650	228	152	144	263	1000	1230	539	377	405	753
14	304	605	219	151	144	272	1060	1180	484	345	457	633
15	312	575	211	151	144	438	1130	1400	444	315	398	548
16	432	540	482	150	145	632	1180	1940	427	292	340	489
17	1890	500	830	150	150	857	1210	2060	461	280	292	467
18	3050	470	820	150	155	1090	1270	1910	466	321	264	455
19	4560	440	782	150	167	1260	1610	1680	444	530	248	432
20	7220	410	680	150	161	1370	2180	1450	401	677	235	403
21	7100	394	600	150	161	1220	2360	1240	364	589	221	454
22	5900	376	530	149	161	1410	3160	1060	356	500	221	483
23	4900	345	480	149	161	1410	5110	902	361	434	279	569
24	4250	335	420	148	166	1330	7900	770	350	432	351	1530
25	3720	335	375	148	175	1170	8290	683	324	465	360	2160
26	3250	344	330	147	184	1390	6720	661	668	469	356	1820
27	2900	377	290	146	185	1630	5200	720	2540	429	332	1550
28	2600	394	270	146	190	1750	4200	720	3490	390	293	1300
29	2300	388	250	145	---	1500	3480	683	3410	355	263	1130
30	2100	377	225	145	---	1230	2900	822	2640	339	247	1140
31	1900	---	210	145	---	1170	---	1690	---	322	246	---
TOTAL	63368	21074	11568	4808	4321	24048	76239	40391	37774	18850	8587	39163
MEAN	2044	702	373	155	154	776	2541	1303	1259	608	277	1305
MAX	7220	1700	830	193	190	1750	8290	2500	3490	2010	457	5310
MIN	304	335	210	145	144	202	952	661	324	280	182	245
CFSM	2.37	.81	.43	.18	.18	.90	2.94	1.51	1.46	.71	.32	1.51
IN.	2.73	.91	.50	.21	.19	1.04	3.29	1.74	1.63	.81	.37	1.69
AC-FT	125700	41800	22950	9540	8570	47700	151200	80120	74920	37390	17030	77680

CAL YR 1984 TOTAL 333155 MEAN 910 MAX 7220 MIN 125 CFSM 1.05 IN 14.36 AC-FT 660800
WTR YR 1985 TOTAL 350191 MEAN 959 MAX 8290 MIN 144 CFSM 1.11 IN 15.10 AC-FT 694600

ST. CROIX RIVER BASIN

05337050 KETTLE RIVER NEAR CLOVERDALE, MN

LOCATION.--Lat 45°54'13", long 92°43'47", in SW¼NW¼ sec. 33, T.40 N., R.19 W., Pine County, Hydrologic Unit 07030003, St. Croix National Scenic Riverway, 200 ft (61 m) west of Town Road, 8.0 mi (12.9 km) south of Cloverdale, Minnesota and 9.0 mi (14.5 km) northwest of Grantsburg, Wisconsin.

DRAINAGE AREA.--1,050 mi^2 (2,720 km^2).

PERIOD OF RECORD.--Water years 1975-83, 1985.

WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUC-TANCE (US/CM) (00095)	PH (STAND-ARD UNITS) (00400)	TEMPER-ATURE (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
AUG 27...	1340	383	155	8.3	19.5	9.6	754	36	450

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)	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)
AUG 27...	19	6.8	3.8	1.9	72	2.7	4.7	<.10	10	124

DATE	NITRO-GEN, NITRATE TOTAL (MG/L AS N) (00620)	NITRO-GEN, NITRITE TOTAL (MG/L AS N) (00615)	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)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	SEDI-MENT, SUS-PENDED (MG/L) (80154)
AUG 27...	.38	.02	.09	.70	.07	.04	740	17	7.8	89

ST. CROIX RIVER BASIN

05337400 KNIFE RIVER NEAR MORA, MN

LOCATION.--Lat 45½55'12", long 93½18'26", in SW¼SW¼S sec.26, T.40 N., R.24 W., Kanabec County, Hydrologic Unit 07030004, on left bank 400 ft upstream from bridge on County Highway 77, 1.1 mi upstream from mouth and 2.5 mi north of Mora.

DRAINAGE AREA.--102 mi^2.

PERIOD OF RECORD.--Occasional low-flow measurements, water years 1969-74; July 1974 to current year.

GAGE.--Water-stage recorder. Datum of gage is 991.20 ft above National Geodetic Vertical Datum of 1929. (Kanabec County bench mark).

REMARKS.--Estimated daily discharges: Nov. 18, 20, Dec. 3-6, 12, 13, 24-27, 29-31, Jan. 6, Jan. 9 to Feb. 25, and Mar. 3-11. Records good except those for periods with ice effect, Nov. 18, 20, Dec. 3-6, 12, 13, 24-27, 29-31, Jan. 6, Jan. 9 to Feb. 25, and Mar. 3-11, which are fair.

AVERAGE DISCHARGE.--11 years, 64.8 ft^3/s, 8.63 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,840 ft^3/s, May 10, 1979, gage height, 6.31 ft; maximum gage height, 6.69 ft, Nov. 24, 1977, from floodmark (backwater from ice); minimum daily discharge, 1.1 ft^3/s, Jan. 12 to Feb. 9, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of July 26, 1972, reached a stage of 14.0 ft, from information by local resident (discharge not determined). Result of dam failure and backwater from collapsed bridge.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct. 20	0215	*1,430	5.76	Apr. 24	1245	1,420	*5.81

Minimum discharge, 9.2 ft^3/s, Aug. 11, 12, gage height, 1.75 ft.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	56	114	34	27	12	23	162	203	104	181	21	45
2	49	98	33	24	12	22	157	121	116	163	17	56
3	44	90	33	24	12	20	170	117	107	129	15	130
4	37	92	33	22	12	19	189	99	91	114	13	171
5	35	88	32	19	12	17	191	102	80	103	15	172
6	32	83	32	18	12	16	183	90	66	82	15	151
7	34	82	32	18	11	17	167	84	59	69	13	126
8	36	77	27	17	11	18	149	70	53	58	12	136
9	31	84	23	16	11	20	130	66	45	48	12	216
10	29	74	22	16	11	22	119	65	38	38	11	219
11	27	63	22	15	11	24	108	63	39	34	10	223
12	26	61	22	14	11	28	103	68	39	29	31	169
13	26	60	22	14	11	35	110	73	33	27	43	132
14	26	59	22	14	11	41	112	79	30	26	52	109
15	41	54	18	13	11	53	115	89	31	23	55	93
16	88	52	83	13	11	79	116	102	27	21	55	87
17	309	52	110	13	11	130	112	100	25	25	55	97
18	494	50	103	12	11	176	110	96	26	29	55	97
19	1030	46	98	12	11	222	114	88	22	30	52	95
20	1320	43	86	12	11	245	123	75	18	25	37	88
21	963	39	73	12	11	241	160	62	19	26	36	82
22	676	37	67	12	12	245	324	54	24	21	36	83
23	497	34	54	12	12	254	982	50	26	17	67	94
24	360	34	50	12	13	250	1350	47	21	23	96	125
25	282	32	46	12	15	220	1020	49	25	27	103	167
26	222	33	40	12	17	236	757	47	95	23	89	167
27	186	34	36	12	24	267	553	40	133	26	80	160
28	166	34	33	12	21	285	407	35	219	28	74	150
29	141	34	31	12	---	264	318	32	259	27	70	132
30	133	34	29	12	---	215	262	34	229	24	58	133
31	119	---	28	12	---	189	---	71	---	25	46	---
TOTAL	7515	1767	1374	465	351	3893	8873	2371	2099	1521	1344	3905
MEAN	242	58.9	44.3	15.0	12.5	126	296	76.5	70.0	49.1	43.4	130
MAX	1320	114	110	27	24	285	1350	203	259	181	103	223
MIN	26	32	18	12	11	16	103	32	18	17	10	45
CFSM	2.37	.58	.43	.15	.12	1.24	2.90	.75	.69	.48	.43	1.28
IN.	2.74	.64	.50	.17	.13	1.42	3.24	.86	.77	.55	.49	1.42
AC-FT	14910	3500	2730	922	696	7720	17600	4700	4160	3020	2670	7750

CAL YR 1984	TOTAL	35691.4	MEAN 97.5	MAX 1320	MIN 4.5	CFSM .96	IN 13.02	AC-FT 70790
WTR YR 1985	TOTAL	35478.0	MEAN 97.2	MAX 1350	MIN 10	CFSM .95	IN 12.94	AC-FT 70370

05338500 SNAKE RIVER NEAR PINE CITY, MN

LOCATION.--Lat 45°50'30", long 92°56'00", in SE¼NW¼ sec.26, T.39 N., R.21 W., Pine County, Hydrologic Unit 07030004, on left bank, at site of former powerplant and dam, 0.5 mi (0.8 km) downstream from Cross Lake, and 1.5 mi (2.4 km) northeast of Pine City.

DRAINAGE AREA.--958 mi^2 (2,480 km^2).

PERIOD OF RECORD.--Water years 1963, 1965, 1967-68, 1975-83, 1985.

WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUC-TANCE (US/CM) (00095)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (90095)	PH (STAND-ARD UNITS) (00400)	PH LAB (STAND-ARD UNITS) (00403)	TEMPER-ATURE (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
AUG 27...	1715	484	190	191	8.5	7.9	19.0	9.5	750	900	89

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)	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)
AUG 27...	24	8.7	3.5	1.1	92	2.9	3.8	<.10	6.1	127

DATE	NITRO-GEN, NITRITE TOTAL (MG/L AS N) (00615)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	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)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	SEDI-MENT, SUS-PENDED (MG/L) (80154)
AUG 27...	<.01	<.10	.07	.90	.10	.04	370	10	12	10

05340050 SUNRISE RIVER NEAR LINDSTROM, MN

LOCATION.--Lat 45°27'00", long 92°53'10", in SW¼NE¼ sec.7, T.34 N., R.20 W., Chisago County, Hydrologic Unit 07030005, on left bank 20 ft downstream from highway bridge and 4.5 mi northwest of Lindstrom.

DRAINAGE AREA.--231 mi^2.

PERIOD OF RECORD.--July 1965 to September 1985 (discontinued).

GAGE.--Water-stage recorder. Datum of gage is 846.10 ft above National Geodetic Vertical Datum of 1929. (Chisago County bench mark).

REMARKS.--Estimated daily discharges: Nov. 18, Dec. 3-8, 13, 14, 16-20, Dec. 22 to Feb. 11, Feb. 13 to Mar. 1, 4-6. Records good except those for periods with ice effect, Nov. 18, Dec. 3-8, 13, 14, 16-20, Dec. 22 to Jan. 27, Feb. 12 and Feb. 26 to Mar. 1, 4-6, and periods of no gage-height record, Jan. 28 to Feb. 11, 13-25, which are fair. Some regulation by Minnesota Game and Fish Wildlife Refuge ponds above the station. At high stages a small part of flow discharges into the Rum River and Coon Creek basins from West Arm of Coon Lake and South Coon Lake, respectively.

AVERAGE DISCHARGE.--20 years, 101 ft^3/s, 5.94 in/yr; median of yearly mean discharges, 104 ft^3/s, 6.11 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 745 ft^3/s, July 3, 1975, gage height, 7.65 ft; minimum, 1.9 ft^3/s, Sept. 19, 20, 21, 1976; minimum gage height, 1.98 ft, Oct. 3, 1971.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 408 ft^3/s, Apr. 4, gage height, 6.60 ft; minimum discharge, 17 ft^3/s, Aug. 11, 12, gage height, 2.56 ft.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	41	233	89	94	36	48	357	310	118	63	29	38
2	43	220	87	90	36	54	340	297	114	57	54	44
3	45	206	86	86	35	58	338	283	109	56	44	83
4	46	199	83	83	35	59	397	270	107	56	37	83
5	46	192	81	80	34	61	373	257	106	73	32	47
6	46	182	80	77	34	62	342	239	102	63	29	60
7	55	175	78	74	33	64	325	225	102	66	27	73
8	68	168	76	71	33	65	309	210	99	77	46	107
9	71	160	74	69	33	70	294	203	97	52	42	191
10	73	148	72	66	32	77	285	194	95	64	24	255
11	72	143	72	64	32	89	273	188	100	58	17	261
12	71	139	72	62	32	99	268	188	100	54	35	258
13	70	135	72	59	32	108	305	183	97	59	67	257
14	75	131	70	58	31	123	323	174	93	59	57	270
15	80	128	67	56	31	141	314	174	90	48	42	278
16	93	100	85	54	31	186	298	180	85	63	59	280
17	140	108	110	52	31	230	289	178	84	56	43	287
18	152	107	130	51	31	245	283	174	96	53	40	288
19	198	106	128	49	31	266	274	170	168	50	40	284
20	240	127	122	48	31	289	270	163	173	46	42	280
21	245	138	112	47	31	312	267	159	147	38	44	262
22	251	133	110	45	31	328	271	157	117	34	41	251
23	249	127	107	44	31	336	289	157	87	32	27	262
24	251	121	105	43	32	345	379	154	72	38	25	289
25	262	117	104	42	33	342	377	147	93	37	24	287
26	268	117	106	42	35	336	351	139	103	35	24	274
27	270	113	115	40	38	343	332	130	91	35	25	262
28	271	107	110	39	42	355	327	123	81	28	29	258
29	260	99	106	39	---	375	321	117	73	28	33	266
30	249	92	102	38	---	367	318	112	67	28	35	285
31	238	---	97	37	---	357	---	124	---	28	37	---
TOTAL	4539	4271	2908	1799	927	6190	9489	5779	3066	1534	1150	6420
MEAN	146	142	93.8	58.0	33.1	200	316	186	102	49.5	37.1	214
MAX	271	233	130	94	42	375	397	310	173	77	67	289
MIN	41	92	67	37	31	48	267	112	67	28	17	38
CFSM	.63	.62	.41	.25	.14	.87	1.37	.81	.44	.21	.16	.93
IN.	.73	.69	.47	.29	.15	1.00	1.53	.93	.49	.25	.19	1.03
AC-FT	9000	8470	5770	3570	1840	12280	18820	11460	6080	3040	2280	12730

CAL YR 1984 TOTAL 53366 MEAN 146 MAX 417 MIN 10 CFSM .63 IN 8.59 AC-FT 105900
WTR YR 1985 TOTAL 48072 MEAN 132 MAX 397 MIN 17 CFSM .57 IN 7.74 AC-FT 95350

05340500 ST. CROIX RIVER AT ST. CROIX FALLS, WI
(National stream-quality accounting network station)

LOCATION.--Lat 45°24'25", long 92°38'49", in SW¼NW¼ sec.30, T.34 N., R.18 W., Polk County, Hydrologic Unit 07030005, St. Croix National Scenic Riverway, on left bank, 1,500 ft downstream from powerplant of Northern States Power Co., in St. Croix Falls, and at mile 52.2.

DRAINAGE AREA.--6,240 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--January 1902 to current year. Prior to January 1910, monthly discharge only, published in WSP 1308. Prior to October 1939, published as "near St. Croix Falls."

REVISED RECORDS.--WSP 1115: 1929. WDR WI-82-1: Drainage area.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 689.94 ft above National Geodetic Vertical Datum of 1929. Prior to July 1905, gage heights and discharge measurements were used by Loweth and Wolff, consulting engineers of St. Paul, Minn., to determine the flow. July 1905 to February 1940, records were computed from power generation at the St. Croix Falls Powerplant. February 1940 to Sept. 30, 1979, water-stage recorder at site 300 ft downstream at same datum.

REMARKS.--No estimated daily discharges: Records are good. Diurnal fluctuation caused by St. Croix Falls Powerplant 1,500 ft upstream. Satellite telemeter at station.

AVERAGE DISCHARGE.--83 years, 4,295 ft^3/s, 9.35 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 54,900 ft^3/s, May 8, 1950, gage height, 25.19 ft; minimum daily, 75 ft^3/s, July 17, 1910.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 27,600 ft^3/s, Apr.26, gage height, 12.96 ft; minimum daily, 957 ft^3/s, Dec. 4.

RATING TABLE (gage height, in feet, and discharge, in cubic feet per second).

2.1	838	6.0	10,700
2.5	1,400	9.0	18,200
3.0	2,350	12.0	25,400
4.0	4,950	13.0	27,600

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6300	9070	4270	3300	2730	3540	11600	17700	8330	13200	2900	2780
2	5570	8930	3580	3190	2600	3490	10400	15100	10900	11400	2930	3110
3	5290	8160	2430	3220	2610	3450	10500	13000	12000	9830	2830	4940
4	4740	8000	957	2400	2500	3090	11300	11300	11200	8550	2570	6420
5	4490	7690	2680	3190	2730	3190	11500	10100	9690	7810	2520	10700
6	4320	7100	2700	3200	2410	3280	12000	10600	8600	7520	2590	11000
7	4040	6850	1540	3570	2600	3080	11700	8320	7790	7220	2570	9890
8	4220	6650	2620	3050	1960	3500	11000	7000	7170	6840	2240	9000
9	4110	6750	3050	3070	2360	3230	10400	6590	6250	6050	3280	10200
10	4400	6660	3750	3220	2530	3480	9340	6690	5080	5450	2880	10300
11	4340	6340	3840	2970	2490	3770	8670	6580	4920	4020	2600	9810
12	4150	5930	4120	2930	2370	3900	8370	6790	4760	3560	3940	9070
13	3880	5630	4050	3100	2710	4300	8350	6670	4230	4180	5100	7860
14	3990	5630	3550	3080	2570	4730	8840	7150	3280	3430	5380	7690
15	4050	5450	3480	2830	1960	5180	8990	7450	4020	3730	6670	7150
16	4770	5140	3940	3050	2380	6160	9590	9770	3690	3480	5640	6630
17	6350	4900	5460	2100	2230	7140	9590	10900	3980	3160	5400	6490
18	8070	4490	6310	2670	2390	7360	9550	11200	4360	3310	4810	6300
19	12700	3560	6280	2950	2560	8980	9480	10600	4100	3890	4810	6360
20	16400	3180	5670	3040	2510	9660	10100	9820	3780	3940	4600	6500
21	20800	3880	5570	2180	2640	10400	10800	8900	4280	3930	3660	5830
22	22000	3950	5600	2650	2770	11200	11600	7710	3290	3580	3540	5670
23	20700	3930	5060	2760	2770	11300	14600	7230	3490	3480	3920	5920
24	19200	4560	4530	2730	3170	11000	18400	6890	3360	3770	3750	8170
25	17600	4450	3430	2250	3080	10900	24000	5710	3130	3480	4590	10100
26	15800	5550	4260	2830	3060	10900	27200	5570	5240	3970	3910	11500
27	14600	4620	3530	2590	3290	12500	27000	5400	12000	3800	4640	11400
28	12800	4410	4050	2730	3130	13500	25000	5510	13700	3410	4680	10500
29	11100	4370	3940	2510	---	13700	22200	5400	15100	3410	4420	9590
30	9960	4230	2780	2660	---	13300	19500	5460	14900	3100	4310	9080
31	8770	---	3610	2740	---	12600	---	5740	---	3330	2920	---
TOTAL	289510	170060	120637	88760	73110	225810	401570	262850	206620	159830	120600	239960
MEAN	9339	5669	3892	2863	2611	7284	13390	8479	6887	5156	3890	7999
MAX	22000	9070	6310	3570	3290	13700	27200	17700	15100	13200	6670	11500
MIN	3880	3180	957	2100	1960	3080	8350	5400	3130	3100	2240	2780
CFSM	1.50	.91	.62	.46	.42	1.17	2.15	1.36	1.10	.83	.62	1.28
IN.	1.73	1.01	.72	.53	.44	1.35	2.39	1.57	1.23	.95	.72	1.43
AC-FT	574200	337300	239300	176100	145000	447900	796500	521400	409800	317000	239200	476000

CAL YR 1984	TOTAL	2555037	MEAN	6981	MAX	34200	MIN	957	CFSM 1.12	IN 15.23	AC-FT	5068000
WTR YR 1985	TOTAL	2359317	MEAN	6464	MAX	27200	MIN	957	CFSM 1.04	IN 14.07	AC-FT	4680000

ST. CROIX RIVER BASIN

05340500 ST. CROIX RIVER AT ST. CROIX FALLS, WI--Continued
(National stream-quality accounting network station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1967-68, 1974 to current year.

REMARKS.--Letter K indicates non-ideal colony count.

WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (UMHOS) (00095)	TEMPER-ATURE (DEG C) (00010)
OCT 01...	1255	6320	142	6.0
NOV 07...	1305	6860	145	3.5
DEC 26...	1125	5780	142	1.0
JAN 07...	1330	3660	209	.0
FEB 27...	1035	5750	225	1.0
APR 01...	1240	11900	123	1.5
MAY 28...	1110	6630	140	18.0
JUL 22...	1205	5010	150	24.0
AUG 12...	1210	5690	165	20.5
SEP 13...	1300	7280	138	16.0

DATE	TIME	SPE-CIFIC CON-DUCT-ANCE LAB (UMHOS) (90095)	PH (STAND-ARD UNITS) (00400)	PH LAB (STAND-ARD UNITS) (00403)	TEMPER-ATURE, AIR (DEG C) (00020)	TUR-BID-ITY (NTU) (00076)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
OCT 01...	1255	141	8.0	7.8	19.5	1.2	752	33	45
JAN 07...	1330	198	7.6	7.3	-2.0	2.5	745	K12	K7
APR 01...	1240	115	7.7	7.2	4.0	3.0	749	260	K29
AUG 12...	1210	169	8.2	7.5	19.0	3.0	745	280	1700

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)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY FIELD (MG/L AS CACO3) (00410)	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)
OCT 01...	18	5.9	2.7	.90	65	64	5.5	3.5	<.10
JAN 07...	25	7.9	3.8	1.3	87	87	6.2	4.1	<.10
APR 01...	13	4.2	3.0	1.9	45	45	4.6	4.7	<.10
AUG 12...	21	6.9	2.9	.90	77	77	5.3	1.8	.10

05340500 ST. CROIX RIVER AT ST. CROIX FALLS, WI--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	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)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT										
01...	9.3	99	<.10	.05	.60	.03	.01	<.01	8	83
JAN										
07...	16	122	.32	.07	.40	.03	.02	.02	4	80
APR										
01...	7.7	82	<.10	<.01	.60	.05	.07	<.01	15	89
AUG										
12...	11	110	.14	.02	.60	.01	<.01	<.01	16	74

DATE	TIME	ALUM-INUM, DIS-SOLVED (UG/L AS AL) (01106)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE) (01010)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	COBALT, DIS-SOLVED (UG/L AS CO) (01035)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)
OCT											
01...	1255	<10	<1	19	<.5	<1	<1	<3	2	260	3
JAN											
07...	1330	20	<1	27	<.5	<1	3	<3	2	340	1
APR											
01...	1240	20	1	20	<.5	1	1	<3	2	470	<1
AUG											
12...	1210	30	<1	21	<.5	<1	1	<3	2	62	<1

DATE	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										
01...	<4	13	<.1	<10	4	<1	<1	37	<6	67
JAN										
07...	<4	18	.2	<10	<1	<1	<1	46	<6	3
APR										
01...	16	15	<.1	<10	1	<1	<1	26	<6	11
AUG										
12...	<4	3	<.1	<10	3	<1	<1	45	<6	<3

MISSISSIPPI RIVER MAIN STEM

05344500 MISSISSIPPI RIVER AT PRESCOTT, WI

LOCATION.--Lat 44°44'45", long 92°48'00", in sec.9, T.26 N., R.20 W., Pierce County, Hydrologic Unit 07040001, on left bank at Prescott, 200 ft downstream from St. Croix River, 300 ft south of Chicago, Burlington & Quincy Railroad bridge, 800 ft south of bridge on U.S. Highway 10, and at mile 811.4 upstream from Ohio River.

DRAINAGE AREA.--44,800 mi^2, approximately.

PERIOD OF RECORD.--June 1928 to current year.

REVISED RECORDS.--WSP 1508: 1941. WRD MN-74: 1973.

GAGE.--Water-stage recorder. Datum of gage is 649.50 ft above National Geodetic Vertical Datum of 1929. Prior to Aug. 2, 1932, nonrecording gage at railroad bridge 300 ft upstream at following datums: June 3, 1928, to Sept. 30, 1929, 19.27 ft higher; Oct. 1, 1929, to Sept. 30, 1930, 17.68 ft higher; Oct. 1, 1930, to Aug. 1, 1932, 19.28 ft higher. Aug. 2, 1932, to Oct. 30, 1938, water-stage recorder at present site at datum 19.28 ft higher; Nov. 1, 1938, to Sept. 7, 1971, water-stage recorder at present site at datum 50.00 ft lower. Auxiliary water-stage recorder 10.7 mi downstream from base gage.

REMARKS.--No estimated daily discharges. Records good. Some regulation by reservoirs, navigation dams, and powerplants at low and medium stages. Flood flow not materially affected by artificial storage.

AVERAGE DISCHARGE.--57 years, 17,000 ft^3/s, 5.15 in/yr; median of yearly mean discharges, 15,960 ft^3/s, 4.84 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 228,000 ft^3/s, Apr. 18, 1965, gage height, 43.11 ft; minimum daily, 1,380 ft^3/s, July 13, 1940; minimum gage height, 15.08 ft, Aug. 29, 1934, present datum.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 73,400 ft^3/s, Apr. 30, gage height, 33.54 ft; minimum daily, 8,390 ft^3/s, Feb. 10; minimum gage height, 24.78 ft, Oct. 6.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15000	40800	19900	15100	9900	12200	57300	72500	30500	39200	21000	17500
2	14100	37900	19200	15100	10100	12200	55100	71400	32500	40500	20600	17300
3	14400	35600	18400	15000	9790	13000	52500	69300	33600	39600	20000	17300
4	11000	34300	17000	14800	9540	12800	51000	66600	34800	39000	18600	19600
5	10700	32700	12200	14900	10300	12500	50500	64000	36700	37800	18100	22800
6	10700	30700	11800	14700	9130	11600	49800	60400	36400	36200	17500	24100
7	10300	29800	11600	13900	9410	12600	49600	57900	35700	34800	17200	25600
8	9770	29600	10600	14300	9240	12800	48300	54500	34400	33600	17400	27800
9	10500	29400	12100	13500	8860	13300	46800	49700	33100	31500	15400	29400
10	11100	28900	14200	13400	8390	12400	44900	46600	31500	29200	16100	31600
11	10900	27600	16400	12300	9240	12600	43100	43100	30400	27000	16100	34100
12	11400	26900	17900	13000	9310	12800	41800	40700	29700	26200	14400	34400
13	11300	26300	17500	12200	8620	13100	40500	38000	28800	24600	17200	34000
14	10600	26000	16500	12100	9070	14800	38800	36100	28000	23900	22000	33700
15	11300	25900	15900	12500	9160	20900	36600	35900	28500	22000	20500	33000
16	11100	25200	16000	12400	9290	25100	35200	36600	28400	22100	21200	32200
17	11500	24800	18700	12300	8420	29800	34100	38300	28400	21000	20300	32100
18	16600	23700	20100	12200	8900	35200	33200	40800	28800	19500	20800	32100
19	21000	22700	20700	12300	9370	41800	32200	43000	28600	19300	21300	31000
20	30300	20800	19700	11700	9430	48000	30900	43700	28000	18900	20200	31100
21	36400	18800	19600	10500	8860	55100	30700	43300	27100	19000	19700	30600
22	43700	17600	18900	11000	10100	61000	31600	42200	26900	20000	18600	30000
23	48500	18400	20400	10900	10200	65000	33100	40600	26200	20100	17900	30200
24	50900	19800	18600	11100	9940	66600	37500	39200	24900	20500	17400	30500
25	52400	20300	17400	10900	10400	66400	45500	37500	23500	20900	17100	31000
26	52800	19800	16600	10900	11500	65900	55000	35500	22400	21700	17300	31500
27	52600	20600	17500	10300	11700	64900	64400	33400	24400	22700	17600	32400
28	52000	20900	17200	10200	12200	63900	69500	32100	28900	21800	17100	32500
29	48900	20900	17100	10300	---	62600	71800	30100	32900	21400	17100	31600
30	46500	20500	16900	10100	---	60800	73000	29200	36300	22800	17500	31200
31	43200	---	15100	10400	---	59700	---	29600	---	22100	17100	---
TOTAL	791470	777200	521700	384300	270370	1071400	1384300	1401800	900300	818900	570300	872200
MEAN	25530	25910	16830	12400	9656	34560	46140	45220	30010	26420	18400	29070
MAX	52800	40800	20700	15100	12200	66600	73000	72500	36700	40500	22000	34400
MIN	9770	17600	10600	10100	8390	11600	30700	29200	22400	18900	14400	17300
CFSM	.57	.58	.38	.28	.22	.77	1.03	1.01	.67	.59	.41	.65
IN.	.66	.65	.43	.32	.22	.89	1.15	1.16	.75	.68	.47	.72
AC-FT	1570000	1542000	1035000	762300	536300	2125000	2746000	2780000	1786000	1624000	1131000	1730000

CAL YR 1984 TOTAL 11154380 MEAN 30480 MAX 90700 MIN 7940 CFSM .68 IN 9.26 AC-FT 22120000
WTR YR 1985 TOTAL 9764240 MEAN 26750 MAX 73000 MIN 8390 CFSM .60 IN 8.11 AC-FT 19370000

VERMILLION RIVER BASIN

05345000 VERMILLION RIVER NEAR EMPIRE, MN

LOCATION.--Lat 44°40'00", long 93°03'17", in SW¼NW¼ sec.24, T.114 N., R.19 W., Dakota County, Hydrologic Unit 07040001, on right bank and just downstream from County Road 79, 2 mi west of Empire and 4 mi northeast of Farmington.

DRAINAGE AREA.--110 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1942 to June 1945 (no record during July, August, and September 1944), September 1969 to September 1973 (discharge measurements only), October 1973 to current year. Prior to October 1975 published as "near Empire City".

GAGE.--Water-stage recorder. Datum of gage is 851.99 ft above National Geodetic Vertical Datum of 1929 (levels by Corps of Engineers). April 12, 1942, to June 30, 1944, and October 1, 1944, to July 7, 1945, nonrecording gage at same site and present datum.

REMARKS.--Estimated daily discharges: Dec. 2-15, 24, 25, Jan. 1-3, 12, 15, 19-23, 25-28, Jan. 30 to Feb. 8, 14, 15, and Mar.6; Records good. Some regulation at low flow by sewage plant upstream.

AVERAGE DISCHARGE.--13 years (water years 1943, 1974-85), 52.6 ft^3/s, 6.49 in/yr, 38,110 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,030 ft^3/s, Sept. 18, 1942; maximum gage height, 7.72 ft, Aug. 8, 1984; minimum daily discharge, 8.4 ft^3/s, Jan. 15, 1975; minimum gage height, 1.63 ft, Oct. 14, 1976.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in April 1965, reached a stage of 7.5 ft, from information by local resident, discharge 6,200 ft^3/s, from rating extended above 2,100 ft^3/s.

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)
Oct. 18	0415	226	5.53	Apr. 4	2015	207	5.19
Mar. 14	1415	*500	*6.59				

Minimum discharge, 22 ft^3/s, Aug. 9, gage height, 2.05 ft.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	45	85	54	49	41	110	116	82	56	40	29	35
2	46	79	52	47	40	115	124	78	54	39	28	34
3	45	75	49	46	38	105	159	76	50	38	28	40
4	44	75	47	45	35	164	200	77	48	38	27	41
5	47	72	45	44	34	94	193	76	47	36	30	37
6	47	69	43	45	33	56	160	75	46	36	28	36
7	55	69	42	45	33	48	132	74	46	35	26	35
8	61	69	41	43	32	53	115	68	43	35	25	34
9	58	68	40	43	32	67	104	69	40	35	26	35
10	56	88	40	43	31	126	100	67	40	33	28	33
11	55	86	42	42	32	290	97	69	42	31	27	32
12	54	77	46	42	32	399	99	71	43	31	45	31
13	53	72	41	43	32	449	136	68	41	30	50	31
14	52	73	40	43	32	485	134	69	40	32	37	30
15	64	72	40	42	32	396	121	81	49	32	34	30
16	98	64	87	40	32	356	108	84	44	30	33	32
17	184	63	127	40	31	336	98	78	63	29	35	31
18	218	62	109	40	32	277	93	73	63	30	34	30
19	191	59	82	38	32	237	89	69	48	28	31	30
20	178	57	71	35	33	202	83	66	44	27	31	35
21	147	57	65	36	66	170	85	64	44	26	31	32
22	111	57	59	37	126	148	104	58	56	26	30	38
23	95	57	56	38	106	134	132	55	52	25	48	46
24	87	57	54	37	72	139	143	54	48	32	42	69
25	82	59	51	37	64	134	126	52	44	37	36	62
26	80	63	50	37	65	126	108	49	44	31	34	53
27	81	63	50	36	57	140	98	47	45	30	33	46
28	88	60	59	36	68	149	92	46	43	29	35	42
29	91	58	60	35	---	162	88	48	42	29	44	47
30	83	56	50	35	---	150	86	49	41	29	43	68
31	78	---	50	41	---	130	---	63	---	31	37	---
TOTAL	2674	2021	1742	1260	1293	5947	3523	2055	1406	990	1045	1175
MEAN	86.3	67.4	56.2	40.6	46.2	192	117	66.3	46.9	31.9	33.7	39.2
MAX	218	88	127	49	126	485	200	84	63	40	50	69
MIN	44	56	40	35	31	48	83	46	40	25	25	30
CFSM	.79	.61	.51	.37	.42	1.75	1.06	.60	.43	.29	.31	.36
IN.	.90	.68	.59	.43	.44	2.01	1.19	.69	.48	.33	.35	.40
AC-FT	5300	4010	3460	2500	2560	11800	6990	4080	2790	1960	2070	2330

CAL YR 1984 TOTAL 31976 MEAN 87.4 MAX 571 MIN 30 CFSM .80 IN 10.81 AC-FT 63420
WTR YR 1985 TOTAL 25131 MEAN 68.9 MAX 485 MIN 25 CFSM .63 IN 8.50 AC-FT 49850

VERMILLION RIVER BASIN

05345000 VERMILLION RIVER NEAR EMPIRE, MN--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1973 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: February 1974 to current year.
pH: February 1974 to current year.
WATER TEMPERATURES: February 1974 to current year.
DISSOLVED OXYGEN: February 1974 to current year.

INSTRUMENTATION.--Water quality monitor since February 1974.

REMARKS.--Water is pumped to a monitor that is inside a heated shelter; water temperature during the winter may be affected. Extremes are for those years with 80 percent or more record unless a maximum or minimum was set.

COOPERATION.--Water-quality monitor is operated by the Metropolitan Waste Control Commission, St. Paul, MN. Monitor data was furnished by the Commission.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE (water years 1979-82, 1984-85): Maximum, 997 microsiemens Jan. 7, 1982; minimum, 236 microsiemens June 8, 1980.
pH (water years 1979-82): Maximum, 9.3 units Nov. 11, 1978; minimum, 6.7 units Mar. 20, 1980.
WATER TEMPERATURES (water years 1979-82, 1984-85): Maximum, 30.0°C July 13, 1984; minimum 0.0°C many days during winter period.
DISSOLVED OXYGEN (water years 1979-82, 1984-85): Maximum, 16.0 mg/L Apr. 18, 1985; minimum, 1.5 mg/L Nov. 14, 1979.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum, 962 microsiemens Sep. 19; minimum, 241 microsiemens Mar. 12.
WATER TEMPERATURES: Maximum, 26.1°C July 7; minimum, 0.1°C several days during winter period.
DISSOLVED OXYGEN: Maximum 16.0 mg/L Apr. 18; minimum 5.8 mg/L Sep. 20.

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	676	611	637	666	634	652	656	611	635	---	---	---
2	693	619	649	645	617	634	642	590	618	---	---	---
3	706	630	666	674	633	650	629	591	610	---	---	---
4	697	636	658	678	640	658	630	590	613	---	---	---
5	676	629	654	664	617	638	633	599	614	---	---	---
6	688	626	657	661	619	636	640	586	617	---	---	---
7	675	606	642	668	629	648	650	609	628	---	---	---
8	648	581	622	680	643	664	670	627	645	---	---	---
9	---	---	---	667	633	653	669	622	647	---	---	---
10	---	---	---	635	589	607	666	616	645	---	---	---
11	684	625	654	633	599	613	681	633	654	---	---	---
12	701	642	671	640	604	623	674	613	645	---	---	---
13	722	657	683	666	630	647	654	612	634	---	---	---
14	714	669	689	688	645	667	646	609	630	---	---	---
15	---	---	---	677	624	651	673	616	641	---	---	---
16	---	---	---	658	601	632	676	475	594	---	---	---
17	---	---	---	680	629	650	535	472	506	---	---	---
18	476	452	461	666	603	630	567	533	554	---	---	---
19	488	472	480	644	604	628	---	---	---	---	---	---
20	497	472	485	649	605	628	---	---	---	---	---	---
21	522	496	505	663	616	636	---	---	---	---	---	---
22	---	---	---	667	631	647	---	---	---	609	573	590
23	---	---	---	661	609	637	---	---	---	621	565	590
24	---	---	---	682	624	656	---	---	---	627	566	601
25	---	---	---	681	643	662	---	---	---	672	564	609
26	596	557	580	---	---	---	---	---	---	620	568	592
27	619	582	604	---	---	---	---	---	---	628	575	601
28	598	534	560	642	602	623	---	---	---	633	578	607
29	669	527	607	654	611	631	---	---	---	647	588	619
30	683	661	669	661	615	640	---	---	---	644	584	611
31	673	645	662	---	---	---	---	---	---	669	604	628

VERMILLION RIVER BASIN

05345000 VERMILLION RIVER NEAR EMPIRE, MN--Continued

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	683	587	616	636	549	583	528	473	495	705	632	650
2	634	587	614	589	526	553	544	498	518	712	623	647
3	639	582	614	---	---	---	540	505	523	676	640	658
4	641	590	615	659	608	631	526	497	508	686	580	657
5	624	590	606	658	613	641	527	494	504	688	636	659
6	629	587	607	663	619	643	540	510	522	677	623	644
7	661	595	623	717	659	680	574	523	535	686	644	662
8	646	600	622	714	659	687	550	518	533	706	648	674
9	671	591	609	695	640	672	576	522	546	737	667	692
10	674	598	622	652	492	552	602	554	574	718	680	699
11	803	629	728	491	243	337	624	578	595	722	663	692
12	799	754	772	258	241	247	644	592	612	688	619	659
13	806	746	772	256	244	250	595	530	574	667	620	640
14	802	714	761	266	254	259	577	562	568	668	624	648
15	816	720	766	---	---	---	632	565	594	638	589	612
16	815	742	772	313	301	306	643	585	610	638	598	611
17	829	747	789	335	301	315	647	580	609	675	598	629
18	826	764	795	411	319	369	719	638	670	689	631	655
19	810	726	774	445	408	425	744	679	693	719	643	669
20	813	751	775	473	441	454	727	658	689	700	630	667
21	933	664	762	497	458	475	712	654	688	691	632	657
22	661	561	592	520	481	497	704	645	668	717	643	674
23	640	575	595	509	438	498	688	629	657	722	650	681
24	676	636	653	---	---	---	645	613	628	746	656	696
25	715	625	661	509	490	498	647	615	629	735	688	706
26	664	623	640	541	498	517	682	606	619	711	669	690
27	688	626	650	545	523	534	638	604	616	740	648	689
28	684	630	651	530	507	518	655	601	629	806	688	748
29	---	---	---	515	498	506	682	634	651	788	726	761
30	---	---	---	518	493	505	681	634	661	820	744	779
31	---	---	---	513	473	488	---	---	---	783	665	722
MONTH	933	561	680	---	---	---	744	473	597	820	580	675

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	736	691	714	765	648	700	---	---	---	910	812	850
2	753	683	706	781	688	709	863	807	830	906	792	834
3	776	706	744	763	671	713	946	811	839	838	765	750
4	767	712	746	768	689	721	905	778	842	811	740	776
5	821	726	759	759	670	711	889	755	828	869	761	802
6	808	744	772	778	678	729	910	790	834	---	---	---
7	880	738	791	808	703	759	938	791	849	---	---	---
8	886	800	832	825	700	746	903	818	853	910	755	851
9	853	794	821	771	683	717	---	---	---	891	774	829
10	832	716	765	758	675	706	---	---	---	861	777	805
11	741	688	716	751	668	701	---	---	---	855	779	804
12	788	690	725	784	665	707	---	---	---	860	769	798
13	795	722	751	751	675	707	740	642	684	863	761	792
14	765	718	742	737	647	699	---	---	---	845	730	766
15	738	658	694	767	667	711	831	715	761	811	728	768
16	764	696	725	789	683	724	838	743	781	876	767	816
17	729	523	621	811	725	762	---	---	---	942	820	874
18	697	542	592	836	710	771	---	---	---	957	857	903
19	706	606	645	842	746	784	---	---	---	962	878	918
20	723	632	668	876	735	778	---	---	---	894	757	821
21	732	658	695	851	725	774	---	---	---	824	741	779
22	---	---	---	---	---	---	---	---	---	825	712	773
23	---	---	---	961	839	890	---	---	---	826	637	729
24	---	---	---	915	731	815	---	---	---	704	620	652
25	789	676	722	797	722	748	---	---	---	664	618	644
26	751	692	721	883	751	820	845	708	773	728	642	685
27	713	661	688	880	780	822	905	726	823	752	676	705
28	716	656	677	872	787	825	902	811	858	730	658	696
29	703	625	661	871	784	823	872	756	823	718	652	687
30	729	643	677	---	---	---	907	790	829	725	626	655
31	---	---	---	---	---	---	895	823	847	---	---	---

VERMILLION RIVER BASIN

05345000 VERMILLION RIVER NEAR EMPIRE, MN--Continued

PH (STANDARD UNITS), WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	7.6	7.3	7.4	8.3	7.6	7.9	7.9	7.8	7.9			
2	7.6	7.5	7.6	7.7	7.5	7.6	7.9	7.7	7.8			
3	7.8	7.5	7.5	7.9	7.7	7.8	8.0	7.8	7.9			
4	7.6	7.5	7.6	7.9	7.7	7.8	8.0	7.8	7.9			
5	8.2	7.5	7.8	8.1	7.7	7.9	8.0	7.9	8.0			
6	---	---	---	8.2	8.1	8.2	8.1	7.9	8.0			
7	---	---	---	8.3	8.2	8.2	8.2	8.0	8.1			
8	---	---	---	8.3	8.2	8.2	8.2	8.0	8.1			
9	---	---	---	8.2	8.1	8.2	8.1	7.9	8.0			
10	---	---	---	8.2	8.0	8.1	8.1	7.9	8.0			
11	---	---	---	8.0	7.8	7.9	8.1	8.0	8.0			
12	---	---	---	7.8	7.7	7.8	8.1	7.9	8.0			
13	---	---	---	7.8	7.7	7.8	8.0	7.7	7.9			
14	---	---	---	7.8	7.7	7.8	8.0	7.7	7.8			
15	---	---	---	7.7	7.5	7.6	7.9	7.7	7.8			
16	---	---	---	7.6	7.5	7.5	7.9	7.8	7.9			
17	---	---	---	7.7	7.5	7.6	8.1	7.8	7.9			
18	---	---	---	7.6	7.5	7.6	8.2	8.0	8.1			
19	---	---	---	7.6	7.5	7.5	---	---	---			
20	---	---	---	7.6	7.5	7.6	---	---	---			
21	---	---	---	7.7	7.5	7.6	---	---	---			
22	---	---	---	7.7	7.6	7.7	---	---	---			
23	---	---	---	7.8	7.7	7.7	---	---	---			
24	---	---	---	7.9	7.8	7.8	---	---	---			
25	---	---	---	7.9	7.8	7.8	---	---	---			
26	8.1	7.8	8.0	---	---	---	---	---	---			
27	---	---	---	---	---	---	---	---	---			
28	8.4	7.9	8.0	7.9	7.7	7.8	---	---	---			
29	8.1	7.9	8.0	7.9	7.7	7.8	---	---	---			
30	8.1	8.0	8.1	7.9	7.8	7.9	---	---	---			
31	8.3	8.1	8.2	---	---	---	---	---	---			

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	---	---	---	7.9	7.8	7.8	8.2	7.9	8.0	8.7	8.1	8.2
2	---	---	---	7.9	7.8	7.8	8.0	7.9	7.9	9.2	8.0	8.2
3	---	---	---	---	---	---	9.0	7.8	8.0	8.8	8.0	8.1
4	---	---	---	7.8	7.8	7.8	8.3	7.8	7.9	8.6	8.0	8.1
5	---	---	---	8.4	7.8	8.0	8.1	7.8	7.9	8.3	8.0	8.1
6	---	---	---	8.8	8.0	8.2	8.0	7.8	7.9	8.7	8.0	8.1
7	---	---	---	8.2	8.0	8.1	8.6	7.9	8.0	8.2	8.0	8.1
8	---	---	---	8.1	8.0	8.1	8.4	7.9	8.0	8.2	8.0	8.1
9	---	---	---	8.1	8.0	8.0	8.6	7.9	8.0	8.7	8.0	8.1
10	---	---	---	8.6	7.7	7.9	8.2	7.9	8.0	8.4	8.0	8.1
11	---	---	---	8.1	7.5	7.7	8.6	7.9	7.9	8.2	8.0	8.1
12	---	---	---	7.6	7.4	7.5	8.0	7.8	7.9	8.6	8.0	8.1
13	---	---	---	8.0	7.4	7.5	8.0	7.7	7.8	8.3	8.1	8.2
14	---	---	---	8.1	7.5	7.5	8.8	7.8	7.9	8.2	8.0	8.1
15	---	---	---	8.2	7.5	7.7	9.2	7.8	8.0	8.1	7.9	8.0
16	---	---	---	7.9	7.6	7.7	8.0	7.8	7.9	8.1	8.0	8.1
17	---	---	---	7.7	7.6	7.6	8.0	7.8	8.0	8.2	8.1	8.1
18	---	---	---	8.1	7.7	7.7	8.0	7.8	7.9	9.3	8.1	8.3
19	8.0	7.6	7.7	8.0	7.7	7.8	8.0	7.8	7.8	8.4	8.0	8.1
20	7.7	7.5	7.6	8.0	7.8	7.9	8.0	7.8	7.9	8.4	8.1	8.2
21	7.5	7.2	7.3	8.3	7.9	7.9	8.0	7.8	7.9	8.2	8.1	8.1
22	7.2	7.0	7.1	8.3	7.9	8.0	8.5	7.7	7.9	8.1	8.1	8.1
23	7.5	7.0	7.1	8.0	7.9	8.0	7.9	7.7	7.8	8.1	8.0	8.0
24	7.4	7.2	7.3	---	---	---	7.9	7.8	7.8	8.1	8.0	8.0
25	7.9	7.3	7.6	8.1	8.0	8.0	8.1	7.8	7.9	8.4	8.0	8.1
26	7.9	7.8	7.9	8.1	8.0	8.1	8.0	7.9	7.9	8.3	8.0	8.1
27	8.0	7.8	7.9	8.1	8.0	8.0	8.2	7.9	8.0	8.2	8.1	8.1
28	8.0	7.8	7.9	8.1	7.8	8.0	8.5	7.8	8.0	8.2	8.1	8.1
29	---	---	---	8.1	8.0	8.1	8.5	7.9	8.1	8.3	8.1	8.1
30	---	---	---	8.2	8.1	8.1	---	---	---	8.2	8.1	8.1
31	---	---	---	8.5	8.1	8.2	---	---	---	8.2	8.0	8.0
MONTH	---	---	---	---	---	---	---	---	---	9.3	7.9	8.1

VERMILLION RIVER BASIN

05345000 VERMILLION RIVER NEAR EMPIRE, MN--Continued

PH (STANDARD UNITS), WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	8.1	8.0	8.1	8.5	7.9	8.1	---	---	---	8.1	7.9	8.0
2	8.5	8.1	8.1	8.9	8.0	8.2	8.3	8.0	8.1	8.1	7.8	8.0
3	8.2	8.0	8.1	8.2	8.0	8.1	8.3	8.1	8.2	8.0	7.9	8.1
4	8.1	7.8	8.1	8.4	8.0	8.1	8.3	8.1	8.2	8.0	7.9	8.0
5	8.3	8.1	8.1	8.2	8.0	8.1	8.3	8.1	8.2	8.1	7.9	8.0
6	8.2	8.0	8.1	8.4	7.9	8.0	8.4	8.1	8.2	---	---	---
7	8.1	8.0	8.1	8.4	7.9	8.0	8.3	8.1	8.2	---	---	---
8	8.1	8.0	8.1	8.5	7.8	8.0	8.3	8.1	8.2	8.1	7.8	7.9
9	8.2	8.0	8.1	8.9	7.9	8.0	---	---	---	8.1	7.9	8.0
10	8.2	8.0	8.1	8.7	7.9	8.1	---	---	---	8.2	8.0	8.1
11	8.1	8.1	8.1	8.2	7.9	8.0	---	---	---	8.2	8.0	8.1
12	8.4	8.0	8.1	8.1	7.9	8.0	---	---	---	8.2	8.0	8.1
13	8.7	8.0	8.2	8.3	7.9	8.0	8.1	7.8	7.9	8.2	8.0	8.2
14	8.3	8.0	8.1	8.3	7.9	8.1	---	---	---	8.3	8.1	8.2
15	8.6	7.9	8.1	8.3	8.0	8.1	8.2	8.1	8.1	8.4	8.1	8.3
16	8.7	7.9	8.1	8.2	7.9	8.1	8.4	8.0	8.1	8.4	8.1	8.3
17	8.4	7.7	7.9	8.2	7.9	8.1	---	---	---	8.2	8.1	8.1
18	8.4	7.8	7.9	8.6	7.9	8.1	---	---	---	8.2	8.1	8.1
19	8.2	7.9	8.0	8.4	7.9	8.0	---	---	---	8.2	8.0	8.1
20	8.1	7.9	8.0	8.4	7.9	8.0	---	---	---	8.3	8.0	8.1
21	8.1	8.1	8.0	8.7	7.9	8.1	---	---	---	8.3	8.1	8.2
22	---	---	---	---	---	---	---	---	---	8.2	8.0	8.1
23	---	---	---	8.4	8.1	8.3	---	---	---	8.2	8.0	8.1
24	---	---	---	8.2	7.9	8.1	---	---	---	8.2	8.1	8.1
25	8.0	7.9	8.0	8.2	7.9	8.1	---	---	---	8.2	8.1	8.2
26	8.0	7.9	8.0	8.3	8.1	8.2	8.1	8.0	8.1	8.3	8.1	8.2
27	8.0	7.9	8.0	8.4	8.1	8.2	8.1	7.9	8.0	8.3	8.2	8.3
28	8.1	8.0	8.0	8.3	8.2	8.2	8.0	7.9	7.9	8.4	8.3	8.3
29	8.1	8.0	8.0	8.3	8.3	8.2	7.9	7.8	7.8	8.4	8.2	8.3
30	8.4	7.9	8.1	---	---	---	8.1	7.8	7.9	8.3	8.1	8.2
31	---	---	---	---	---	---	8.1	7.9	8.0	---	---	---

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	9.7	5.8	7.6	4.1	1.2	3.0	2.5	1.4	2.1	---	---	---
2	11.0	7.0	8.9	1.2	0.1	0.4	1.4	0.1	0.6	---	---	---
3	11.1	8.0	9.4	3.5	0.6	1.8	1.4	0.1	0.6	---	---	---
4	10.8	7.9	9.2	3.3	2.7	3.0	1.8	0.3	0.9	---	---	---
5	11.2	8.7	9.8	3.8	2.2	2.9	2.0	0.2	1.1	---	---	---
6	11.1	10.1	10.7	4.4	1.9	3.0	0.9	0.1	0.4	---	---	---
7	11.3	10.7	11.0	5.8	3.5	4.4	3.9	0.6	2.2	---	---	---
8	11.8	10.7	11.3	6.5	4.7	5.5	5.1	3.4	4.2	---	---	---
9	11.8	11.1	11.5	5.3	3.6	4.5	5.5	4.2	4.9	---	---	---
10	13.2	10.8	11.8	3.5	1.8	2.5	5.1	2.0	3.2	---	---	---
11	13.2	12.1	12.5	2.3	1.0	1.7	3.5	2.1	2.7	---	---	---
12	13.8	12.1	13.0	2.2	0.7	1.5	3.3	0.6	1.9	---	---	---
13	14.1	11.4	12.6	3.5	1.7	2.7	1.2	0.3	0.7	---	---	---
14	12.9	11.7	12.2	4.8	3.2	4.0	1.8	0.1	0.7	---	---	---
15	15.6	8.0	12.4	4.5	0.1	2.3	2.9	0.8	1.6	---	---	---
16	8.5	7.4	8.0	0.8	0.1	0.3	3.5	0.1	2.2	---	---	---
17	7.6	5.1	6.0	2.5	0.3	1.4	0.6	0.1	0.2	---	---	---
18	6.2	5.7	5.9	1.6	0.1	0.6	1.0	0.1	0.5	---	---	---
19	6.3	4.6	5.5	2.0	0.1	0.9	---	---	---	---	---	---
20	4.8	3.1	4.1	1.7	0.1	0.9	---	---	---	---	---	---
21	---	---	---	2.2	0.5	1.4	---	---	---	---	---	---
22	---	---	---	3.2	1.5	2.4	---	---	---	0.1	0.1	0.1
23	---	---	---	3.6	1.3	2.6	---	---	---	1.7	0.1	0.6
24	---	---	---	4.6	2.4	3.6	---	---	---	2.3	0.1	1.5
25	---	---	---	5.0	3.8	4.5	---	---	---	0.1	0.1	0.1
26	9.3	6.5	8.5	---	---	---	---	---	---	0.3	0.1	0.1
27	11.5	9.1	10.2	---	---	---	---	---	---	1.4	0.2	0.7
28	9.2	5.1	6.7	2.6	1.6	2.0	---	---	---	2.1	0.1	0.8
29	5.9	3.8	4.9	2.9	1.4	2.1	---	---	---	3.1	0.8	1.9
30	5.9	4.1	5.4	2.8	2.1	2.5	---	---	---	2.8	0.2	1.1
31	4.1	2.9	3.7	---	---	---	---	---	---	0.3	0.1	0.2

VERMILLION RIVER BASIN

05345000 VERMILLION RIVER NEAR EMPIRE, MN--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	0.3	0.1	0.2	2.4	0.2	1.3	6.3	0.2	3.1	16.8	12.6	14.6
2	2.3	0.2	0.2	0.6	0.1	0.2	7.6	4.0	5.6	17.3	12.9	15.0
3	0.3	0.2	0.3	---	---	---	8.8	5.1	7.0	17.2	14.1	15.6
4	0.4	0.2	0.3	0.1	0.1	0.1	8.1	6.5	7.1	18.1	13.5	15.8
5	1.3	0.2	0.6	3.3	0.1	1.1	7.2	4.9	6.1	17.1	14.5	15.5
6	2.2	0.3	0.8	2.5	0.2	1.4	8.8	5.1	6.6	17.3	12.6	14.9
7	2.3	0.3	0.8	5.9	2.5	4.0	8.1	5.6	6.9	18.4	13.8	15.9
8	1.7	0.2	0.7	6.3	2.7	4.4	7.7	4.8	6.3	18.7	13.6	16.1
9	1.8	0.6	1.0	6.5	2.8	4.4	9.0	4.7	6.8	21.2	15.7	18.3
10	3.3	1.8	2.5	4.2	1.1	2.7	11.9	6.9	9.3	21.1	17.9	19.5
11	2.3	0.4	1.6	1.8	0.3	0.6	13.1	9.3	11.1	21.4	17.5	18.5
12	1.8	0.1	0.6	1.6	0.3	0.7	15.1	10.6	12.8	18.1	14.6	16.3
13	2.1	0.1	1.0	3.2	0.3	1.5	13.9	9.6	11.5	15.3	11.1	13.6
14	1.2	0.1	0.2	3.5	0.4	1.9	10.1	8.3	9.1	14.0	12.5	13.1
15	0.7	0.1	0.2	5.3	0.4	2.7	13.4	8.0	10.5	13.0	12.1	12.3
16	2.7	0.1	1.2	5.6	0.4	3.8	14.9	8.5	10.3	12.4	11.6	11.9
17	3.9	0.6	2.0	5.3	1.6	3.4	13.6	7.2	10.3	15.4	9.9	12.5
18	3.6	1.5	2.5	5.0	1.3	3.4	18.1	12.4	15.0	17.3	12.4	14.7
19	3.5	0.4	1.8	6.0	2.9	4.5	19.5	15.6	17.3	18.8	13.9	16.0
20	4.6	1.7	3.1	6.5	3.9	5.2	19.0	15.2	17.0	16.6	12.5	14.5
21	3.6	0.6	2.1	6.9	3.6	5.3	19.4	15.1	17.1	16.6	11.5	14.0
22	0.6	0.1	0.1	7.8	4.8	6.2	17.5	15.5	16.1	17.5	12.2	14.7
23	1.0	0.1	0.3	6.4	5.0	5.7	16.8	14.7	15.6	15.5	13.0	14.1
24	1.8	0.4	1.1	---	---	---	14.8	12.1	13.6	18.4	12.1	15.0
25	1.5	0.3	1.1	3.6	2.8	3.3	13.4	11.7	12.6	18.0	14.1	16.1
26	1.4	0.1	0.8	7.9	3.2	5.2	12.2	10.6	11.3	16.4	13.7	15.1
27	2.0	0.1	0.8	8.0	6.9	7.5	11.7	9.8	10.7	17.5	11.5	14.4
28	4.0	0.1	1.8	6.5	5.4	5.9	15.6	9.9	12.6	16.0	12.6	14.4
29	---	---	---	5.5	4.2	5.0	17.4	12.6	14.9	15.8	12.8	14.0
30	---	---	---	5.3	2.9	4.1	16.6	14.4	15.4	19.0	13.1	15.9
31	---	---	---	4.4	0.8	2.3	---	---	---	17.3	14.3	15.8
MONTH	4.6	0.1	1.1	---	---	---	19.5	0.2	11.0	21.4	9.9	15.1

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	15.4	12.3	13.5	22.8	16.6	19.6	---	---	---	16.0	14.3	15.1
2	13.0	10.0	11.0	22.9	17.5	19.9	22.1	15.6	19.1	16.7	13.4	14.5
3	15.7	9.8	13.6	22.4	16.8	19.7	23.7	16.6	19.7	23.3	19.6	21.9
4	14.9	13.0	13.8	23.6	18.1	20.4	19.4	17.3	18.1	22.3	18.7	20.4
5	18.6	11.6	14.9	22.9	17.1	19.8	23.9	16.7	19.8	22.4	19.1	20.6
6	19.5	13.4	16.4	24.3	16.9	20.3	24.4	17.5	20.6	---	---	---
7	21.6	15.6	18.2	26.1	17.1	22.0	24.3	16.8	20.3	---	---	---
8	24.4	17.3	20.3	22.2	19.2	20.8	22.3	18.3	20.2	24.4	20.3	22.0
9	21.8	16.5	19.1	24.2	17.9	20.8	---	---	---	21.4	17.9	19.4
10	17.9	14.5	15.6	23.8	16.7	20.0	---	---	---	19.2	16.2	17.7
11	14.6	13.6	14.1	23.3	17.3	19.7	---	---	---	19.4	16.3	17.7
12	18.5	11.9	15.0	24.4	17.0	20.3	---	---	---	18.7	14.7	17.0
13	19.5	13.3	16.3	22.8	18.5	20.6	21.0	16.1	18.3	18.6	14.4	16.4
14	17.1	14.7	15.4	21.8	17.1	19.5	---	---	---	18.9	14.4	16.4
15	18.3	14.0	15.8	22.2	16.0	19.1	21.0	14.9	17.9	19.0	14.3	16.5
16	19.8	14.8	17.1	23.7	15.6	18.8	20.1	16.9	18.2	17.8	15.1	16.6
17	18.1	15.4	16.6	22.8	17.7	20.0	---	---	---	19.2	17.5	18.1
18	17.8	14.3	16.0	23.3	18.4	20.5	---	---	---	23.1	17.5	19.9
19	19.3	14.2	16.6	25.0	18.4	21.3	---	---	---	24.2	19.9	21.1
20	19.8	14.2	17.1	24.6	16.5	20.7	---	---	---	20.9	15.6	17.9
21	20.2	16.7	18.3	24.0	16.8	20.1	---	---	---	15.5	12.9	14.0
22	---	---	---	---	---	---	---	---	---	14.8	13.5	14.2
23	---	---	---	23.4	16.4	21.1	---	---	---	14.7	11.6	13.3
24	---	---	---	19.5	17.0	18.0	---	---	---	11.5	10.1	10.8
25	23.9	17.3	20.4	22.8	16.2	19.2	---	---	---	10.7	9.5	10.1
26	21.9	19.9	20.9	23.5	16.5	19.2	20.1	15.1	18.4	12.9	9.0	10.9
27	19.9	17.2	18.6	23.9	17.7	20.4	17.5	15.1	16.5	14.0	9.5	11.7
28	19.4	14.7	17.0	22.2	18.6	20.4	16.0	15.1	15.5	12.6	10.6	11.0
29	20.9	14.3	16.6	22.4	16.5	18.0	16.4	14.6	15.3	10.5	9.6	10.0
30	21.7	15.3	18.5	---	---	---	16.7	14.0	15.3	9.8	9.0	9.5
31	---	---	---	---	---	---	16.0	13.4	14.7	---	---	---

VERMILLION RIVER BASIN

05345000 VERMILLION RIVER NEAR EMPIRE, MN--Continued

OXYGEN, DISSOLVED (DO), MG/L, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	12.5	11.6	12.0	14.1	9.9	12.3	13.4	12.4	12.8	---	---	---
2	11.7	10.9	11.3	14.7	14.0	14.4	13.9	12.8	13.3	---	---	---
3	11.4	10.9	11.1	14.0	12.7	13.5	14.2	13.3	13.8	---	---	---
4	11.6	11.0	11.3	13.3	12.7	13.0	14.3	13.7	14.0	---	---	---
5	11.2	10.5	10.9	13.3	12.9	13.1	14.0	13.5	13.7	---	---	---
6	10.7	10.4	10.6	13.2	12.4	12.8	14.1	13.5	13.8	---	---	---
7	10.5	10.2	10.4	12.4	11.8	12.1	13.6	12.4	13.1	---	---	---
8	10.3	10.0	10.2	12.1	11.8	11.9	13.1	12.2	12.6	---	---	---
9	10.7	9.9	10.1	12.2	11.8	12.0	13.0	12.2	12.5	---	---	---
10	10.3	9.5	10.0	13.1	12.1	12.7	13.1	12.2	12.6	---	---	---
11	9.9	9.7	9.8	13.7	13.0	13.3	12.7	11.8	12.3	---	---	---
12	9.7	9.2	9.5	13.7	13.1	13.4	13.3	11.8	12.5	---	---	---
13	9.3	8.5	9.0	13.2	12.2	12.8	13.9	12.8	13.2	---	---	---
14	9.9	8.5	9.4	12.2	11.7	11.9	14.0	12.8	13.3	---	---	---
15	12.0	7.9	9.3	13.3	11.7	12.4	13.4	12.2	12.9	---	---	---
16	12.5	12.0	12.3	13.9	13.2	13.5	12.9	11.7	12.1	---	---	---
17	13.7	11.4	12.5	13.2	12.8	13.0	13.6	12.8	13.3	---	---	---
18	12.4	8.2	10.4	13.6	12.8	13.3	13.6	12.5	13.0	---	---	---
19	9.7	8.5	9.2	13.9	13.3	13.5	---	---	---	---	---	---
20	10.9	9.7	10.4	13.8	13.3	13.6	---	---	---	---	---	---
21	---	---	---	13.7	13.1	13.4	---	---	---	---	---	---
22	---	---	---	13.3	12.6	13.0	---	---	---	10.2	9.8	10.0
23	---	---	---	13.2	12.4	12.9	---	---	---	9.9	9.6	9.7
24	---	---	---	12.7	11.9	12.4	---	---	---	---	---	---
25	---	---	---	12.5	11.7	12.1	---	---	---	10.0	9.0	9.4
26	10.3	9.3	9.8	---	---	---	---	---	---	9.8	9.5	9.7
27	9.3	8.5	8.8	---	---	---	---	---	---	10.1	9.6	9.9
28	9.9	8.9	9.7	13.2	12.2	12.7	---	---	---	---	---	---
29	11.7	9.8	10.7	13.3	12.5	12.8	---	---	---	12.7	12.1	12.3
30	10.8	10.4	10.6	13.0	12.3	12.6	---	---	---	12.7	12.0	12.4
31	10.9	10.0	10.6	---	---	---	---	---	---	12.9	12.5	12.7
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	12.9	12.5	12.8	12.7	11.5	12.2	14.6	11.8	13.0	9.4	7.8	8.4
2	13.3	10.3	12.9	12.5	11.8	12.1	13.6	11.8	12.5	11.0	7.3	9.0
3	13.5	12.4	13.0	---	---	---	12.9	11.0	12.0	10.5	8.0	9.1
4	13.4	12.9	13.1	12.4	12.0	12.2	11.2	10.6	10.9	11.3	8.2	9.5
5	14.8	12.7	13.8	12.6	11.6	11.9	14.3	10.3	10.9	9.7	8.2	8.9
6	15.0	14.2	14.6	11.9	8.7	10.0	11.9	10.3	11.0	10.1	7.8	8.8
7	15.2	13.4	14.5	9.2	8.3	8.8	11.6	10.2	10.8	9.6	7.3	8.4
8	15.1	11.4	12.4	9.1	8.0	8.4	12.8	10.1	11.4	11.2	6.3	8.8
9	11.7	11.3	11.5	9.1	7.0	8.2	13.5	11.3	12.3	11.5	8.3	9.8
10	11.6	11.0	11.4	10.2	8.0	9.2	15.0	11.2	12.7	11.0	8.4	9.0
11	11.7	9.8	10.9	13.5	9.4	11.5	13.7	10.4	11.8	9.9	8.0	8.4
12	10.4	9.6	10.0	13.5	12.6	13.0	15.3	10.6	12.4	8.2	7.1	7.7
13	10.2	9.6	9.9	13.8	12.5	13.1	11.4	9.4	10.0	11.8	6.2	8.5
14	10.7	9.9	10.2	13.6	12.5	13.1	11.5	9.8	10.5	10.6	8.5	9.5
15	10.4	10.1	10.2	---	---	---	14.8	9.9	11.8	10.3	9.2	9.8
16	11.0	9.8	10.5	13.5	12.7	13.1	15.1	9.6	10.1	10.5	9.7	10.1
17	10.9	10.0	10.5	13.7	12.4	13.0	15.4	10.2	12.4	12.8	8.9	10.8
18	10.7	10.0	10.4	14.9	12.4	13.6	16.0	10.0	12.8	12.7	9.4	11.0
19	12.2	9.7	10.9	14.7	12.9	13.7	13.3	11.0	11.9	12.2	9.5	10.9
20	11.6	10.9	11.2	13.9	12.5	13.2	11.6	9.1	10.1	---	---	---
21	12.1	10.9	11.6	14.0	12.5	13.1	11.9	8.6	10.1	---	---	---
22	12.3	12.0	12.1	14.0	12.2	13.0	10.0	8.3	9.2	---	---	---
23	12.4	11.9	12.1	12.6	12.2	12.4	10.1	8.3	9.2	12.1	7.1	9.1
24	12.0	11.5	11.9	---	---	---	10.4	8.0	9.0	---	---	---
25	12.2	11.5	11.7	13.8	12.7	13.3	10.6	8.6	9.6	---	---	---
26	11.8	11.4	11.6	14.7	13.1	13.8	10.5	9.0	9.8	11.0	8.0	9.5
27	12.0	11.4	11.6	13.0	11.6	12.1	11.8	7.1	10.1	---	---	---
28	12.2	11.5	12.0	12.5	11.5	11.9	14.5	8.6	11.3	---	---	---
29	---	---	---	12.3	11.6	11.9	11.8	8.8	10.3	---	---	---
30	---	---	---	12.5	11.9	12.2	10.9	8.6	9.2	---	---	---
31	---	---	---	13.3	11.9	12.6	---	---	---	12.9	6.1	9.2
MONTH	15.2	9.6	11.8	---	---	---	16.0	7.1	11.0	---	---	---

05345000 VERMILLION RIVER NEAR EMPIRE, MN--Continued

OXYGEN, DISSOLVED (DO), MG/L, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	11.9	8.0	9.7	---	---	---	---	---	---	8.5	7.1	7.6
2	---	---	---	8.2	5.9	6.9	9.6	7.2	8.6	8.1	6.4	7.6
3	---	---	---	9.4	7.1	8.2	9.2	7.2	8.0	9.3	7.0	8.0
4	---	---	---	9.4	7.3	8.4	8.5	6.8	7.7	8.5	7.0	7.9
5	---	---	---	9.7	7.6	8.6	8.8	6.8	7.8	9.0	7.1	8.2
6	---	---	---	9.3	7.4	8.5	8.5	6.5	7.4	---	---	---
7	---	---	---	8.1	6.5	7.3	8.8	6.7	7.6	---	---	---
8	---	---	---	9.0	6.3	7.7	8.9	6.6	7.8	8.7	6.3	7.3
9	---	---	---	9.7	8.0	8.8	---	---	---	9.8	6.4	8.3
10	---	---	---	9.7	7.5	8.7	---	---	---	11.1	9.2	10.2
11	---	---	---	9.0	7.0	7.8	---	---	---	12.4	9.5	11.0
12	---	---	---	8.9	6.5	7.6	---	---	---	12.6	10.4	11.3
13	---	---	---	9.0	6.0	7.0	8.7	7.8	8.2	12.9	10.5	11.6
14	---	---	---	8.6	6.5	7.6	---	---	---	12.7	10.7	11.7
15	---	---	---	9.5	6.9	8.2	10.2	8.3	9.4	13.3	10.9	12.0
16	---	---	---	9.5	7.2	8.1	9.9	7.9	8.8	11.0	8.0	10.1
17	---	---	---	9.1	6.5	7.7	---	---	---	8.8	7.4	8.0
18	---	---	---	8.7	6.4	7.4	---	---	---	10.5	7.3	8.7
19	---	---	---	8.7	6.2	7.3	---	---	---	8.8	6.5	7.2
20	---	---	---	8.2	6.1	7.3	---	---	---	9.5	5.8	7.5
21	---	---	---	8.2	6.3	7.3	---	---	---	11.4	8.0	9.6
22	---	---	---	---	---	---	---	---	---	11.2	7.6	9.4
23	---	---	---	9.3	7.3	8.6	---	---	---	10.5	8.6	9.4
24	---	---	---	8.0	6.1	7.2	---	---	---	11.7	9.9	11.0
25	---	---	---	8.5	6.0	7.6	---	---	---	13.0	11.0	11.9
26	---	---	---	8.6	7.4	8.1	10.7	8.8	9.9	13.2	11.1	12.2
27	---	---	---	8.4	7.2	7.7	9.3	7.7	8.7	12.8	10.4	11.7
28	---	---	---	8.1	6.9	7.6	8.5	7.4	7.9	13.0	10.3	11.6
29	---	---	---	9.0	7.4	8.6	7.9	7.1	7.5	13.6	10.9	12.2
30	---	---	---	---	---	---	8.1	7.1	7.6	11.8	10.3	11.2
31	---	---	---	---	---	---	7.9	7.1	7.5	---	---	---

CANNON RIVER BASIN

05353800 STRAIGHT RIVER NEAR FARIBAULT, MN

LOCATION.--Lat 44°15'29", long 93°13'51", in W½SE¼ sec.9, T.109 N., R.20 W., Rice County, Hydrologic Unit 07040002, on right bank 15 ft downstream from highway bridge, 2.8 mi upstream from Falls Creek and 3.2 mi southeast of Faribault.

DRAINAGE AREA.--442 mi^2.

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

GAGE.--Water-stage recorder. Datum of gage is 1,034.58 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Nov. 20, 21, Dec. 4 to Feb. 21, 26, and Mar. 6, 12, 13. Records good except those for periods with ice effect, Nov. 20, 21, Dec. 4 to Feb. 21, 26, and Mar. 6, and period of no gage-height record Mar. 12, 13, which are fair.

AVERAGE DISCHARGE.--20 years, 264 ft^3/s, 8.11 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,990 ft^3/s, May 1, 1973, gage height, 11.20 ft; maximum gage height, 12.74 ft, Mar. 5, 1974 (backwater from ice); minimum discharge, 10 ft^3/s, Oct. 27, 1976; minimum gage height, 3.66 ft, Nov. 27, 1976.

EXTREMES FOR CURRENT YEAR.--Peak discharge 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. 12	unknown	*2,650	*8.47	No other peak greater than base discharge.			

Minimum discharge, 22 ft^3/s, July 23, 24, Aug. 11, 12; minimum gage height, 3.72 ft, Aug. 11, 12.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	44	166	151	220	62	428	293	240	88	43	35	138
2	44	185	143	175	62	398	359	220	83	43	34	99
3	42	194	134	157	62	344	617	204	80	41	31	92
4	43	178	132	145	62	190	793	192	78	40	28	85
5	49	163	131	130	62	156	821	182	77	36	27	87
6	53	148	130	125	62	145	742	188	75	36	28	94
7	64	105	133	115	62	148	564	177	75	35	28	96
8	72	134	140	110	62	172	462	167	79	32	26	82
9	67	137	141	103	61	485	402	160	68	33	26	114
10	65	278	141	95	61	1220	360	155	62	32	27	151
11	65	456	142	93	61	2010	332	152	78	32	24	157
12	67	442	141	88	61	2470	323	152	79	31	58	118
13	64	350	132	84	61	2280	417	141	74	31	57	93
14	63	329	127	81	60	2090	476	145	74	31	47	80
15	84	375	130	78	60	1550	434	166	77	30	41	68
16	175	317	290	76	60	1190	386	156	78	31	42	61
17	543	306	625	74	60	896	344	150	76	29	64	61
18	504	271	520	72	60	689	318	148	75	29	42	58
19	433	238	440	70	60	590	294	136	72	28	33	54
20	321	223	385	69	90	513	270	128	67	28	33	65
21	260	207	355	68	654	443	288	117	64	26	29	53
22	214	198	255	67	863	391	324	108	62	25	30	59
23	182	182	230	66	648	361	387	115	56	26	47	100
24	163	175	230	65	492	376	464	120	51	43	53	223
25	151	175	215	65	360	356	460	116	51	77	45	248
26	145	175	205	64	300	329	388	109	48	44	37	225
27	154	178	240	64	249	360	336	101	53	36	36	197
28	171	175	485	63	278	406	301	93	50	31	35	174
29	172	163	610	63	---	447	278	86	47	29	265	188
30	160	160	475	63	---	416	260	86	45	30	265	434
31	145	---	329	62	---	366	---	102	---	43	199	---
TOTAL	4779	6783	7937	2870	5095	22215	12493	4512	2042	1081	1772	3754
MEAN	154	226	256	92.6	182	717	416	146	68.1	34.9	57.2	125
MAX	543	456	625	220	863	2470	821	240	88	77	265	434
MIN	42	105	127	62	60	145	260	86	45	25	24	53
CFSM	.35	.51	.58	.21	.41	1.62	.94	.33	.15	.08	.13	.28
IN.	.40	.57	.67	.24	.43	1.87	1.05	.38	.17	.09	.15	.32
AC-FT	9480	13450	15740	5690	10110	44060	24780	8950	4050	2140	3510	7450

CAL YR 1984	TOTAL	159116	MEAN 435	MAX 3380	MIN 37	CFSM .98	IN 13.39	AC-FT	315600	
WTR YR 1985	TOTAL	75333	MEAN 206	MAX 2470	MIN 24	CFSM .47	IN 6.34	AC-FT	149400	

ZUMBRO RIVER BASIN

05372995 SOUTH FORK ZUMBRO RIVER AT ROCHESTER, MN

LOCATION.--Lat 44°03'42", long 92°27'58", in NW¼NE¼ sec.23, T.107 N., R.14 W., Olmsted County, Hydrologic Unit 07040004, on left bank 50 ft downstream from 37th Street bridge, 0.2 mi upstream from sewer plant, and 2.0 mi downstream from Silver Lake Dam.

DRAINAGE AREA.--303 mi^2.

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

GAGE.--Water-stage recorder. Datum of gage is 950.00 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharge. Records good. Slight regulation at times from Silver Lake.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,450 ft^3/s, July 1, 1983, gage height, 14.93 ft; minimum discharge, 10 ft^3/s, Oct. 23, 1981, result of regulation; minimum gage height, 2.76 ft, July 21, 1985.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of July 6, 1978, reached a stage of about 28.0 ft, on upstream side of bridge, discharge 30,500 ft^3/s. This is the highest known stage since at least 1908.

EXTREMES FOR CURRENT PERIOD.--Peak discharges greater than base discharge of 1,300 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 12	0230	*2,030	*9.11	No other peak greater than base discharge.			

Minimum discharge, 21 ft^3/s, July 21, gage height, 2.76 ft.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	51	120	93	161	59	644	205	175	87	37	26	134
2	50	122	86	135	55	350	212	167	79	28	26	117
3	49	112	63	128	53	201	299	157	77	31	26	109
4	48	108	77	125	53	100	508	160	75	30	25	95
5	48	103	86	123	54	105	521	151	72	30	26	137
6	58	94	81	125	55	110	419	176	69	31	50	137
7	60	90	71	121	53	133	325	153	66	29	27	134
8	76	86	74	107	52	244	284	143	63	29	25	108
9	74	161	81	109	51	1080	258	137	57	30	27	130
10	69	228	83	107	53	1340	243	129	54	28	31	190
11	75	239	91	100	53	1390	233	125	59	26	26	136
12	77	187	95	86	53	1580	222	125	60	26	103	111
13	69	164	95	100	53	1100	221	121	57	25	44	96
14	67	153	88	94	53	710	220	138	64	26	38	86
15	112	146	95	84	54	440	218	130	61	25	36	78
16	139	129	207	88	53	389	207	130	57	23	86	73
17	165	133	280	87	54	333	194	127	54	23	52	69
18	170	122	182	86	56	281	188	121	51	23	36	66
19	142	106	177	69	54	258	179	115	48	23	34	60
20	131	94	182	84	67	238	169	112	46	22	34	95
21	113	106	175	65	261	216	195	106	47	22	33	68
22	102	108	138	65	1050	205	211	102	47	22	37	70
23	95	100	137	69	510	205	333	105	46	23	46	175
24	91	106	128	70	292	217	428	103	46	53	55	204
25	99	103	112	66	257	206	348	100	41	40	47	235
26	94	103	114	65	267	192	276	95	44	31	41	195
27	114	112	127	68	261	203	239	91	52	26	38	180
28	111	106	309	64	310	221	213	82	44	25	43	181
29	114	101	333	64	---	273	195	69	41	25	376	265
30	103	97	207	63	---	247	183	92	42	26	448	577
31	113	---	177	60	---	224	---	104	---	33	192	---
TOTAL	2879	3739	4244	2838	4296	13435	7946	3841	1706	871	2134	4311
MEAN	92.9	125	137	91.5	153	433	265	124	56.9	28.1	68.8	144
MAX	170	239	333	161	1050	1580	521	176	87	53	448	577
MIN	48	86	63	60	51	100	169	69	41	22	25	60
CFSM	.31	.41	.45	.30	.51	1.43	.88	.41	.19	.09	.23	.48
IN.	.35	.46	.52	.35	.53	1.65	.98	.47	.21	.11	.26	.53
AC-FT	5710	7420	8420	5630	8520	26650	15760	7620	3380	1730	4230	8550

CAL YR 1984	TOTAL	88345	MEAN 241	MAX 1650	MIN 48	CFSM .80	IN 10.85	AC-FT	175200	
WTR YR 1985	TOTAL	52240	MEAN 143	MAX 1580	MIN 22	CFSM .47	IN 6.41	AC-FT	103600	

05374900 ZUMBRO RIVER AT KELLOGG, MN

LOCATION.--Lat 44°18'43", long 92°00'14", in SW¼ sec.22, T.110 N., R.10 W., Wabasha County, Hydrologic Unit 07040004, on right bank at downstream side of bridge on U.S. Highway 61, and 4 mi above mouth.

DRAINAGE AREA.--1,400 mi^2.

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

GAGE.--Water-stage recorder. Datum of gage is 669.47 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Dec. 6 to Mar. 5. Records good except those for period with ice effect Dec. 6 to Mar. 5, which are fair. Some regulation by powerplant upstream from station.

AVERAGE DISCHARGE.--10 years, 862 ft^3/s, 8.36 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,800 ft^3/s, July 8, 1978, gage height, 13.70 ft; minimum daily, 140 ft^3/s, Dec. 3, 1980; minimum gage height, 1.69 ft, Dec. 2, 1980, result of freezeup.

EXTREMES OUTSIDE PERIOD OF RECORD.--A discharge of 33,000 ft^3/s, occurred on July 22, 1951, at station 05374500, 20 mi upstream; this was the greatest since 1938.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 12	1515	*8,420	*10.14	No other peak greater than base discharge.			

Minimum discharge, 333 ft^3/s, Aug. 9, gage height, 2.44 ft; minimum gage height, 2.43 ft, July 23, 24.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	508	924	930	860	350	2470	1350	1230	584	422	392	1110
2	554	935	801	800	350	1750	1230	1180	512	428	397	977
3	539	932	762	750	350	1330	1190	1090	534	486	425	846
4	475	941	747	700	348	1060	1330	1120	587	463	426	744
5	513	896	726	660	345	870	1960	1020	666	466	430	688
6	528	879	700	620	343	808	2180	1010	517	436	416	653
7	515	903	650	590	340	859	2020	896	603	417	398	643
8	537	855	680	560	340	953	1740	1060	558	414	391	643
9	575	852	720	540	340	1930	1540	861	560	447	359	582
10	623	1210	766	510	340	3630	1410	915	468	447	372	553
11	609	1230	800	500	340	5170	1300	834	555	419	379	612
12	602	1200	800	480	340	7550	1290	764	792	395	428	656
13	564	1090	790	470	340	7000	1250	1010	532	391	464	613
14	531	1080	750	450	340	6380	1540	928	438	415	507	616
15	555	1160	710	440	340	4230	1710	648	436	439	440	517
16	623	1160	650	420	340	2880	1680	566	554	406	555	468
17	654	1150	580	410	345	2330	1490	753	503	411	452	525
18	820	1160	800	400	350	1940	1400	852	543	372	417	530
19	1010	1150	1500	390	355	1680	1300	916	556	397	444	419
20	1110	1130	1400	380	400	1520	1230	690	599	444	425	482
21	1060	1100	1250	374	800	1410	1180	709	518	392	389	451
22	974	1010	1150	370	2190	1320	1070	828	472	368	467	445
23	926	819	1050	367	2570	1110	1330	734	499	354	398	521
24	868	771	1020	365	2650	1220	1650	559	475	369	405	553
25	874	772	1000	360	2100	1150	1840	581	457	405	456	613
26	779	755	1020	360	1990	1140	1820	581	502	489	390	731
27	805	872	1100	360	1910	1120	1710	598	591	407	379	824
28	916	1040	1700	358	1680	1100	1570	614	535	403	465	836
29	837	1050	1600	357	---	1200	1370	672	470	401	403	761
30	862	1010	1100	355	---	1360	1290	840	433	397	507	866
31	842	---	970	355	---	1450	---	795	---	417	821	---
TOTAL	22188	30036	29222	14911	22826	69920	44970	25854	16049	12917	13597	19478
MEAN	716	1001	943	481	815	2255	1499	834	535	417	439	649
MAX	1110	1230	1700	860	2650	7550	2180	1230	792	489	821	1110
MIN	475	755	580	355	340	808	1070	559	433	354	359	419
CFSM	.51	.72	.67	.34	.58	1.61	1.07	.60	.38	.30	.31	.46
IN.	.59	.80	.78	.40	.61	1.86	1.19	.69	.43	.34	.36	.52
AC-FT	44010	59580	57960	29580	45280	138700	89200	51280	31830	25620	26970	38630

CAL YR 1984 TOTAL 463028 MEAN 1265 MAX 6320 MIN 475 CFSM .90 IN 12.30 AC-FT 918400
WTR YR 1985 TOTAL 321968 MEAN 882 MAX 7550 MIN 340 CFSM .63 IN 8.56 AC-FT 638600

WHITEWATER RIVER BASIN

05376000 NORTH FORK WHITEWATER RIVER NEAR ELBA, MN
(Hydrologic bench-mark station)

LOCATION.--Lat 44°05'30", long 92°03'57", in sec.7, T.107 N., R.10 W., Winona County, Hydrologic Unit 07040003, on left bank 2.3 mi upstream from Middle Fork, 2.4 mi west of Elba, and 3.5 mi upstream from confluence with South Fork.

DRAINAGE AREA.--101 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1939 to September 1941, July 1967 to current year.

REVISED RECORDS.--WRD MN-74: 1967(M), 1969(M), 1971(M), 1972(M), 1973(M). WRD MN-80-2: 1978.

GAGE.--Water-stage recorder. Datum of gage is 769.60 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 12, 1939, nonrecording gage at site 2 mi downstream at different datum. Oct. 12, 1939, to Sept. 30, 1941, water-stage recorder at site 600 ft downstream at present datum. Prior to July 6, 1978, water-stage recorder at same site and present datum (gage destroyed by flood of July 1978), July 6 to Oct. 30, 1978, nonrecording gage at same site and present datum.

REMARKS.--Estimated daily discharges: Dec. 6, Jan. 2, 4, 5, 19-22, 25, 28, Jan. 31 to Feb. 8, and Feb. 12-15. Records good except those for periods with ice effect, Dec. 6, Jan. 2, 4, 5, 19-22, 25, 28, Jan. 31 to Feb. 8, and Feb. 12-15, which are fair.

AVERAGE DISCHARGE.--20 years (water years 1940-41, 1968-85), 47.4 ft^3/s, 6.37 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,100 ft^3/s, June 21, 1974, gage height, 16.32 ft, from floodmark; minimum, 11 ft^3/s, Feb. 21, 1968.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 600 ft^3/s and maximum (*).

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 22	0800	640	5.86	Mar. 11	1345	*1,790	*7.26
Feb. 28	2215	719	5.99				

Minimum daily discharge, 26 cfs, June 5, 10, 11, 24, 25; minimum gage height, 4.02 Feb. 18, 19.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	44	50	48	49	38	432	50	44	29	29	44	44
2	44	49	48	47	38	174	52	42	28	29	43	43
3	44	48	43	46	38	83	59	42	27	29	43	43
4	44	48	43	46	38	54	93	41	27	30	43	43
5	44	47	42	45	38	47	82	41	27	31	43	46
6	45	47	42	45	38	45	72	42	28	32	43	45
7	47	47	43	45	38	46	64	40	27	32	43	43
8	57	47	44	45	38	230	58	39	28	32	43	42
9	53	49	44	45	38	689	56	39	28	31	45	40
10	50	77	44	45	38	580	55	37	26	32	48	39
11	47	72	43	45	38	789	56	37	27	32	44	39
12	47	59	44	40	38	455	55	36	28	32	57	37
13	47	56	44	44	38	427	54	35	27	34	54	37
14	47	57	44	42	37	343	53	37	27	34	48	36
15	47	54	44	44	37	177	53	39	27	33	46	36
16	51	50	53	43	37	131	53	37	28	33	47	34
17	56	47	77	42	37	94	52	35	29	35	50	34
18	56	49	54	42	37	78	52	34	28	36	47	34
19	54	48	57	42	36	75	51	34	28	37	43	33
20	51	46	52	42	37	69	50	50	28	37	43	34
21	49	46	49	41	215	63	49	35	28	37	43	33
22	46	48	44	41	553	60	49	33	28	37	43	33
23	45	47	43	41	264	59	54	32	27	37	45	38
24	45	47	43	40	141	60	57	31	27	41	45	40
25	47	47	44	39	148	56	56	30	27	46	45	37
26	47	48	43	38	238	55	50	30	30	41	43	37
27	48	48	43	38	163	57	49	29	33	41	43	35
28	50	48	149	38	249	57	48	28	30	41	43	33
29	51	48	104	38	---	56	44	28	30	42	48	36
30	48	48	57	38	---	55	44	28	30	42	47	43
31	48	---	51	38	---	55	---	29	---	45	44	---
TOTAL	1499	1522	1623	1314	2723	5651	1670	1114	842	1100	1406	1147
MEAN	48.4	50.7	52.4	42.4	97.3	182	55.7	35.9	28.1	35.5	45.4	38.2
MAX	57	77	149	49	553	789	93	50	33	46	57	46
MIN	44	46	42	38	36	45	44	28	26	29	43	33
CFSM	.48	.50	.52	.42	.96	1.80	.55	.36	.28	.35	.45	.38
IN.	.55	.56	.60	.48	1.00	2.08	.62	.41	.31	.41	.52	.42
AC-FT	2970	3020	3220	2610	5400	11210	3310	2210	1670	2180	2790	2280

CAL YR 1984 TOTAL 21772 MEAN 59.5 MAX 161 MIN 27 CFSM .59 IN 8.02 AC-FT 43180
WTR YR 1985 TOTAL 21611 MEAN 59.2 MAX 789 MIN 26 CFSM .59 IN 7.96 AC-FT 42870

05376000 NORTH FORK WHITEWATER RIVER NEAR ELBA, MN--Continued
(Hydrologic bench-mark station)

WATER-QUALITY RECORDS

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

REMARKS.--Letter K indicates non-ideal colony count.

WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (90095)	PH (STAND-ARD UNITS) (00400)	PH LAB (STAND-ARD UNITS) (00403)	TEMPER-ATURE, AIR (DEG C) (00020)	TEMPER-ATURE (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	OXYGEN, DIS-SOLVED (MG/L) (00300)
OCT											
24...	1225	48	590	590	8.2	8.1	10.5	7.0	2.7	744	13.1
JAN											
14...	1145	42	550	591	8.1	8.2	-14.0	1.0	1.5	740	14.2
MAR											
06...	1035	40	500	552	8.3	7.9	-3.0	1.0	2.5	751	13.1
APR											
22...	1140	50	560	560	8.3	8.0	20.0	15.5	10	758	10.4
JUL											
15...	1130	33	590	557	8.2	8.1	24.0	16.5	4.5	768	12.3

DATE	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	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)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY FIELD (MG/L AS CACO3) (00410)	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)
OCT											
24...	K36	130	79	27	6.2	1.7	277	275	22	13	0.2
JAN											
14...	K2	K10	78	27	6.6	1.2	269	266	18	15	0.1
MAR											
06...	K9	34	73	26	5.9	2.0	249	247	17	11	0.1
APR											
22...	27	65	74	26	6.6	1.5	253	258	17	13	0.2
JUL											
15...	100	160	71	27	8.9	<0.1	271	272	19	14	0.2

DATE	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	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)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT										
24...	16	340	4.40	<0.01	0.4	0.15	0.15	0.13	--	--
JAN										
14...	16	351	4.70	0.05	0.2	0.16	0.16	0.16	--	--
MAR										
06...	17	304	--	--	0.5	0.20	0.15	--	32	47
APR										
22...	11	343	4.10	0.02	0.4	0.23	0.17	0.16	58	92
JUL										
15...	16	357	3.40	0.01	0.3	0.23	0.23	0.22	43	93

05376000 NORTH FORK WHITEWATER RIVER NEAR ELBA, MN--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	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)	LEAD, DISSOLVED (UG/L AS PB) (01049)
MAR											
06...	1035	<10	<1	59	<0.5	<1	<1	<3	<1	4	8

DATE	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)
MAR										
06...	9	25	0.3	<10	4	<1	<1	79	<6	3

WHITEWATER RIVER BASIN

05376800 WHITEWATER RIVER NEAR BEAVER, MN

LOCATION.--Lat 44°09'03", long 92°00'19", in SW¼SE¼ sec.15, T.108 N., R.10 W., Winona County, Hydrologic Unit 07040003, on left bank at downstream side of bridge on County Road No. 30, 0.5 mi above mouth of Beaver Creek, and 4.7 mi north of Elba.

DRAINAGE.--271 mi^2.

PERIOD OF RECORD.--May 1975 to September 1985 (discontinued).

GAGE.--Water-stage recorder. Datum of gage is 692.01 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 1, 1976, at datum 2.00 ft higher.

REMARKS.--Estimated daily discharges: Dec. 3-8, 18, 24-27, 30, Jan. 2-4, 12, 15-17, and Jan. 19 to Feb. 21. Records good except those for periods with ice effect, Dec. 3-8, 18, 24-27, 30, Jan. 2-4, 15-17, and Jan. 20 to Feb. 7, and periods of no gage-height record, Jan. 19 and Feb. 8-21, and periods when gage heights exceeded 4.80 ft, Mar. 1, 9-13, which are fair.

AVERAGE DISCHARGE.--10 years (water years 1976-85), 164 ft^3/s, 8.22 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 15,400 ft^3/s, July 6, 1978, gage height, 12.88 ft, present datum; minimum daily, 53 ft^3/s, Feb. 20 to Mar. 20, 1978; minimum gage height, 1.81 ft, Aug. 8, 9, 1985.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge since at least 1939, 19,200 ft^3/s, June 21, 1974, gage height, 13.00 ft, present datum, determined by contracted-opening measurement.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,000 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 11	1845	*3,000	*9.00	No other peak greater than base discharge.			

Minimum daily discharge, 120 ft^3/s, Feb. 19, but may have been less during period of no gage-height record Feb. 8-21; minimum gage height, 1.81 ft, Aug. 8, 9.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	152	174	153	148	128	930	178	158	136	133	129	132
2	152	173	155	145	128	420	180	156	132	132	128	132
3	152	170	153	143	128	288	190	154	131	133	128	132
4	155	169	151	142	129	232	236	153	131	136	127	132
5	155	166	150	142	130	202	232	151	131	135	127	139
6	160	163	149	138	130	190	222	155	130	137	126	139
7	161	162	148	138	130	190	200	153	130	136	126	136
8	177	163	146	136	130	490	190	151	131	134	124	135
9	162	162	144	134	130	1560	180	150	129	134	125	138
10	155	187	143	136	130	1580	180	150	128	133	131	138
11	153	187	143	135	130	2080	178	150	129	133	126	136
12	158	174	145	135	129	1370	174	151	130	133	137	137
13	156	169	143	138	128	1100	173	146	130	134	138	136
14	153	169	144	134	127	754	172	149	130	133	131	136
15	156	167	144	134	136	490	173	153	134	131	128	136
16	164	165	154	133	135	413	171	150	133	131	129	136
17	175	162	176	132	133	350	170	147	131	131	131	136
18	176	163	161	131	132	310	170	144	130	134	128	135
19	173	161	157	130	120	290	169	143	130	134	127	133
20	169	158	151	127	123	266	166	149	131	131	126	136
21	164	158	152	130	300	248	162	143	132	131	127	136
22	162	159	149	138	1120	238	164	140	132	130	127	136
23	161	158	143	138	532	232	172	138	131	131	130	146
24	159	157	148	135	373	230	181	139	131	136	131	152
25	162	157	148	130	366	214	175	138	131	145	128	149
26	167	157	148	128	476	210	166	137	148	133	127	148
27	167	157	148	128	352	214	162	135	153	130	127	146
28	169	157	372	128	496	214	163	134	138	129	127	145
29	166	154	220	128	---	200	160	136	134	127	136	152
30	165	153	163	128	---	190	157	137	133	127	138	171
31	164	---	151	128	---	192	---	138	---	131	134	---
TOTAL	5020	4931	4952	4170	6601	15887	5366	4528	3980	4118	4004	4191
MEAN	162	164	160	135	236	512	179	146	133	133	129	140
MAX	177	187	372	148	1120	2080	236	158	153	145	138	171
MIN	152	153	143	127	120	190	157	134	128	127	124	132
CFSM	.60	.61	.59	.50	.87	1.89	.66	.54	.49	.49	.48	.52
IN.	.69	.68	.68	.57	.91	2.18	.74	.62	.55	.57	.55	.58
AC-FT	9960	9780	9820	8270	13090	31510	10640	8980	7890	8170	7940	8310

CAL YR 1984 TOTAL 71804 MEAN 196 MAX 425 MIN 143 CFSM .72 IN 9.86 AC-FT 142400
WTR YR 1985 TOTAL 67748 MEAN 186 MAX 2080 MIN 120 CFSM .69 IN 9.30 AC-FT 134400

GARVIN BROOK BASIN

05378230 STOCKTON VALLEY CREEK AT STOCKTON, MN

LOCATION.--Lat 44°00'56", long 91°45'36", in SE¼NE¼ sec. 3, T.106 N., R.8 W., Winona County, Hydrologic Unit 07040003, on left bank at driveway to abandoned farmstead 100 ft east of County Road, 0.9 mi above mouth, and 1.0 mi south of Stockton.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--February 1982 to August 1983, February to December 1984, February to July 1985.

GAGE.--Water-stage recorder. Datum of gage is 750 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--No estimated daily discharges. Records good.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 731 ft^3/s, Mar. 11, 1985, gage height, 7.69 ft; minimum discharge, 7.3 ft^3/s, Aug. 12, 1982, gage height, 1.96 ft.

EXTREMES FOR CURRENT PERIOD.--October to December 1984, February to July 1985: Maximum discharge during period, 731 ft^3/s, Mar. 11, gage height, 7.69 ft; minimum, 9.4 ft^3/s, July 17, gage height, 2.10 ft.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	17	13		---	51	16	14	12	12		
2	13	14	13		---	19	16	13	12	12		
3	13	14	12		---	18	16	13	12	11		
4	13	14	---		---	17	17	13	12	11		
5	13	13	---		---	17	17	14	12	12		
6	13	13	---		---	16	16	14	11	12		
7	14	13	---		---	16	16	13	11	11		
8	14	13	---		---	21	15	13	11	12		
9	13	14	---		---	82	15	13	11	11		
10	13	14	---		---	120	15	13	11	11		
11	13	14	---		---	217	15	13	12	11		
12	13	13	---		---	47	15	13	12	11		
13	14	13	---		---	29	15	13	12	11		
14	13	13	---		---	20	14	13	12	11		
15	14	13	---		---	19	15	13	12	11		
16	14	13	---		---	18	14	13	12	11		
17	15	13	---		---	17	14	13	12	11		
18	14	13	---		---	17	14	13	12	11		
19	14	13	---		---	17	14	12	12	11		
20	13	12	---		---	16	14	12	12	11		
21	13	12	---		110	16	14	12	12	11		
22	13	13	---		46	16	14	12	12	11		
23	13	13	---		29	16	16	12	12	11		
24	12	13	---		31	16	15	12	12	11		
25	14	13	---		20	16	14	12	12	---		
26	14	13	---		40	16	14	12	12	---		
27	14	13	---		18	17	14	12	13	---		
28	13	13	---		77	16	14	12	12	---		
29	13	13	---		---	16	13	12	12	---		
30	13	13	---		---	15	14	12	12	---		
31	14	---	---		---	16	---	12	---	---		
TOTAL	415	398	---		---	970	445	393	356	---		
MEAN	13.4	13.3	---		---	31.3	14.8	12.7	11.9	---		
MAX	15	17	---		---	217	17	14	13	---		
MIN	12	12	---		---	15	13	12	11	---		
AC-FT	823	789	---		---	1920	883	780	706	---		

05378230 STOCKTON VALLEY CREEK AT STOCKTON, MN--Continued

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--
SUSPENDED-SEDIMENT DISCHARGE: February to September 1982, February to September 1984, October to July 1985.

INSTRUMENTATION.--Sediment pumping sampler since March 1982.

REMARKS.--Records fair. Sediment observer collects suspended-sediment samples weekly (more often during runoff events). An automatic sampler was used to collect samples during runoff events.

COOPERATION.--Minnesota Pollution Control Agency.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 2,480 mg/L June 8, 1984; minimum daily mean, 10 mg/L Sept. 20-27, 1982, Apr. 30, May 1, 1985.
SEDIMENT LOADS: Maximum daily, 1,720 tons (1,560 tonnes) Mar. 11, 1985; minimum daily, 0.24 tons (0.22 tonnes) Sept. 21-27, 1982.

WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (90095)	PH LAB (STAND-ARD UNITS) (00403)	TEMPER-ATURE (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	SOLIDS, RESIDUE AT 105 DEG. C, SUS-PENDED (MG/L) (00530)	SOLIDS, VOLA-TILE, SUS-PENDED (MG/L) (00535)	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)
OCT											
17...	0824	14	--	--	9.5	--	--	--	--	--	--
FEB											
28...	1326	18	--	--	6.0	--	--	--	--	--	--
28...	1330	18	--	--	--	20	144	16	1.60	0.18	0.7
28...	1537	68	--	--	--	40	1550	98	1.40	0.93	6.4
28...	1541	72	--	--	5.5	--	--	--	--	--	--
28...	1605	104	--	--	3.5	--	--	--	--	--	--
28...	1638	158	--	--	3.0	--	--	--	--	--	--
28...	1640	260	--	--	--	25	2620	158	0.90	1.00	8.4
28...	1722	286	--	--	3.5	--	--	--	--	--	--
28...	1810	324	--	--	2.0	20	3170	212	0.83	1.30	11
28...	2045	179	--	--	1.5	45	1150	66	0.81	1.30	5.2
28...	2155	126	--	--	1.5	--	--	--	--	--	--
MAR											
01...	0715	15	298	7.4	--	20	106	2	--	0.93	2.3
11...	1427	534	--	--	0.5	--	--	--	--	--	--
11...	1500	512	--	--	0.5	--	--	--	--	--	--
11...	1629	293	--	--	1.0	--	--	--	--	--	--
JUL											
24...	1255	13	--	--	16.0	--	--	--	--	--	--

05378230 STOCKTON VALLEY CREEK AT STOCKTON, MN--Continued

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. FALL DIAM. % FINER THAN .002 MM (70337)	SED. SUSP. FALL DIAM. % FINER THAN .004 MM (70338)	SED. SUSP. FALL DIAM. % FINER THAN .016 MM (70340)	SED. SUSP. FALL DIAM. % FINER THAN .062 MM (70342)	SED. SUSP. FALL DIAM. % FINER THAN .125 MM (70343)	SED. SUSP. FALL DIAM. % FINER THAN .250 MM (70344)	SED. SUSP. FALL DIAM. % FINER THAN .500 MM (70345)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
FEB												
28...	1326	18	157	7.5	--	--	--	--	--	--	--	96
28...	1541	72	2090	407	18	20	40	94	99	100	--	--
28...	1605	104	3510	986	18	21	41	93	98	100	--	--
28...	1638	158	3710	1580	16	18	33	89	96	100	--	--
28...	1722	286	5150	3980	16	20	32	85	94	99	100	--
28...	1810	324	4320	3780	18	22	37	86	93	99	100	--
28...	2045	179	1480	715	--	--	--	89	95	99	100	--
28...	2155	126	1060	361	--	--	--	87	94	97	100	--
MAR												
11...	1427	534	3430	4950	22	28	41	84	92	98	100	--
11...	1500	512	3010	4160	24	27	44	86	93	99	100	--
11...	1629	293	2400	1900	26	32	45	89	95	100	--	--

PARTICLE-SIZE DISTRIBUTION OF SURFACE BED MATERIAL, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	TEMPER-ATURE (DEG C) (00010)	NUMBER OF SAM-PLING POINTS (00063)	BED MAT. FALL DIAM. % FINER THAN .004 MM (80157)	BED MAT. FALL DIAM. % FINER THAN .062 MM (80158)	BED MAT. FALL DIAM. % FINER THAN .125 MM (80159)	BED MAT. FALL DIAM. % FINER THAN .250 MM (80160)	BED MAT. FALL DIAM. % FINER THAN .500 MM (80161)	BED MAT. FALL DIAM. % FINER THAN 1.00 MM (80162)
OCT										
17...	0824	14	9.5	3	--	--	--	--	--	--
JUL										
24...	1255	13	16.0	2	10	--	--	--	--	--
24...	1255	13	16.0	2	10	65	89	94	97	99

DATE	BED MAT. SIEVE DIAM. % FINER THAN .062 MM (80164)	BED MAT. SIEVE DIAM. % FINER THAN .125 MM (80165)	BED MAT. SIEVE DIAM. % FINER THAN .250 MM (80166)	BED MAT. SIEVE DIAM. % FINER THAN .500 MM (80167)	BED MAT. SIEVE DIAM. % FINER THAN 1.00 MM (80168)	BED MAT. SIEVE DIAM. % FINER THAN 2.00 MM (80169)	BED MAT. SIEVE DIAM. % FINER THAN 4.00 MM (80170)	BED MAT. SIEVE DIAM. % FINER THAN 8.00 MM (80171)	BED MAT. SIEVE DIAM. % FINER THAN 16.0 MM (80172)	BED MAT. SIEVE DIAM. % FINER THAN 32.0 MM (80173)
OCT										
17...	21	33	44	57	64	67	71	76	89	100
JUL										
24...	65	89	94	98	99	99	100	--	--	--
24...	--	--	--	--	--	99	100	--	--	--

GARVIN BROOK BASIN

05378230 STOCKTON VALLEY CREEK AT STOCKTON, MN

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	20	.70	45	2.1					---	---	696	164
2	20	.70	35	1.3					---	---	100	5.1
3	20	.70	35	1.3					---	---	50	2.4
4	20	.70	32	1.2					---	---	50	2.3
5	20	.70	29	1.0					---	---	50	2.3
6	20	.70	26	.91					---	---	50	2.2
7	20	.76	23	.81					---	---	50	2.2
8	20	.76	21	.74					---	---	358	32
9	20	.70	19	.72					---	---	1080	479
10	20	.70	17	.64					---	---	1290	847
11	20	.70	17	.64					---	---	1710	1720
12	20	.70	17	.60					---	---	644	151
13	31	1.2	17	.60					---	---	384	38
14	35	1.2	18	.63					---	---	70	3.8
15	33	1.2	18	.63					---	---	55	2.8
16	30	1.1	18	.63					---	---	58	2.8
17	34	1.4	18	.63					---	---	58	2.7
18	31	1.2	18	.63					---	---	58	2.7
19	31	1.2	18	.63					---	---	58	2.7
20	31	1.1	18	.58					---	---	57	2.5
21	31	1.1	18	.58					1190	576	57	2.5
22	31	1.1	18	.63					298	45	57	2.5
23	31	1.1	18	.63					244	21	57	2.5
24	31	1.0	18	.63					216	19	55	2.4
25	31	1.2	18	.63					65	3.5	53	2.3
26	31	1.2	18	.63					431	60	50	2.2
27	31	1.2	18	.63					60	2.9	48	2.2
28	31	1.1	18	.63					920	491	45	1.9
29	31	1.1	18	.63					---	---	43	1.9
30	31	1.1	18	.63					---	---	41	1.7
31	38	1.4	---	---					---	---	41	1.8
TOTAL	---	30.72	---	23.17					---	---	---	3491.4

	APRIL		MAY		JUNE		JULY		AUGUST	SEPTEMBER
1	41	1.8	10	.38	24	.78	---	---		
2	40	1.7	11	.39	24	.78	---	---		
3	40	1.7	11	.39	23	.75	---	---		
4	40	1.8	12	.42	23	.75	---	---		
5	39	1.8	15	.57	22	.71	---	---		
6	39	1.7	18	.68	22	.65	---	---		
7	39	1.7	22	.77	22	.65	13	.39		
8	38	1.5	25	.88	23	.68	---	---		
9	38	1.5	28	.98	23	.68	---	---		
10	38	1.5	32	1.1	24	.71	---	---		
11	37	1.5	32	1.1	24	.78	---	---		
12	37	1.5	33	1.2	24	.78	---	---		
13	37	1.5	33	1.2	24	.78	16	.48		
14	36	1.4	34	1.2	23	.75	---	---		
15	36	1.5	34	1.2	22	.71	---	---		
16	36	1.4	36	1.3	22	.71	---	---		
17	35	1.3	38	1.3	21	.68	---	---		
18	35	1.3	41	1.4	20	.65	---	---		
19	35	1.3	48	1.6	19	.62	---	---		
20	35	1.3	46	1.5	19	.62	---	---		
21	32	1.2	44	1.4	18	.58	---	---		
22	29	1.1	42	1.4	17	.55	---	---		
23	40	1.7	40	1.3	17	.55	---	---		
24	36	1.5	38	1.2	17	.55	---	---		
25	36	1.4	36	1.2	17	.55	---	---		
26	36	1.4	35	1.1	17	.55	---	---		
27	36	1.4	33	1.1	17	.60	---	---		
28	27	1.0	31	1.0	17	.55	---	---		
29	18	.63	29	.94	17	.55	---	---		
30	10	.38	28	.91	17	.55	---	---		
31	---	---	26	.84	---	---	---	---		
TOTAL	---	42.41	---	31.95	---	19.80	---	---		

GARVIN BROOK BASIN

05378235 GARVIN BROOK NEAR MINNESOTA CITY, MN

LOCATION.--Lat 44°04'16", long 91°45'51", in SE¼NE¼ sec. 15, T.107 N., R.8 W., Winona County, Hydrologic Unit 07040003, on left bank, 20 ft downstream from County 23 bridge, 1.8 mi south of Minnesota City, and 2.3 mi upstream from Rollingstone Creek.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1982 to November 1983, January 1984 to current year (partial winter records in 1984).

GAGE.--Water stage recorder and broad-crested weir.

REMARKS.--Estimated daily discharges: Dec. 2-8, 18, 19, 21, 22,24-29, Jan.2 to Feb. 21, and Mar. 4-6. Records good except those for periods with ice effect, Dec. 2-8, 18, 19, 21, 22, 24-29, Jan. 2-6, and Mar. 4-6, and period of no gage-height record, Jan. 7 to Feb. 21, which are fair.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge 1,570 ft^3/s, Mar. 11, 1985, gage height, 6.60 ft; minimum, 15 ft^3/s, Mar. 9, 1982, gage height, 0.75 ft, result of freezeup.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,570 ft^3/s, Mar. 11, gage height, 6.60 ft; minimum discharge, 18 ft^3/s, June 28, gage height, 0.86 ft, caused by gate closure at dam in Stockton.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	32	56	37	39	33	138	41	38	34	35	33	33
2	33	41	36	38	33	57	42	36	34	34	33	31
3	34	40	35	36	33	43	44	37	34	34	33	32
4	34	40	35	35	33	41	45	36	33	34	32	31
5	34	38	34	35	33	40	45	36	34	34	33	38
6	35	38	35	35	33	39	44	37	33	34	32	35
7	39	38	35	35	33	38	42	36	33	33	32	32
8	41	37	36	35	33	51	41	35	33	34	32	32
9	37	39	36	35	33	221	41	35	33	33	31	34
10	36	44	36	35	33	286	41	35	33	33	33	32
11	37	39	36	35	32	478	41	35	34	32	31	31
12	37	38	37	34	32	129	41	35	35	33	34	31
13	37	38	35	34	32	82	40	34	34	32	33	31
14	37	39	36	34	32	62	40	35	34	33	33	30
15	40	38	36	34	32	53	39	35	36	32	32	30
16	40	36	49	34	32	49	39	35	36	32	32	30
17	42	37	42	33	32	42	39	34	36	32	32	31
18	39	37	36	33	34	41	39	34	35	33	31	31
19	40	36	36	33	55	41	39	34	35	33	31	31
20	38	36	36	33	150	40	38	34	35	32	31	33
21	37	36	36	33	268	41	38	34	35	32	30	31
22	38	36	36	33	145	48	38	34	34	32	30	32
23	37	37	37	33	79	45	44	34	34	31	32	38
24	36	38	37	33	106	41	41	34	34	38	33	37
25	39	38	36	33	61	40	39	34	35	44	31	34
26	40	38	36	33	102	40	38	34	36	34	31	35
27	40	39	36	33	50	43	38	34	38	33	31	33
28	39	37	50	33	141	41	37	34	21	33	31	33
29	38	37	44	33	---	41	37	34	34	32	36	36
30	37	37	41	33	---	40	37	34	34	32	34	44
31	39	---	39	33	---	41	---	34	---	34	33	---
TOTAL	1162	1158	1162	1058	1745	2432	1208	1080	1019	1037	996	992
MEAN	37.5	38.6	37.5	34.1	62.3	78.5	40.3	34.8	34.0	33.5	32.1	33.1
MAX	42	56	50	39	268	478	45	38	38	44	36	44
MIN	32	36	34	33	32	38	37	34	21	31	30	30
AC-FT	2300	2300	2300	2100	3460	4820	2400	2140	2020	2060	1980	1970

WTR YR 1985 TOTAL 15049 MEAN 41.2 MAX 478 MIN 21 AC-FT 29850

05378235 GARVIN BROOK NEAR MINNESOTA CITY, MN--Continued

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--
SUSPENDED-SEDIMENT DISCHARGE: March to September 1982, March to September 1984, October to July 1985.

INSTRUMENTATION.--Sediment pumping sampler since March 1982.

REMARKS.--In addition to automatic sampler, suspended-sediment samples were collected weekly, plus extra samples were taken during periods of higher runoff. Daily sediment load was estimated based on water discharge records and available sediment samples.

COOPERATION.--Minnesota Pollution Control Agency.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 3,020 mg/L June 8, 1984; minimum daily mean, 14 mg/L Mar. 1-25, 1984, Nov. 11-15, 1985.
SEDIMENT LOADS: Maximum daily, 4,810 tons (4,360 tonnes) June 8, 1984; minimum daily, 1.3 tons (1.2 tonnes) Apr. 12, 1982.

EXTREMES FOR CURRENT PERIOD.--October to July, 1985.
SEDIMENT CONCENTRATIONS: Maximum daily mean during period, 1,980 mg/L Mar. 11; minimum daily mean, 14 mg/L Nov. 11-15.
SEDIMENT LOADS: Maximum daily during period, 4,810 tons (4,360 tonnes) Mar. 11; minimum daily, 1.4 tons (1.3 tonnes) Nov. 12-13, 15.

WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (90095)	PH LAB (STAND-ARD UNITS) (00403)	TEMPER-ATURE (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	SOLIDS, RESIDUE AT 105 DEG. C, SUS-PENDED (MG/L) (00530)	SOLIDS, VOLA-TILE, SUS-PENDED (MG/L) (00535)	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)
OCT												
16...	1727	39	--	--	--	11.5	--	--	--	--	--	--
16...	1733	39	493	--	--	11.5	--	--	--	--	--	--
FEB												
28...	1231	45	--	--	--	5.5	--	--	--	--	--	--
28...	1515	46	--	--	--	7.0	20	124	6	1.70	0.25	1.8
28...	1705	54	--	--	--	7.5	--	--	--	--	--	--
28...	1826	162	--	--	--	6.5	--	--	--	--	--	--
28...	1828	204	--	464	7.8	6.5	4.5	610	22	--	0.19	1.1
28...	1910	378	--	394	7.4	5.0	40	2070	92	--	0.55	1.6
28...	2115	588	--	--	--	4.0	--	--	--	--	--	--
28...	2120	584	--	--	--	4.0	30	1610	116	1.10	0.98	6.5
28...	2215	490	--	--	--	2.5	--	--	--	--	--	--
28...	2220	460	--	228	7.1	2.5	40	1310	72	--	1.10	2.7
MAR												
01...	0730	100	--	--	--	2.0	45	270	46	0.89	1.10	3.5
11...	1329	1210	--	--	--	1.0	--	--	--	--	--	--
11...	1405	1490	--	--	--	1.0	--	--	--	--	--	--
11...	1524	1290	--	--	--	1.0	--	--	--	--	--	--
11...	1642	1010	--	--	--	1.0	--	--	--	--	--	--
JUL												
22...	1540	32	--	--	--	20.5	--	--	--	--	--	--

GARVIN BROOK BASIN

05378235 GARVIN BROOK NEAR MINNESOTA CITY, MN--Continued

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)	SED. SUSP. FALL DIAM. % FINER THAN .002 MM (70337)	SED. SUSP. FALL DIAM. % FINER THAN .004 MM (70338)	SED. SUSP. FALL DIAM. % FINER THAN .008 MM (70339)
FEB							
28...	1231	45	118	14	--	--	--
28...	1515	46	162	20	--	--	--
28...	1705	54	190	28	--	--	--
28...	1826	162	821	359	--	--	--
28...	1910	378	1850	1890	1	11	--
28...	2115	588	2340	3710	--	--	--
28...	2215	490	1620	2140	5	11	--
MAR							
11...	1329	1210	6830	22300	20	24	32
11...	1405	1490	7350	29600	21	25	34
11...	1524	1290	6220	21700	23	30	40
11...	1642	1010	4150	11300	33	40	42

DATE	SED. SUSP. FALL DIAM. % FINER THAN .016 MM (70340)	SED. SUSP. FALL DIAM. % FINER THAN .062 MM (70342)	SED. SUSP. FALL DIAM. % FINER THAN .125 MM (70343)	SED. SUSP. FALL DIAM. % FINER THAN .250 MM (70344)	SED. SUSP. FALL DIAM. % FINER THAN .500 MM (70345)	SED. SUSP. FALL DIAM. % FINER THAN 1.00 MM (70346)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
FEB							
28...	--	--	--	--	--	--	91
28...	--	--	--	--	--	--	96
28...	--	--	--	--	--	--	91
28...	--	86	97	100	--	--	--
28...	34	82	88	92	98	100	--
28...	--	86	92	99	100	--	--
28...	35	84	88	99	100	--	--
MAR							
11...	44	88	93	99	100	--	--
11...	47	88	92	96	100	--	--
11...	53	88	91	97	100	--	--
11...	54	90	93	99	100	--	--

PARTICLE-SIZE DISTRIBUTION OF SURFACE BED MATERIAL, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	TEMPER-ATURE (DEG C) (00010)	NUMBER OF SAM-PLING POINTS (00063)	BED MAT. SIEVE DIAM. % FINER THAN .062 MM (80164)	BED MAT. SIEVE DIAM. % FINER THAN .125 MM (80165)	BED MAT. SIEVE DIAM. % FINER THAN .250 MM (80166)	BED MAT. SIEVE DIAM. % FINER THAN .500 MM (80167)	BED MAT. SIEVE DIAM. % FINER THAN 1.00 MM (80168)	BED MAT. SIEVE DIAM. % FINER THAN 2.00 MM (80169)	BED MAT. SIEVE DIAM. % FINER THAN 4.00 MM (80170)
OCT											
16...	1727	39	11.5	3	1	2	15	84	98	100	--
16...	1733	39	11.5	3	<1	2	15	84	98	100	--
JUL											
22...	1540	32	20.5	3	11	19	29	75	97	99	100

GARVIN BROOK BASIN

05378235 GARVIN BROOK NEAR MINNESOTA CITY, MN

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	40	3.5	338	60					---	---	621	268
2	40	3.6	30	3.3					---	---	208	34
3	40	3.7	25	2.7					---	---	70	8.1
4	35	3.2	20	2.2					---	---	60	6.6
5	33	3.0	20	2.1					---	---	50	5.4
6	30	2.8	20	2.1					---	---	50	5.3
7	141	19	20	2.1					---	---	50	5.1
8	135	15	20	2.0					---	---	114	32
9	50	5.0	22	2.3					---	---	672	837
10	48	4.7	19	2.3					---	---	953	1300
11	46	4.6	14	1.5					---	---	1980	4810
12	44	4.4	14	1.4					---	---	424	201
13	43	4.3	14	1.4					---	---	252	66
14	43	4.3	14	1.5					---	---	152	27
15	58	6.3	14	1.4					---	---	130	19
16	66	7.1	19	1.8					---	---	115	15
17	58	6.6	31	3.1					---	---	85	9.6
18	51	5.4	30	3.0					---	---	84	9.3
19	45	4.9	30	2.9					---	---	83	9.2
20	39	4.0	29	2.8					---	---	83	9.0
21	36	3.6	29	2.8					835	854	90	10
22	33	3.4	28	2.7					439	173	115	17
23	30	3.0	28	2.8					490	105	112	14
24	30	2.9	28	2.9					520	149	106	12
25	35	3.7	27	2.8					220	36	106	11
26	35	3.8	26	2.7					459	148	108	12
27	131	16	25	2.6					140	19	122	14
28	50	5.3	24	2.4					499	521	120	13
29	30	3.1	23	2.3					---	---	114	13
30	30	3.0	22	2.2					---	---	101	11
31	50	5.3	---	---					---	---	91	10
TOTAL	---	168.5	---	128.1					---	---	---	7813.6

	APRIL		MAY		JUNE		JULY		AUGUST	SEPTEMBER
1	82	9.1	29	3.0	80	7.3	50	4.7		
2	76	8.6	28	2.7	84	7.7	50	4.6		
3	70	8.3	27	2.7	88	8.1	50	4.6		
4	64	7.8	25	2.4	92	8.2	51	4.7		
5	58	7.0	26	2.5	96	8.8	50	4.6		
6	52	6.2	27	2.7	101	9.0	48	4.4		
7	52	5.9	29	2.8	98	8.7	47	4.2		
8	52	5.8	30	2.8	95	8.5	45	4.1		
9	52	5.8	31	2.9	92	8.2	44	3.9		
10	52	5.8	33	3.1	90	8.0	43	3.8		
11	52	5.8	34	3.2	87	8.0	41	3.5		
12	52	5.8	35	3.3	84	7.9	40	3.6		
13	52	5.6	37	3.4	81	7.4	39	3.4		
14	52	5.6	38	3.6	78	7.2	---	---		
15	52	5.5	39	3.7	74	7.2	---	---		
16	52	5.5	41	3.9	75	7.3	---	---		
17	52	5.5	42	3.9	75	7.3	---	---		
18	52	5.5	44	4.0	75	7.1	---	---		
19	52	5.5	47	4.3	75	7.1	---	---		
20	52	5.3	49	4.5	75	7.1	---	---		
21	52	5.3	52	4.8	75	7.1	---	---		
22	52	5.3	54	5.0	75	6.9	---	---		
23	90	11	57	5.2	75	6.9	---	---		
24	61	6.8	59	5.4	75	6.9	---	---		
25	60	6.3	62	5.7	75	7.1	---	---		
26	59	6.1	64	5.9	100	9.7	---	---		
27	57	5.8	67	6.2	60	6.2	---	---		
28	48	4.8	69	6.3	120	6.8	---	---		
29	39	3.9	72	6.6	280	26	---	---		
30	30	3.0	74	6.8	50	4.6	---	---		
31	---	---	77	7.1	---	---	---	---		
TOTAL	---	184.2	---	130.4	---	244.3	---	---		

GARVIN BROOK BASIN

05378300 STRAIGHT VALLEY CREEK NEAR ROLLINGSTONE, MN

LOCATION.--Lat 44°05'09", long 91°50'34", in SE¼NE¼ sec.12, T.107 N., R.9 W., Winona County, Hydrologic Unit 07040003, at bridge on County Highway, 0.2 mi above mouth, and 1.5 mi southwest of Rollingstone.

DRAINAGE AREA.--5.16 mi^2.

PERIOD OF RECORD.--Water years 1959-66 (annual maximums), 1967-70 (peaks above base), October 1970 to September 1985 (discontinued).

GAGE.--Water-stage recorder, crest-stage gage, and v-notch weir. Datum of gage is 723.85 ft above National Geodetic Vertical Datum of 1929. Nov. 6, 1958, to Oct. 20, 1966, crest-stage gage at present site and datum.

REMARKS.--Estimated daily discharges: Feb. 21, 22, July 31, Aug. 12, 13, and Sept. 3-30. Records fair.

AVERAGE DISCHARGE.--15 years (water years 1971-85), 2.36 ft^3/s, 6.21 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,500 ft^3/s, July 5, 1978, gage height, 18.10 ft, from high-water mark in well; minimum observed, 0.12 ft^3/s, Aug. 5, 1960.

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. 11	1045	*258	*13.23	No other peak greater than base discharge.			

Minimum discharge, 1.3 ft^3/s, July 27, 28, 30, Aug. 6, 7, 9, 15, gage height, 10.14 ft; minimum gage height, 10.10 ft, Feb. 15.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.0	3.0	2.2	2.4	1.6	15	3.8	2.3	2.0	1.5	1.4	1.4
2	2.1	2.6	2.2	2.2	1.6	3.8	4.0	2.3	1.9	1.5	1.4	1.4
3	2.1	2.6	2.1	2.2	1.6	3.1	4.4	2.3	1.8	1.5	1.4	1.4
4	2.1	2.5	2.0	2.2	1.6	2.7	4.4	2.1	1.8	1.6	1.4	1.4
5	2.1	2.5	2.0	2.2	1.6	3.0	4.2	2.2	1.7	1.5	1.4	1.7
6	2.2	2.3	1.9	2.2	1.6	3.2	3.9	2.4	1.7	1.5	1.3	1.5
7	3.1	2.3	2.0	2.2	1.5	3.5	3.6	2.0	1.7	1.5	1.3	1.4
8	3.2	2.3	2.0	2.2	1.5	14	3.3	1.9	1.6	1.5	1.4	1.4
9	2.4	2.8	2.0	2.2	1.5	24	3.3	1.9	1.6	1.6	1.3	1.5
10	2.2	3.1	2.0	2.2	1.5	24	3.2	1.8	1.6	1.5	1.4	1.4
11	2.3	2.6	2.2	2.2	1.5	43	3.2	1.8	1.5	1.5	1.4	1.4
12	2.4	2.4	2.2	2.1	1.5	7.2	3.1	1.9	1.5	1.5	1.7	1.4
13	2.4	2.4	2.1	2.1	1.5	12	3.1	1.7	1.5	1.5	1.5	1.4
14	2.3	2.4	2.2	2.1	1.4	9.8	3.1	2.0	1.6	1.5	1.4	1.4
15	2.7	2.3	2.2	2.0	1.4	7.2	3.0	2.1	1.6	1.5	1.3	1.4
16	3.0	2.3	4.1	2.0	1.5	6.0	2.8	2.1	1.6	1.5	1.4	1.4
17	2.9	2.3	2.7	2.0	1.4	4.7	2.8	2.1	1.6	1.5	1.4	1.4
18	2.8	2.2	2.3	1.9	1.4	4.5	2.7	2.0	1.6	1.5	1.4	1.4
19	2.8	2.2	2.3	1.8	1.4	4.7	2.6	2.0	1.5	1.4	1.4	1.4
20	2.6	2.2	2.2	1.8	1.6	4.2	2.6	2.0	1.4	1.4	1.4	1.4
21	2.5	2.2	2.5	1.8	35	4.0	2.6	2.1	1.5	1.4	1.4	1.4
22	2.4	2.2	2.2	1.8	14	4.0	2.8	2.0	1.4	1.4	1.4	1.5
23	2.4	2.2	2.1	1.8	7.0	4.2	3.3	1.9	1.4	1.4	1.4	1.7
24	2.4	2.2	2.0	1.8	10	4.0	2.8	2.0	1.3	1.9	1.4	1.6
25	2.7	2.2	1.9	1.8	4.5	3.8	2.7	2.0	1.3	1.6	1.4	1.5
26	2.7	2.2	1.9	1.8	10	5.0	2.6	2.0	1.3	1.4	1.4	1.4
27	2.7	2.2	2.0	1.7	4.0	4.8	2.5	2.1	1.4	1.3	1.4	1.4
28	2.5	2.2	17	1.7	13	4.2	2.5	1.9	1.4	1.3	1.4	1.4
29	2.5	2.2	3.2	1.7	---	4.0	2.4	2.0	1.4	1.4	1.5	1.7
30	2.4	2.2	2.7	1.7	---	3.8	2.4	2.0	1.4	1.3	1.4	2.1
31	2.9	---	2.5	1.7	---	3.9	---	1.9	---	1.5	1.4	---
TOTAL	77.8	71.3	84.9	61.5	127.7	245.3	93.7	62.8	46.6	45.9	43.5	44.2
MEAN	2.51	2.38	2.74	1.98	4.56	7.91	3.12	2.03	1.55	1.48	1.40	1.47
MAX	3.2	3.1	17	2.4	35	43	4.4	2.4	2.0	1.9	1.7	2.1
MIN	2.0	2.2	1.9	1.7	1.4	2.7	2.4	1.7	1.3	1.3	1.3	1.4
CFSM	.49	.46	.53	.38	.88	1.53	.61	.39	.30	.29	.27	.29
IN.	.56	.51	.61	.44	.92	1.77	.68	.45	.34	.33	.31	.32
AC-FT	154	141	168	122	253	487	186	125	92	91	86	88

CAL YR 1984 TOTAL 795.8 MEAN 2.17 MAX 17 MIN 1.2 CFSM .42 IN 5.74 AC-FT 1580
WTR YR 1985 TOTAL 1005.2 MEAN 2.75 MAX 43 MIN 1.3 CFSM .53 IN 7.25 AC-FT 1990

MISSISSIPPI RIVER MAIN STEM

05378500 MISSISSIPPI RIVER AT WINONA, MN

LOCATION.--Lat 44°03'21", long 91°38'16", in sec.23, T.107 N., R.7 W., Winona County, Hydrologic Unit 07040003, on right bank at Winona pumping station in Winona, 9.5 mi upstream from Trempealeau River, and at mile 725.7 upstream from the Ohio River.

DRAINAGE AREA.--59,200 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1928 to current year. Gage-height records collected in this vicinity since 1878 are contained in reports of Mississippi River Commission.

GAGE.--Water-stage recorder. Datum of gage is 639.64 ft above National Geodetic Vertical Datum of 1929. June 10, 1928, to Apr. 15, 1931, nonrecording gage at site 800 ft upstream. Prior to Oct. 1, 1929, at datum 0.20 ft higher and Oct. 1, 1929, to Apr. 15, 1931, at datum 0.12 ft lower. Apr. 16, 1931, to Nov. 12, 1934, nonrecording gage at present site and datum. Since Mar. 31, 1937, auxiliary water-stage recorder 2.7 mi upstream at tailwater of navigation dam 5A.

REMARKS.-- No estimated daily discharges. Records good. Some regulation by reservoirs, navigation dams, and powerplants at low and medium stages. Flood flow not materially affected by artificial storage.

AVERAGE DISCHARGE.--57 years, 27,470 ft^3/s, 6.30 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 268,000 ft^3/s, Apr. 19, 1965, gage height, 20.77 ft, from floodmark; minimum, 1,940 ft^3/s, Dec. 12, 1980, gage height, 3.96 ft, result of ice jam; minimum gage height, -3.38 ft, Aug. 31, 1934 (prior to dam construction in 1936); minimum gage height since 1938, after completion of dam, 1.95 ft, Jan. 27, 1944.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 18, 1880, reached an elevation of 657.14 ft, discharge, 172,000 ft^3/s, from information by Corps of Engineers.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 101,000 ft^3/s, Apr. 2, gage height, 11.70 ft; minimum daily discharge, 12,000 ft^3/s, Dec. 6; minimum gage height, 5.04 ft, Oct. 6.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	25500	65100	32300	26900	18300	30000	100000	90900	48200	40400	27300	24700
2	25400	64400	31700	24800	18300	33500	101000	92500	46000	44900	26400	26400
3	24300	59000	27900	25000	18400	30000	97700	92800	44800	49700	25700	28000
4	23700	56500	23000	25000	18400	26700	91400	92200	45200	51100	24800	29000
5	22300	58100	13000	25400	18300	28500	85600	91600	47400	52100	23900	29900
6	19300	57900	12000	26000	17000	29400	82500	89700	50600	51600	23200	31700
7	18200	54500	15000	26800	17200	30000	82800	85300	50600	50700	23200	35400
8	20400	50000	18500	26800	17300	30300	82900	81900	50900	50200	22900	38800
9	20300	48100	22100	26800	17300	31000	80900	77900	50100	49300	19900	39400
10	20800	48600	23800	25700	17300	33500	77600	74700	48700	47700	18200	41800
11	21500	49000	24000	25500	17400	39400	74800	71300	46100	46300	18700	45300
12	21400	48100	27500	24300	17300	49300	71700	67200	45000	44700	21300	50100
13	20000	46000	28700	23200	17300	52600	68100	65300	45300	41200	26600	54400
14	20100	43400	29100	22000	17400	52400	67400	65800	45200	37800	31900	56900
15	20500	42400	29100	18800	16800	54000	67100	64100	44400	36500	31000	56300
16	21400	43100	31400	18700	17000	54700	68900	62600	42000	33900	29900	53700
17	24300	42400	30200	19700	17000	53600	71700	60100	40000	27700	29300	50000
18	27800	40200	25300	20800	17000	54500	73700	59300	38900	26100	28600	50200
19	30300	36700	29000	20300	17000	58700	73900	59500	39400	30100	28600	50500
20	39400	35000	33500	18100	17000	62900	68100	60600	39700	29500	28300	50600
21	46200	33400	33500	17800	19100	65200	63000	61400	39300	26600	28300	49200
22	49000	32200	33300	18300	22000	68100	62900	61300	38600	25100	28200	46000
23	50500	31700	33100	18700	25000	73400	61800	61000	38300	24200	29200	44900
24	53500	30600	31700	18800	28000	77600	61900	60700	37700	24200	29300	44700
25	56900	29300	28500	19100	29100	81800	63200	59700	35600	27600	26100	45200
26	60600	27200	26800	19200	29700	84500	65400	57600	34100	29000	23100	47800
27	62100	28500	27000	19300	29700	87600	68600	54600	34100	28400	23000	51000
28	63300	31500	28000	20500	29000	89100	73500	51000	35300	28200	25200	53200
29	64600	31600	31800	20100	---	91100	80100	49100	36700	28900	28500	57300
30	64400	32100	29600	19900	---	93300	86900	50000	38100	28400	29000	58400
31	65400	---	28500	19700	---	97400	---	49600	---	27600	25400	---
TOTAL	1103400	1296600	838900	682000	560600	1744100	2275100	2121300	1276300	1139700	805000	1340800
MEAN	35590	43220	27060	22000	20020	56260	75840	68430	42540	36760	25970	44690
MAX	65400	65100	33500	26900	29700	97400	101000	92800	50900	52100	31900	58400
MIN	18200	27200	12000	17800	16800	26700	61800	49100	34100	24200	18200	24700
CFSM	.60	.73	.46	.37	.34	.95	1.28	1.16	.72	.62	.44	.76
IN.	.69	.81	.53	.43	.35	1.10	1.43	1.33	.80	.72	.51	.84
AC-FT	2189000	2572000	1664000	1353000	1112000	3459000	4513000	4208000	2532000	2261000	1597000	2659000

CAL YR 1984 TOTAL 16462700 MEAN 44980 MAX 106000 MIN 11100 CFSM .76 IN 10.34 AC-FT 32650000
WTR YR 1985 TOTAL 15183800 MEAN 41600 MAX 101000 MIN 12000 CFSM .70 IN 9.54 AC-FT 30120000

05378500 MISSISSIPPI RIVER AT WINONA, MN--Continued
(National stream-quality accounting network station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1963 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: May 1980 to current year (discontinued).
WATER TEMPERATURES: October 1975 to current year.
SUSPENDED-SEDIMENT DISCHARGE: September 1975 to current year.

REMARKS.--For the winter period, daily sediment loads were estimated on the basis of water records and weekly sediment samples. Water temperature and specific conductance were obtained once daily during most of the open water period and weekly during the winter period. Letter K indicates a non-ideal colony count.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 550 microsiemens, July 17, 1984; minimum daily, 180 microsiemens, Sept. 24, 1980, May 9, 1981.
WATER TEMPERATURES: Maximum daily, 29.0°C, July 10, 1976; minimum daily, 0.0°C on many days each year.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 393 mg/L, July 2, 1978; minimum daily mean, 1/mg/L many days during several years.
SEDIMENT LOADS: Maximum daily 65,300 tons, July 2, 1978; minimum daily, 19 tons , Dec. 12, 1980.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum daily, 460 microsiemens, Dec. 6, 11, Jan. 18, Feb. 1, 8, July 1-7; minimum daily, 280 microsiemens, Apr. 1, 2.
WATER TEMPERATURES: Maximum daily, 25.0°C, July 9; minimum daily, 0.0°C on many days during winter period.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 122 mg/L, Mar. 16; minimum daily mean, 1 mg/L, Dec. 11.
SEDIMENT LOADS: Maximum daily, 18,000 tons, Mar. 16; minimum daily, 65 tons, Dec. 11.

WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	DIS-CHARGE, IN CUBIC FEET PER SECOND (00060)	STREAM-FLOW, INSTAN-TANEOUS (CFS) (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (90095)	PH (STAND-ARD UNITS) (00400)	PH LAB (STAND-ARD UNITS) (00403)	TEMPER-ATURE, AIR (DEG C) (00020)	TEMPER-ATURE (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	BARO-METRIC PRES-SURE (MM OF HG) (00025)
OCT											
24...	1555	--	54200	362	373	8.1	7.9	15.0	10.0	4.6	748
JAN											
14...	1430	22000	--	425	440	8.1	7.8	-9.0	0.5	2.0	744
APR											
22...	1415	--	63000	340	335	8.4	7.9	19.5	15.5	5.0	760
JUL											
15...	1430	--	36400	370	363	8.0	7.9	26.0	26.5	4.7	770

DATE	OXYGEN, DIS-SOLVED (MG/L) (00300)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	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)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY FIELD (MG/L AS CACO3) (00410)	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)
OCT											
24...	10.3	63	50	40	16	11	2.2	136	137	29	16
JAN											
14...	13.2	K12	K12	51	20	12	2.6	166	162	38	16
APR											
22...	11.2	K11	K16	39	14	6.5	2.9	112	115	34	11
JUL											
15...	7.9	21	<100	42	17	7.4	2.6	138	138	36	9.6

DATE	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)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	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)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT											
24...	0.2	10	219	0.82	0.23	--	0.17	0.10	0.09	--	--
JAN											
14...	0.2	14	285	1.90	0.33	0.9	0.11	0.10	0.10	--	--
APR											
22...	<0.1	7.6	202	1.40	<0.01	0.7	0.13	0.04	0.04	--	--
JUL											
15...	0.2	9.2	232	1.20	0.07	1.3	0.09	0.04	0.04	33	98

MISSISSIPPI RIVER MAIN STEM

05378500 MISSISSIPPI RIVER AT WINONA, MN--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	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)	LEAD, DISSOLVED (UG/L AS PB) (01049)
OCT											
24...	1555	<10	1	41	<0.5	<1	<1	<3	1	24	<1
JAN											
14...	1430	10	1	45	<0.5	<1	1	<3	1	83	2
APR											
22...	1415	10	1	38	<0.5	<1	<1	<3	<1	60	1
JUL											
15...	1430	<10	2	52	<0.5	<1	<1	<3	4	11	2

DATE	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										
24...	5	6	<0.1	<10	2	<1	<1	96	<6	<3
JAN										
14...	14	56	0.1	<10	1	<1	<1	120	<6	13
APR										
22...	9	5	<0.1	<10	1	<1	<1	98	<6	<3
JUL										
15...	16	2	4.6	<10	6	<1	<1	110	<6	7

PARTICLE-SIZE DISTRIBUTION OF SURFACE BED MATERIAL

DATE	TIME	NUMBER OF SAMPLING POINTS (00063)	BED MAT. SIEVE DIAM. % FINER THAN .125 MM (80165)	BED MAT. SIEVE DIAM. % FINER THAN .250 MM (80166)	BED MAT. SIEVE DIAM. % FINER THAN .500 MM (80167)	BED MAT. SIEVE DIAM. % FINER THAN 1.00 MM (80168)	BED MAT. SIEVE DIAM. % FINER THAN 2.00 MM (80169)	BED MAT. SIEVE DIAM. % FINER THAN 4.00 MM (80170)	BED MAT. SIEVE DIAM. % FINER THAN 8.00 MM (80171)	BED MAT. SIEVE DIAM. % FINER THAN 16.0 MM (80172)
APR										
22...	1415	4	<1	2	34	86	96	98	99	100
JUL										
15...	1505	4	<1	3	36	76	88	93	95	100

05378500 MISSISSIPPI RIVER AT WINONA, MN--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12.0	7.0	2.5	---	.0	2.0	4.5	15.0	19.0	23.0	22.0	20.0
2	13.0	5.5	2.0	---	---	---	5.0	14.5	20.0	24.0	22.5	21.0
3	13.0	5.0	1.0	---	---	---	5.0	15.0	19.0	24.0	23.0	21.0
4	13.0	5.0	1.0	.5	---	---	6.0	16.0	18.0	24.0	23.5	21.5
5	14.5	5.0	1.0	---	---	---	5.0	17.0	18.0	22.0	23.5	21.5
6	14.5	5.0	.5	---	---	---	5.0	17.0	19.0	22.0	24.0	23.0
7	15.0	6.0	.0	---	---	---	5.5	17.0	20.0	23.0	24.0	24.0
8	15.0	6.5	1.0	---	.0	3.0	4.5	17.0	21.0	24.0	24.0	24.5
9	15.5	6.0	2.0	---	---	---	4.0	18.0	22.0	25.0	24.0	23.0
10	16.0	5.0	2.0	---	---	---	6.0	19.0	21.0	24.0	23.0	20.0
11	16.0	---	3.0	.0	.0	---	8.0	19.0	19.0	24.0	22.0	20.0
12	16.0	4.0	2.0	---	---	---	9.0	18.0	18.0	24.0	22.0	19.0
13	16.0	4.0	.5	---	---	---	10.0	18.0	18.0	24.0	23.0	18.0
14	16.0	5.0	.5	.5	---	---	9.0	17.0	19.0	24.0	23.0	18.0
15	15.5	5.0	1.0	---	.0	3.0	9.0	17.0	19.5	24.0	22.0	18.0
16	14.5	4.0	---	---	---	3.0	9.5	16.5	19.5	24.0	22.0	18.0
17	13.0	3.0	---	---	---	3.0	10.0	15.5	19.0	24.0	22.0	19.0
18	13.0	3.0	---	.0	---	3.5	12.5	17.0	18.5	24.0	22.0	20.0
19	12.0	3.0	---	---	---	4.0	15.0	18.0	18.5	24.5	20.0	21.0
20	11.0	3.0	---	---	---	4.5	15.0	18.0	19.0	24.5	19.0	20.0
21	10.0	3.5	---	---	---	4.0	15.0	18.0	20.0	24.5	19.0	18.0
22	10.0	3.0	1.0	---	---	4.5	15.0	18.0	20.0	24.0	19.0	16.0
23	10.0	2.5	---	---	1.0	4.5	15.0	18.5	20.5	23.5	19.0	16.0
24	10.0	2.5	---	.0	---	4.0	13.0	18.5	21.0	23.5	19.0	14.0
25	10.5	2.5	---	---	---	4.0	13.0	19.0	22.0	23.0	20.0	13.0
26	10.0	3.0	---	---	---	4.0	13.0	20.0	23.0	23.5	20.0	12.5
27	13.0	4.0	---	---	---	5.0	12.0	20.0	23.0	23.5	21.0	12.0
28	---	3.0	---	---	---	5.0	12.0	19.5	21.5	24.0	21.0	---
29	11.0	3.0	---	---	---	5.5	13.0	19.0	21.0	24.0	21.0	---
30	9.5	2.5	---	---	---	5.0	15.0	19.5	22.0	23.0	20.0	---
31	8.0	---	---	---	---	4.5	---	19.0	---	21.5	20.0	---
MEAN	---	---	---	---	---	---	10.0	17.5	20.0	23.5	21.5	---

SPECIFIC CONDUCTANCE, MICROSIEMENS PER CENTIMETER AT 25°C, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	380	340	430	---	460	380	280	390	380	460	400	350
2	380	340	430	---	---	---	280	380	390	460	400	370
3	380	340	440	---	---	---	290	370	400	460	400	370
4	380	340	440	420	---	---	290	360	400	460	400	370
5	380	330	450	---	---	---	300	360	400	460	400	370
6	380	330	460	---	---	---	300	360	400	460	390	360
7	380	330	460	---	---	---	300	360	400	460	390	340
8	360	330	460	---	460	390	300	360	410	420	400	340
9	370	340	460	---	---	---	310	380	410	410	380	330
10	360	350	460	---	---	---	320	400	400	400	370	360
11	360	350	460	430	---	---	320	400	400	400	360	360
12	350	380	410	---	---	---	330	400	400	400	350	340
13	350	380	400	---	---	---	340	400	380	400	350	340
14	350	380	400	425	---	---	340	400	380	400	350	340
15	340	370	400	---	440	320	300	390	380	400	340	340
16	340	385	---	---	---	310	300	400	380	400	320	400
17	340	400	---	---	---	340	300	410	380	410	320	410
18	340	390	---	460	---	360	300	400	380	400	340	420
19	340	400	---	---	---	360	310	410	390	410	350	420
20	320	400	---	---	---	360	320	390	400	410	350	400
21	310	400	---	---	---	350	330	390	400	410	350	410
22	340	400	430	---	---	360	340	400	400	400	360	430
23	350	410	---	---	400	360	340	400	400	400	360	430
24	360	415	---	450	---	360	350	400	410	410	360	420
25	370	420	---	---	---	310	350	380	400	410	360	430
26	390	420	---	---	---	310	360	380	410	400	360	430
27	400	420	---	---	---	290	340	380	425	400	370	430
28	400	430	450	---	---	300	350	380	440	400	360	---
29	360	430	---	---	---	300	380	380	440	400	350	---
30	350	430	---	---	---	300	390	380	440	400	340	---
31	350	---	---	---	---	290	---	380	---	400	340	---
MEAN	360	379	---	---	---	---	322	386	401	416	364	---

MISSISSIPPI RIVER MAIN STEM

05378500 MISSISSIPPI RIVER AT WINONA, MN--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN-TRATION (MG/L)	LOADS (T/DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	13	895	46	8090	6	523	4	291	3	148	29	2350
2	12	823	34	5910	5	428	4	268	3	148	32	2890
3	12	787	25	3980	4	301	4	270	3	149	35	2840
4	12	768	26	3970	4	248	4	270	3	149	29	2090
5	13	783	16	2510	4	140	4	274	4	198	17	1310
6	12	625	14	2190	4	130	4	281	4	184	11	873
7	13	639	15	2210	3	121	4	289	4	186	8	648
8	14	771	17	2300	2	100	3	217	4	187	7	573
9	13	713	20	2600	2	119	3	217	4	187	7	586
10	14	786	14	1840	2	129	3	208	4	187	7	633
11	12	697	13	1720	1	65	3	207	4	188	9	957
12	12	693	11	1430	3	223	3	197	3	140	33	4390
13	11	594	10	1240	3	232	3	188	3	140	72	10200
14	11	597	13	1520	4	314	3	178	3	141	100	14100
15	13	720	24	2750	3	236	3	152	3	136	115	16800
16	14	809	31	3610	3	254	3	151	3	138	122	18000
17	16	1050	17	1950	3	245	3	160	3	138	115	16600
18	16	1200	12	1300	3	205	3	168	3	138	52	7650
19	23	1880	6	595	3	235	3	164	4	184	54	8560
20	22	2340	10	945	3	271	3	147	4	184	49	8320
21	25	3120	6	541	3	271	3	144	5	258	42	7390
22	28	3700	7	609	3	270	4	198	9	535	40	7350
23	27	3680	8	685	3	268	4	202	15	1010	41	8130
24	27	3900	6	496	3	257	4	203	21	1590	46	9640
25	25	3840	8	633	3	231	4	206	26	2040	71	15700
26	27	4420	6	441	3	217	4	207	28	2250	71	16200
27	33	5530	8	616	3	219	4	208	29	2330	56	13200
28	37	6320	9	765	3	227	4	221	28	2190	41	9860
29	26	4530	6	512	3	258	3	163	---	---	41	10100
30	36	6260	6	520	3	240	3	161	---	---	39	9820
31	29	5120	---	---	3	231	3	160	---	---	38	9990
TOTAL	---	68590	---	58478	---	7208	---	6370	---	15453	---	237750
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	34	9180	22	5400	38	4950	47	5130	14	1030	11	734
2	33	9000	26	6490	42	5220	57	6910	16	1140	11	784
3	37	9760	23	5760	33	3990	42	5640	16	1110	11	832
4	26	6420	24	5970	27	3300	45	6210	12	804	12	940
5	22	5080	25	6180	25	3200	52	7310	10	645	14	1130
6	28	6240	23	5570	18	2460	48	6690	11	689	13	1110
7	29	6480	34	7830	30	4100	43	5890	12	752	12	1150
8	26	5820	30	6630	61	8380	40	5420	12	742	13	1360
9	20	4370	24	5050	52	7030	37	4930	12	645	16	1700
10	19	3980	27	5450	29	3810	35	4510	12	590	17	1920
11	19	3840	26	5010	40	4980	21	2630	11	555	16	1960
12	20	3870	24	4350	43	5220	19	2290	13	748	20	2710
13	19	3490	23	4060	39	4770	17	1890	15	1080	23	3380
14	19	3460	24	4260	37	4520	19	1940	20	1720	23	3530
15	29	5250	24	4150	37	4440	23	2270	18	1510	25	3800
16	20	3720	25	4230	39	4420	16	1460	14	1130	19	2750
17	23	4450	25	4060	39	4210	15	1120	15	1190	20	2700
18	23	4580	25	4000	29	3050	14	987	19	1470	21	2850
19	28	5590	28	4500	43	4570	15	1220	16	1240	21	2860
20	23	4230	35	5730	36	3860	15	1190	13	993	22	3010
21	23	3910	29	4810	41	4350	17	1220	14	1070	22	2920
22	23	3910	42	6950	45	4690	12	813	14	1070	16	1990
23	20	3340	42	6920	43	4450	13	849	15	1180	15	1820
24	24	4010	36	5900	26	2650	14	915	15	1190	14	1690
25	24	4100	37	5960	24	2310	14	1040	13	916	16	1950
26	23	4060	38	5910	21	1930	15	1170	13	811	16	2060
27	22	4070	28	4130	21	1930	13	997	13	807	18	2480
28	21	4170	27	3720	32	3050	14	1070	12	816	20	2870
29	20	4330	41	5440	43	4260	12	936	12	923	22	3400
30	23	5400	34	4590	45	4630	13	997	14	1100	25	3940
31	---	---	36	4820	---	---	14	1040	12	823	---	---
TOTAL	---	150110	---	163830	---	124730	---	86684	---	30489	---	66330

TOTAL LOAD FOR YEAR: 1016022 TONS.

ROOT RIVER BASIN

05384000 ROOT RIVER NEAR LANESBORO, MN

LOCATION.--Lat 43°44'58", long 91°58'43", in sec.1, T.103 N., R.10 W., Fillmore County, Hydrologic Unit 07040008, on left bank 0.5 mi upstream from highway bridge, 1.2 mi upstream from South Branch, and 2.5 mi northeast of Lanesboro.

DRAINAGE AREA.--615 mi^2.

PERIOD OF RECORD.--February to November 1910, February 1911 to September 1914, July 1915 to September 1917, August 1940 to September 1985 (discontinued). Published as North Branch Root River near Lanesboro, 1910-17.

REVISED RECORDS.--WSP 355: 1912. WSP 1308: 1911(M).

GAGE.--Water-stage recorder. Datum of gage is 791.32 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 1, 1917, nonrecording gage at site 0.5 mi downstream at datum about 1.5 ft higher.

REMARKS.--Estimated daily discharges: Dec. 18 to Feb. 22, and June 19-26. Records good except those for period with ice effect, Dec. 18 to Feb. 22, and period of no gage-height record, June 19-26, which are fair.

AVERAGE DISCHARGE.--50 years (water years 1912-14, 1916-17, 1941-85), 357 ft^3/s, 7.88 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,100 ft^3/s, Mar. 29, 1962, gage height, 16.11 ft; maximum gage height, 17.83 ft, Mar. 1, 1965, from floodmark (backwater from ice); minimum discharge, 29 ft^3/s, Aug. 27, 1949, gage height, 1.08 ft; minimum gage height, 0.42 ft, Dec. 3, 1980.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 11	2200	*4,620	*7.60	No other peak greater than base discharge.			

Minimum discharge, 102 ft^3/s, Dec. 4, gage height, 0.71 ft.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	227	362	263	270	233	1810	366	349	205	166	154	212
2	224	354	265	250	234	1250	342	335	211	162	153	183
3	221	336	189	245	235	799	356	325	202	157	150	174
4	221	322	139	250	237	502	627	317	197	159	147	167
5	227	303	256	260	240	346	989	313	196	157	146	191
6	230	289	226	260	243	332	970	312	193	158	147	214
7	238	282	272	255	247	375	714	308	190	155	143	204
8	244	276	274	250	250	461	585	297	187	151	141	224
9	241	276	275	248	255	3350	518	286	183	152	142	464
10	241	355	272	244	260	3030	476	273	177	165	155	395
11	241	481	274	242	265	3240	450	265	177	153	144	308
12	250	487	272	240	260	2410	432	263	179	148	147	267
13	247	406	260	235	255	1740	418	258	180	151	166	233
14	244	373	249	235	250	1240	409	262	180	154	164	213
15	250	353	261	235	248	936	402	267	180	151	162	198
16	280	330	319	232	245	742	394	262	180	147	152	188
17	324	310	457	230	242	651	378	259	180	144	150	182
18	338	315	420	228	242	548	367	249	178	144	147	177
19	315	290	409	228	240	498	356	244	170	144	142	172
20	296	267	382	230	245	460	345	239	170	140	140	180
21	280	276	358	230	819	427	336	230	170	139	139	179
22	268	298	299	231	1720	401	337	226	170	138	139	180
23	259	283	260	231	1400	387	371	224	170	138	145	202
24	250	276	250	231	1300	390	459	224	170	152	150	254
25	256	274	250	231	990	381	548	223	171	187	152	295
26	268	275	250	232	910	371	492	219	172	208	151	285
27	268	277	300	232	807	375	440	214	172	179	148	275
28	271	277	1020	232	805	374	408	207	185	161	144	260
29	268	274	550	232	---	374	383	204	182	153	296	269
30	268	268	440	232	---	366	364	203	172	148	416	368
31	267	---	330	232	---	376	---	204	---	155	270	---
TOTAL	8022	9545	10041	7413	13677	28942	14032	8061	5449	4816	5142	7113
MEAN	259	318	324	239	488	934	468	260	182	155	166	237
MAX	338	487	1020	270	1720	3350	989	349	211	208	416	464
MIN	221	267	139	228	233	332	336	203	170	138	139	167
CFSM	.42	.52	.53	.39	.79	1.52	.76	.42	.30	.25	.27	.39
IN.	.49	.58	.61	.45	.83	1.75	.85	.49	.33	.29	.31	.43
AC-FT	15910	18930	19920	14700	27130	57410	27830	15990	10810	9550	10200	14110

CAL YR 1984 TOTAL 213622 MEAN 584 MAX 3540 MIN 139 CFSM .95 IN 12.92 AC-FT 423700
WTR YR 1984 TOTAL 122253 MEAN 335 MAX 3350 MIN 138 CFSM .55 IN 7.39 AC-FT 242500

IOWA RIVER BASIN

05457000 CEDAR RIVER NEAR AUSTIN, MN

LOCATION.--Lat 43°38'11", long 92°58'26", in NE¼SE¼ sec.15, T.102 N., R.18 W., Mower County, Hydrologic Unit 07080201, on left bank 200 ft upstream from abandoned powerhouse, 500 ft downstream from highway bridge, 1.1 mi downstream from Turtle Creek, and 1.1 mi south of Austin.

DRAINAGE AREA.--425 mi^2.

PERIOD OF RECORD.--May 1909 to September 1914, October 1944 to current year.

REVISED RECORDS.--WSP 1145: 1945, 1948.

GAGE.--Water-stage recorder. Datum of gage is 1,162.10 ft above National Geodetic Vertical Datum of 1929. May 1909 to April 1912, nonrecording gage in tailwater of powerplant 200 ft downstream at datum 3.1 ft lower. May 1912 to September 1914, nonrecording gage on highway bridge 500 ft downstream at datum 1.1 ft lower.

REMARKS.--Estimated daily discharges: Dec. 3, 4, 6, 7, Dec. 23 to Jan. 5, 12-17, Jan. 19 to Feb. 15, 17, and Mar. 6. Records good except those for periods with ice effect, Dec. 3, 4, 6, 7, Dec. 23 to Jan. 5, 12-17, and Mar. 6, which are fair.

AVERAGE DISCHARGE.--46 years (water years 1910-14, 1945-85), 207 ft^3/s, 6.61 in/yr; median of yearly mean discharges, 196 ft^3/s, 6.26 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,400 ft^3/s, July 17, 1978, gage height, 20.35 ft, from floodmark in well; no flow for several days in 1911.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,400 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 12	0200	*2,190	*7.43	No other peak greater than base discharge.			

Minimum discharge, 36 ft^3/s, Aug. 11, gage height, 2.20 ft.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	67	285	156	155	74	396	237	256	101	70	54	73
2	67	320	144	150	73	421	268	234	98	69	53	67
3	67	237	120	145	72	299	632	216	96	64	49	61
4	65	215	130	143	72	169	910	203	93	62	46	62
5	69	191	134	140	72	129	1190	194	93	59	50	100
6	71	177	133	136	71	125	929	193	90	57	49	88
7	95	167	132	131	71	132	598	184	88	53	46	94
8	91	164	131	128	70	243	435	173	84	53	43	112
9	88	199	138	120	70	792	352	163	80	54	43	156
10	84	469	145	117	70	1340	319	156	75	53	43	232
11	84	592	148	110	70	1850	299	154	94	52	39	173
12	84	424	154	106	70	2060	281	158	115	52	65	125
13	82	327	149	104	70	1640	278	150	101	54	65	99
14	77	294	140	102	70	1110	278	166	99	53	61	87
15	144	283	143	99	70	683	285	172	111	54	52	78
16	218	231	305	98	70	553	279	179	102	52	49	74
17	463	226	670	96	72	436	255	173	98	52	51	73
18	348	212	495	96	73	338	250	164	100	50	48	71
19	269	197	428	88	76	302	237	155	93	52	46	68
20	250	177	345	76	93	275	224	152	86	47	44	104
21	197	177	288	80	250	247	268	142	97	45	42	70
22	168	182	221	87	457	230	325	133	89	46	57	75
23	150	177	195	92	477	224	542	133	75	46	73	126
24	139	173	170	93	305	234	775	136	70	84	59	126
25	143	168	150	91	226	222	722	129	69	75	55	194
26	141	174	140	90	230	208	538	120	86	62	50	208
27	149	182	140	87	192	233	420	116	103	53	49	188
28	179	176	208	83	222	277	354	110	84	48	54	189
29	179	167	552	80	---	415	307	105	75	49	73	226
30	165	164	311	78	---	442	279	106	70	49	61	412
31	168	---	173	76	---	319	---	112	---	61	67	---
TOTAL	4561	7127	6888	3277	3808	16344	13066	4937	2715	1730	1636	3811
MEAN	147	238	222	106	136	527	436	159	90.5	55.8	52.8	127
MAX	463	592	670	155	477	2060	1190	256	115	84	73	412
MIN	65	164	120	76	70	125	224	105	69	45	39	61
CFSM	.35	.56	.52	.25	.32	1.24	1.03	.37	.21	.13	.12	.30
IN.	.40	.62	.60	.29	.33	1.43	1.14	.43	.24	.15	.14	.33
AC-FT	9050	14140	13660	6500	7550	32420	25920	9790	5390	3430	3250	7560

CAL YR 1984 TOTAL 151916 MEAN 415 MAX 3260 MIN 65 CFSM .98 IN 13.30 AC-FT 301300
WTR YR 1985 TOTAL 69900 MEAN 192 MAX 2060 MIN 39 CFSM .45 IN 6.12 AC-FT 138600

DES MOINES RIVER BASIN

05476000 DES MOINES RIVER AT JACKSON, MN

LOCATION.--Lat 43°37'10", long 94°59'10", in SE¼SW¼ sec.24, T.102 N., R.35 W., Jackson County, Hydrologic Unit 07100001, on right bank in storage room of city powerplant in Jackson.
DRAINAGE AREA.--1,220 mi^2, approximately.
PERIOD OF RECORD.--May 1909 to December 1913, August 1930 to current year (winter record incomplete prior to 1936). Published as Des Moines River near Jackson, 1930-35, as West Fork Des Moines River near Jackson, 1936-44, and as West Fork Des Moines River at Jackson, 1945-69.
REVISED RECORDS.--WSP 1115: 1942. WSP 1175: Drainage area. WSP 1238: 1950. WSP 1308: 1938(M).
GAGE.--Water-stage recorder. Datum of gage is 1,287.75 ft above National Geodetic Vertical Datum of 1929. May 31, 1909, to Dec. 20, 1913, nonrecording gage at site 0.6 mi downstream at datum 0.99 ft lower. Aug. 22, 1930, to Sept. 30, 1944, nonrecording gage at site 7 mi upstream at datum 17.10 ft higher. Oct. 1, 1944, to Oct. 26, 1949, nonrecording gage at site 600 ft upstream at datum 10.64 ft higher. Oct. 27, 1949, to Dec. 15, 1965, water-stage recorder 200 ft downstream at present datum.
REMARKS.--Estimated daily discharges: Nov. 30 to Mar. 19 and Aug. 25, 26. Records good except those for periods with ice effect, Nov. 30 to Jan. 12, Jan. 17-24, Feb. 2, 4, 5, Feb. 9 to Mar. 5, Mar. 7-17, periods of no gage-height record, Jan. 13-16, Jan. 25 to Feb. 1, Feb. 3, 6-8, and Mar. 6, 18, 19, which are poor, and period of no gage-height record, Aug. 25, 26, which are fair. Regulation at times by Yankton, Long, Shetek, and Heron Lakes.
AVERAGE DISCHARGE.--50 years (water years 1936-85), 317 ft^3/s, 3.53 in/yr; median of yearly mean discharges, 240 ft^3/s, 2.67 in/yr.
EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 15,700 ft^3/s, Apr. 11, 1969, gage height, 19.45 ft; no flow at times.
EXTREMES FOR CURRENT YEAR.--Peak discharge above base of 900 ft^3/s (revised) and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 18	0400	2,140	[a] 10.73	June 15	0900	1,030	7.02
Apr. 29	1600	* 2,460	* 11.12	July 3	0845	1,190	7.50

[a] Backwater from ice.
Minimum daily discharge, 22 ft^3/s, Feb. 10; minimum gage height, 3.45 ft, Sept. 6.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	54	323	167	94	37	89	937	2110	987	1070	167	139
2	52	300	136	99	34	94	901	1960	971	1150	159	132
3	52	261	86	84	32	88	1020	1830	968	1180	151	160
4	51	306	115	86	29	64	1060	1770	969	1130	149	119
5	48	300	140	87	28	58	1070	1750	959	1040	143	157
6	51	289	180	84	27	49	1030	1710	920	899	133	213
7	52	281	150	81	26	54	973	1610	871	816	111	314
8	56	275	149	75	24	61	923	1500	828	760	82	439
9	67	281	163	65	23	74	873	1400	780	696	80	523
10	74	272	168	55	22	88	847	1330	711	656	83	521
11	77	242	166	55	23	620	816	1250	679	603	78	517
12	77	237	177	54	25	950	781	1240	674	561	91	515
13	80	253	150	53	30	1040	764	1240	655	512	137	383
14	100	292	125	52	34	1140	741	1170	684	482	137	468
15	131	278	164	52	32	1270	713	1210	1000	453	129	453
16	151	250	350	52	30	1420	707	1290	960	413	115	424
17	256	182	300	52	29	1760	687	1290	859	369	123	406
18	329	187	266	62	29	1870	690	1280	776	348	119	393
19	427	168	187	62	31	1560	664	1300	686	317	115	365
20	543	142	203	99	51	1520	645	1290	647	292	100	365
21	543	206	196	102	95	1480	683	1230	616	264	92	366
22	519	252	192	82	90	1440	1200	1160	566	248	89	352
23	498	259	161	67	80	1400	1710	1090	507	227	119	380
24	474	241	178	63	69	1350	2030	1070	458	227	135	400
25	453	222	175	60	60	1280	2120	1040	432	229	133	411
26	430	217	142	55	65	1220	2040	990	426	220	119	407
27	418	210	141	45	74	1220	2120	926	508	208	111	397
28	413	200	138	43	82	1160	2280	858	591	201	114	378
29	378	172	140	41	---	1090	2380	855	757	190	152	371
30	352	185	124	40	---	1040	2300	935	931	180	173	406
31	337	---	96	38	---	988	---	996	---	173	149	---
TOTAL	7543	7283	5225	2039	1211	27537	35705	40680	22376	16114	3788	10874
MEAN	243	243	169	65.8	43.3	888	1190	1312	746	520	122	362
MAX	543	323	350	102	95	1870	2380	2110	1000	1180	173	523
MIN	48	142	86	38	22	49	645	855	426	173	78	119
CFSM	.20	.20	.14	.05	.04	.73	.98	1.08	.61	.43	.10	.30
IN.	.23	.22	.16	.06	.04	.84	1.09	1.24	.68	.49	.12	.33
AC-FT	14960	14450	10360	4040	2400	54620	70820	80690	44380	31960	7510	21570

CAL YR 1984 TOTAL 416793 MEAN 1139 MAX 7560 MIN 41 CFSM .93 IN 12.71 AC-FT 826700
WTR YR 1985 TOTAL 180375 MEAN 494 MAX 2380 MIN 22 CFSM .41 IN 5.50 AC-FT 357800

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

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 flood-flow 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 two tables. The first is a table of discharge measurements at low-flow partial-record stations and the second is a table of annual maximum stage and discharge at high-flow stations. Discharge measurements made at miscellaneous sites for both low flow and high flow are given in a third table.

Low-flow partial-record stations

Measurements of streamflow in the area covered by this report made at low-flow partial-record stations are given in the following table. These measurements were made during periods of base flow when streamflow is primarily from ground-water storage. These measurements, when correlated with the simultaneous discharge of a nearby stream when continuous records are available, will give a picture of the low-flow potentiality of a stream. The column headed "Period of record" shows the water years in which measurements were made at the same, or practically the same site.

Discharge measurements made at low-flow partial-record stations during water year 1985

Station No.	Station name	Location	Drainage area (mi^2)	Period of record	Measurements	
					Date	Discharge (ft^3/s)
		Minnesota River basin				
05314725	Timms Creek near North Redwood, MN	Lat 44°38'08", long 95°11'10", in NW¼SE¼ sec.33, T.114 N., R.36 W., Renville County, Hydrologic Unit 07020004, on County Road 15, 6 miles northwest of North Redwood.	-	1985	9-17-85	14.0
05316680	Ridgely Creek at Fort Ridgely State Memorial Park near St. George, MN	Lat 44°26'49", long 94°43'22", in NW¼SW¼ sec.5, T.111 N., R.32 W., Nicollet County, Hydrologic Unit 07020007, at culvert on County Highway 29, 10 miles northwest of St. George.	70.4	1969-70, 1974, 1976, 1978, 1985	6-25-85	16.0
05316863	Lone Tree Creek near Walnut Grove, MN	Lat 44°18'01", long 95°28'20", in SE¼SE¼ sec.25 T.110 N., R.39 W., Redwood County, Hydrologic Unit 07020008, at bridge on County State Highway 5, 5 miles north of Walnut Grove.	-	1985	9-17-85	12.5
05316910	Dry Creek at Sanborn, MN	Lat 44°11'43", long 95°08'15", on line between sec.35, T.109 N., R.36 W., Redwood County and sec.2, T.108 N., R.36 W., Cottonwood County, Hydrologic Unit 07020008, at bridge on County Highway 41, at the southwest limits of Sanborn, and 1.5 miles upstream from mouth.	39.6	1969, 1973-76, 1978, 1983, 1985	8-21-85	1.21
05317300	Morgan Creek at Cambria, MN	Lat 44°14'32", long 94°19'36", in SW¼SW¼ sec.16, T.109 N., R.29 W., Blue Earth County, Hydrologic Unit 07020007, at culvert on State Highway 68, 0.5 mile upstream from mouth, 0.6 mile northwest of Cambria.	59.6	1969-70, 1973, 1980, 1985	6-26-85	10.5
05317830	Coon Creek near Cambria, MN	Lat 43°36'57", long 94°05'51", on line between secs.20 and 29, T.102 N., R.27 W., Faribault County, Hydrologic Unit 07020009, at bridge on county road, 0.5 mile upstream from mouth, 1.8 miles south of Blue Earth.	96.6	1969-71, 1976, 1980, 1985	6-26-85	24.4
05317840	Badger Creek near Blue Earth, MN	Lat 43°38'26", long 94°08'16", in SW¼NE¼ sec.13, T.102 N., R.28 W., Faribault County, Hydrologic Unit 07020009, at bridge on county road, 1.2 miles upstream from mouth, 1.2 miles west of Blue Earth.	80.6	1969-71, 1976, 1980, 1985	6-26-85	20.0
05318120	East Branch Blue Earth River at Blue Earth, MN	Lat 43°38'58", long 94° 06'10", in NW¼SW¼ sec.8, T. 102 N., R.27 W., Faribault County, Hydrologic Unit 07020009, at bridge on U.S. Highway 169 in Blue Earth.	[a]285	1969-71, 1976, 1980, 1985	6-26-85	78.8

"See footnotes at the end of table."

Low-flow partial-record stations--Continued

Station No.	Station name	Location	Drainage area (mi^2)	Period of record	Measurements Date	Measurements Discharge (ft^3/s)
		Minnesota River basin--Continued				
05318140	South Creek near Winnebago, MN	Lat 43°42'33", long 94°10'38", in NW¼SE¼ sec.22, T.103 N., R.28 W., Faribault County, Hydrologic Unit 07020009, at bridge on County Highway 5, 3.5 miles south of Winnebago.	106	1969-70, 1976, 1980, 1985	6-26-85	33.7
05318160	Lily Creek near Fairmont, MN	Lat 43°40'47", long 94°29'30", in NW¼SW¼ sec.31, T.103 N., R.30 W., Martin County, Hydrologic Unit 07020009, at culvert on Interstate 90, 1.5 miles upstream from mouth, 2.3 miles northwest of Fairmont.	41.7	1969-71, 1975, 1976, 1980, 1985	6-26-85	2.1
05318180	Center Creek near Huntley, MN	Lat 43°43'50", long 94°12'26", on line between secs.16 and 17, T.103 N., R.28 W., Faribault County Hydrologic Unit 07020009, at bridge on county road, 1.5 miles east of Huntley, 2 miles upstream from mouth.	[a]130	1968-73, 1976, 1980, 1985	6-26-85	9.78
05318900	South Fork Watonwan River near Ormsby, MN	Lat 43°53'03", long 94°41'09", in NW¼SE¼ sec.21, T.105 N., R.32 W., Watonwan County, Hydrologic Unit 07020010, at bridge on State Highway 4, 2.5 miles north of Ormsby.	110	1969-71, 1974-76, 1980, 1985	6-26-85	17.4
05325250	Dog Creek near Kasota, MN	Lat 44°17'26", long 93°54'09", in NE¼SW¼ sec.36, T.110 N., R.26 W., Le Sueur County, Hydrologic Unit 07020007, on County Road 18, 3 miles east of Kasota 3.5 miles southeast of St. Peter, same as County Ditch 53.	-	1984-85	6-25-85 8- 2-85	0.95 [b]0.01
05325260	Shanaska Creek at Kasota, MN	Lat 44°17'19", long 93°57'18", in NW¼SE¼ sec.33, T.110 N., R.26 W., Le Sueur County, Hydrologic Unit 07020007, on State Highway 22 at east edge of Kasota, 2.5 miles south of St. Peter.	-	1984-85	6-25-85 8- 7-85	7.67 0
05325280	Cherry Creek near Ottawa, MN	Lat 44°21'28", long 93°54'32", in SE¼SE¼ sec.2, T.110 N., R.26 W., Le Sueur County, Hydrologic Unit 07020007, at culvert on County Highway 20, 3.3 miles southeast of Ottawa.	-	1969, 1984-85	6-25-85 8- 7-85	1.46 [b]0.1
05326400	Rush River near Henderson, MN	Lat 44°29'57", long 93°54'18", in NW¼NW¼ sec.24, T.112 N., R.26 W., Sibley County, Hydrologic Unit 07020012, at bridge on State Highway 93, 0.4 miles upstream from mouth, 2.0 miles south of Henderson.	[a]397	1970-71, 1979-80, 1984-85	6-25-85 8- 6-85	136 11.0
05326800	Buffalo Creek near New Rome, MN	Lat 44°33'44", long 94°03'06", in NW¼SW¼ sec.26, T.113 N., R.27 W., Sibley County, Hydrologic Unit 07020012, on County Highway 17, 2.4 miles northeast of New Rome.	-	1969, 1985	6-25-85	4.92
05329900	Bevens Creek at East Union, MN	Lat 44°42'44", long 93°40'59", in SW¼NW¼ sec.2, T.114 N., R.24 W., Carver County, Hydrologic Unit 07020012, at bridge on County Highway 40, 0.4 miles south of East Union, 2.3 miles upstream from mouth.	126	1969-70, 1975-76, 1979-80, 1985	7-23-85	2.76
05329925	Porter Creek near Jordan, MN	Lat 44°38'38", long 93°33'44", in NE¼NE¼ sec.34, T.114 N., R.23 W., Scott County, Hydrologic Unit 07020012, on County Highway 15, 5 miles southeast of Jordan.	-	1969, 1985	8- 7-85	0

"See footnotes at the end of table."

Low-flow partial-record stations--Continued

Station No.	Station name	Location	Drainage area (mi^2)	Period of record	Measurements Date	Measurements Discharge (ft^3/s)
		Minnesota River basin--Continued				
05329940	Sand Creek at Jordan, MN	Lat 44°40'20", long 93°38'05", in NE¼NW¼ sec.19, T.114 N., R.23 W., Scott County, Hydrologic Unit 07020012, at bridge on U.S. Highway 169 in Jordan.	[a]238	1936, 1960, 1966, 1968, 1985	7-23-85 8- 6-85	0.84 1.34
05330700	Chaska Creek at Chaska, MN	Lat 44°47'19", long 93°36'19", in NE¼NE¼ sec.8, T.115 N., R.23 W., Caver County, Hydrologic Unit 07020012, at bridge on U.S. Highway 212, in Chaska, 1 mile upstream from mouth.	14.8	1967-70, 1975-76, 1979-80, 1985	7-23-85	0.76
		Cannon River basin				
05348700	White Water Creek at Waterville, MN	Lat 44°13'04", long 93°33'48", in NW¼SW¼ sec.26, T.109N., R.23 W., LeSueur County, Hydrologic Unit 07040002, at bridge on County Road 14 in Waterville.	-	1985	8- 8-85	[b]0.01
05349000	Devil Creek near Morristown, MN	Lat 44°15'15", long 93°28'04", in SE¼SE¼ sec.9, T.109 N., R.22 W., Rice County, Hydrologic Unit 07040002 at County Highway 16, 2 miles Northwest of Morristown.	-	1965, 1985	8- 7-85	[b]0.05
05350000	MacKenzie Creek near Warsaw, MN	Lat 44°15'18", long 93°21'24", in SE¼SW¼ sec.9, T.109 N., R.21 W., Rice County, Hydrologic Unit 07040002, at State Highway 60, 2 miles east of Warsaw.	-	1965, 1985	8- 7-85	0.22
		Spring Creek basin				
05355260	Spring Creek near Red Wing, MN	Lat 44°33'42", long 92°36'42", on line between secs.27 and 28, T.113 N., R.15 W., Goodhue County, Hydrologic Unit 07040002, at bridge on County Highway 53, 4 miles west of Red Wing.	23.1	1969-71, 1974, 1976-77, 1980, 1984-85	8- 2-85	5.35
		Hay Creek basin				
05355280	Hay Creek at Red Wing, MN	Lat 44°33'09", long 92°33'46", in SW¼NW¼ sec.36, T.113 N., R.15 W., Goodhue County, Hydrologic Unit 07020001, at bridge on county road in Red Wing, 1.9 miles upstream from mouth.	45.6	1939-41, 1969-71, 1974, 1976-77, 1980, 1984-85	8- 2-85	26.4
		Bullard Creek basin				
05355340	Bullard Creek at Wacouta, MN	Lat 44°32'39", long 92°26'02", in SE¼SE¼ sec.36, T.113 N., R.14 W., Goodhue County, Hydrologic Unit 07040001, at U.S. Highway 61.	-	1985	8- 2-85	4.16
		Wells Creek basin				
05355350	Wells Creek near Frontenac, MN	Lat 44°30'32", long 92°19'26", in NE¼NW¼ sec.13, T.112 N., R.13 W., Goodhue County, Hydrologic Unit 07040001, at bridge on county road leading to Old Frontenac, 1.2 miles south of Old Frontenac, and 1.6 mile east of Frontenac.	68.9	1969-71, 1974, 1976-77, 1980, 1984-85	8- 2-85	26.8

"See footnotes at the end of table."

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Low-flow partial-record stations--Continued

Station No.	Station name	Location	Drainage area (mi^2)	Period of record	Measurements Date	Measurements Discharge (ft^3/s)
		Gilbert Creek basin				
05355350	Gilbert Creek near Lake City, MN	Lat 44°27'31", long 92°17'33", in NE¼SE¼ sec.31, T.112 N., R.12 W., Goodhue County, Hydrologic Unit 07040001, County Road 5, at north west corner of Lake City.	-	1985	8- 2-85	8.73
		Miller Creek basin				
05355360	Miller Creek near Lake City, MN	Lat 44°25'51", long 92°16'35", in NW¼SE¼ sec.8, T.111 N., R.12 W., Wabasha County, Hydrologic Unit 07040001, at bridge on County Highway 9, 1.3 miles south of Lake City.	14.6	1969-71, 1974, 1976-77, 1980, 1984-85	8- 2-85	4.97
		King Creek basin				
05355365	King Creek at Maple Springs, MN	Lat 44°24'38", long 92°09'46", in SE¼SW¼ sec. 17, T.111 N., R.11 W., Wabasha County, Hydrologic Unit 07040001, at bridge on U.S. Highway 61, at Maple Springs.	-	1985	8- 7-85	0.81
		Zumbro River basin				
05372700	Salem Creek near Rochester, MN	Lat 43°58'45", long 92°34'04", in SE¼NW¼ sec.24, T.106 N., R.15 W., Olmsted County, Hydrologic Unit 07040004, on County Road 15, southwest of Rochester, 3.5 miles south of U.S. Highway 14.	-	1985	6-20-85	7.18
05373130	North Branch Middle Fork Zumbro River at Pine Island, MN	Lat 44°12'10", long 92°38'45", in SW¼NW¼ sec.32, T.109 N., R.15 W., Goodhue County, Hydrologic Unit 07040004, at bridge on Main Street in Pine Island, 0.3 mile upstream from Middle Fork Zumbro River.	58.6	1967, 1970-71, 1974-75, 1977, 1980, 1984-85	8- 2-85	6.64
05373150	Middle Fork Zumbro River near Oronoco, MN	Lat 44°10'10", long 92°34'24", in SW¼SW¼ sec.12, T.108 N., R.15 W., Olmsted County, Hydrologic Unit 07040004 at bridge on County Highway 31, 2 miles west of Oronoco.	203	1969-71, 1974, 1976, 1985	8- 2-85	25.0
05373290	South Branch Middle Fork Zumbro Oronoco, MN	Lat 44°08'35", long 92°35'51', in NW¼SW¼ sec.23, T.108 N., R.15 W., 07040004 at bridge on County Highway 3, 3.5 miles southwest of Oronoco.	[a]210	1969-71, 1974, 1985	8- 2-85	20.8
05373850	North Fork Zumbro River at Mazeppa, MN	Lat 44°16'00", long 92°32'58", in NW¼NW¼ sec.7, T.109 N., R.14 W., Wabasha County, Hydrologic Unit 07040004 at bridge on County Highway 1 at the southwest edge of Mazeppa.	174	1969-71, 1974, 1977, 1980, 1984-85	8- 2-85	30
05373950	Trout Brook near Mazeppa, MN.	Lat 44°16'34", long 92°31'16", in SW¼NE¼ sec.5, T.109 N., R.14 W., Wabasha County, Hydrologic Unit 07040004, at bridge on State Highway 60, 1.3 miles east of Mazeppa.	53.8	1969-71, 1974, 1977, 1980, 1984-85	8- 2-85	14.7
05374600	Trout Brook at Dumfries, MN.	Lat 44°20'49", long 92°06'53", in SW¼NE¼ sec.10, T.110 N., R.11 W., Wabasha County, Hydrologic unit 07040004, at bridge on State Highway 60, 0.3 mile east of intersection of County Highway 30 and State Highway 60 in Dumfries, 1.2 miles upstream from mouth.	21.6	1969-70, 1974, 1977, 1985	8- 7-85	0.15

"See footnotes at the end of table."

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Low-flow partial-record stations--Continued

Station No.	Station name	Location	Drainage area (mi^2)	Period of record	Measurements Date	Measurements Discharge (ft^3/s)
		Gorman Creek basin				
05375000	Gorman Creek near Kellogg, MN.	Lat 44°17'34", long 91°59'21", on line between secs.34 and 35, T.110 N., R.10 W., Wabasha County, Hydrologic Unit 07040003, at bridge on U.S. Highway 61, 1.1 miles southeast of Kellogg.	16.6	1969-71, 1974, 1977, 1979-80, 1984-85	8- 7-85	2.28
		East Indian Creek basin				
05375830	East Indian Creek near Weaver,MN	Lat 44°13'39", long 91°56'46", in NW¼SW¼ sec.19, T.109 N., R.9 W., Wabasha County, Hydrologic Unit 07040003, at bridge on U.S. Highway 61, 1.7 miles north of Weaver.	-	1985	8- 7-85	10.0
		Rollingstone Creek basin				
05378400	Rollingstone Creek near Minnesota City, MN.	Lat 44°05'52", long 91°46'44", in NW¼SW¼ sec.3, T.107 N., R.8 W., Winona County, Hydrologic Unit 07040003, at bridge on county road, 1.4 miles west of Minnesota City.	49. 7	1969-71, 1977, 1979-80, 1985	8- 7-85	22.7
		Gilmore Creek basin				
05379000	Gilmore Creek at Winona, MN	Lat 44°02'40", long 91°41'25", in SE¼NW¼ sec.29, T.107 N., R.7 W., Winona County, Hydrologic Unit 07040003, at bridge on U.S. Highway 14 at west edge of Winona, 2.2 miles upstream from Lake Winona, 6.5 miles upstream from mouth.	8.95	1939-63$ 1964-65+ 1971, 1985	8-07-85	4.08
		Burns Valley Creek basin				
05379050	Burns Valley Creek at Winona, MN	Lat 44°01'30", long 91°37'15", in NE¼SE¼ sec.35, T.107 N., R.7 W., Winona County, Hydrologic Unit 07040003, at bridge on County Highway 17, at southeast edge of Winona.	14.3	1967-71, 1974, 1977, 1979, 1985	8- 8-85	7.07
		Pleasant Valley Creek basin				
05379090	Pleasant Valley Creek at Winona, MN	Lat 44°01'12", long 91°36'08", on line between secs.36, T.107 N., R.7 W., and sec. 1, T.106 N., R.7 W., Winona County, Hydrology Unit 07040003, at bridge on County Highway 15, at southeast edge of Winona.	12.0	1967-71, 1974-76, 1979-80, 1985	8- 8-85	7.20
		Cedar Creek basin				
05379100	Cedar Creek near LaMoille, MN	Lat 44°00'25", long 91°29'45", in SW¼SW¼ sec.1, T.106 N., R.6 W., Winona County, Hydrologic Unit 07040003, at bridge on U.S. Highway 14, 1.2 miles northwest of LaMoille.	-	1937, 1940, 1985	8- 8-85	8.05
		Trout Creek basin				
05380400	Trout Creek at LaMoille, MN	Lat 43°59'45", long 91°27'39", in NE¼SE¼ sec.7, T.106 N., R.5 W., Winona County, Hydrologic Unit 07040003, above pooled area at bridge on US. Highway 14, 0.7 mile southeast of LaMoille.	-	1937, 1985	8- 8-85	12.2

"See footnotes at the end of table."

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Low-flow partial-record stations--Continued

Station No.	Station name	Location	Drainage area (mi^2)	Period of record	Measurements Date	Measurements Discharge (ft^3/s)
		Dakota Creek basin				
05382250	Dakota Creek at Dakota, MN.	Lat 43°55'00", long 91°21'48", in NE¼NE¼ sec.12, T.105 N., R.5 W., Winona County, Hydrologic Unit 07040006, at U.S. Highway 14, at Dakota, southeast of LaMoille.	-	1985	8- 8-85	5.31
		Pine Creek basin				
05383520	Pine Creek at La Crescent, MN	Lat 43°49'04", long 91°19'30", in NE¼NW¼ sec.16, T.104 N., R.4 W., Houston County, Hydrologic Unit 07040006 at bridge on County Highway 25, 1 mile southwest of La Crescent.	55.2	1971, 1977, 1980, 1985	8-22-85	33.8
		Root River basin				
05383740	North Branch Root River near Chatfield, MN	Lat 43°49'29", long 92°10'24", in SE¼SE¼ sec.8, T.104 N., R.11 W., Fillmore County, Hydrologic Unit 07040008, at bridge on County Highway 5, 1.6 miles upstream from Middle Branch Root River, and 1.7 miles southeast of Chatfield.	[a]225	1969-71, 1976-77, 1985	6-20-85	42.0
05383830	Deer Creek near Fillmore, MN	Lat 43°44'21", long 92°18'15", in SE¼NE¼ sec.8, T.103 N., R.12 W., Fillmore County, Hydrologic Unit 07040008, at culvert on County Road 8, 1.5 miles southwest of Fillmore, 2.5 miles northwest of Wykoff.	-	1985	6-26-85	17.3
05383860	Bear Creek near Fillmore, MN	Lat 43°45'12", long 92°17'17", in NW¼SW¼ sec.4, T.103 N., R.12 W., Fillmore County, Hydrologic Unit 07040008, at culvert on township road, 1.0 mile west of Fillmore, 3.5 miles north of Wykoff.	-	1985	6-26-85	12.4
05383895	Upper Bear Creek near Chatfield, MN	Lat 43°48'40", long 92°11'45", in NW¼SE¼ sec.18, T.104 N., R.11 W., Fillmore County, Hydrologic Unit 07040008, at culvert on County Highway 5, 1.5 miles south of Chatfield.	-	1985	8- 5-85	3.3
05383900	Middle Branch Root River near Chatfield, MN	Lat 43°48'24", long 92°11'18", on line between secs.17 and 18, T.104 N., R.11 W., Fillmore County, Hydrologic Unit 07040008, at bridge on County Highway 7, 1 mile upstream from North Branch Root River 2.7 miles south of Chatfield.	a250	1969-71, 1977, 1985	6-20-85 8- 5-85	47.5 32.4
05383920	Rice Creek near Fountain, MN	Lat 43°48'04", long 92°06'51", in NE¼ sec.23, T.104 N., R.11 W., Fillmore County, Hydrologic Unit 07040008, at culvert on township road, 3.5 miles north of Fountain, 3 miles southeast of Chatfield.	-	1985	6-26-85 8- 5-85	3.24 2.64
05383940	Trout Run near Pilot Mound, MN	Lat 43°49'04", long 92°02'59", in NE¼NE¼ sec.17, T.104 N., R.10 W., Fillmore County, Hydrologic Unit 07040008, at bridge on State Highway 30, 1.3 miles west of Pilot Mound.	30.3	1971, 1977, 1985	6-20-85 8- 5-85	38.0 32.6

"See footnotes at the end of table."

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Low-flow partial-record stations--Continued

Station No.	Station name	Location	Drainage area (mi^2)	Period of record	Measurements Date	Measurements Discharge (ft^3/s)
		Root River basin				
05384020	Canfield Creek near Cherry Grove, MN	Lat 43°35'59", long 92°14'11", in NW¼NE¼ sec.35, T.102 N., R.12 W., Fillmore County, Hydrologic Unit 07040008, at triple culverts on County Road 14, 2.5 miles northeast of Cherry Grove, 7 miles north of Minnesota-Iowa border.	-	1985	6-25-85	0
05384030	Willow Creek at Preston, MN	Lat 43°39'34", long 92°05'40", on line between secs.1 and 12, T.102 N., R.11 W., Fillmore County, Hydrologic Unit 07040008, at bridge on County Highway 12, 0.5 mile upstream from mouth, 1.0 mile southwest of Preston.	-	1969, 1985	6-19-85	7.66
05384035	South Branch Root River at Preston, MN	Lat 43°40'00", long 92°05'00", in NW¼SW¼ sec.6, T.102 N., R.10 W., at bridge on County Highway 17 at south edge of Preston.	-	1965-69, 1985	6-19-85	45.4
05384900	Money Creek near Houston, MN	Lat 43°47'42", long 91°35'40", in NE¼SE¼ sec.19, T.104 N., R.6 W., Houston County, Hydrologic unit 07040008, at bridge on State Highway 76, 2.7 miles northwest of Houston.	74.2	1969-71, 1974, 1976-77, 1985	8-22-85	35.0
05385300	Riceford Creek at Yucatan, MN	Lat 43°40'52", long 91°41'13", in SW¼NW¼ sec.33, T.103 N., R.7 W., Houston County, Hydrologic Unit 07040008, at bridge on township road, 0.4 mile east of Yucatan, and 0.7 mile upstream from mouth.	61.1	1971, 1974, 1976-77, 1985	8-22-85	41.0
05385400	Beaver Creek near Sheldon, MN	Lat 43°42'24", long 91°36'01", in NW¼SE¼ sec.19, T.103 N., R.6 W., Houston County, Hydrologic Unit 07040008, at bridge on County Highway 10, 1.3 miles upstream from mouth, 2 miles north of Sheldon.	52.6	1971, 1974, 1976-77, 1980, 1985	8-22-85	46.9
05386050	Silver Creek near Houston, MN	Lat 43°47'10", long 91°29'52", in NW¼NE¼ sec.25, T.104 N., R.6 W., Houston County, Hydrologic Unit 07040008, at bridge on County Highway 21, 4 miles northeast of Houston.	17.3	1971, 1974, 1976-77, 1980, 1985	8-22-85	8.92
05386060	Crystal Creek near Houston, MN	Lat 43°46'20", long 91°28'36", in NE¼NE¼ sec.31, T.104 N., R.5 W., Houston County, Hydrologic unit 07040008, at bridge on Highway 16, 4.5 miles east of Houston.	-	1985	8-22-85	8.38
05386120	Indian-Spring Thompson Creek at Hokah, MN	Lat 43°45'29", long 91°20'42", in NE¼NW¼ T.103 N., R.4 W., Houston County, Hydrologic Unit 07040008, on County Road 18 at Hokah.	-	1985	8-22-85	23.0
		Crooked Creek basin				
05387040	Crooked Creek at Reno, MN	Lat 43°35'22", long 91°16'47", in SW¼SE¼ sec.35, T.102 N., R.4 W., Houston County, Hydrologic Unit 07060001, at bridge State Highway 26, 0.8 mile southwest of Reno.	69.7	1971, 1976-77, 1980, 1983, 1985	8-22-85	40.8
		Winnebago Creek basin				
05387200	Winnebago Creek near New Albin, Iowa	Lat 43°31'04", long 91°18'28", in SW¼SW¼ sec.27, T.101 N., R. 4 W., Houston County, Hydrologic Unit 07060001, at bridge on County Highway 5, 1.3 miles northwest of New Albin, Iowa.	59.0	1969-71, 1976-77, 1980, 1983, 1985	8-22-85	42.6

"See footnotes at the end of table."

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Low-flow partial-record stations--Continued

Station No.	Station name	Location	Drainage area (mi^2)	Period of record	Measurements: Date	Measurements: Discharge (ft^3/s)
		Upper Iowa River basin				
05387240	Upper Iowa River near LeRoy, MN	Lat 43°31'38", long 92°32'12", in NW¼NE¼ sec.29, T.101 N., R.14 W., Mower County, Hydrologic Unit 07060002, at bridge on county road, 2 miles northwest of LeRoy.	36.1	1971, 1974, 1976, 1985	6-18-85 8- 2-85	4.34 2.09
05387250	Little Iowa River near LeRoy, MN	Lat 43°31'57", long 92°31'06", in SW¼SE¼ sec.21. T.101 N., R.14 W., Mower County, Hydrologic unit 07060002, at bridge on county road in Lake Louise State Park, 1.7 miles northwest of LeRoy.	26.8	1969, 1974 1976, 1980, 1984-85	6-18-85 8- 2-85	2.49 0.47
05387270	Beaver Creek near LeRoy, MN	Lat 43°30'28", long 92°23'25", in SE¼NE¼ sec.33, T.101 N., R.13 W., Fillmore County, Hydrologic unit 07060002, at bridge on State Highway 56, 1.5 miles northwest of Chester, Iowa, 5.8 miles east of LeRoy.	26.4	1971, 1976, 1984-85	6-18-85	1.98
05387500	Pine Creek near Canton, MN	Lat 43°30'02", long 91°57'24", in SW¼SE¼ sec.31, T.101 N., R.9 W., Fillmore County, Hydrologic Unit 07060002, on Minnesota-Iowa Border 2 miles southwest of Canton.	-	1985	6-18-85	1.52
05388325	Bee Creek near Eitzen, MN	Lat 43°30'09", long 91°34'11" in SW¼SW¼ T.101 N., R.6 W., Houston County, Hydrologic Unit 07060002, on Minnesota-Iowa Border, at Bee; 55 miles west of Eitzen, tributary to Waterloo creek in Iowa.	-	1985	6-26-85 8-22-85	14.3 14.0
		Iowa River Basin				
05455900	Cedar River near Blooming Prairie, MN	Lat 43°51'47", long 93°00'24", on line between secs.29 and 32, T.105 N., R.18 W., Dodge County, Hydrologic Unit 07080201, at bridge on County Highway 2, 2.1 miles east of Blooming Prairie, Minnesota.	81.6	1971, 1974, 1976, 1984-85	6-17-85 8- 2-85	5.42 1.32
05457160	Rose Creek near Austin, MN	Lat 43°36'48", long 92°58'10", on line between secs.26 and 27, T.102 N., R.18 W., Mower County, Hydrologic Unit 07080201, at bridge on County Highway 29, 0.3 mile upstream from mouth, and 3.8 miles south of Austin.	65.8	1969, 1971, 1974, 1976, 1980, 1984-85	8- 2-85	4.22
05457220	Woodbury Creek near Lyle, MN	Lat 43°30'37", long 93°00'34", on line between secs.32 and 33, T.101 N., R.18 W., Mower County, Hydrologic Unit 07080201, at bridge on State Highway 105, 3.3 miles west of Lyle.	40.4	1971, 1974, 1976, 1984-85	8- 2-85	1.92
05457280	Otter Creek at Lyle, MN	Lat 43°30'00", long 92°55'52", in SE¼SE¼ sec.36, T.101 N., R.18 W., Mower County, Hydrologic Unit 07080201, at bridge on County Road on Minnesota-Iowa border in Lyle.	38.3	1971, 1974, 1984-85	8- 2-85	3.21
05457780	Little Cedar River near Johnsburg, MN	Lat 43°30'00", long 92°44'57", in SE¼SE¼ sec.33, T.101 N., R.16 W., Mower County, Hydrologic Unit 07080201, at bridge on County Road on Minnesota-Iowa Border, 1.1 miles southeast of Johnsburg.	48.0	1971, 1974, 1976, 1984-85	8- 2-85	3.41

"See footnotes at the end of table."

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Low-flow partial-record stations--Continued

Station No.	Station name	Location	Drainage area (mi^2)	Period of record	Measurements	
					Date	Discharge (ft^3/s)
		Iowa River basin--Continued				
05458960	Bancroft Creek at Bancroft, MN.	Lat 43°42'09", long 93°21'23", in SW¼SE¼ sec.21, T.103 N., R.21 W., Freeborn County, Hydrologic Unit 07080202, at bridge on County Road 14, 1.6 miles northeast of Fountain Lake, 1 mile north of Interstate 90.	[a]29	1985	8- 6-85	2.80
05458970	Shell Rock River at Gordonsville, MN	Lat 43°30'51", long 93°16'06", on line between secs.29 and 32, T.101 N., R.20 W., Freeborn County, Hydrologic Unit 07080202, at bridge on County Highway 1, 0.8 mile west of Gordonsville.	191	1971, 1974, 1976, 1980, 1985	8- 6-85	13.2
05458975	Goose Creek near Gordonsville, MN	Lat 43°30'13", long 93°16'24", in NE¼SE¼ sec.31, T.101 N., R.20 W., Freeborn County, Hydrologic Unit 07080202 at bridge on County Highway 1, 0.2 mile upstream from mouth, and 1.1 miles southwest of Gordonsville.	53.8	1971, 1974, 1976, 1980, 1984-85	8- 6-85	0.54
05459040	Lime Creek near Emmons, MN	Lat 43°30'00", long 93°33'29", in SW¼SWE¼ sec.35, T.101 N., R.23 W., Freeborn County, Hydrologist Unit 07080203 at bridge on County Highway 60, 3.5 miles west of Emmons.	58.4	1971, 1974, 1976, 1980, 1984-85	8- 6-85	2.27
		Des Moines River Basin				
05474770	Beaver Creek near Currie, MN	Lat 44°03'30", long 95°43'08", in NW¼SW¼ sec.24, T.107 N., R.41 W., Murray County, Hydrologic Unit 07100001, at bridge on county road, 2.8 miles southwest of Currie.	177	1969-70, 1972-76, 1983, 1985	8-15-85	14.0
05474800	Lime Creek near Avoca, MN	Lat 43°56'58", long 95°31'17", at Common Corner of secs.27, 28 and 33, T.106 N, R.39 W., Murray County, Hydrologic Unit 07100001, at bridge on County Highway 6, 0.6 mile upstream from mouth, 6.2 miles east of Avoca.	95.0	1969-70, 1972-74, 1983, 1985	8-15-85	7.48
05474920	Okabena Creek at Okabena, MN	Lat 43°44'38", long 95°18'54", on line between secs.7 and 8, T.103 N., R.37 W., Jackson County, Hydrologic Unit 07100001, at bridge on County Highway 9, 0.3 mile north of Okabena.	141	1969-70, 1973-76, 1983, 1985	8-15-85	10.7
05474980	Jack Creek near Heron Lake, MN	Lat 43°46'10", long 95°18'54", on line between secs.31 and 32, T.104 N., R.37 W., Jackson County, Hydrologic Unit 07100001, on County Highway 9, 1.8 miles south of Heron Lake.	218	1969-70, 1973-74, 1979, 1983, 1985	8-15-85	18.4
05476100	Story Brook near Petersburg, MN	Lat 44°32'22", long 94°59'38", in SW¼NW¼ sec.24, T.101 N., R.35 W., Jackson County, Hydrologic Unit 07100002, on US. Highway 71, 3 miles upstream from mouth, 3.8 miles west of Petersburg.	-	1960-62, 1964-69, 1985	8-15-85	0.06
05476990	East Fork Des Moines River near Ceylon, MN	Lat 43°34'08", long 94°38'04", on line between secs.11 and 12, T.101 N., R.32 W., Martin County, Hydrologic Unit 07100003, on County Highway 125, 2.4 miles north of Ceylon.	[a]155	1971-76, 1983, 1985	8-15-85	0.41

"See footnotes at the end of table."

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Low-flow partial-record stations--Continued

Station No.	Station name	Location	Drainage area (mi^2)	Period of record	Measurements	
					Date	Discharge (ft^3/s)
		Big Sioux River Basin				
06479970	Medary Creek near Lake Benton, MN	Lat 44°14'53", long 96°26'39", in NW¼SW¼ sec.18, T.109 N., R.46 W., Lincoln County, Hydrologic Unit 10170202 on township road, 7 miles west of Lake Benton, 1.5 miles south of U.S. Highway 14, 0.5 mile upstream of Minnesota-South Dakota border.	-	1985	8-19-85	0.88
06480550	Spring Creek near Verdi, MN	Lat 44°12'30", long 96°26'40", in NW¼NW¼ sec.31, T.109 N., R.46 W., Lincoln County, Hydrologic Unit 10170202, on township road, 4.5 miles west of Verdi, 8 miles southwest of Lake Benton, 0.5 miles upstream of Minnesota-South Dakota border.	-	1985	8-19-85	0
06480590	Willow Creek near Cazenovia, MN	Lat 44°07'32", long 96°25'28", in SW¼SW¼ sec.30, T.108 N., R.46 W., Pipestone County, Hydrologic Unit 1017203, on township road, 5 miles northwest of Cazenovia, 10 miles northwest of Pipestone, 6 miles east of Highway 75, 1 mile upstream of mouth.	-	1985	8-19-85	0.23
06480600	Flandreau Creek near Cazenovia, MN	Lat 44°04'54", long 96°26'27", in NE¼NW¼ sec.13, T.107 N., R.47 W., Pipestone County, Hydrologic Unit 10170203, at bridge on County Highway 13, 3.5 miles northwest of Cazenovia.	92.2	1971-76, 1979, 1983, 1985	8-19-85	11.2
06482520	Pipestone Creek near Pipestone, MN	Lat 43°58'49", long 96°26'08", on line between secs.13 and 24, T.106 N., R.47 W., Pipestone County, Hydrologic Unit 10170203 on County Highway 55, 6.1 miles southwest of Pipestone.	113	1971, 1973-76, 1979, 1983, 1985	8-19-85	19.6
06482540	Split Rock Creek near Jasper, MN	Lat 43°46'36", long 96°26'13", on line between secs.26 and 35, T.104 N., R.47 W., Rock County, Hydrologic Unit 10170203 at bridge on county road, 5.4 miles southwest of Jasper.	310	1969-70, 1973-76, 1983, 1985	8-16-85	31.6
06482740	Beaver Creek near Beaver Creek, MN	Lat 43°35'31", long 96°25'55", on line between secs.35 and 36, T.102 N., R.47 W., Rock County, Hydrologic Unit 10170203, at bridge on State Highway 23, 3.8 miles southwest of Beaver Creek.	84.6	1969-70, 1973-74, 1983, 1985	8-16-85	6.27
06482965	Mound Creek near Luverne, MN.	Lat 43°42'51", long 96°10'21" NE¼NE¼ sec.24, T.103 N., R.45 W., Rock County, Hydrologic Unit 10170204, at county road below lower dam in Blue Mounds State Park, 4.5 miles north of Luverne.	-	1959, 1985	8-16-85	1.94
06482980	Champepadan Creek near Hardwick, MN.	Lat 43°42'31", long 96°07'59", in NE¼SE¼ sec.20, T.103 N., R.44 W., Rock County, Hydrologic Unit 10170204, at bridge on County Highway 9, 1.2 miles upstream from mouth, and 5.8 miles southeast of Hardwick.	75.5	1969-70, 1973-74, 1983, 1985	8-16-85	5.85

"See footnotes at the end of table."

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Low-flow partial-record stations--Continued

Station No.	Station name	Location	Drainage area (mi^2)	Period of record	Measurements	
					Date	Discharge (ft^3/s)
		Big Sioux River basin--Continued				
06483030	Elk River near Luverne, MN.	Lat 43°36'11", long 96°10'22", on line between sec.25, T.102 N., R.45 W., and sec.30, T.102 N., R.44 W., Rock County, Hydrologic Unit 10170204, at bridge on County Highway 9, 4 miles southeast of Luverne.	62.0	1969-70, 1973-74, 1983, 1985	8-16-85	3.57
06483240	Kanaranzi Creek near Kanaranzi, MN.	Lat 43°30'01", long 96°07'12", on line between sec.11, T.100 N., R.45 W., and sec.33, T.101 N., R.44 W., Rock County, Hydrologic Unit 10170204, at bridge on county road on Minnesota-Iowa border, 5.3 miles southwest of Kanaranzi.	192	1969-70, 1973-76, 1983, 1985	8-16-85	24.3
06483355	Little Rock River near Bigelow, MN	Lat 43°30'00", long 95°50'57", in SE¼SW¼ sec.35, T.101 N., R.42 W., Nobles County, Hydrologic Unit 10170204, at bridge on county road on Minnesota-Iowa border, 8 miles west of Bigelow.	91.5	1971, 1973-74, 1983, 1985	8-16-85	7.32
06603690	West Fork Little Sioux River near Sioux Valley, MN.	Lat 43°30'02", long 95°16'46", SE¼SE¼ sec.33, T.101 N., R.37 W. Jackson County, Hydrologic Unit 10170204, at bridge on County Highway 62, 3.3 miles southeast of Sioux Valley.	106	1971, 1973-75, 1985	8-15-85	1.59

Operated as a continuous-record gaging station.
† Operated as a crest-stage gaging station.
a Approximately
b Estimated

HIGH-FLOW PARTIAL RECORDS


Red River of the North
Rainy River
Upper Red Lake
Lower Red Lake
International Falls
Bemidji
Grand Rapids
Moorhead
Mille Lacs Lake
SUPERIOR LAKE
5086900
5075700
5078400
5073800
5073600
5131878
5073750
5131750
5077700
5078180
5130300
4012500
4013200
5062280
5200445
5200200
5062700
5062470
5062908
5062500
5067050
5063200
5060800
4020480
4015200
4020700
4015250
4021205
4015370
4015400
5210200
5061400
5061200
5244000
5244200
5244440
5245800
5221020
4024110
4024100
4024095
5336200
5050700
5261000
5330550
Volume 1
Volume 2
Volume 2

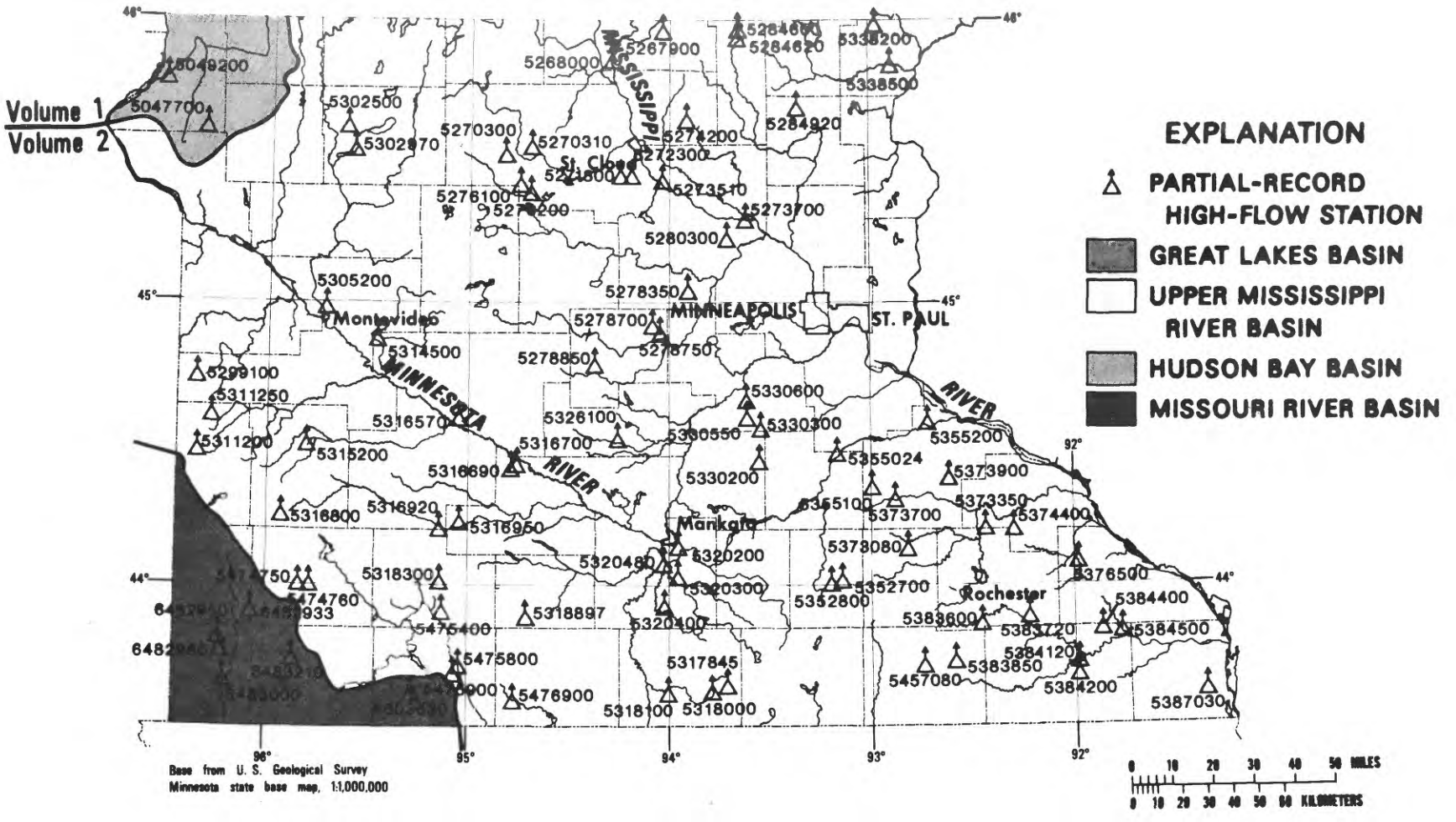


Figure 11.--Location of high-flow partial-record stations

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

High-flow partial-record stations

The following table contains annual maximum discharge for high-flow stations. A high-flow partial-record station is equipped with a crest-stage gage, 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 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, and discharge measurements may have been made for purposes of establishing the stage-discharge relation, but these are 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 high-flow partial-record stations during water year 1985

Station No.	Station name	Location	Drainage area (mi^2)	Period of Record	Annual maximum		
					Date	Gage height (feet)	Discharge (ft^3/s)
		Mississippi River main stem					
05200200	Hennepin Creek near Becida, MN	Lat 47°23'52", long 95°05'12", in NW¼NE¼ sec.11, T.145 N., R.35 W., Hubbard County, Hydrologic Unit 07010101, gages upstream and downstream from culvert on Stumphges Rapids Trail approximately 0.5 mile west of Hubbard County Road 3, 3 miles north of Becida, 1.5 miles upstream from mouth.	41.4	1979-85	5-11-85	a15.25	375
05200445	Mississippi River at Bemidji, MN	Lat 47°27'04", long 94°54'23", in NW¼NW¼ sec.20, T.146 N., R.33 W., Beltrami County, Hydrologic Unit 07010101, at bridge on County Highway 11, 1.5 miles southwest of intersection of U.S. Highway 2 and County Highway 7 in Bemidji.	b400	1973-85	5-31-85	c11.80	690
		Smith Creek basin					
05210200	Smith Creek near Hill City, MN	Lat 47°04'58", long 93°34'59", in SE¼NW¼ sec.13, T.53 N., R.26 W., Itasca County, Hydrologic Unit 07010101, at culvert on U.S. Highway 169, 6.2 miles north of Hill City.	8.00	1961-85	4-24-85	c5.88	140
		Swan River basin					
05216980	Swan River tributary at Warba, MN	Lat 47°07'11", long 93°15'00", in SE¼NW¼ sec.34, T.54 N., R.23 W., Itasca County, Hydrologic Unit 07010103, at culvert on U.S. Highway 2, 0.9 mile upstream from mouth, 1.1 miles southeast of Warba.	3.95	1961-85	7-18-85	a6.68	40
		Willow River basin					
05221020	Willow River below Palisade, MN	Lat 46°42'36", long 93°33'21", in NW¼NE¼ sec.30, T.49 N., R.25 W., Aitkin County, Hydrologic Unit 07010103, at bridge on County Highway 3, 3.2 miles west of Palisade.	445	1972-85	5- 1-85	13.68	1,960
		Crow Wing River basin					
05244000	Crow Wing River at Nimrod, MN	Lat 46°38'25", long 94°52'44", in SE¼NW¼ sec.32, T.137 N., R.33 W., Wadena County, Hydrologic Unit 07010106, 200 ft upstream from bridge on County Highway 121, 0.2 mile north of Nimrod, 0.7 mile upstream of Cat River.	b1,010	1910-14#, 1931-81#, 1982-85	7-20-85	5.36	2,070
05244200	Cat River near Nimrod, MN	Lat 46°37'49", long 94°55'51", in SW¼SW¼ sec.36, T.137 N., R.34 W., Wadena County, Hydrologic Unit 07010106, at bridge on State Highway 227, 2.5 miles west of Nimrod, 3.0 miles upstream from mouth.	49.2	1961-85	5-31-85	6.46	205

"See footnotes at end of the table."

Annual maximum discharge at high-flow partial-record stations during water year 1985--Continued

Station No.	Station name	Location	Drainage area (mi^2)	Period of Record	Annual maximum Date	Gage height (feet)	Discharge (ft^3/s)
		Crow Wing River basin--Continued					
05244440	Leaf River near Aldrich, MN	Lat 46°27'25", long 94°50'29", in SW¼SW¼ sec.34, T.135 N., R.33 W., Wadena County, Hydrologic Unit 07010107, at bridge on County Highway 29, 3.3 miles upstream from mouth, 7.0 miles northeast of Aldrich.	860	1972-85	5-15-85	14.26	2,500
05245800	Sevenmile Creek near Pillager, MN	Lat 46°20'32", long 94°32'56", in SW¼SE¼ sec.11, T.133 N., R.31 W., Cass County, Hydrologic Unit 07010106, at downstream wingwall of bridge on township road, 3.5 miles northwest of Pillager, 3.2 miles upstream from mouth.	18.3	1979-85	10-19-84	11.93	86
		Mississippi River main stem					
05261000	Mississippi River near Fort Ripley, MN	Lat 46°10'50", long 94°21'56", in SE¼NW¼ sec.27, T.43 N., R.32 W., Crow Wing County, Hydrologic Unit 07010104, on left bank 600 ft upstream from Nokasippi River, 1.0 mile north of Fort Ripley.	11,010	1929#, 1972-85	5- 1-85	1144.39	17,900
		Platte River basin					
05267900	Hillman Creek near Pierz,	Lat 45°58'27", long 94°04'21", in NE¼SE¼ sec.9, T.40 N., R.30 W., Morrison County, Hydrologic Unit 07010201, at bridge on county highway, 1.1 miles upstream from mouth, 1.5 miles east of Pierz.	46.7	1964-85	4-23-85	14.08	800
05268000	Platte River above Royalton, MN	Lat 45°50'43", long 94°17'40", in SE¼NW¼ sec.26, T.39 N., R.32 W., Morrison County, Hydrologic Unit 07010201, at bridge on County Highway 27, 0.6 mile north of Royalton, 6.6 miles upstream from mouth.	335	1929-36#, 1972-85	4-23-85	4.04	2,500
		Sauk River basin					
05270300	Sauk River tributary at Spring Hill, MN	Lat 45°31'22", long 94°48'31", in SW¼NE¼ sec.27, T.124 N., R.33 W., Stearns County, Hydrologic Unit 07010202, at culvert on State Highway 4, 1.0 mile east of Spring Hill, 2.7 miles upstream from mouth.	7.06	1960-85	3-19-85	d11.37	122
05270310	Sauk River tributary No. 2 near St. Martin, MN	Lat 45°31'44", long 94°44'50", in SE¼SE¼ sec.19, T.124 N., R.32 W., Stearns County, Hydrologic Unit 07010202, at culvert on county highway, 4.2 miles northwest of St. Martin.	.26	1960, 1962-85	4-23-85	7.64	16
		Johnson Creek basin					
05271800	Johnson Creek tributary at Luxemburg, MN	Lat 45°26'30", long 94°14'46", in NW¼NE¼ sec.30, T.123 N., R.28 W., Stearns County, Hydrologic Unit 07010203, at culverts on State Highway 15, 0.8 mile south of Luxemburg.	3.82	1964-85	9- 9-85	11.25	218
05272300	Johnson Creek near St. Augusta, MN	Lat 45°27'49", long 94°09'19", in NW¼SW¼ sec.13, T.123 N., R.28 W., Stearns County, Hydrologic Unit 07010203, at bridge on County Highway 7, 1.0 mile south of St. Augusta, 3.3 miles upstream from mouth.	46.7	1964-85	6-26-83 6-12-84 9- 9-85	15.30 e12.90 16.37	f1,100 220 2,350

"See footnotes at end of the table."

Annual maximum discharge at high-flow partial-record stations during water year 1985--Continued

Station No.	Station name	Location	Drainage area (mi^2)	Period of Record	Annual maximum Date	Gage height (feet)	Discharge (ft^3/s)
		Clearwater River basin					
05272950	Clearwater River near South Haven, MN	Lat 45°16'45", long 94°15'04", in NE¼NW¼ in sec.19, T.121 N., R.28 W., Wright County, Hydrologic Unit 07010203 at culverts 3.4 miles southeast of Kimball, 0.25 mile downstream of Scott Lake Outlet, 2.0 miles southeast of South Haven.	-	1985	9- 9-85	17.11	†
		Mississippi River main stem					
05273510	Mississippi River at Clearwater, MN	Lat 45°25'15", long 94°02'37", in NW¼SW¼ sec.23, T.34 N., R.30 W., Sherburne County, Hydrologic Unit 07010203, on left bank 700 ft upstream from bridge, on State Highway 24 at Clearwater.	-	1972-85	4-30-85	16.77	28,000
		Otsego Creek basin					
05273700	Otsego Creek near Otsego, MN	Lat 45°17'19", long 93°38'59", in SW¼NE¼ sec.13, T.131 N., R.24 W., Wright County, Hydrologic Unit 07010203, at culvert on County Highway 39, 1.3 miles upstream from mouth, 1.9 miles west of Otsego.	3.11	1964-85	3- 8-85	d6.54	153
		Elk River basin					
05274200	Stony Brook tributary near Foley, MN	Lat 45°38'42", long 93°54'54", in NE¼NW¼ sec.2, T.36 N., R.29 W., Benton County, Hydrologic Unit 07010203, at culvert on State Highway 25, 0.3 mile upstream from mouth, 1.5 miles south of Foley.	2.26	1960-85	9- 9-85	10.06	93
		Crow River basin					
05276100	North Fork Crow River tributary near Paynesville, MN	Lat 45°23'29", long 94°46'56", in SW¼NW¼ sec.12, T.122 N., R.33 W., Kandiyohi County, Hydrologic Unit 07010204, at culvert on county highway, 1.2 miles upstream from mouth, 3.0 miles west of Paynesville.	.55	1960-85	3-15-85	d17.78	11
05276200	North Fork Crow River at Paynesville, MN	Lat 45°23'09", long 94°42'41", in SW¼SE¼ sec.9, T.122 N., R.32 W., Stearns County, Hydrologic Unit 07010204, at bridge on county road at northeast edge of Paynesville city limits.	236	1973-85	4-23-85	7.47	1,600
05278120	North Fork Crow River near Kingston, MN	Lat 45°12'13", long 94°23'16", in SW¼SE¼ sec 13, T.120 N., Meeker County, Hydrologic Unit 07010204, at bridge on State Highway 24, 3.7 miles west of Kingston, 3.9 miles east of Forest City.	-	1985	3-20-85	d19.11	3,000
05278350	Fountain Creek near Montrose, MN	Lat 45°01'20", long 93°56'29", in NE¼NW¼ sec.22, T.118 N., R.26 W., Wright County, Hydrologic Unit 07010204, at culvert on County Highway 30, 3.3 miles southwest of Montrose.	6.73	1962-85	4-23-85	6.21	57

"See footnotes at end of the table."

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Annual maximum discharge at high-flow partial-record stations during water year 1985--Continued

Station No.	Station name	Location	Drainage area (mi^2)	Period of Record	Annual maximum Date	Gage height (feet)	Discharge (ft^3/s)
		Crow River basin--Continued					
05278700	Otter Creek near Lester Prairie, MN	Lat 44°54'23", long 94°04'24", in SE¼SE¼ sec.28, T.117 N., R.27 W., McLeod County, Hydrologic Unit 07010205, at culvert on State Highway 7, 2.1 miles northwest of Lester Prairie, 4.4 miles upstream from mouth.	30.2	1961-85	3-16-85	d.91	270
05278750	Otter Creek tributary near Lester Prairie, MN	Lat 44°53'34", long 94°04'24", in SE¼SE¼ sec.33, T.117 N., R.27 W., McLeod County, Hydrologic Unit 07010205, at culvert on County Highway 63, 1.7 miles northwest of Lester Prairie, 3.3 miles upstream from mouth.	1.54	1962-85	3-16-85	d9.08	†
05278850	Buffalo Creek tributary near Brownton, MN	Lat 44°45'55", long 94°22'33", in NE¼SE¼ sec.13, T.115 N., R.30 W., McLeod County, Hydrologic Unit 07010205, at culvert on State Highway 15, 0.6 mile upstream from mouth, 2.6 miles northwest of Brownton.	9.45	1961-85	3-16-85	14.00	39
05280300	School Lake Creek tributary near St. Michael, MN	Lat 45°12'09", long 93°41'31", in NW¼SE¼ sec.15, T.120 N., R.24 W., Wright County, Hydrologic Unit 07010204, at culvert on county highway, 0.2 mile upstream from mouth, 1.5 miles southwest of St. Michael.	2.04	1964-85	4-23-85	9.44	66
		Rum River basin					
05284600	Robinson Brook near Onamia, MN	Lat 45°58'22", long 93°39'42", in NE¼SE¼ sec.11, T.40 N., R.27 W., Mille Lacs County, Hydrologic Unit 07010207, at culvert on U.S. Highway 169, 0.2 mile upstream from mouth, 6.8 miles south of Onamia.	4.79	1960-85	4-23-85	15.77	160
05284620	Rum River tributary near Onamia, MN	Lat 45°57'29", long 93°39'43", in NE¼SE¼ sec.14, T.40 N., R.27 W., Mille Lacs County, Hydrologic Unit 07010207, at culvert on U.S. Highway 169, 0.3 mile upstream from mouth, 7.8 miles south of Onamia.	2.37	1960-85	4-23-85	10.20	96
05284920	Stanchfield Creek tributary near Day, MN	Lat 45°41'29", long 93°23'45", in NW¼SE¼ sec.13, T.37 N., R.25 W., Isanti County, Hydrologic Unit 07010207, at culvert on County Highway 60, 0.5 mile upstream from mouth, 1.5 miles southwest of Day.	1.26	1961-85	4-23-85	5.97	g24
		Minnesota River basin					
05299100	Lazarus Creek tributary near Canby, MN	Lat 44°43'04", long 96°19'42", in NE¼NW¼ sec.6, T.114 N., R.45 W., Yellow Medicine County, Hydrologic Unit 07020003, at culvert on State Highway 68, 2.7 miles west of Canby, 4.2 miles upstream from mouth.	2.97	1960-85	4-23-85	h	i8

"See footnotes at end of the table."

Annual maximum discharge at high-flow partial-record stations during water year 1985--Continued

Station No.	Station name	Location	Drainage area (mi^2)	Period of Record	Annual maximum Date	Gage height (feet)	Discharge (ft^3/s)
		Minnesota River basin--Continued					
05302500	Little Chippewa River near Starbuck, MN	Lat 45°36'52", long 95°37'12", in NW¼NE¼ sec.30, T.125 N., R.39 W., Pope County, Hydrologic Unit 07020005, at downstream wingwall on triple box culvert on State Highway 28, 4.4 miles west of Starbuck.	69.6	1979-85	5-15-85	12.40	160
05302970	Outlet Creek tributary near Starbuck, MN	Lat 45°31'35", long 95°33'43", in NW¼NW¼ sec.27, T.124 N., R.39 W., Pope County, Hydrologic Unit 07020005, at culvert on State Highway 29, 0.2 mile upstream from mouth, 6.6 miles south of Starbuck.	.47	1962-85	10-18-84	7.36	8.2
05305200	Spring Creek near Montevideo, MN	Lat 44°58'41", long 95°42'57", in NW¼NW¼ sec.5, T.117 N., R.40 W., Chippewa County, Hydrologic Unit 07020005, at culvert on State Highway 29, 1.2 miles upstream from mouth, 2.0 miles north of Montevideo.	16.0	1959-85	4-23-85	14.67	128
05311200	North Branch Yellow Medicine River near Ivanhoe, MN	Lat 44°27'32", long 96°21'27", in NE¼NW¼ sec.2, T.111 N., R.46 W., Lincoln County, Hydrologic Unit 07020004, at culvert on State Highway 19, 5.3 miles west of Ivanhoe.	14.8	1960-85	5-31-85	14.65	320
05311250	North Branch Yellow Medicine River tributary near Wilno, MN	Lat 44°33'12", long 96°16'33", in SE¼NE¼ sec.33, T.113 N., R.45 W., Lincoln County, Hydrologic Unit 07020004, at culvert on U.S. Highway 75, 2.1 miles upstream from mouth, 4.3 miles northwest of Wilno.	.33	1960-85	10-18-84	8.69	14
05314500	Hawk Creek near Maynard, MN	Lat 44°52'10", long 95°28'58", in SW¼NW¼ sec.7, T.116 N., R.38 W., at Renville and Chippewa County line, Hydrologic Unit 07020004, at right downstream side of bridge on State Highway 23, 3.0 miles southwest of Maynard.	474	1949-54#, 1981-85	3-15-85	d17.39	1,430
05315200	Prairie Ravine near Marshall, MN	Lat 44°29'44", long 95°47'48", in SE¼NE¼ sec.20, T.112 N., R.41 W., Lyon County, Hydrologic Unit 07020006, at culvert on U.S. Highway 59, 2.7 miles north of Marshall.	5.63	1959-64#, 1965-85	4-22-85	5.93	28
05316570	Beaver Creek at Beaver Falls, MN	Lat 44°35'03", long 95°02'49", in NE¼NW¼ sec.22, T.113 N., R.35 W., Renville County, Hydrologic Unit 07020004, at bridge on County Highway 2 in Beaver Falls, 2.2 miles upstream from mouth, 3.8 miles northwest of Morton.	194	1972-85	4-23-85	d11.33	1,070
05316690	Spring Creek tributary near Sleepy Eye, MN	Lat 44°23'54", long 94°45'35", in NW¼ sec.25, T.111 N., R.33 W., Brown County, Hydrologic Unit 07020007, at culvert on county highway, 0.1 mile upstream from mouth, 7.5 miles north of Sleepy Eye.	3.69	1966-85	6-23-84 4-23-85	e6.00 e4.75	f78 41

"See footnotes at end of the table."

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Annual maximum discharge at high-flow partial-record stations during water year 1985--Continued

Station No.	Station name	Location	Drainage area (mi^2)	Period of Record	Annual maximum Date	Gage height (feet)	Discharge (ft^3/s)
		Minnesota River basin--Continued					
05316700	Spring Creek near Sleepy Eye, MN	Lat 44°24'12", long 94°44'41", in NE¼SE¼ sec.24, T.111 N., R.33 W., Brown County, Hydrologic Unit 07020007, at culvert on county highway, 4.3 miles upstream from mouth, 7.5 miles north of Sleepy Eye.	31.3	1959-85	4-23-85	13.82	430
05316800	Cottonwood River tributary near Balaton, MN	Lat 44°14'24", long 95°57'22", in NW¼NW¼ sec.19, T.109 N., R.42 W., Lyon County, Hydrologic Unit 07020008, at culvert on U.S. Highway 14, 4.0 miles west of Balaton.	.91	1959-85	3-11-85	d8.20	94
05316920	Cottonwood River tributary No. 2 near Sanborn, MN	Lat 44°10'34", long 95°07'15", in SW¼NW¼ sec.12,T.108 N.,R.36 W., Cottonwood County, Hydrologic Unit 07020008, at culvert on U.S. Highway 71, 2.4 miles south of Sanborn.	.42	1966-85	6-14-85	d7.15	94
05316950	Cottonwood River near Springfield, MN	Lat 44°12'12", long 95°02'53", on line between secs.33 and 34, T.109 N., R.35 W., Brown County, Hydrologic Unit 07020008, at bridge on County Highway 2, 1.3 miles downstream from Mound Creek, 1.0 mile upstream from Coal Mine Creek, 3.5 miles southwest of Springfield.	773	1973-85	3-14-85	d26.62	5,500
05317845	East Branch Blue Earth River near Walters, MN	Lat 43°37'58", long 93°42'28", in SE¼SE¼ sec.16, T.102 N., R.24 W., Faribault County, Hydrologic Unit 07020009, at left downstream wingwall of box culvert on State Highway 22, 2.5 miles northwest of Walters.	29.6	1979-85	3-12-85	d15.83	290
05318000	East Branch Blue Earth River near Bricelyn, MN	Lat 43°37'50", long 93°47'25", in NE¼NE¼ sec.23, T.102 N., R.25 W., Faribault County, Hydrologic Unit 07020009, at bridge on county highway, 2.0 miles upstream from Brush Creek, 3.0 miles downstream from South Walnut Lake, 5.0 miles northeast of Bricelyn.	132	1973-85	3-14-85	8.08	320
05318100	East Branch Blue Earth River tributary near Blue Earth, MN	Lat 43°37'09", long 94°01'03", in SW¼SE¼ sec.24, T.102 N., R.27 W., Faribault County, Hydrologic Unit 07020009, at culvert on County Highway 13, 0.5 mile upstream from mouth, 4.3 miles east of Blue Earth.	9.20	1960-85	4-22-85	3.57	47
05318300	Watonwan River near Delft, MN	Lat 43°59'55", long 95°07'11", in NE¼SE¼ sec.11, T.106 N., R.36 W., Cottonwood County, Hydrologic Unit 07020010, at culvert on U.S. Highway 71, 1.7 miles northwest of Delft.	13.0	1960-85	4-23-85	e15.49	42
05318897	South Fork Watonwan River near Ormsby, MN	Lat 43°53'08", long 94°41'27", in SE¼NW¼ sec.21, T.105 N., R.32 W., Watonwan County, Hydrologic Unit 07020010, at right downstream wingwall of bridge on township road, 2.6 miles north of Ormsby, 5.0 miles upstream from mouth at Willow Creek.	109	1979-85	4-23-85	15.47	815

"See footnotes at end of the table."

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Annual maximum discharge at high-flow partial-record stations during water year 1985--Continued

Station No.	Station name	Location	Drainage area (mi^2)	Period of Record	Annual maximum Date	Gage height (feet)	Discharge (ft^3/s)
		Minnesota River basin--Continued					
05320200	Le Sueur River tributary near Mankato, MN	Lat 44°07'29", long 93°57'33", in SE¼SW¼ sec.28, T.108 N., R.26 W., Blue Earth County, Hydrologic Unit 07020011, at culvert on State Highway 22, 0.2 mile upstream from mouth, 1.5 miles southeast of Mankato Airport.	.073	1959-85	3-12-85	19.42	7.6
05320300	Cobb River tributary near Mapleton, MN	Lat 44°01'05", long 93°57'30", in SW¼NE¼ sec.4, T.106 N., R.26 W., Blue Earth County, Hydrologic Unit 07020011, at culvert on State Highway 22, 1.0 mile upstream from mouth, 6.3 miles north of Mapleton.	7.25	1959-85	3-12-85	15.85	135
05320400	Maple River tributary near Mapleton, MN	Lat 43°55'18", long 94°01'17", in SE¼SW¼ sec.1, T.105 N., R.27 W., Blue Earth County, Hydrologic Unit 07020011, at culvert on State Highway 30, 0.9 mile upstream from mouth, 3.3 miles west of Mapleton.	6.22	1959-85	3-13-85	18.22	144
05320480	Maple River near Rapidan, MN	Lat 44°03'54", long 94°01'32", in SW¼ sec.13, T.107 N., R.27 W., Blue Earth County, Hydrologic Unit 07020011, at bridge on County Highway 35, 3.0 miles southeast of Rapidan, 3.3 miles upstream from mouth.	343	1972-85	3-14-85	d11.54	2,400
05326100	Middle Branch Rush River near Gaylord, MN	Lat 44°30'27", long 94°15'00", in SW¼NW¼ sec.18, T.112 N., on line between R.28 W. and R.29 W., Sibley County, Hydrologic Unit 07020012, at downstream side of bridge on township road, 3.0 miles southwest of Gaylord, 10.5 miles upstream from the main branch of Rush River.	68.5	1979-85	3-15-85	16.65	†
05330200	Rice Lake tributary near Montgomery, MN	Lat 44°25'42", long 93°32'10", in NE¼NW¼ sec.13, T.111 N., R.23 W., Le Sueur County, Hydrologic Unit 07020012, at culvert on State Highway 21, 1.8 miles upstream from Rice Lake, 2.5 miles east of Montgomery.	3.16	1960-85	3-13-85	8.04	62
05330300	Sand Creek near New Prague, MN	Lat 44°32'37", long 93°32'16", in NE¼NW¼ sec.1, T.112 N., R.23 W., Le Sueur County, Hydrologic Unit 07020012, at culvert on State Highway 13 and 19, 1.9 miles east of New Prague.	62.4	1960-85	12-16-84	12.02	490
05330550	East Branch Raven Stream near New Prague, MN	Lat 44°34'21", long 93°35'58", in NW¼ sec.28, T.113 N., R.23 W., Scott County, Hydrologic Unit 07020012, at culvert on county road, 1.6 miles upstream from mouth, 2.3 miles northwest of New Prague.	22.1	1960-85	3-16-85	11.47	183
05330600	Sand Creek tributary No. 2 near Jordan, MN	Lat 44°37'45", long 93°36'33", in NW¼NE¼ sec.5, T.113 N., R.23 W., Scott County, Hydrologic Unit 07020012, at culvert on State Highway 21, 0.8 mile upstream from mouth, 2.8 miles south of Jordan.	2.62	1960-85	3-13-85	13.77	68

"See footnotes at end of the table."

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Annual maximum discharge at high-flow partial-record stations during water year 1985--Continued

Station No.	Station name	Location	Drainage area (mi^2)	Period of Record	Annual maximum Date	Gage height (feet)	Discharge (ft^3/s)
		St. Croix River basin					
05336200	Glaisby Brook near Kettle River, MN	Lat 46°27'19", long 92°51'34", in SE¼NW¼ sec.22, T.46 N., R.20 W., Carlton County, Hydrologic Unit 07030003, at bridge on State Highways 27 and 73, 1.0 mile upstream from mouth, 2.4 miles south of Kettle River.	g27.5	1960-70#, 1971-85	9- 3-85	8.16	870
05336550	Wolf Creek tributary near Sandstone, MN	Lat 46°09'45", long 92°51'58", in NE¼SE¼ sec.33, T.43 N., R.20 W., Pine County, Hydrologic Unit 07030003, at culvert on U.S. Highway 61, 0.2 mile upstream from mouth, 2.2 miles north of Sandstone.	5.46	1960-85	10-19-84	18.47	160
05338200	Mission Creek near Hinckley, MN	Lat 45°59'52", long 92°56'44", in SW¼SW¼ sec.25, T.42 N., R.21 W., Pine County, Hydrologic Unit 07030004, at culvert on U.S. Highway 23, 1.2 miles south of Hinckley.	3.84	1960-85	10-19-84	14.21	54
05338500	Snake River near Pine City, MN	Lat 45°50'30", long 92°56'00", in SE¼NW¼ sec.26, T.39 N., R.21 W., Pine County, Hydrologic Unit 07030004, on left bank at site of former powerplant and dam, 0.5 mile downstream from Cross Lake and 1.5 miles northeast of Pine City.	958	1913-17, 1951-81#, 1982-85	4-28-85	7.64	6,460
		Cannon River basin					
05348550	Cannon River below Sabre Lake near Kilkenny, MN	Lat 44°17'50", long 93°37'44", in NE¼NE¼ sec. 31, T.110 N., R.23 W., LeSueur County, Hydrologic Unit 07040002, at right downstream side of bridge, on township road, 0.25 mile downstream of Sabre Lake, 3 miles southeast of Kilkenny.	-	1985	3-16-85	12.76	280
05352700	Turtle Creek tributary No. 2 near Pratt, MN	Lat 44°00'02", long 93°08'30", in NW¼SW¼ sec.8, T.106 N., R.19 W., Steele County, Hydrologic Unit 07040002, at culvert on U.S. Highway 218, 1.0 mile upstream from mouth, 1.7 miles southeast of Pratt.	1.26	1960-85	3-11-85	d16.67	38
05352800	Turtle Creek tributary near Steele Center, MN	Lat 44°00'26", long 93°12'20", in NW¼NW¼ sec.11, T.106 N., R.20 W., Steele County, Hydrologic Unit 07040002, at culvert on township road, 1.3 miles upstream from mouth, 1.6 miles northeast of Steele Center.	5.01	1960-85	3-11-85	d6.83	75
05355024	Cannon River at Northfield, MN	Lat 44°27'19", long 93°09'46", in NE¼NE¼ sec.1, T.111 N., R.20 W., Rice County, Hydrologic Unit 07040002, on left bank at downstream side of Fifth Street bridge in Northfield.	934	1980-85	3-13-85	d904.74	5,550
05355100	Little Cannon River tributary near Kenyon, MN	Lat 44°20'45", long 92°58'47", in NE¼SE¼ sec.9, T.110 N., R.18 W., Goodhue County, Hydrologic Unit 07040002, at culvert on State Highway 56, 0.3 mile upstream from mouth, 5.3 miles north of Kenyon.	2.20	1960-85	3-11-85	d13.25	125

"See footnotes at end of the table."

Annual maximum discharge at high-flow partial-record stations during water year 1985--Continued

Station No.	Station name	Location	Drainage area (mi^2)	Period of Record	Annual maximum Date	Gage height (feet)	Discharge (ft^3/s)
		Cannon River basin--continued					
05355200	Cannon River at Welch, MN	Lat 44°33'50", long 92°43'55", in NW¼SW¼ sec.27, T.113 N., R.16 W., Goodhue County, Hydrologic Unit 07040002, on right bank 0.3 mile downstream from highway bridge at Welch, 1.8 miles upstream from Belle Creek.	1,320	1909-14#, 1930-71#, 1973-85	3-14-85	8.93	6,500
		Zumbro River basin					
05373080	Milliken Creek near Concord, MN	Lat 44°07'13", long 92°49'08", in NW¼NW¼ sec.36, T.108 N., R.17 W., Dodge County, Hydrologic Unit 07040004, at bridge on County Road 9, 8.0 miles upstream from mouth, 2.1 miles southeast of Concord.	22.2	1979-85	3-11-85	c12.33	290
05373350	Zumbro River tributary near South Troy, MN	Lat 44°11'16", long 92°25'22", in SE¼NE¼ sec.6, T.108 N., R.13 W., Olmsted County, Hydrologic Unit 07040004, at culvert on county road, 0.8 mile upstream from mouth, 1.3 miles south of South Troy.	.16	1962-85	3-11-85	d9.11	31
05373700	Spring Creek near Wanamingo, MN	Lat 44°17'13", long 92°52'17", in SE¼SE¼ sec.32, T.110 N., R.17 W., Goodhue County, Hydrologic Unit 07040004, at culvert on County Highway 1, 3.5 miles upstream from mouth, 4.2 miles southwest of Wanamingo.	9.93	1960-85	3-11-85	10.11	222
05373900	Trout Brook tributary near Goodhue, MN	Lat 44°21'30", long 92°36'58", in NE¼SE¼ sec.4, T.110 N., R.15 W., Goodhue County, Hydrologic Unit 07040004, at culvert on State Highway 58, 0.8 mile upstream from mouth, 3.0 miles south of Goodhue.	.40	1960-85	3-11-85	d7.76	37
05374400	Long Creek near Potsdam, MN	Lat 44°10'48", long 92°17'23", at quarter corner on north line of sec.8, T.108 N., R.12 W., Wabasha County, Hydrologic Unit 07040004, at culvert on county highway, 2.6 miles northeast of Potsdam.	4.46	1966-85	3-11-85	16.06	168
		Whitewater River basin					
05376500	South Fork Whitewater River near Altura, MN	Lat 44°04'10", long 91°58'49", in SE¼ sec.14, T.107 N., R.10 W., Winona County, Hydrologic Unit 07040003, on left bank 500 ft upstream from highway bridge, 2.0 miles west of Altura, 2.4 miles upstream from Keefer Creek.	76.8	1939-71#, 1973-85	3-11-85	4.57	700
		Root River basin					
05383600	North Branch Root River tributary near Stewartville, MN	Lat 43°51'20", long 92°26'50", near center sec.36, T.105 N., R.14 W., Olmsted County, Hydrologic Unit 07040008, at culvert on State Highway 30, 2.0 miles east of Stewartville, 2.3 miles upstream from mouth.	.73	1958, 1959-64#, 1965-85	3-11-85	7.43	24
05383720	Mill Creek near Chatfield, MN	Lat 43°53'01", long 92°13'46", in SE¼NW¼ sec.23, T.105 N., R.12 W., Olmsted County, Hydrologic Unit 07040008, at bridge on county highway, 3.4 miles northwest of Chatfield, 4.8 miles upstream from mouth.	22.4	1962-85	3-11-85	11.62	730

"See footnotes at end of the table"

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Annual maximum discharge at high-flow partial-record stations during water year 1985--Continued

Station No.	Station name	Location	Drainage area (mi^2)	Period of Record	Annual maximum Date	Gage height (feet)	Discharge (ft^3/s)
		Root River basin--Continued					
05383850	South Fork Bear Creek near Grand Meadow, MN	Lat 43°43'24", long 92°35'24", in NE¼SE¼ sec.14, T.103 N., R.15 W., Mower County, Hydrologic Unit 07040008, at bridge on county highway, 1.5 miles northwest of Grand Meadow, 4.0 miles upstream from North Fork Bear Creek.	14.0	1962-85	3-11-85	d17.35	360
05384120	South Branch Root River at Lanesboro, MN	Lat 43°43'19", long 91°58'43", in NW¼SE¼ sec.13, T.103 N., R.10 W., Fillmore County, Hydrologic Unit 07040008, at bridge to ball park in Lanesboro, 2.5 miles upstream from mouth.	b297	1973-85	3-11-85	8.93	3,550
05384200	Gribben Creek near Whalan, MN	Lat 43°42'26", long 91°54'50", in NE¼SE¼ sec.21, T.103 N., R.9 W., Fillmore County, Hydrologic Unit 07040008, at bridge on county highway, 1.9 miles southeast of Whalan, 2.4 miles upstream from mouth.	7.80	1959-85	3-11-85	15.54	280
05384400	Pine Creek near Arendahl, MN	Lat 43°50'27", long 91°53'39", in SE¼NE¼ sec.3, T.104 N., R.9 W., Fillmore County, Hydrologic Unit 07040008, at bridge on County Highway 25, 1.3 miles northeast of Arendahl, 4.9 miles upstream from Hemingway Creek.	28.1	1959-85	3-11-85	13.37	1,160
05384500	Rush Creek near Rushford, MN	Lat 43°50'00", long 91°46'40", on line between secs.3 and 10, T. 104 N., R.8 W., Fillmore County, Hydrologic Unit 07040008, on downstream side near center of span of highway bridge, 1.5 miles northwest of Rushford, 3.0 miles upstream from mouth.	129	1942-79#, 1980-85	3-11-85	5.97	1,770
		Crooked Creek basin					
05387030	Crooked Creek at Freeburg, MN	Lat 43°36'37", long 91°21'39", in SW¼NE¼ sec.30, T.102 N., R.4 W., Houston County, Hydrologic Unit 07060001, on right downstream wingwall of bridge on State Highway 249 at Freeburg, 6.5 miles upstream from mouth.	44.2	1979-85	3-11-85	10.66	430
		Iowa River basin					
05457080	Rose Creek tributary near Dexter, MN	Lat 43°42'11", long 92°44'35", in SE¼SW¼ sec.22, T.103 N., R.16 W., Mower County, Hydrologic Unit 07080201, at culvert on county highway, 0.2 mile upstream from mouth, 2.2 miles southwest of Dexter.	1.17	1962-85	3-11-85	d9.65	53

"See footnotes at end of the table."

Annual maximum discharge at high-flow partial-record stations during water year 1985--Continued

Station No.	Station name	Location	Drainage area (mi^2)	Period of Record	Annual maximum Date	Gage height (feet)	Discharge (ft^3/s)
		Des Moines River basin					
05474750	Beaver Creek tributary No. 2 near Slayton, MN	Lat 43°59'35", long 95°48'01", in NW¼NW¼ sec.17, T.106 N., R.41 W., Murray County, Hydrologic Unit 07100001, at culvert on State Highway 30, 2.4 miles west of Slayton, 3.2 miles upstream from mouth.	3.53	1961-85	6-25-85	19.51	190
05474760	Beaver Creek tributary above Slayton, MN	Lat 43°59'35", long 95°47'12", in NE¼NE¼ sec.17, T.106 N., R.41 W., Murray County, Hydrologic Unit 07100001, at culvert on State Highway 30, 0.9 mile upstream from mouth, 1.7 miles west of Slayton.	2.20	1961-85	10-15-84	17.73	40
05475400	Warren Lake tributary near Windom, MN	Lat 43°54'02", long 95°07'13", in SE¼NE¼ sec.14, T.105 N., R.36 W., Cottonwood County, Hydrologic Unit 07100001, at culvert on U.S. Highway 71, 0.2 mile up stream from Warren Lake, 2.4 miles north of Windom.	1.39	1960-85	6-14-85	e5.48	37
05475800	Des Moines River tributary near Jackson, MN	Lat 43°41'36", long 95°01'26", in NW¼SE¼ sec.27, T.103 N., R.35 W., Jackson County, Hydrologic Unit 07100001, at culvert on county highway, 0.8 mile upstream from mouth, 5.3 miles north of Jackson.	1.52	1960-85	4-23-85	e14.15	27
05475900	Des Moines River tributary No. 2 near Lakefield, MN	Lat 43°40'28", long 95°03'15", in SE¼SE¼ sec.32, T.103 N., R.35 W., Jackson County, Hydrologic Unit 07100001, at culvert on County Highway 19, 1.9 miles upstream from mouth, 5.8 miles east of Lakefield.	5.18	1960-85	4-23-85	e6.54	70
05476900	Fourmile Creek near Dunnell, MN	Lat 43°34'57", long 94°46'26", in SW¼NW¼ sec.2, T.101 N., R.33 W., Martin County, Hydrologic Unit 07100003, at bridge on State Highway 4, 0.6 mile upstream from mouth, 1.6 miles north of Dunnell.	14.0	1960-85	4-23-85	e12.63	195
		Big Sioux River basin					
06482933	Chanarambi Creek near Edgerton, MN	Lat 43°53'59", long 96°03'39", in NW¼SW¼ sec.18, T.105 N., R.43 W., near Murray and Pipestone County line, Hydrologic Unit 10170204, at right downstream wingwall of bridge on township road, 3.8 miles northeast of Edgerton, 7.4 miles upstream from mouth.	56.1	1979-85	4-22-85	d14.65	245
06482950	Mound Creek near Hardwick, MN	Lat 43°48'18", long 96°12'47", in SE¼SE¼ sec.15, T.104 N., R.45 W., RockCounty, Hydrologic Unit 10170204,at culvert on county highway, 2.2 miles northwest of Hardwick.	2.47	1959-85	5-16-85	7.22	18
06482960	Mound Creek tributary at Hardwick, MN	Lat 43°46'05", long 96°12'44", in NE¼SE¼ sec.34, T.104 N., R.45 W., Rock County, Hydrologic Unit 10170204, at culvert on U.S. Highway 75, 0.7 mile upstream from mouth, 0.9 mile southwest of Hardwick.	.19	1959-85	3-10-85	d9.37	17

"See footnotes at end of the table."

Annual maximum discharge at high-flow partial-record stations during water year 1985--Continued

Station No.	Station name	Location	Drainage area (mi^2)	Period of Record	Annual maximum Date	Gage height (feet)	Discharge (ft^3/s)
		Big Sioux River basin--Continued					
06483000	Rock River at Luverne, MN	Lat 43°39'15", long 96°12'03", in SW¼NE¼ sec.11, T.102 N., R.45 W., Rock County, Hydrologic Unit 10170204, at bridge on Main Street (County Highway 4) in Luverne.	425	1911-14#, 1972-85	3-21-78	d9.78	f2,980
					4-15-79	8.30	f2,950
					11- 3-79	8.00	f2,675
					6-13-81	5.04	f628
					2-22-82	d7.54	f870
					4-14-83	d8.80	f2,675
					6-25-84	10.53	f5,650
					3-11-85	9.55	3,750
06483210	Kanaranzi Creek tributary No. 2 near Wilmont, MN	Lat 43°43'32", long 95°52'20", in SW¼NW¼ sec.15, T.103 N., R.42 W., Nobles County, Hydrologic Unit 10170204, at culvert on County Highway 15, 3.5 miles southwest of Wilmont, 3.7 miles upstream from mouth.	2.14	1966-85	6-15-85	e6.40	160
		Little Sioux River basin					
06603530	Little Sioux River near Spafford, MN	Lat 43°36'08", long 95°15'27", in NE¼NE¼ sec.34, T.102 N., R.37 W., Jackson County, Hydrologic Unit 10230003, at bridge on county highway, 1.6 miles downstream from Jackson County ditch No. 11, 5.8 miles east of Spafford.	41.1	1962-85	4-23-85	8.74	410

\# Operated as a continuous-record gaging station.
† Discharge not determined.
a Affected by beaver dam.
b Approximately.
c Affected by shifting control.
d Backwater from ice.
e Backwater from aquatic growth or debris.
f Revised.
g Adjusted for inflow from drainage ditch.
h Stage unknown
i Estimated.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Discharge measurements at miscellaneous sites

Measurements of streamflow points other than gaging stations are given in the following table. The measurements of base flow are designated by an asterisk (*); measurements of peak flow by a dagger (†).

Discharge measurements made at miscellaneous sites during water year 1985

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements Date	Measurements Discharge (ft^3/s)
		Mississippi River main stem				
Mississippi River	Gulf of Mexico	Lat 47°15'100", long 93°35'12", in N½ sec.13, T.155 N., R.26 W., Itasca County, Hydrologic Unit 07010103, at dam at outlet of Pokegama Lake, 3.5 miles northwest of Grand Rapids, MN (05120700).	[a]3,360	1929-30, 1944-45, 1948-55, 1957-75, 1983-84	5-24-85 9-26-85	2,600 2,660
		Prairie River basin				
Prairie River	Mississippi River	Lat 47°23'20", long 93°22'50", in NW¼SW¼ sec.27, T.57 N., R.24 W., Itasca County, Hydrologic Unit 07010103, upstream from Highway bridge, 1.5 miles downstream from outlet of Lawrence Lake, 5 miles North of Taconite (05212700).	485	1967-83	4-30-85	2,060
		Crow Wing River basin				
Straight River	Fish Hook River	Lat 46°58'58", long 95°17'24", in sec.31, T.141 N., R.36 W., Becker County, Hydrologic Unit 07010106, at culvert on township road, 4.5 miles east of Ponsford, 4.5 miles north of Osage, in Two Inlets State Forest.	-	1984	10-25-84 4- 9-85 5-16-85 6- 4-85 7-17-85 8-15-85 10-18-85	5.4 3.3 16.2 9.5 26.8 9.5 11.9
		Mississippi River main stem				
Mississippi River	Gulf of Mexico	Lat 44°58'46", long 93°14'50", in SE¼SE¼ sec.23, T.29 N., R.24 W., Hennepin County, Hydrologic Unit 07010206, at lower St. Anthony Falls lock and dam in Minneapolis, MN at River Mile 853.3 upstream from Ohio River. (Discharge measurements made between Hennepin Avenue and Franklin Avenue bridges over the Mississippi River are included). (05288920)	[a]19,700	1912, 1938-39, 1941, 1943, 1953-54, 1957, 1963-84	3-27-85 6-21-85	27,400 14,700
Mississippi River	Gulf of Mexico	Lat 44°54'57", long 93°11'59", in NE¼NW¼ sec.17, T.28 N., R.23 W., Ramsey County, Hydrologic Unit 07010206, at Ford Motor Company hydroelectric plant, 800 ft downstream from Ford Parkway bridge in St. Paul, MN, 3.5 miles upstream from Minnesota River, and at River mile 847.6 upstream from Ohio River (05288950).	[a]19,700	1924, 1935, 1938-39, 1941, 1943, 1945-50, 1954, 1957, 1959, 1961-62, 1964-70, 1972-84	8-21-85	12,000
		Minnesota River basin				
Chippewa River diversion	Minnesota River	Lat 45°01'30", long 95°48'00", in SE¼ sec.16, T.118 N., R.41 W., Chippewa County, Hydrologic Unit 07020005, 1 mile north of Watson, MN.	-	1945-84	10-22-84 11-27-84 4- 3-85	3,300 795 982
Chippewa River below diversion	Minnesota River	Lat 45°01'10", long 95°47'30", in NW¼ NW¼ sec.22, T.118 N., R.41 W., Chippewa County, Hydrologic Unit 07020005, 1.4 miles northeast of Watson, MN.	- -	1945-84	10-22-84 11-27-84 12-20-85 2-14-85 4- 3-85	1,700 - 162 30 906

"See footnote at end of table."

Discharge measurements made at miscellaneous sites during water year 1985--Continued

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements Date	Measurements Discharge (ft^3/s)
		Vadnais Lake basin				
Wilkinson Creek inlet	Wilkinson Lake	Lat 45°06'30", long 93°03'40", in NW¼NW¼ sec.9, T.30 N., R.22 W., Ramsey County, Hydrologic Unit 07010206, at culvert on County road J, 1300 ft west of Centerville Road in North Oaks, and 2200 ft upstream of Wilkinson Lake.	4.83	1984	3-17-85 3-18-85 4- 3-85	2.0 2.0 1.5
Lamberts Creek	Vadnais Lake	Lat 45°04'35", long 93°01'31", in NE¼NE¼ sec.22, T.30 N., R.22 W., Ramsey County, Hydrologic Unit 07010206, at site on stream in Ramaley Park on Dillon Street, 300 ft north of Whitaker Street in the City of White Bear Lake, 0.45 mile downstream of White Bear Lake.	1.07	1984	2-20-85 2-21-85 3-12-85	2.5 1.6 3.9
East Branch Lamberts Creek	Lamberts	Lat 45°03'53", long 93°03'27", in NE¼NW¼ sec.28, T.30 N., R.22 W., Ramsey County Hydrologic Unit 07010206, at culvert on County Road F, 2.4 miles east of County Road 49 in Vadnais Heights, 2.1 miles downstream of White Bear Lake.	4.56	1984	3-12-85 3-16-85 3-17-85 3-26-85 3-27-85 4- 1-85 4- 3-85 4- 9-85 4-12-85 5- 7-85 5-10-85 6-14-85 7- 1-85 7- 9-85	5.9 8.5 7.6 4.5 3.6 4.1 5.3 2.6 2.2 1.8 3.3 1.1 1.3 0.33
Lamberts Creek	Vadnais Lake	Lat 45°03'22", long 93°04'03", in SE¼NE¼ sec.29, T.30 N., R.22 W., Ramsey County, Hydrologic Unit 07010206, 1 mile upstream of Vadnais Lake, in Vadnais Heights, 100 ft from end of Stockdale Road.	6.41	1984	3-11-85 3-12-85 3-15-85 3-16-85 3-17-85 3-26-85 9-25-85 9-27-85 10- 5-85 10- 7-85 10-20-85	4.4 8.9 10.0 20.0 14.0 8.1 7.2 8.0 22.0 12.0 6.3
Lamberts Creek inlet	Vadnais Lake	Lat 45°03'06", long 93°05'08", in SW¼SW¼ sec.29, T.30 N., R.22 W., Ramsey County, Hydrologic Unit 07010206, 200 ft above Lake Side road, 300 ft above Vadnais Lake, in Vadnais Heights.	7.53	1984	3-19-85 8-19-85 9-26-85 9-27-85 10- 5-85	16 0.51 7.0 7.7 21.0
Vadnais Creek inlet	Vadnais Lake	Lat 45°02'42", long 93°04'35", in SE¼NE¼ sec.32, T.30 N., R.22 W., Ramsey County, Hydrologic Unit 07010206 at culvert on Edgerton St, in Vadnais Heights.	0.40	1984	3-14-85 3-15-85 3-16-85	1.29 0.28 2.01
		Mississippi River main stem				
Mississippi River	Gulf of Mexico	Lat 44°44'48", long 93°51'08", between secs.21 and 22, T.115 N., Washinton County line, Hydrologic Hydrologic Unit 07010206, a bridge on U.S. Highway 61, at Hasting, MN, 2.5 miles upstream from St. Croix River (05331580).	[a]37,100	1928, 1931-39, 1941-52, 1959-84	3-28-85 6- 3-85	48,200 24,600
St. Croix River	Mississippi River	Lat 44°44'57", long 92°48'16", in SE¼SE¼ sec.9, T.26 N., R.20 W., Pierce County, Hdrologic Unit 07030005, at bridge in Prescott, WI, 0.1 mile upstream from mouth. (05344490)	[a]7,650	1928-30, 1932-39 1947-48, 1950, 1953-57, 1959-84	3-28-85 8- 3-85	15,300 10,700

[a] Approximately

Low-flow investigations in the Crow and Chippewa River Basins

Discharge measurements made for the Brooten-Belgrade ground water study to determine base flow variations which will facilitate modeling of ground-surface water relations. Base-flow conditions were poor and measurements are not considered base flow. Total precipitation measured by the New London, Melrose and Litchfield U.S. Weather Bureau observers for 10 days preceding the measurements and including August 28 are 2.58 inches, 0.67 inches, and 2.94 inches respectively. Daily rainfalls greater than 0.5 inches were measured at New London on August 23, 24, and 28 and at Litchfield on August 17, 23, and 24.

Discharge measurements made in Crow and Chippewa River basins, August 26-28, 1985

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Date	Discharge (ft^3/s)
		Crow River basin				
North Fork Crow River	Crow River	Lat 45°36'06", long 95°10'13", in SW¼SE¼ sec.26, T.125 N., R.36 W., Pope County, Hydrologic Unit 07010204, at culvert on County Road 39, below Grove Lake outlet, 4 miles northeast of Sedan.	-	-	8-27-85	3.78
Intermittent Ditch	North Fork Crow River	Lat 45°35'23", long 95°10'14", in NW¼SE¼ sec.35, T.125 N., R.36 W., Pope County, Hydrologic Unit 07010204, at culvert on County Road 39, 1 mile south of Grove Lake.	-	-	8-27-85	0.46
North Fork Crow River	Crow River	Lat 45°35'20", long 95°06'30", in SW¼SE¼ sec.32, T.125 N., R.35 W., Stearns County, Hydrologic Unit 07010204, at bridge on County Road 18, 6 miles east of Sedan.	-	-	8-27-85	6.75
North Fork Crow River	Crow River	Lat 45°32'57", long 95°04'28", in NE¼SE¼ sec.16, T.124 N., R.35 W., Stearns County, Hydrologic Unit 07010204, at bridge on township road, 3 miles northeast of Brooten.	-	-	8-27-85	8.44
Sedan Brook	North Fork Crow River	Lat 45°31'49", long 95°03'46", in SE¼SW¼ sec.22, T.124 N., R.35 W., Stearns County, Hydrologic Unit 07010204, at culverts on County Road 27, 2.5 miles northeast of Brooten.	-	-	8-27-85	5.37
Intermittent Creek	North Fork Crow River	Lat 45°32'08", long 95°00'28", in SW¼NW¼ sec.19, T.124 N., R.34 W., Stearns County, Hydrologic Unit 07010204, at culvert on County Road 13, 6.5 miles northeast of Brooten.	-	-	8-28-85	0.02
North Fork Crow River	Crow River	Lat 45°31'12", long 95°00'29", in NW¼SW¼ sec.30, T.124 N., R.34 W., Stearns County, Hydrologic Unit 07010204, at bridge on County Road 13, 4.5 miles north of Belgrade.	-	-	8-27-85	12.5
County Ditch No. 7	North Fork Crow River	Lat 45°30'59", long 95°00'29", in SE¼SE¼ sec.25, T.124 N., R.35 W., Stearns County, Hydrologic Unit 07010204, at culvert on County Road 13, 6.0 miles northeast of Brooten.	-	-	8-28-85	2.65
Intermittent Creek	North Fork Crow River	Lat 45°31'14", long 94°59'55", in NE¼SW¼ sec.30, T.124 N., R.34 W., Stearns County, Hydrologic Unit 07010204, on east-west township road, 3 miles southwest of Elrosa.	-	-	8-27-85	0.02
Intermittent Creek	North Fork Crow River	Lat 45°31'14", long 94°58'40", in NW¼SE¼ sec.29, T.124 N., R.34 W., Stearns County, Hydrologic Unit 07010204, at culvert on east-west township road, 3 miles southwest of Elrosa.	-	-	8-28-85	0.60
North Fork Crow River	Crow River	Lat 45°29'57", long 94°58'14", in NE¼NE¼ sec.5, T.123 N., R.34 W., Stearns County, Hydrologic Unit 07010204, at culvert on east-west township road, 3 miles northeast of Belgrade.	-	-	8-27-85	16.4

"See footnote at end of the table."

Low-flow investigations in the Crow and Chippewa River Basins--Continued

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Date	Discharge (ft^3/s)
		Crow River basin--Continued				
Skunk River	North Fork Crow River	Lat 45°29'12", long 94°57'30", in SE¼SW¼ sec.4, T.123 N., R.34 W., Stearns County, Hydrologic Unit 07010204, at culvert on U.S. Highway 71, 3 miles northeast of Belgrade.	-	-	8-28-85	14.9
Intermittent Creek	North Fork Crow River	Lat 45°29'57", long 94°55'53", in NE¼NE¼ sec.3, T.123 N., R.34 W., Stearns County, Hydrologic Unit 07010204, at culvert on County Road 175, 5 miles northeast of Belgrade.	-	-	8-27-85	0.87
North Fork Crow River	Crow River	Lat 45°29'06", long 94°55'37", in SE¼SE¼ sec.3, T.123 N., R.34 W., Stearns County, at bridge on County Highway 32, 2 miles east of U.S. Highway 71 and 4 miles north of Georgeville (05275970).	166	1969-73, 1976	8-27-85	26.6
Intermittent Creek	North Fork Crow River	Lat 45°29'06", long 94°55'34", in NW¼NW¼ sec.11, T.123 N., R.34 W., Stearns County, Hydrologic Unit 07010204, at culvert on County Road 32, 4.5 miles northeast of Belgrade.	-	-	8-27-85	0.16
Intermittent Creek	North Fork Crow River	Lat 45°28'48", long 94°55'34", in NE¼SE¼ sec.10, T. 123N., R. 34W., Stearns County, Hydrologic Unit 07010204, at culvert on County Road 196, 4 miles northeast of Belgrade.	-	-	8-28-85	0.30
Intermittent Creek	North Fork Crow River	Lat 45°28'37", long 94°54'22", in NW¼SW¼ sec.12, T.123 N., R.34 W., Stearns County, Hydrologic Unit 07010204, at culvert on township road.	-	-	8-27-85	0.4
Intermittent Creek	North Fork Crow River	Lat 45°27'29", long 94°53'31", in SW¼SE¼ sec.13, T.123 N., R.34 W., Stearns County, Hydrologic Unit 07010204, at culvert on township road, 5.8 miles east of Belgrade.	-	-	8-28-85	0.18
North Fork Crow River	Crow River	Lat 45°26'56", long 94°53'32", in NE¼SE¼ sec.24, T.123 N., R.34 W., Stearns County, Hydrologic Unit 07010204, at bridge on County Road 19, 0.5 miles east of Belgrade.	-	-	8-27-85	29.0
Intermittent Creek	North Fork Crow River	Lat 45°26'18", long 94°54'22", in SW¼NW¼ sec.25, T.123 N., R.34 W., Stearns County, Hydrologic Unit 07010204, at culvert on township road, 5 miles southeast of Belgrade, 1 mile northeast of Georgeville.	-	-	8-28-85	1.64
Intermittent Creek	North Fork Crow River	Lat 45°26'14", long 94°52'35", in SE¼NW¼ sec.30, T.123 N., R.33 W., Stearns County, Hydrologic Unit 07010204, at culvert on County Road 178, 2.5 miles northeast of Georgeville.	-	-	8-27-85	0.14
Intermittent Creek	North Fork Crow River	Lat 45°25'18", long 94°51'58", in SE¼NE¼ sec.31, T.123 N., R.33 W., Stearns County, Hydrologic Unit 07010204, at culvert on north-south township road, 1.5 miles northwest of Regal.	-	-	8-27-85	0.42
North Fork Crow River	Crow River	Lat 45°24'38", long 94°52'03", in NE¼NE¼ sec.6, T.122 N., R.33 W., Kandiyohi County, Hydrologic Unit 07010204, at bridge on State Highway 55, 8 miles northwest of Paynesville.	-	-	8-27-85	38.0
North Fork Crow River	Crow River	Lat 45°24'02", long 94°50'42", in SW¼SW¼ sec.4, T.122 N., R.33 W., Kandiyohi County, Hydrologic Unit 07010204, at bridge on township road, 6 miles northwest of Paynesville.	-	-	8-27-85	44.4

"See footnote at end of the table."

Low-flow investigations in the Crow and Chippewa River Basins--Continued

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Date	Discharge (ft^3/s)
		Crow River basin--Continued				
North Fork Crow River	Crow River	Lat 45°23'04", long 94°47'38", in SE¼SW¼ sec.11, T.122 N., R.33 W., Kandiyohi County, Hydrologic Unit 07010204, at bridge on County Road 6, 3.5 miles west of Paynesville, 3 miles southeast of Regal (05276000).	-	-	8-26-85	47.2
Intermittent Creek	North Fork Crow River	Lat 45°23'28", long 94°45'55", in SE¼NE¼ sec.12, T.122 N., R.33 W., Kandiyohi County, Hydrologic Unit 07010204, at bridge on County Road 39, 4 miles southeast of Regal.	-	-	8-26-85	0.01
Intermittent Creek	North Fork Crow Rver	Lat 45°22'49", long 94°43'47", in SW¼NE¼ sec.17, T.122 N., R.32 W., Stearns County, Hydrologic Unit 07010204, at culvert on upstream side of State Highway 55 bridge at Paynesville.	-	-	8-26-85	0.48
North Fork Crow River	Crow River	Lat 45°22'56", long 94°43'18", in NW¼NW¼ sec.16, T.122 N., R.32 W., Stearns County, Hydrologic Unit 07010204, at the end of Oak Park Avenue in Paynesville.	-	-	8-26-85	70.7
Intermittent Creek	North Fork Crow River	Lat 45°23'07", long 94°43'45", in SW¼SE¼ sec.8, T.122 N., R.32 W., Stearns County, Hydrologic Unit 07010204, at culverts on County Road 130, 0.5 mile north of Paynesville.	-	-	8-26-85	1.91
Intermittent Creek	North Fork Crow River	Lat 45°23'22", long 94°42'42", in NE¼SW¼ sec.9, T.122 N., R.32 W., Stearns County, Hydrologic Unit 07010204, at culvert on County Road 123, 0.5 mile north of Paynesville.	-	-	8-26-85	1.11
North Fork Crow River	Crow River	Lat 45°21'52", long 94°39'18", in SE¼NW¼ sec.24, T.122 N., R.32 W., Stearns County, Hydrologic Unit 07010204, at bridge on township road, 3.5 miles east of Paynesville, 0.6 mile upstream of Rice Lake.	-	-	8-26-85	81.7
Middle Fork Crow River	Crow River	Lat 45°25'19", long 94°58'20", in SE¼NE¼ sec.32, T.123 N., R.34 W., Stearns County, Hydrologic Unit 07010204, at culvert on township road, 2.25 miles southeast of Belgrade.	-	-	8-26-85	3.37
County Ditch	Middle Fork Crow River	Lat 45°25'06", long 94°57'28", in NW¼SE¼ sec.33, T.123 N., R.34 W., Stearns County, Hydrologic Unit 07010204, at culvert on County Road 126, 3 miles southeast of Belgrade.	-	-	8-26-85	2.41
County Ditch No. B5	Middle Fork Crow River	Lat 45°24'28", long 94°57'28", in SW¼NE¼ sec.4, T.122 N., R.34 W., Kandiyohi County, Hydrologic Unit 07010204, at culvert on County Road 126, 3.5 miles southeast of Belgrade.	-	-	8-26-85	[a]0.71
Middle Fork Crow River	Crow River	Lat 45°23'54", long 94°58'46", in SE¼SW¼ sec.5, T.122 N., R.34 W., Kandiyohi County, Hydrologic Unit 07010204, at culvert on County Road 35, 3.75 miles southeast of Belgrade.	-	-	8-26-85	7.63
County Ditch No. B6	Middle Fork Crow River	Lat 45°25'00", long 95°00'22", in NW¼SW¼ sec.31, T.123 N., R.34 W., Stearns County, Hydrologic Unit 07010204, at culvert on County Road 197, 0.8 mile south of Belgrade.	-	-	8-26-85	0.97
County Ditch No. B6	Middle Fork Crow River	Lat 45°23'53", long 94°59'04", in SW¼SW¼ sec.5, T.122 N., R.34 W., Kandiyohi County, Hydrologic Unit 07010204, at bridge on County Road 35, 2.75 miles southeast of Belgrade.	-	-	8-26-85	3.94

"See footnote at end of the table."

Low-flow investigations in the Crow and Chippewa River Basins--Continued

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Date	Discharge (ft^3/s)
		Crow River basin--Continued				
County Ditch No. B7	Middle Fork Crow River	Lat 45°23'53", long 94°59'30", in NE¼NE¼ sec.7, T.122 N., R.34 W., Kandyohi County, Hydrologic Unit 07010204, at culvert on County Road 35, 2.75 miles south of Belgrade.	-	-	8-26-85	[a]0.18
Middle Fork Crow River	Crow River	Lat 45°22'18", long 94°57'37", in SE¼SW¼ sec.16, T.122 N., R.34 W., Kandiyohi County, Hydrologic Unit 07010204, at culvert on County Road 128, 2 miles north of Mud Lake.	-	-	8-26-85	16.0
County Ditch No. 37	Middle Fork Crow River	Lat 45°21'14", long 94°58'05", in NW¼NW¼ sec.28, T.122 N., R.34 W., Kandiyohi County, Hydrologic Unit 07010204, at bridge on County Road 128, 3 miles northwest of New London.	-	-	8-26-85	6.87
Middle Fork Crow River	Crow River	Lat 45°20'57", long 94°57'05", in SE¼NE¼ sec.28, T.122 N., R.34 W., Kandiyohi County, Hydrologic Unit 07010204, at culvert on County Road 33, 3 miles north of New London, at inlet to Mud Lake.	-	-	8-26-85	30.6
Intermittent Creek (wetland area)	Middle Fork Crow River	Lat 45°20'17", long 94°58'24", in NE¼NE¼ sec.32, T.122 N., R.34 W., Kandiyohi County, Hydrologic Unit 07010204, at culvert on County Road 33, 3 miles northwest of New London, 0.25 mile east of Mud Lake.	-	-	8-26-85	2.20
Intermittent Creek (wetland area)	Middle Fork Crow River	Lat 45°19'45", long 94°58'03", in SW¼SW¼ sec.33, T.122 N., R.34 W., Kandiyohi County, Hydrologic Unit 07010204, at culvert on County Road 33, 2 miles northwest of New London, 2.25 miles west of Mud Lake.	-	-	8-26-85	0.7
Middle Fork Crow River	Crow River	Lat 45°18'00", long 94°56'25", in NE¼SW¼ sec.10, T.121 N., R.34 W., Kandiyohi County, Hydrologic Unit 07010204, at bridge on County Road 9, at New London, (05277000).	-	-	8-27-85	53.2
Middle Fork Crow River	Crow River	Lat 45°16'38", long 94°57'20", in SW¼NE¼ sec.21, T.121 N., R.34 W., Kandiyohi County, Hydrologic Unit 07010204, at bridge on township road, 1.25 miles southwest of New London.	-	-	8-27-85	55.6
Middle Fork Crow River	Crow River	Lat 45°16'07", long 94°57'54", in SW¼SW¼ sec.21, T.121 N., R.34 W., Kandiyohi County, Hydrologic Unit 07010204, at bridge on township road, at inlet to Nest Lake.	-	-	8-27-85	62.0
		Minnesota River basin				
East Branch Chippewa River	Chippewa River	Lat 45°39'37", long 95°18'07", in SW¼SW¼ sec.2, T.125 N., R.37 W., Pope County, Hydrologic Unit 07020005, at bridge on State Highway 28, 3.2 miles northeast of Glenwood.	-	-	8-26-85	0.41
East Branch Chippewa River	Chippewa River	Lat 45°39'02", long 95°18'02", in SW¼NW¼ sec.11, T.125 N., R.37 W., Pope County, Hydrologic Unit 07020005, at culvert on County Road 22, 3 miles east of Glenwood.	-	-	8-26-85	0.92
East Branch Chippewa River	Chippewa River	Lat 45°38'10", long 95°17'57", in SW¼NW¼ sec.14, T.125 N., R.37 W., Pope County, Hydrologic Unit 07020005, at culvert on east-west township road, 3.5 miles southeast of Glenwood.	-	-	8-26-85	2.34

"See footnote at end of the table."

Low-flow investigations in the Crow and Chippewa River Basins--Continued

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Date	Discharge (ft^3/s)
		Minnesota River basin--Continued				
East Branch Chippewa River	Chippewa River	Lat 45°36'23", long 95°17'09", in NE¼SE¼ sec.26, T.125 N., R.37 W., Pope County, Hydrologic Unit 07020005, at bridge on east-west township road, 0.2 mile below Marles Lake outlet, 2.8 miles northwest of Sedan.	-	-	8-26-85	8.13
East Branch Chippewa River	Chippewa River	Lat 45°35'23", Long 95°17'35", in NW¼SE¼ sec.35, T.125 N., R.32 W., Pope County, Hydrologic Unit 07020005, at culvert on State Highway 55, 2.5 miles northwest of Sedan.	-	-	8-27-85	6.87
East Branch Chippewa River	Chippewa River	Lat 45°33'50", long 95°18'27", in NE¼SW¼ sec.10, T.124 N., R.37 W., Pope County, Hydrologic Unit 07020005, at bridge on County Road 21, 3 miles southwest of Sedan.	-	-	8-28-85	9.45
East Branch Chippewa River	Chippewa River	Lat 45°33'14", long 95°18'03", in NE¼NE¼ sec.15, T.124 N., R.37 W., Pope County, Hydrologic Unit 07020005, at culvert on County 23, 3 miles southwest of Sedan.	-	-	8-27-85	9.54
East Branch Chippewa River	Chippewa River	Lat 45°32'40", long 95°17'35", in SW¼SW¼ sec.14, T.124 N., R.37 W., Pope County, Hydrologic Unit 07020005, at bridge on east-west township road, 3 miles northeast of Terrace.	-	-	8-27-85	8.97
Intermittent Creek	East Branch Chippewa River	Lat 45°32'32", long 95°16'27", in NW¼NW¼ sec.24, T.124 N., R.37 W., Pope County, Hydrologic Unit 07020005, at culvert on east-west township road, 0.5 mile south of Round Lake, 3 miles northeast of Terrace.	-	-	8-27-85	1.05
East Branch Chippewa River	Chippewa River	Lat 45°31'14", long 95°17'34", in NW¼SW¼ sec.26, T.124 N., R.37 W., Pope County, Hydrologic Unit 07020005, at bridge on township road, 1.5 miles northeast of Terrace.	-	-	8-27-85	10.1
Intermittent Creek	East Branch Chippewa River	Lat 45°30'57", long 95°17'08", in SW¼SE¼ sec.26, T.124 N., R.37 W., Pope County, Hydrologic Unit 07020005, at culvert on County Road 26, 1.5 miles northeast of Terrace.	-	-	8-27-85	2.24
Intermittent Creek	East Branch Chippewa River	Lat 45°30'24", long 95°17'50", in NE¼SE¼ sec.34, T.124 N., R.37 W., Pope County, Hydrologic Unit 07020005, at culvert on State Highway 104, 1 mile southeast of Terrace.	-	-	8-27-85	0.68
East Branch Chippewa River	Chippewa River	Lat 45°30'42", long 95°19'15", in NE¼NE¼ sec.33, T.124 N., R.37 W., Pope County, Lat 45°30'42", long 95°19'15", in NE¼NE¼ Hydrologic Unit 07020005, at bridge on County Road 21, at Terrace.	-	-	8-27-85	13.6
Intermittent Creek	East Branch Chippewa River	Lat 45°30'49", long 95°20'58", in SE¼SW¼ sec.29, T.124 N., R.37 W., Pope County, Hydrologic Unit 07020005, at culvert on State Highway 104, 1.25 miles west of Terrace.	-	-	8-27-85	0.03
Intermittent Creek	East Branch Chippewa River	Lat 45°29'24", long 95°20'55", in NE¼SW¼ sec.5, T.123 N., R.37 W., Pope County, Hydrologic Unit 07020005, site adjacent to field road, 0.4 mile east of Lake Linka.	-	-	8-28-85	1.47
East Branch Chippewa River	Chippewa River	Lat 45°28'57", long 95°21'40", in NE¼NE¼ sec.7, T.123 N., R.37 W., Pope County, Hydrologic Unit 07020005, at bridge on County Road 20, 0.5 mile east of Gilchrist Lake.	-	-	8-27-85	16.1

"See footnote at end of table."

Low-flow investigations in the Crow and Chippewa River Basins--Continued

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Date	Discharge (ft^3/s)
		Minnesota River basin--Continued				
East Branch Chippewa River	Chippewa River	Lat 45°27'52", long 95°21'19", in SW¼NW¼ sec.17, T.123 N., R.37 W., Pope County, Hydrologic Unit 07020005, at culvert on County Road 82, 0.1 mile below Gilchrist Lake.	-	-	8-27-85	20.5
East Branch Chippewa River	Chippewa River	Lat 45°26'36", long 95°24'28", in SW¼SE¼ sec.23, T.123 N., R.38 W., Pope County, Hydrologic Unit 07020005, at culvert on County Road 19, 3.3 miles northeast of Swift Falls.	-	-	8-27-85	19.6

[a] Estimated

MISCELLANEOUS ANALYSES OF STREAMS IN MINNESOTA

WATER QUALITY DATA AT STREAMFLOW STATIONS

Field determinations of water temperature and specific conductance are made at many streamflow stations in addition to those that are also regular water-quality stations. These data are usually collected at regular intervals during routine visits to the station. Additional data for each station are published elsewhere in this report.

WATER QUALITY DATA AT STREAMFLOW STATIONS, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERATURE (^oC)	SPECIFIC CONDUCTANCE (MICROMHOS)	DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERATURE (^oC)	SPECIFIC CONDUCTANCE (MICROMHOS)
05211000 MISSISSIPPI RIVER AT GRAND RAPIDS, MN							
OCT. 26, 1984	2300	7.0	---	MAY 15	2540	16.0	300
NOV. 09	2100	4.0	240	MAY 23	2520	16.0	215
DEC. 20	1820	2.0	300	JUNE 06	2530	16.0	245
FEB. 04, 1985	1710	2.0	335	JUNE 28	2780	18.0	245
FEB. 28	1120	2.5	335	JULY 12	2980	----	---
MAR. 12	1340	3.5	305	JULY 16	2840	----	---
APR. 26	1170	11.0	240	JULY 26	2410	21.0	260
MAY 03	1090	14.0	200	AUG. 29	2670	18.0	300
MAY 10	1490	15.0	220				
05216820 INITIAL TAILINGS BASIN OUTFLOW NEAR KEEWATIN, MN							
MAR. 25, 1985	.51	1.5	390	MAY 13	4.0	15.0	380
APR. 23	24	8.0	440	JULY 03	.12	19.5	362
APR. 23	36	8.5	310				
05216860 SWAN RIVER NEAR CALUMET, MN							
NOV. 05, 1984	69	2.0	327	APR. 26	414	5.0	270
DEC. 20	41	1.0	300	MAY 20	273	13.0	290
JAN. 31, 1985	25	---	---	JUNE 03	208	13.0	270
MAR. 18	21	2.0	310	JULY 16	58	20.0	300
APR. 04	69	2.0	280	AUG. 10	18	16.5	285
APR. 22	96	7.0	240				
05227500 MISSISSIPPI RIVER AT AITKIN, MN							
NOV. 06, 1984	4080	1.0	235	APR. 23	4150	---	---
NOV. 08	4000	---	---	APR. 24	6470	7.5	200
DEC. 18	3010	.0	230	MAY 02	9560	11.0	140
JAN. 29, 1985	2160	.0	320	JUNE 04	7600	15.0	165
MAR. 14	1670	.0	305	JULY 17	5230	22.5	230
APR. 05	2490	3.5	220	AUG. 27	3520	18.0	340

DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERATURE (^oC)	SPECIFIC CONDUCTANCE (MICROMHOS)	DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERATURE (^oC)	SPECIFIC CONDUCTANCE (MICROMHOS)
05245100 LONG PRAIRIE RIVER AT LONG PRAIRIE MN							
OCT. 17, 1984	397	9.5	335	APR. 11	305	12.0	430
DEC. 11	200	.0	495	MAY 21	536	16.0	500
JAN. 23, 1985	143	---	---	JULY 16	174	23.0	450
MAR. 20	894	2.5	210	SEPT. 03	202	18.0	450
05247500 CROW WING RIVER NEAR PILLAGER, MN							
DEC. 18, 1984	1150	.5	250	MAY 15	7450	13.5	280
FEB. 05, 1985	490	.5	330	JULY 17	1390	23.0	380
MAR. 20	2730	2.0	230	SEPT. 05	2360	18.0	370
05267000 MISSISSIPPI RIVER NEAR ROYALTON, MN							
OCT. 11, 1984	2140	13.5	360	APR. 08	5950	4.0	265
DEC. 13	3810	.5	330	JUNE 18	10300	16.5	270
FEB. 20, 1985	2680	.0	345	AUG. 20	8100	17.5	280
05275000 ELK RIVER NEAR BIG LAKE, MN							
OCT. 26, 1984	1990	---	---	MAR. 22	1470	---	---
NOV. 23	292	2.0	310	APR. 29	2380	14.5	240
DEC. 28	311	.5	390	JUNE 27	451	19.5	---
FEB. 11, 1985	152	.0	400	AUG. 20	224	16.5	300
MAR. 11	361	.0	466				
05278000 MIDDLE FORK CROW RIVER NEAR SPICER, MN							
OCT. 25, 1984	140	6.5	360	MAY 21	219	11.0	470
NOV. 28	203	1.0	510	JULY 16	62	23.0	330
JAN. 23, 1985	98	---	---	SEPT. 06	120	23.0	390
MAR. 20	147	5.0	35				
05280000 CROW RIVER AT ROCKFORD, MN							
OCT. 26, 1984	2940	7.5	647	APR. 25	480	13.0	430
NOV. 28	1170	2.0	560	MAY 30	1800	18.5	590
DEC. 20	1150	0.5	685	JUNE 26	2160	23.0	---
JAN. 30, 1985	334	.0	690	JULY 29	843	22.5	530
FEB. 26	558	.0	---	AUG. 23	903	18.5	---
MAR. 22	6960	4.0	280	SEPT. 27	3240	10.5	---

WATER QUALITY DATA AT STREAMFLOW STATIONS, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERATURE (^oC)	SPECIFIC CONDUCTANCE (MICROMHOS)	DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERATURE (^oC)	SPECIFIC CONDUCTANCE (MICROMHOS)
05286000 RUM RIVER NEAR ST. FRANCIS, MN							
OCT. 11, 1984	451	15.0	280	APR. 29	6200	13.5	---
NOV. 19	650	.0	265	JUNE 27	1220	20.5	---
FEB. 04, 1985	304	.0	340	SEPT. 06	986	20.0	250
MAR. 22	2770	---	---				
05287890 ELM CREEK NEAR CHAPLIN, MN							
NOV. 20, 1984	16.9	.5	520	APR. 03	137	5.0	320
DEC. 31	14.7	.5	---	MAY 22	31.6	16.5	495
FEB. 19, 1985	4.05	.0	---	JULY 10	11.4	20.5	---
MAR. 12	38.5	2.0	460	AUG. 15	51.4	20.0	470
05288500 MISSISSIPPI RIVER NEAR ANOKA, MN							
OCT. 02, 1984	3690	11.5	340	JULY 02	23900	22.5	370
MAR. 20, 1985	21900	1.0	250	AUG. 14	12700	21.0	330
APR. 12	13400	11.0	390				
05291000 WHETSTONE RIVER NEAR BIG STONE CITY, SOUTH DAKOTA							
OCT. 16, 1984	25	10.0	1015	APR. 01	126	4.0	810
DEC. 06	11	---	---	MAY 28	19	21.0	1240
FEB. 13, 1985	5.7	.0	1380	JULY 26	7.8	24.0	1180
MAR. 15	86	4.0	580	SEPT. 12	40	17.0	1110
MAR. 19	3900	5.0	---				
05292000 MINNESOTA RIVER AT ORTONVILLE, MN							
OCT. 16, 1984	1.5	9.0	1610	MAR. 29	1100	5.0	920
DEC. 10	.97	---	---	MAY 28	3.9	20.0	1530
FEB. 13, 1985	15	.0	1150	JULY 11	6.6	---	---
MAR. 15	179	2.5	800	JULY 26	1.9	22.0	1135
MAR. 20	1460	6.0	370	SEPT. 12	.94	16.0	1560
MAR. 21	1870	---	---				
05293000 YELLOW BANK RIVER NEAR ODESSA, MN							
OCT. 16, 1984	29	---	---	APR. 01	235	4.0	670
DEC. 10	23	---	1040	MAY 28	36	19.0	1050
JAN. 28, 1985	8.6	---	---	JULY 26	57	23.0	750
MAR. 20	2450	6.0	300	SEPT. 12	695	17.0	570
MAR. 28	471	5.0	550	SEPT. 20	155	---	---

DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERATURE (^oC)	SPECIFIC CONDUCTANCE (MICROMHOS)
05294000 POMME DE TERRE RIVER AT APPLETON, MN			
OCT. 09, 1984	65	15.0	1240
OCT. 24	1070	6.5	490
DEC. 10	189	---	920
JAN. 28, 1985	78	.0	---
MAR. 08	94	1.0	890
MAR. 18	1600	2.0	380
APR. 01	738	5.0	580
MAY 28	320	21.0	840
JULY 26	144	24.0	715
AUG. 28	141	20.0	780
0530000 LAC QUI PARLE RIVER NEAR LAC QUI PARLE, MN			
OCT. 22, 1984	1720	6.0	780
NOV. 26	193	4.5	1390
JAN. 16, 1985	38	.5	1940
MAR. 18	3100	2.0	510
MAR. 21	4180	---	410
MAY 01	479	15.0	1170
JUNE 24	57	22.0	1320
AUG. 28	31	---	---
SEPT. 05	366	22.0	850
SEPT. 09	1290	17.0	570
05301000 MINNESOTA RIVER NEAR LAC QUI PARLE, MN			
OCT. 09, 1984	505	14.0	800
OCT. 24	3470	13.0	660
NOV. 02	3150	4.0	---
NOV. 26	1650	4.5	795
JAN. 16, 1985	463	2.0	1210
MAR. 08	1100	1.5	1050
MAR. 11	1150	1.0	965
MAR. 21	7770	4.0	390
APR. 02	5960	4.0	465
MAY 01	2010	15.0	850
MAY 03	1590	15.5	850
MAY 23	1420	18.0	950
JUNE 24	1220	20.0	860
AUG. 02	322	24.0	1060
AUG. 28	386	20.0	780
05304500 CHIPPEWA RIVER NEAR MILAN, MN			
OCT. 22, 1984	4840	6.5	500
NOV. 27	1070	4.5	740
DEC. 20	585	.0	940
FEB. 14, 1985	165	.0	940
MAR. 18	3990	2.0	430
APR. 02	1870	6.0	550
MAY 24	1370	20.0	700
JUNE 24	672	20.0	680
AUG. 28	251	---	---
05311000 MINNESOTA RIVER AT MONTEVIDEO, MN			
OCT. 25, 1984	4490	8.0	770
NOV. 26	1780	4.5	920
JAN. 07, 1985	729	.0	1040
FEB. 15	447	.0	1230
MAR. 01	740	---	---
MAR. 11	1130	5.0	970
MAR. 21	8610	---	420
MAY 03	2460	16.0	810
MAY 23	2140	19.0	975
JULY 19	762	25.0	890
JULY 24	804	---	---
JULY 31	270	---	---

DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERATURE (^oC)	SPECIFIC CONDUCTANCE (MICROMHOS)	DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERATURE (^oC)	SPECIFIC CONDUCTANCE (MICROMHOS)
05313500 YELLOW MEDICINE RIVER NEAR GRANITE FALLS, MN							
OCT. 23, 1984	877	7.0	1230	MAR. 18	3010	4.0	400
DEC. 13	123	---	---	MAY 16	236	14.0	1330
JAN. 24, 1985	19	.0	1420	JULY 17	31	24.0	1135
FEB. 27	94	.0	810	SEPT. 10	707	17.0	1390
05315000 REDWOOD RIVER NEAR MARSHALL, MN							
OCT. 23, 1984	100	6.0	830	MAY 14	101	12.0	950
DEC. 13	16	---	---	JULY 17	22	25.0	990
JAN. 24, 1985	8.4	.0	1390	AUG. 08	9.1	---	---
FEB. 27	53	---	---	SEPT. 16	197	17.0	880
MAR. 14	708	1.0	350				
05316500 REDWOOD RIVER NEAR REDWOOD FALLS, MN							
NOV. 21, 1984	112	1.0	1700	MAR. 18	2130	6.0	440
DEC. 19	74	---	---	MAR. 27	589	5.0	760
JAN. 24, 1985	17	.0	1710	APR. 17	199	13.5	1130
FEB. 20	17	.0	1340	MAY 14	232	13.0	1250
MAR. 01	146	---	---	JULY 17	67	23.0	1260
MAR. 15	3050	---	---	SEPT. 17	409	18.0	1380
05317000 COTTONWOOD RIVER NEAR NEW ULM, MN							
OCT. 12, 1984	99.3	18.0	---	APR. 30	1690	---	---
DEC. 13	147	.0	1300	JUNE 20	397	18.0	1130
JAN. 24, 1985	60.0	.5	1010	JULY 17	216	---	---
MAR 15	6270	---	---	SEPT. 10	2190	18.0	850
05317200 LITTLE COTTONWOOD RIVER NEAR COURTLAND, MN							
OCT. 12, 1984	12.0	18.0	---	APR. 01	70.0	4.0	760
DEC. 13	19.4	.0	590	APR. 26	368	11.0	---
JAN. 23, 1985	5.5	1.0	1010	JUNE 20	53.7	19.0	1080
MAR. 13	364	.5	260	JULY 07	15.2	25.5	770
MAR. 15	425	---	---	SEPT. 10	74.2	18.5	800
05319500 WATONWAN RIVER NEAR GARDEN CITY, MN							
OCT. 11, 1984	34.8	17.5	---	JUNE 18	320	18.0	710
JAN. 08, 1985	45.3	.0	1050	AUG. 08	20.0	26.5	740
MAR. 15	2990	2.5	160	SEPT. 11	390	---	840
APR. 24	1830	12.0	---				

WATER QUALITY DATA AT STREAMFLOW STATIONS, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERATURE (^oC)	SPECIFIC CONDUCTANCE (MICROMHOS)	DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERATURE (^oC)	SPECIFIC CONDUCTANCE (MICROMHOS)
05320000 BLUE EARTH NEAR RAPIDAN, MN							
OCT. 11, 1984	73.3	20.0	---	APR. 25	5220	11.5	---
DEC. 11	222	1.0	890	JUNE 19	1330	19.0	670
JAN. 15, 1985	91.7	.5	930	JULY 19	193	25.5	675
MAR. 19	3900	---	---	SEPT. 11	1220	19.5	760
05320500 LE SUEUR RIVER NEAR RAPIDAN, MN							
OCT. 12, 1984	33.7	18.0	---	APR. 25	1510	11.5	---
DEC. 11	166	.0	745	JUNE 19	397	17.0	770
JAN. 15, 1985	122	.5	750	AUG. 08	19.7	25.0	710
FEB. 13	53.9	.0	---	SEPT. 11	164	17.0	720
MAR. 19	2160	---	---				
05325000 MINNESOTA RIVER AT MANKATO, MN							
OCT. 10, 1984	954	15.0	---	APR. 29	17600	---	800
JAN. 07, 1985	2010	.5	---	JUNE 18	6410	19.0	790
FEB. 15	740	.0	---	AUG. 09	815	24.5	905
MAR. 14	14200	---	---	SEPT. 10	6080	20.0	1040
MAR. 18	27500	2.0	345				
05327000 HIGH ISLAND CREEK NEAR HENDERSON, MN							
OCT. 03, 1984	4.48	15.0	770	APR. 02	292	6.0	540
DEC. 10	44.0	.0	865	APR. 30	422	17.0	800
JAN. 08, 1985	19.9	.0	910	JUNE 17	261	20.0	670
MAR. 12	254	1.0	260	AUG. 06	9.11	---	---
MAR. 18	689	---	---	SEPT. 12	73.8	18.0	990
05330000 MINNESOTA RIVER NEAR JORDAN, MN							
OCT. 29, 1984	7570	9.5	950	MAR. 25	22700	5.0	400
NOV. 28	4690	3.0	950	APR. 25	15900	13.5	---
DEC. 19	3820	.5	950	MAY 03	19400	16.5	850
JAN. 09, 1985	2230	.5	1000	MAY 28	6980	20.0	890
JAN. 29	1280	.0	1070	JUNE 26	4890	23.0	680
FEB. 19	1926	.0	940	JULY 29	1960	22.0	950
FEB. 27	1950	.0	790	AUG. 30	2150	19.0	830
MAR. 12	5020	.0	620	SEPT. 24	5800	14.5	---
MAR 18	28400	1.5	330				

WATER QUALITY DATA AT STREAMFLOW STATIONS, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERATURE (^oC)	SPECIFIC CONDUCTANCE (MICROMHOS)	DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERATURE (^oC)	SPECIFIC CONDUCTANCE (MICROMHOS)
05331000 MISSISSIPPI RIVER AT ST. PAUL, MN							
MAR. 26, 1985	54200	3.0	270	AUG. 21	13300	19.0	410
JUNE 20	23200	---	---				
05336700 KETTLE RIVER BELOW SANDSTONE, MN							
NOV. 21, 1984	337	.5	123	MAY 13	1230	16.0	105
DEC. 19	782	.5	100	JULY 16	289	22.5	140
FEB. 06, 1985	144	.5	150	SEPT. 04	5310	---	---
MAR. 21	1300	1.5	75				
05337400 KNIFE RIVER NEAR MORA, MN							
NOV. 21, 1984	38.1	1.5	123	MAY 09	55.7	19.0	120
DEC. 19	102	1.0	150	JUNE 13	840	20.0	90
FEB. 06, 1985	11.5	.5	200	JULY 16	21.2	21.5	150
MAR. 20	240	3.0	135	SEPT. 03	149	24.0	110
05340050 SUNRISE RIVER NEAR LINDSTROM, MN							
OCT. 07, 1984	71.9	14.5	270	MAR. 11	90.4	1.0	330
NOV. 23	126	2.5	260	MAY 20	163	18.0	290
DEC. 27	115	.5	360	JULY 29	28.5	20.5	300
FEB. 12, 1985	31.7	.0	285	SEPT. 03	83.5	18.5	290
05344500 MISSISSIPPI RIVER AT PRESCOTT, WISCONSIN							
OCT. 04, 1984	12200	12.5	470	JUNE 03	35300	18.0	510
MAR. 28, 1985	63500	---	---				
05345000 VERMILLION RIVER NEAR EMPIRE, MN							
OCT. 22, 1984	105	8.0	610	APR. 03	152	6.0	575
NOV. 08	68	9.0	630	MAY 10	63	18.0	700
DEC. 10	40	4.0	740	JUNE 19	47	16.0	700
FEB. 01, 1985	41	.0	660	JULY 31	29	19.5	750
MAR. 08	54	2.5	700	SEPT. 06	36	17.5	840
MAR. 14	498	3.0	230				
05353800 STRAIGHT RIVER NEAR FARIBULT, MN							
OCT. 29, 1984	169	7.0	740	MAY 07	184	15.0	700
DEC. 14	127	.5	765	JUNE 17	76	18.5	---
JAN. 25, 1985	65	.0	850	AUG. 05	27	20.5	800
MAR. 15	1520	2.5	325				

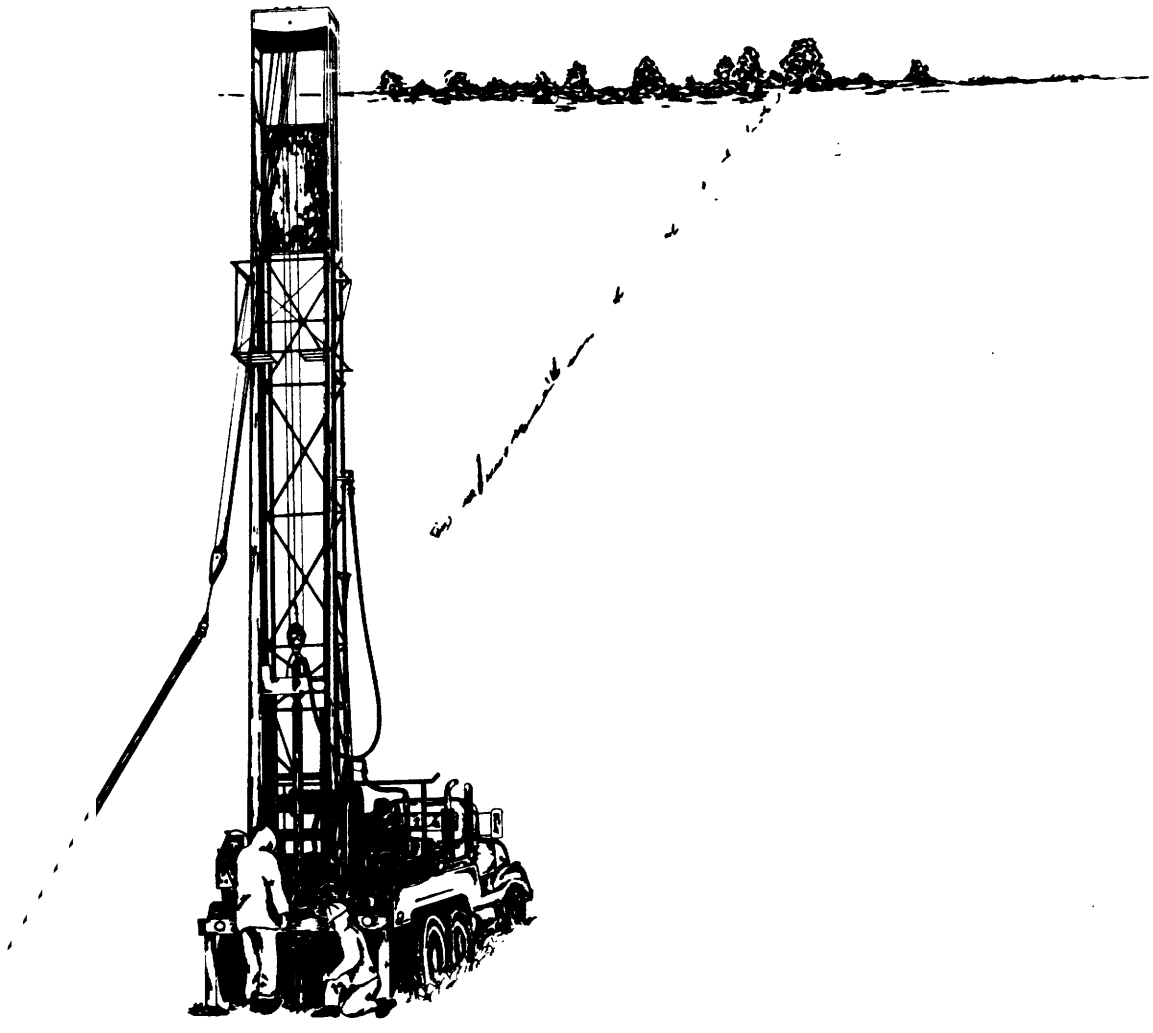
WATER QUALITY DATA AT STREAMFLOW STATIONS, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

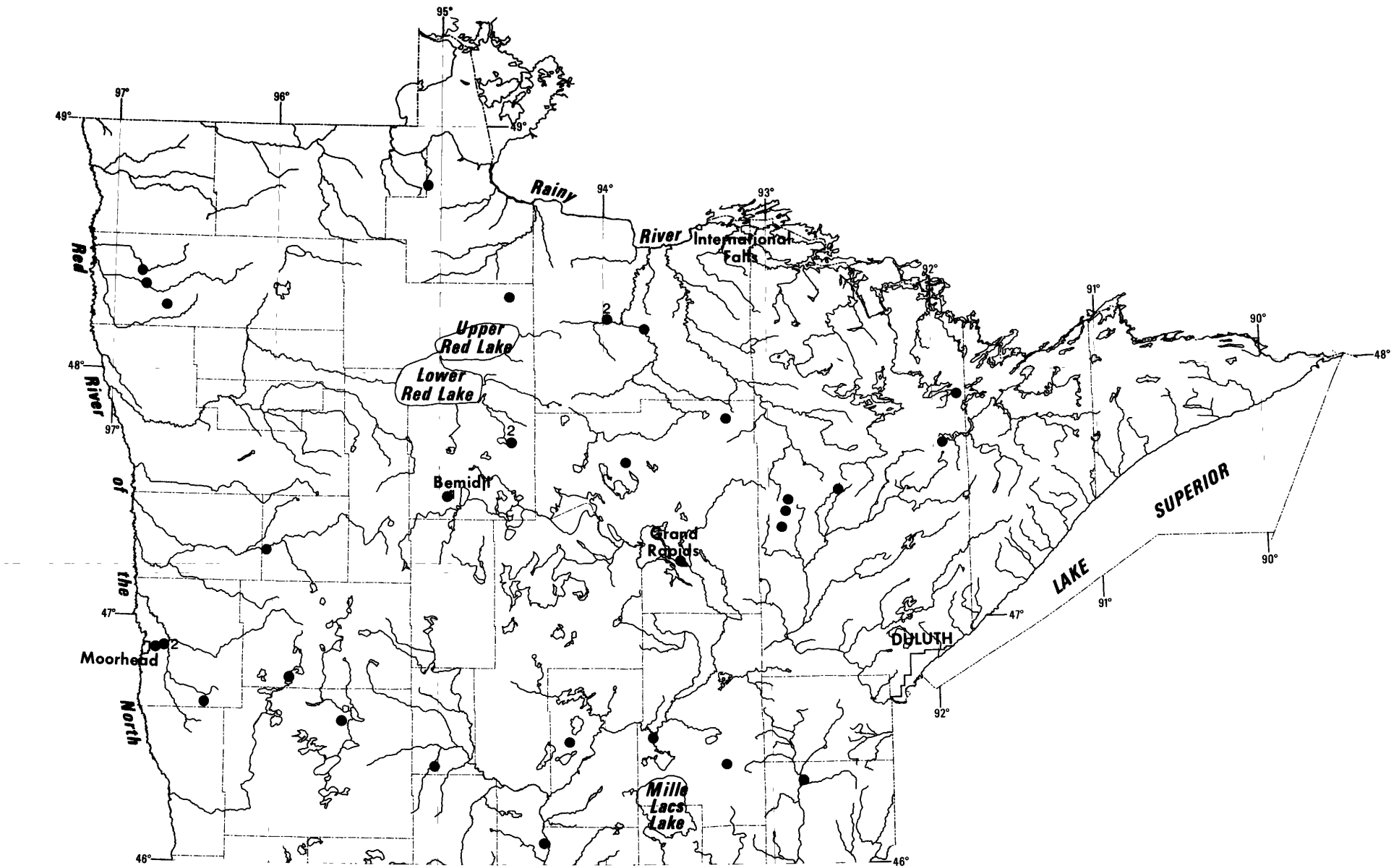
DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERATURE (^oC)	SPECIFIC CONDUCTANCE (MICROMHOS)	DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERATURE (^oC)	SPECIFIC CONDUCTANCE (MICROMHOS)
05372995 SOUTH FORK ZUMBRO RIVER AT ROCHESTER, MN							
OCT. 30, 1984	100	10.0	600	MAY 09	134	20.0	620
DEC. 13	95	4.5	655	JUNE 20	49	23.0	---
JAN. 23, 1985	68	4.5	590	AUG. 08	25	21.5	630
MAR. 14	786	3.5	310				
05374900 ZUMBRO RIVER AT KELLOGG, MN							
OCT. 16, 1984	679	12.5	605	APR. 30	1290	15.0	570
DEC. 10	766	.5	625	JUNE 10	447	19.5	560
JAN. 21, 1985	374	.5	610	JULY 25	378	24.5	470
MAR. 11	4850	2.0	310				
05376000 NORTH FORK WHITEWATER RIVER NEAR ELBA, MN							
OCT. 24, 1984	45	7.0	590	MAR. 06	41	1.0	500
DEC. 12	44	3.0	570	APR. 22	51	15.5	560
JAN. 14, 1985	43	1.0	550	JULY 15	32	16.5	590
05376800 WHITEWATER RIVER NEAR BEAVER, MN							
OCT. 18, 1984	175	9.5	537	MAR. 23	801	3.5	255
Dec 12	146	4.0	567	MAY 02	158	11.5	540
JAN. 23, 1985	138	.0	510	JUNE 12	130	14.0	560
FEB. 22	1330	.5	190	JULY 25	146	19.0	500
05378230 STOCKTON VALLEY CREEK AT STOCKTON, MN							
OCT. 17, 1984	14	9.5	483	FEB. 28	349	---	---
DEC. 11	13	5.5	490	MAR. 11	502	0.5	100
FEB. 21, 1985	247	.0	140	APR. 30	14	14.5	470
FEB. 28	17	6.0	440	JUNE 12	12	11.0	510
FEB. 28	88	3.5	220	JULY 24	13	16.0	460
05378235 GARVIN BROOK NEAR MINNESOTA CITY, MN							
OCT. 16, 1984	39	11.5	493	FEB. 28	43	5.5	440
DEC. 10	36	4.0	505	MAR. 11	1500	1.0	115
JAN. 21, 1985	34	.5	490	APR. 30	37	14.0	510
FEB. 21	201	1.5	360	JUNE 10	33	15.5	510
FEB. 21	406	1.5	250	JULY 22	32	20.5	480
FEB. 21	466	1.5	210				

WATER QUALITY DATA AT STREAMFLOW STATIONS, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERATURE (^oC)	SPECIFIC CONDUCTANCE (MICROMHOS)	DATE	MEASURED DISCHARGE (ft^3/s)	TEMPERATURE (^oC)	SPECIFIC CONDUCTANCE (MICROMHOS)
05378300 STRAIGHT VALLEY CREEK NEAR ROLLINGSTONE, MN							
OCT. 18, 1984	2.6	9.5	590	MAR. 13	5.0	3.0	310
DEC. 12	2.2	5.0	575	MAY 02	2.3	8.5	600
JAN. 23, 1985	1.9	2.0	530	JUNE 12	1.8	12.5	560
FEB. 21	41	.0	230	JULY 22	1.4	27.0	460
05378500 MISSISSIPPI RIVER AT WINONA, MN							
MAR. 21, 1985	63000	---	---	JULY 16	35000	---	---
JUNE 27	35200	23.0	440				
05384000 ROOT RIVER NEAR LANESBORO, MN							
OCT. 30, 1984	283	7.5	550	MAY 08	299	17.0	480
DEC. 12	292	.5	560	JUNE 19	170	19.5	---
JAN. 24, 1985	231	.0	560	AUG. 06	143	26.0	440
MAR. 14	1190	4.5	300				
05385000 ROOT RIVER NEAR HOUSTON, MN							
OCT. 17, 1984	855	10.5	537	MAY 01	830	14.5	530
DEC. 11	756	.5	550	JUNE 11	554	16.0	510
JAN. 22, 1985	634	.5	600	JULY 24	434	19.5	460
MAR. 12	7130	1.5	185				
05385500 SOUTH FORK ROOT RIVER NEAR HOUSTON, MN							
OCT. 17, 1984	347	10.0	522	MAY 01	236	13.5	510
DEC. 11	224	3.0	548	JUNE 11	194	13.5	520
JAN. 22, 1985	252	.5	560	JULY 23	163	19.0	510
MAR. 12	1010	2.0	195				
05457000 CEDAR RIVER NEAR AUSTIN, MN							
OCT. 29, 1984	175	10.0	580	MAY 08	173	15.5	590
DEC. 13	158	1.5	670	JUNE 18	94	16.0	---
JAN. 24, 1985	93	.0	630	AUG. 05	55	26.0	620
MAR. 15	720	2.0	295				
05476000 DES MOINES RIVER AT JACKSON, MN							
NOV. 21, 1984	150	2.0	---	MAR. 19	1580	5.0	490
DEC. 19	181	---	---	MAY 15	1210	13.0	850
JAN. 17, 1985	51	---	---	JULY 18	344	---	---
FEB. 20	34	.0	1050	AUG. 27	111	21.0	670
MAR. 12	954	.0	330				

GROUND-WATER RECORDS




95°
97°
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Lower Red Lake
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92°
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90°
Bemidji
Grand Rapids
SUPERIOR
LAKE
47°
Moorhead
DULUTH
Mille Lacs Lake
46°

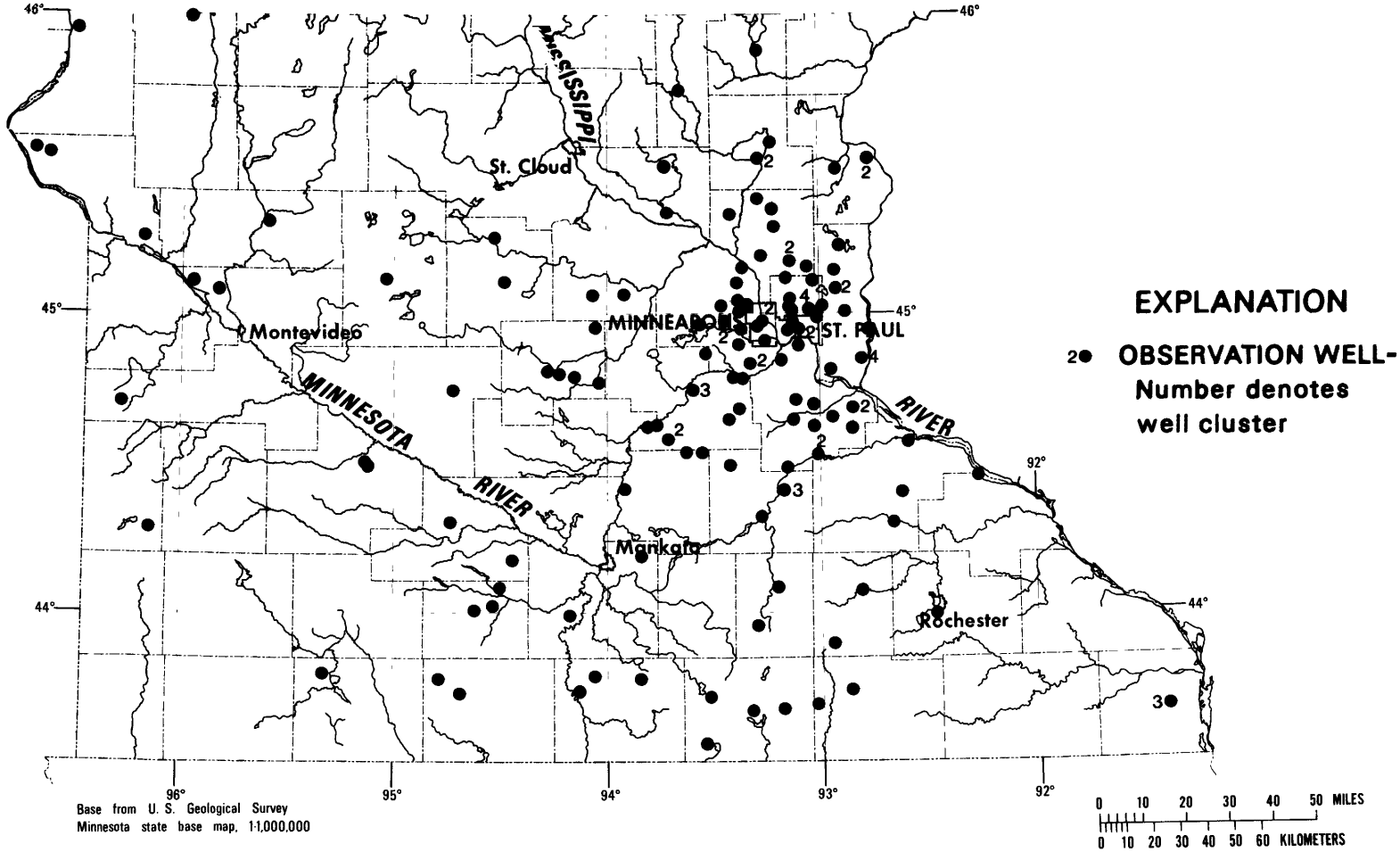


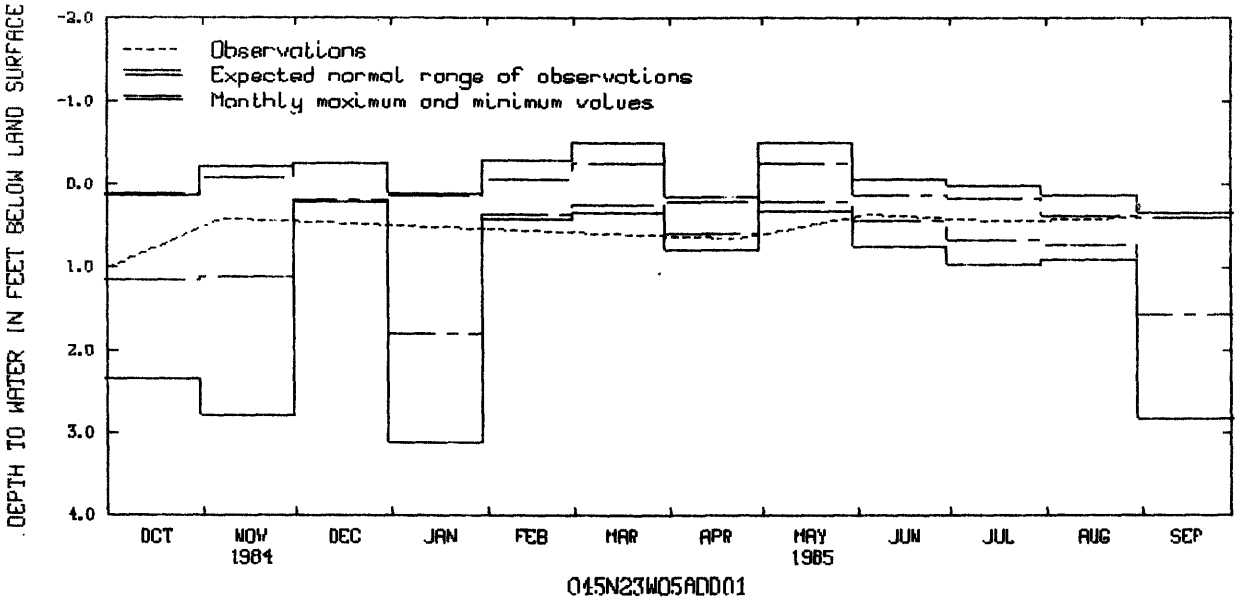
Figure 12.--Location of ground-water wells

AITKIN COUNTY

462447093154401. Local number, 045N23W05ADD01.
LOCATION.--Lat 46°24'47", long 93°15'44", in SE¼SE¼NE¼ sec.5, T.45 N., R.23 W., Hydrologic Unit 07010104, in Solana State Forest.
Owner: U.S. Geological Survey.
AQUIFER.--Shallow buried sand of Pleistocene Age.
WELL CHARACTERISTICS.--Hand augered and driven observation water-table well, diameter 1¼ in (0.03 m), depth 13 ft (4.0 m), screened 10 to 13 ft (3.0 to 4.0 m).
DATUM.--Altitude of land-surface datum is 1,265 ft (386 m). Measuring point: Top of platform, 0.80 ft (0.24 m) above land-surface datum.
REMARKS.--Water level subject to freezing during winter periods.
PERIOD OF RECORD.--October 1973 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 0.50 ft (0.15 m) above land-surface datum, Mar. 22, 1976; lowest, 3.12 ft (0.95 m) below land-surface datum, Jan. 10, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

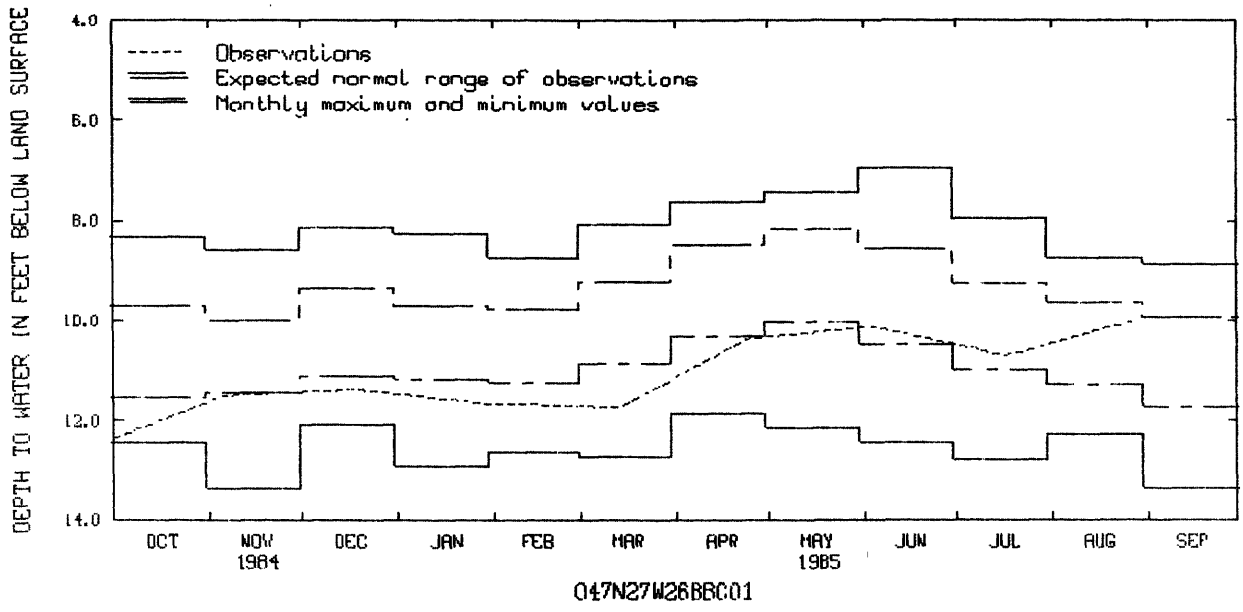
DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 7	0.42	APR 23	0.66	JUN 5	0.37	JUL 18	0.45	AUG 27	0.41



463135093433901. Local number, 047N27W26BBC01.
LOCATION.--Lat 46°31'35", long 93°43'39", in SW¼NW¼NW¼ sec.26, T.47 N., R.27 W., Hydrologic Unit 07010104, in city of Aitkin.
Owner: Woodland Container Co.
AQUIFER.--Buried sand of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 6 in (0.15 m), depth 52 ft (15.8 m), screened 47 to 52 ft (14.3 to 15.8 m).
DATUM.--Altitude of land-surface datum is 1,213 ft (370 m). Measuring point: Top of casing, 1.20 ft (0.37 m) above land-surface datum.
PERIOD OF RECORD.--January 1965 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 6.96 ft (2.12 m) below land-surface datum, June 9, 1965; lowest, 13.38 ft (4.08 m) below land-surface datum, Nov. 29, 1976.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 6	11.50	JAN 29	11.65	APR 24	10.37	JUN 4	10.12	JUL 17	10.71	AUG 27	10.02
DEC 18	11.38	MAR 14	11.73								



ANOKA COUNTY

451056093072201. Local number, 031N22W18AAA01.
LOCATION.--Lat 45°10'56", long 93°07'22", in NE¼NE¼NE¼ sec.18, T.31 N., R.22 W., Hydrologic Unit 07010206, at 4th Avenue and Lilac Street, Lino Lakes.
Owner: U.S. Geological Survey.
AQUIFER.--Buried sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled observation artesian well, diameter 6 in (0.15 m), depth 270 ft (82.3 m), screened 260 to 270 ft (79.2 to 82.3 m).
DATUM.--Land-surface datum is 895.8 ft (273.0 m) National Geodetic Vertical Datum of 1929. Measuring point: Top of well cap, 0.80 ft (0.24 m) above land-surface datum.
REMARKS.--Water level affected by pumping.
PERIOD OF RECORD.--February 1971 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 6.39 ft (1.95 m) below land-surface datum, July 7, 1975; lowest, 14.83 ft (4.52 m) below land-surface datum, July 18, 1985.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 6	10.62	JAN 7	10.46	MAR 6	10.83	MAY 2	10.02	JUL 18	14.83	SEP 6	11.78

451056093072205. Local number, 031N22W18AAA05.
LOCATION.--Lat 45°10'56", long 93°07'22", in NE¼NE¼NE¼ sec.18, T.31 N., R.18 W., Hydrologic Unit 07010206, at 4th Avenue and Lilac Street, Lino Lakes.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial outwash sand of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 13 ft (3.96 m), screened 11 to 13 ft (3.35 to 3.96 m).
DATUM.--Land-surface datum is 895.6 ft (273.0 m) National Geodetic Vertical Datum of 1929. Measuring point: Top of casing, 1.90 ft (0.60 m) above land-surface datum.
PERIOD OF RECORD.--February 1971 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 2.67 ft (0.81 m) below land-surface datum, July 7, 1975; lowest, 6.60 ft (2.01 m) below land-surface datum, Jan. 9, 1984.

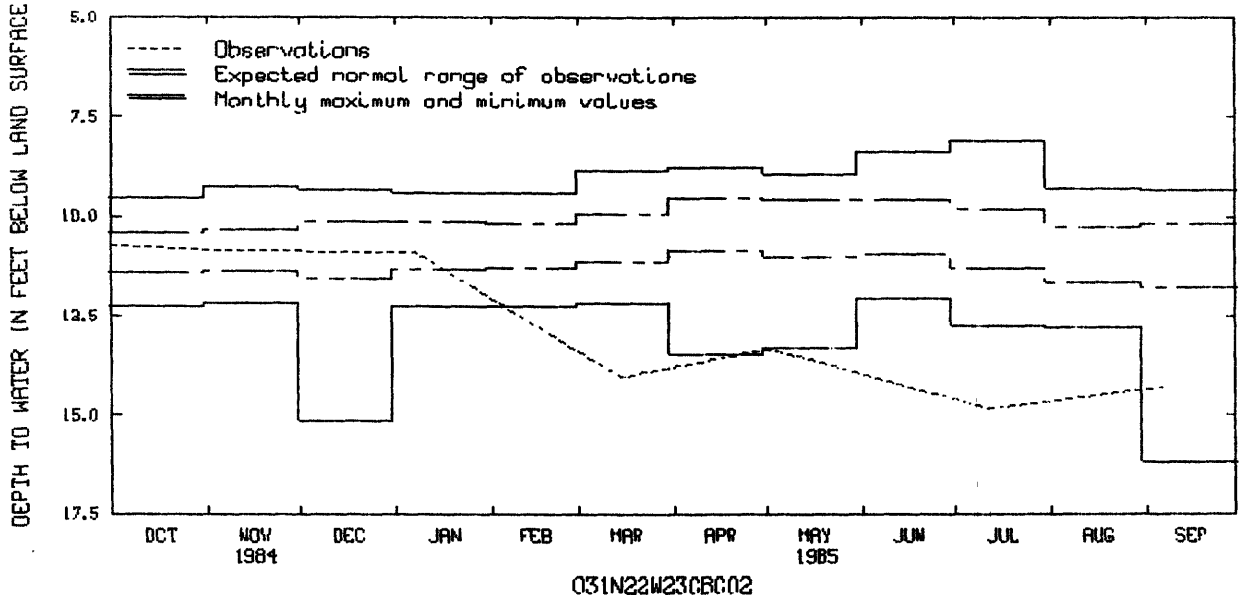
WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 6	5.05	JAN 7	5.38	MAR 6	5.32	MAY 2	4.86	JUL 18	5.29	SEP 6	4.92

450927093033802. Local number, 031N22W23CBC02.
LOCATION.--Lat 45°09'27", long 93°03'38", in SW¼NW¼SW¼ sec.23, T.31 N., R.22 W., Hydrologic Unit 07010206, at city of Centerville.
Owner: U.S. Geological Survey.
AQUIFER.--Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled observation artesian well, diameter 4 in (0.10 m), depth 277 ft (84.4 m), screened 272 to 277 ft (82.9 to 84.4 m).
DATUM.--Land-surface datum is 901.6 ft (274.8 m) National Geodetic Vertical Datum of 1929. Measuring point: Top of recorder platform, 2.20 ft (0.67 m) above land-surface datum.
REMARKS.--Water level affected by nearby flowing wells.
PERIOD OF RECORD.--February 1971 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 8.10 ft (2.47 m) below land-surface datum, July 5, 1975; lowest, 16.20 ft (4.94 m) below land-surface datum, Sept. 15, 1976.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 6	10.86	JAN 7	10.89	MAR 15	14.04	MAY 2	13.32	JUL 12	14.84	SEP 6	14.30



451210093170201. Local number, 031N24W01CBB01.
LOCATION.--Lat 45°12'10", long 93°17'02", in NW¼NW¼SW¼ sec.1, T.31 N., R.24 W., Hydrologic Unit 07010206, at Golf Course.
Owner: City of Coon Rapids.
AQUIFER.--Buried sand of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled irrigation artesian well, diameter 12 in (0.30 m), depth 193 ft (58.8 m), screened 163 to 193 ft (49.7 to 58.8 m).
DATUM.--Altitude of land-surface datum is 897 ft (273 m). Measuring point: Top of breather pipe, 2.00 ft (0.61 m) above land-surface datum.
PERIOD OF RECORD.--December 1980 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 19.87 ft (6.05 m) below land-surface datum, Jan.7, 1985; lowest, 31.30 ft (9.54 m) below land-surface datum, July 13, 1983.

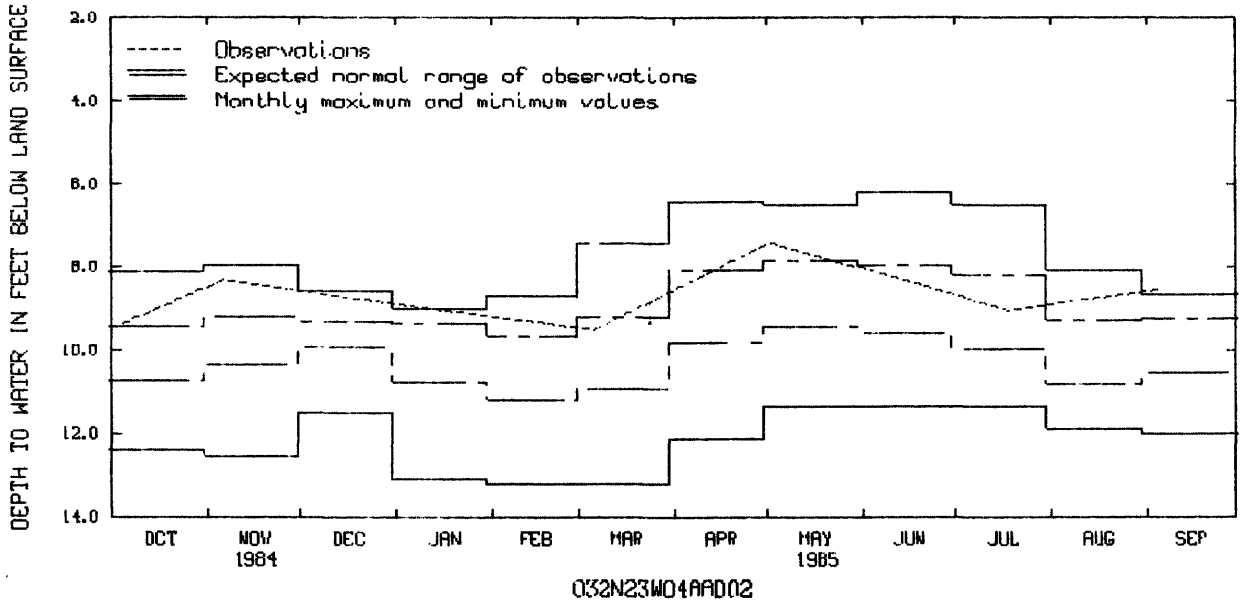
WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 6	20.05	JAN 7	19.87	MAR 6	20.25	MAY 2	24.32	JUL 18	28.43	SEP 6	21.45

451742093122102. Local number, 032N23W04AAD02.
LOCATION.--Lat 45°17'42", long 93°12'21", in SE¼NE¼NE¼ sec.4, T.32 N., R.23 W., Hydrologic Unit 07030005, 1.5 mi (2.4 km) east of Soderville.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial outwash sand of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 2 in (0.05 m), depth 21 ft (6.4 m), screened 19 to 21 ft (5.8 to 6.4 m).
DATUM.--Altitude of land-surface datum is 916 ft (279 m). Measuring point: Top of casing, 3.50 ft (1.07 m) above land-surface datum.
PERIOD OF RECORD.--August 1969 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 6.20 ft (1.89 m) below land-surface datum, July 30, 1975; lowest, 13.22 ft (4.03 m) below land-surface datum, Mar. 5-9, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 6	8.33	JAN 7	8.95	MAR 6	9.50	MAY 2	7.42	JUL 18	9.03	SEP 6	8.54



452305093141501. Local number, 033N23W05BAB01.
LOCATION.--Lat 45°23'05", long 93°14'15", in NW¼NE¼NW¼ sec.5, T.33 N., R.23 W., Hydrologic Unit 07010207, at 1300 229th Ave. NE, Bethel.
Owner: Friendship Baptist Church.
AQUIFER.--Franconian Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled domestic artesian well, diameter 4 in (0.10 m), depth 141 ft (43.0 m), cased to 126 ft (38.4 m).
DATUM.--Altitude of land-surface datum is 923 ft (281 m). Measuring point: Top of well cap, 0.80 ft (0.24 m) above land-surface datum.
PERIOD OF RECORD.--April 1980 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 19.48 ft (5.94 m) below land-surface datum, July 12, 1984; lowest, 22.22 ft (6.77 m) below land-surface datum, Mar. 3, 1982.

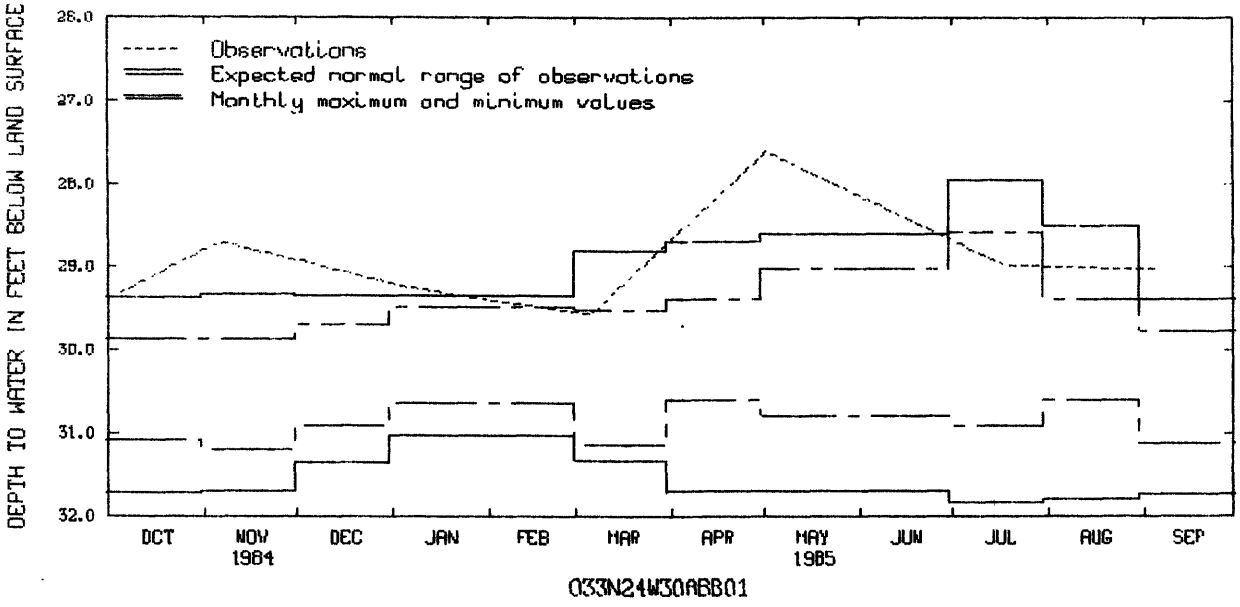
WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 6	20.36	JAN 7	20.87	MAR 6	21.28	MAY 2	21.91	JUL 18	20.80	SEP 6	20.76

451938093223101. Local number, 033N24W30ABB01.
LOCATION.--Lat 45°19'38", long 93°22'31", in NW¼NW¼NE¼ sec.30, T.33 N., R.24 W., Hydrologic Unit 07010207, at 4324 Viking Blvd.
Owner: Northwestern Bell Telephone Co.
AQUIFER.--Ironton-Galesville Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled domestic artesian well, diameter 4 in (0.10 m), depth 280 ft (85.3 m), cased to 223 ft (68.0 m).
DATUM.--Altitude of land-surface datum is 900 ft (274 m). Measuring point: Top of casing, 1.50 ft (0.46 m) above land-surface datum.
PERIOD OF RECORD.--April 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 27.60 ft (8.41 m) below land-surface datum, May 2, 1985; lowest, 31.84 ft (9.70 m) below land-surface datum, July 11, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 6	28.70	JAN 7	29.26	MAR 6	29.57	MAY 2	27.60	JUL 18	28.98	SEP 6	29.03



452416093160801. Local number, 034N24W25DAC01.
LOCATION.--Lat 45°24'16", long 93°16'08", in SE¼NE¼SE¼ sec.25, T.24 N., R.24 W., Hydrologic Unit 07010207, at city of Bethel.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial sand of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 21 ft (6.4 m), screened 19 to 21 ft (5.8 to 6.4 m).
DATUM.--Altitude of land-surface datum is 930 ft (283 m). Measuring point: Top of casing, 2.30 ft (0.70 m) above land-surface datum.
PERIOD OF RECORD.--August 1980 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 7.47 ft (2.28 m) below land-surface datum, July 13, 1983; lowest, 10.87 ft (3.31 m) below land-surface datum, Mar. 10, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 6	8.84	JAN 7	9.45	MAR 6	10.18	MAY 2	7.94	JUL 18	9.17	SEP 6	9.32

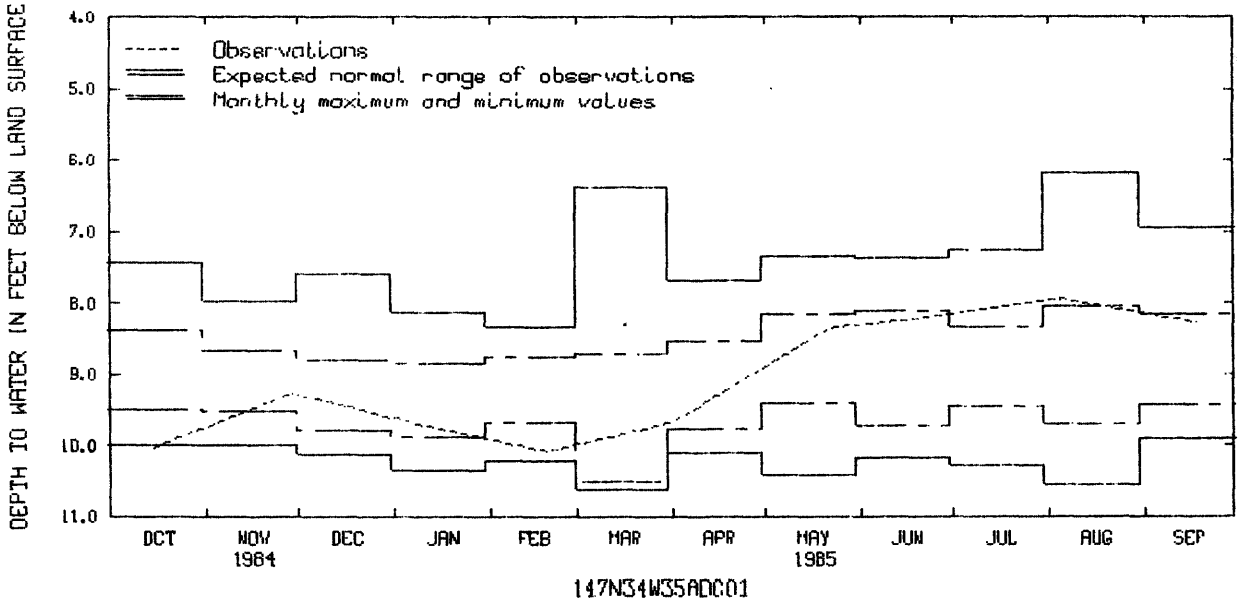
GROUND-WATER LEVELS

BELTRAMI COUNTY

473023094570901. Local number, 147N34W35ADC01.
LOCATION.--Lat 47°30'23", long 94°57'09", in SW¼SE¼NE¼ sec.35, T.147 N., R.34 W., Hydrologic Unit 07010101, on Clarence Hart farm.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial outwash sand of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 20 ft (6.1 m), screened 18 to 20 ft (5.5 to 6.1 m).
DATUM.--Altitude of land-surface datum is 1,383 ft (421 m). Measuring point: Top of casing, 3.00 ft (0.91 m) above land-surface datum.
PERIOD OF RECORD.--October 1970 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 6.17 ft (1.88 m) below land-surface datum, Aug. 1, 1975; lowest, 10.63 ft (3.22 m) below land-surface datum, Mar. 16, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 15	10.03	JAN 7	9.69	APR 1	9.68	JUN 17	8.23	AUG 5	7.94	SEP 18	8.27



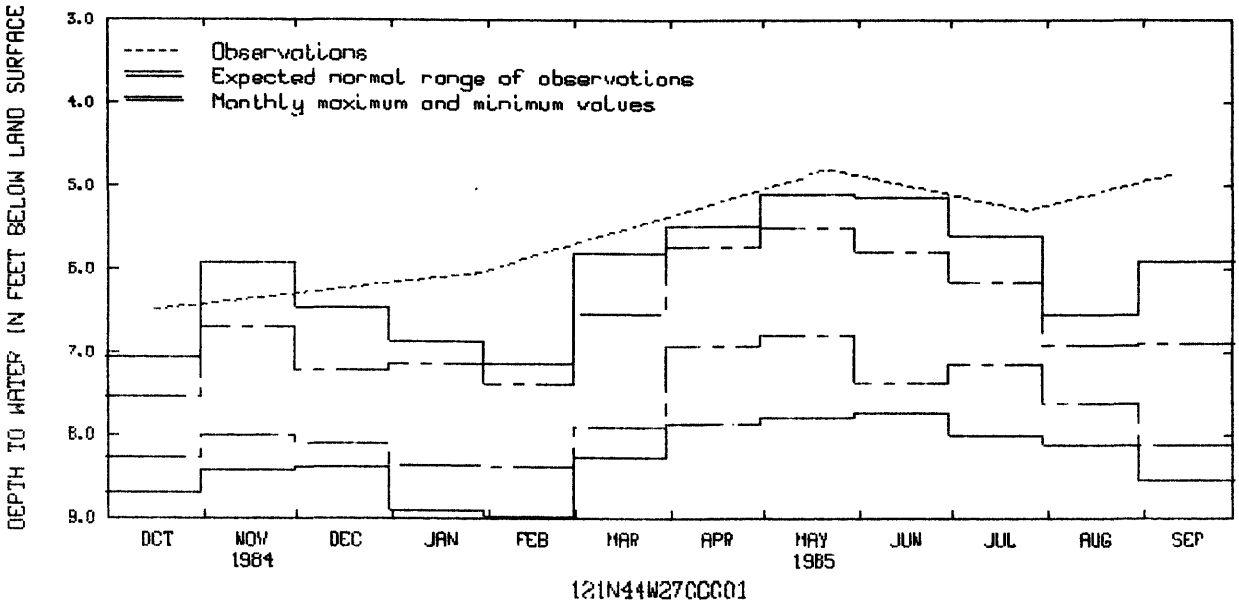
BIG STONE COUNTY

451517096104501. Local number, 121N44W27CCC01.
LOCATION.--Lat 45°15'17", long 96°10'45", in SW¼SW¼SW¼ sec.27, T.121 N., R.44 W., Hydrologic Unit 07010001, north of Correll.
Owner: U.S. Geological Survey
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 16 ft (4.9 m), screened 14 to 16 ft (4.3 to 4.9 m).
DATUM.--Altitude of land-surface datum is 1,018 ft (310 m). Measuring point: Top of casing, 3.10 ft (0.94 m) above land-surface datum.
PERIOD OF RECORD.--September 1972 to February 1974, August 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 4.80 ft (1.46 m) below land-surface datum, May 22, 1985; lowest, 8.99 ft (2.74 m) below land-surface datum, Feb. 8, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 16	6.49	JAN 28	6.05	MAY 22	4.80	JUL 25	5.29	SEP 12	4.85

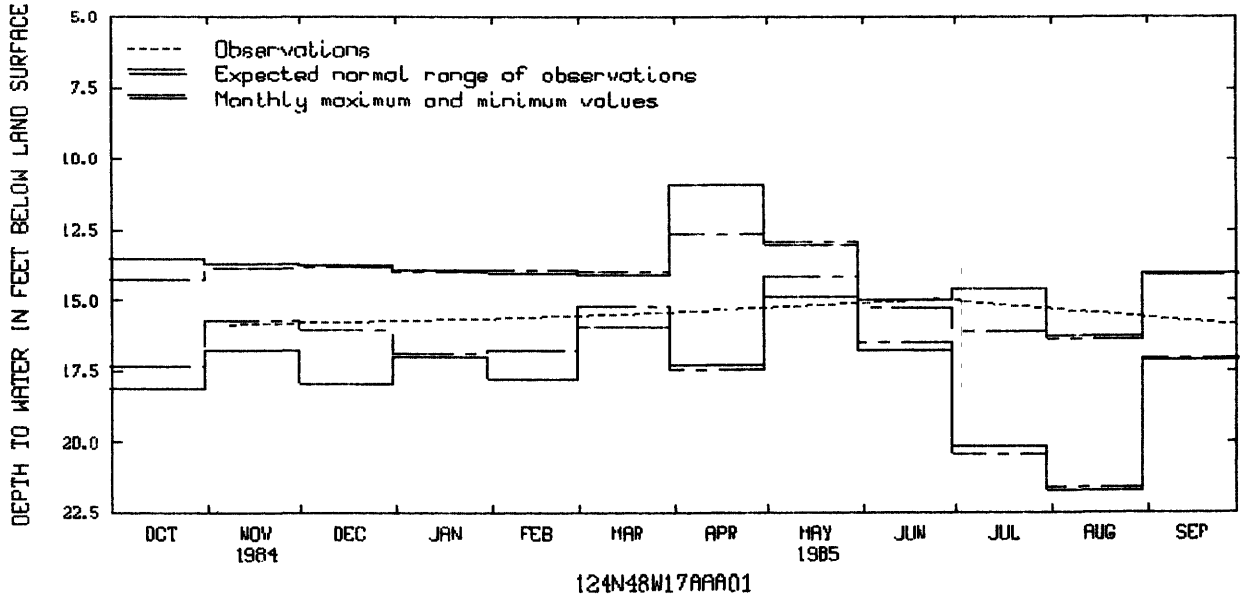
BIG STONE--Continued



453330096420201. Local number, 124N48W17AAA01.
LOCATION.--Lat 45°33'30", long 96°42'02", in NE¼NE¼NE¼ sec.17, T.124 N., R.48 W., Hydrologic Unit 07020001, 0.5 mi (0.8 km) east of Beardsley.
Owner: U.S. Geological Survey.
AQUIFER.--Buried sand of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled observation artesian well, diameter 2 in (0.05 m), depth 282 ft (86.0 m), screened 242 to 282 ft (73.8 to 86.0 m).
DATUM.--Altitude of land-surface datum is 1,086.8 ft (331.3 m) National Geodetic Vertical Datum of 1929. Measuring point: Top of casing, 3.60 ft (1.10 m) above land-surface datum.
PERIOD OF RECORD.--November 1978 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 10.90 ft (3.32 m) below land-surface datum, Apr. 11, 1979; lowest, 21.75 ft (6.63 m) below land-surface datum, Aug. 25, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 8	15.87	JAN 29	15.65	MAR 29	15.43	JUN 25	14.96	SEP 30	15.87



BIG STONE--Continued

453237096381601. Local number, 124N48W23AAA04.
LOCATION.--Lat 45°32'37", long 96°38'16", in NE¼NE¼NE¼ sec.23, T.124 N., R.48 W., Hydrologic Unit 07020001, 3.5 mi (5.6 km) southeast of Beardsley.
Owner: U.S. Geological Survey
AQUIFER.--Buried sand of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled observation artesian well, diameter 2 in (0.05 m), depth 240 ft (73.2 m), screened 200 to 240 ft (61.0 to 73.2 m).
DATUM.--Land-surface datum is 1,087.2 ft (331.4 m) National Geodetic Vertical datum of 1929. Measuring point: Top of casing, 1.00 ft (0.30 m) above land-surface datum.
PERIOD OF RECORD.--November 1978 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 39.25 ft (11.96 m) below land-surface datum, Jan. 28., 1979; lowest, 41.57 ft (12.67 m) below land-surface datum, July 18, 1984.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 8	41.35	JAN 29	41.22	MAR 29	41.24	JUN 25	41.13	SEP 30	41.27

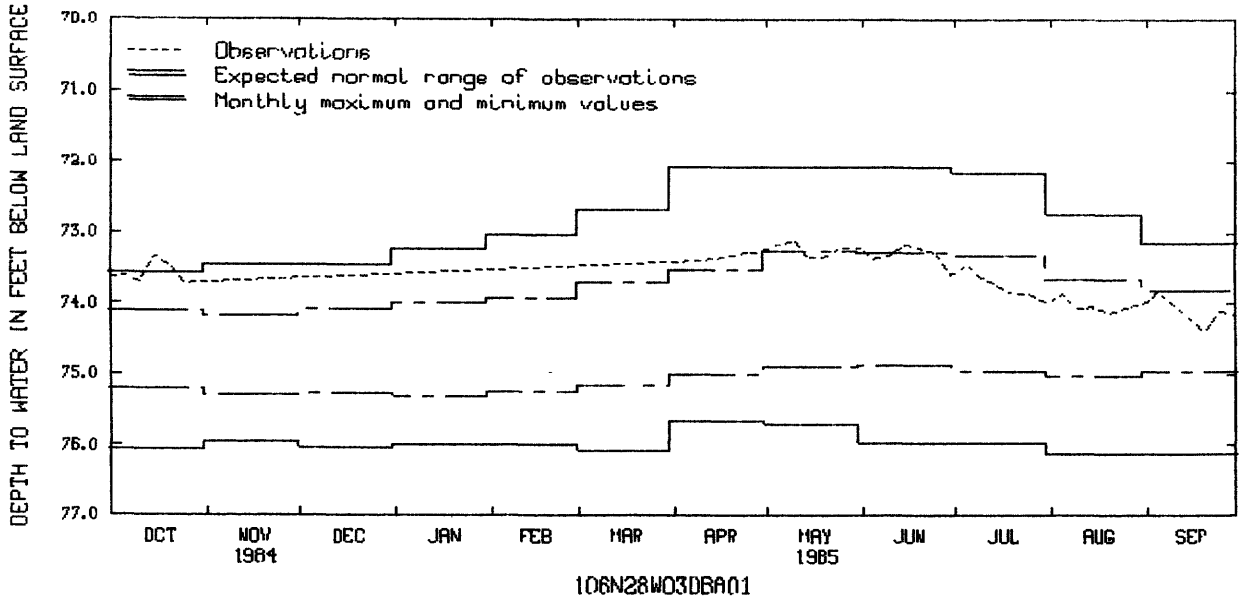
BLUE EARTH COUNTY

440050094102801. Local number, 106N28W03DBA01.
LOCATION.--Lat 44°00'50", long 94°10'28", in NE¼NW¼SE¼ sec.3, T.106 N., R.28 W., Hydrologic Unit 07020010, at Farmland Industries Ammonia Plant, 3.2 mi (5.2 km) north of Vernon Center.
Owner: Farmland Industries.
AQUIFER.--Ironton-Galesville Sandstones of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 16 in (0.41 m), depth 390 ft (119 m), cased to 150 ft (45.7 m).
DATUM.--Altitude of land-surface datum is 1,005 ft (306 m). Measuring point: Top of recorder floor, 2.00 ft (0.61 m) above land-surface datum.
PERIOD OF RECORD.--October 1973 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 71.81 ft (21.89 m) below land-surface datum, Apr. 26, 1983; lowest, 76.17 ft (23.22 m) below land-surface datum, Aug. 17, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	73.62	.....	.....	.....	.....	.....	.....	73.17	73.36	73.46	73.87	73.84
10	73.71	.....	.....	.....	.....	.....	73.39	73.11	73.32	73.63	74.07	.....
15	73.35	.....	.....	.....	.....	.....	73.37	73.35	73.17	73.75	74.04	.....
20	73.47	.....	.....	.....	.....	.....	73.32	73.35	73.22	73.87	74.13	74.38
25	73.72	.....	.....	.....	.....	.....	73.28	73.22	73.28	73.85	74.07	74.11
EOM	.....	.....	.....	.....	.....	.....	73.26	73.20	73.60	74.00	74.00	74.16

WTR YEAR 1985 HIGHEST 72.95 MAY 12, 1985 LOWEST 74.38 SEP 20-23, 1985



BLUE EARTH--Continued

441134093505301. Local number, 108N25W04BBC01.
LOCATION.--Lat 44°11'34", long 93°50'53", in SW¼NW¼NW¼ sec.4, T.108 N., R.25 W., Hydrologic Unit 07020011, at 1.3 mi (2.1 km) west of Madison Lake at waste treatment plant.
Owner: City of Madison Lake.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age.
WELL CHARACTERISTICS.--Drilled domestic artesian well, diameter 6 in (0.15 m), depth 313 ft (95.4 m), cased to 296 ft (90.2 m).
DATUM.--Altitude of land-surface datum is 1,036 ft (316 m). Measuring point: Top of casing, 1.60 ft (0.49 m) above land-surface datum.
PERIOD OF RECORD.--May 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 93.03 ft (28.35 m) below land-surface datum, Nov.7, 1984; lowest, 95.42 ft (29.08 m) below land-surface datum, July 16, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

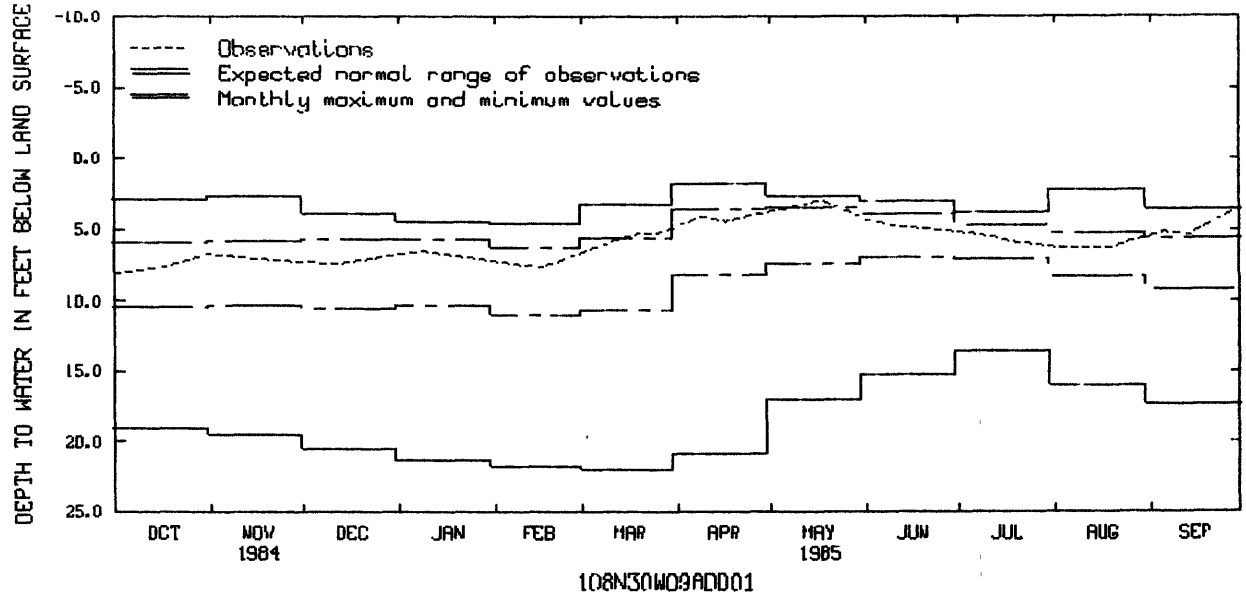
DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 7	93.03	MAR 18	93.22	JUL 9	93.32	SEP 10	93.37
JAN 14	93.20						

BROWN COUNTY

441030094254501. Local number, 108N30W09ADD01.
LOCATION.--Lat 44°10'30", long 94°25'45", in SE¼SE¼NE¼ sec.9, T.108 N., R.30 W., Hydrologic Unit 07020007, 3.7 mi (6.0 km) northeast of Hanska.
Owner: Erwin Kjelshus.
AQUIFER.--Deposits of Pleistocene Age.
WELL CHARACTERISTICS.--Bored unused water-table well, diameter 16 in (0.41 m), depth 32 ft (9.8 m), cased to 32 ft (9.8 m), open end.
DATUM.--Altitude of land-surface datum is 1,003 ft (306 m). Measuring point: Top of concrete cover, at land-surface datum.
REMARKS.--Measured by Erwin Kjelshus. Water level used in monthly Water Resources Review.
PERIOD OF RECORD.--July 1942 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 1.82 ft (0.55 m) below land-surface datum, Apr. 18, 1983; lowest, 22.00 ft (6.71 m) below land-surface datum, Mar. 2, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	7.66	DEC 12	7.44	MAR 26	5.28	MAY 18	2.98	JUL 9	5.40	SEP 5	5.20
31	6.74	JAN 8	6.54	APR 9	4.12	JUN 2	4.40	20	5.90	14	5.37
NOV 9	6.95	FEB 16	7.66	17	4.44	10	4.73	AUG 3	6.28		
25	7.21	MAR 19	5.28	MAY 5	3.57	26	5.04	20	6.25		

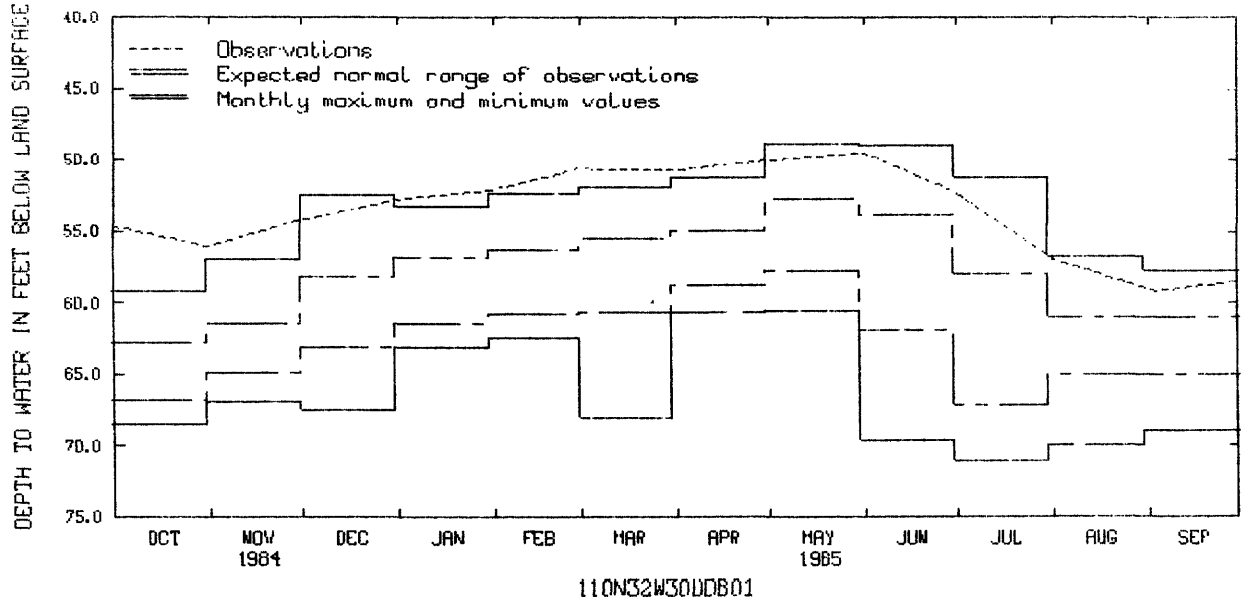


BROWN COUNTY--Continued

441800094434301. Local number, 110N32W30DDB01.
LOCATION.--Lat 44°18'00", long 94°43'43", in NW¼SE¼SE¼ sec.30, T.110 N., R.32 W., Hydrologic Unit 07020008, in Sleepy Eye at hospital.
Owner: City of Sleepy Eye.
AQUIFER.--Buried sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled observation artesian well, diameter 2 in (0.05 m), depth 176 ft (53.6 m).
DATUM.--Altitude of land-surface datum is 1,030 ft (314 m). Measuring point: Top of casing, 1.30 ft (0.40 m) above land-surface datum.
REMARKS.--Water level affected by pumping from nearby wells.
PERIOD OF RECORD.--August 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 48.90 ft (14.90 m) below land-surface datum, May 22, 1984; lowest, 118.1 ft (36.00 m) below land-surface datum, Sept. 15, 1976.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 1	54.70	DEC 1	54.20	FEB 1	52.10	APR 1	50.70	JUN 1	49.50	AUG 1	56.90
NOV 1	56.10	JAN 3	52.70	MAR 1	50.60	MAY 1	50.00	JUL 1	52.30	SEP 3	59.20



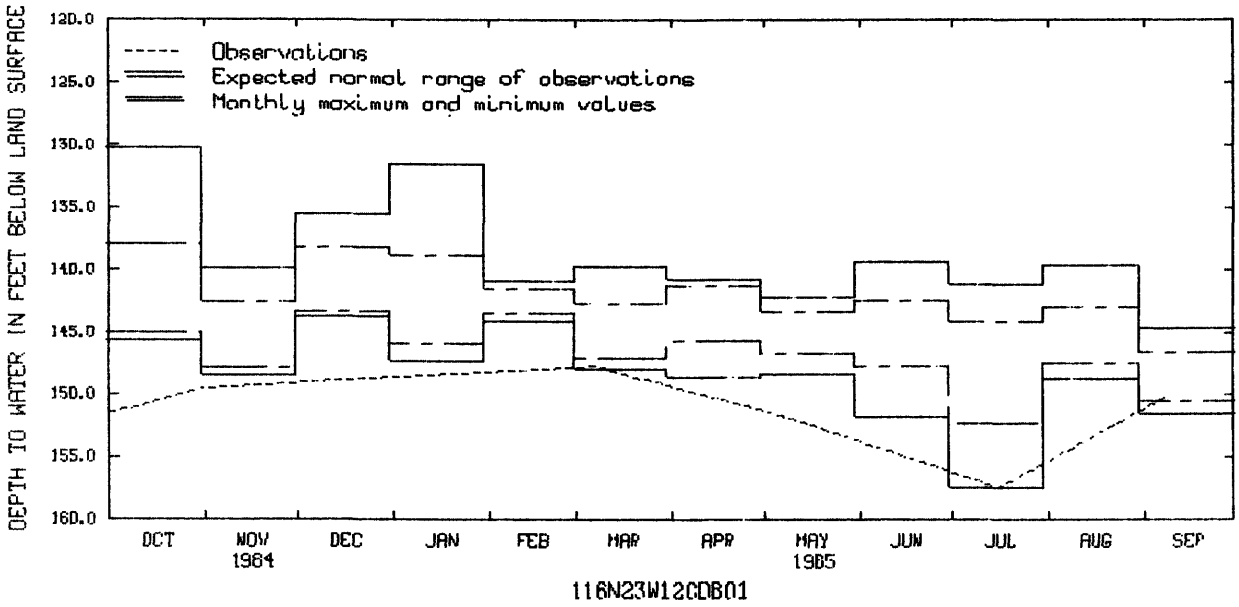
CARVER COUNTY

445155093320101. Local number, 116N23W12CDB01.
LOCATION.--Lat 44°51'55", long 93°32'01", in NW¼SE¼SW¼ sec.12, T.116 N., R.23 W., Hydrologic Unit 07020012, Chanhassen water tower.
Owner: City of Chanhassen, well 1.
AQUIFER.--Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled public supply artesian well, diameter 10 in (0.25 m), depth 518 ft (158 m), cased to 424 ft (129 m).
DATUM.--Altitude of land-surface datum is 990 ft (302 m). Measuring point: Edge of vent pipe, 2.40 ft (0.73 m) above land-surface datum.
PERIOD OF RECORD.--June 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 130.3 ft (39.72 m) below land-surface datum, Oct. 13, 1965; lowest, 157.5 ft (48.00 m) below land-surface datum, July 16, 1985.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 1	149.50	JAN 9	148.52	MAR 7	147.73	MAY 7	151.72	JUL 16	157.49	SEP 9	150.10

CARVER COUNTY--Continued

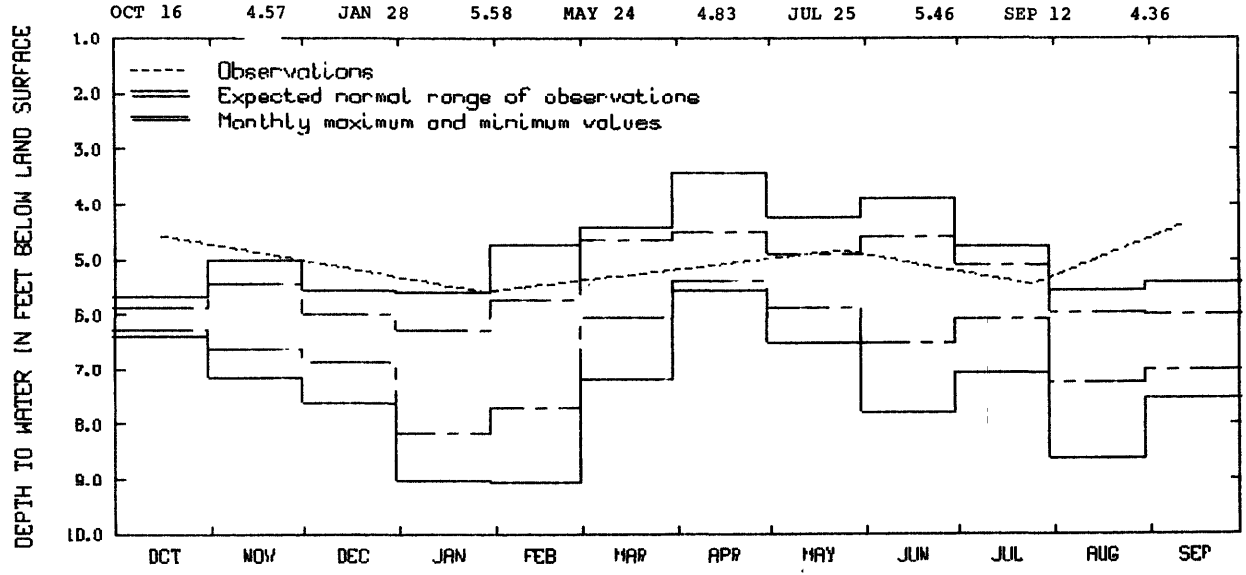


CHIPPEWA COUNTY

450447095490101. Local number, 119N41W29DDD01.
LOCATION.--Lat 45°04'47", long 95°40'01", in SE¼SE¼SE¼ sec.29, T.119 N., R.41 W., Hydrologic Unit 07020005, 5 mi (8.1 km) north of Watson.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 19 ft (5.8 m), screened 17 to 19 ft (5.2 to 5.8 m).
DATUM.--Altitude of land-surface datum is 992 ft (302 m). Measuring point: Top of casing, 3.75 ft (1.14 m) above land-surface datum.
PERIOD OF RECORD.--September 1972 to February 1974, January 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 3.43 ft (1.05 m) below land-surface datum, Apr. 10, 1984; lowest, 9.06 ft (2.76 m) below land-surface datum, Feb. 8, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 16	4.57	JAN 28	5.58	MAY 24	4.83	JUL 25	5.46	SEP 12	4.36



450631095562201. Local number, 119N42W17DDD01.
LOCATION.--Lat 45°06'31", long 95°56'22", in SE¼SE¼SE¼ sec.17, T.119 N., R.42 W., Hydrologic Unit 07020001, west of Milan.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial silt of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 19 ft (5.8 m), screened 17 to 19 ft (5.2 to 5.8 m).
DATUM.--Altitude of land-surface datum is 1,027 ft (313 m). Measuring point: Top of casing, 4.50 ft (1.37 m) above land-surface datum.
PERIOD OF RECORD.--September 1972 to October 1973, April 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 1.50 ft (0.46 m) below land-surface datum, May 7, 1973; lowest, 17.46 ft (5.32 m) below land-surface datum, Apr. 1, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 16	1.89	JAN 28	7.18	JUN 11	4.46	JUL 25	5.34	SEP 12	3.23

CHISAGO COUNTY

453138092445502. Local number, 035N19W17BAB02.
LOCATION.--Lat 45°31'38", long 92°44'55", in NW¼NE¼NW¼ sec.17, T.35 N., R.19 W., Hydrologic Unit 07030005, at Wild River State Park.
Owner: State of Minnesota.
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled domestic water-table well, diameter 6 in (0.15 m), depth 110 ft (33.5 m), screened 104 to 110 ft (31.7 to 33.5 m).
DATUM.--Altitude of land-surface datum is 860 ft (262 m). Measuring point: Top of casing, 1.00 ft (0.30 m) above land-surface datum.
PERIOD OF RECORD.--October 1980 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 51.42 ft (15.67 m) below land-surface datum, Aug. 15, 1984; lowest, 55.81 ft (17.01 m) below land-surface datum, Nov. 17, 1981.

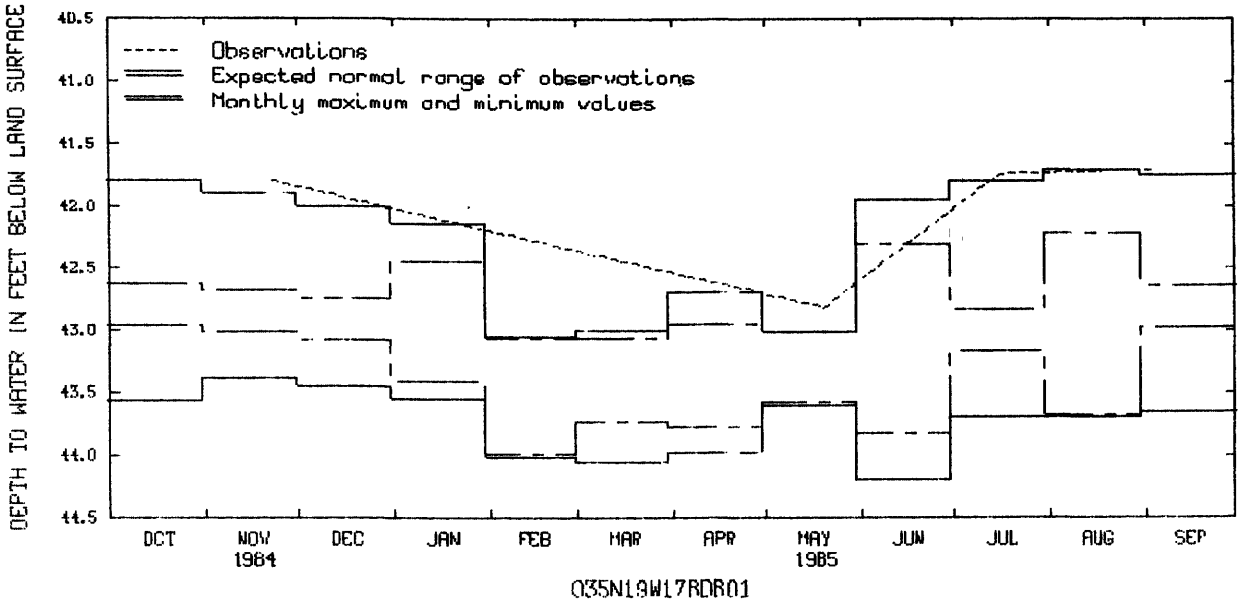
WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 23	51.83	FEB 26	52.39	MAY 20	51.71	JUL 16	51.85	SEP 3	52.05

453125092445401. Local number, 035N19W17BDB01.
LOCATION.--Lat 45°31'25", long 92°44'54", in NW¼SE¼NW¼ sec.17, T.35 N., R.19 W., Hydrologic Unit 07030005, at Wild River State Park.
Owner: State of Minnesota.
AQUIFER.--Mount Simon Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled domestic artesian well, diameter 6 in (0.15 m), depth 270 ft (82.3 m), cased 230 ft (70.1 m).
DATUM.--Altitude of land-surface datum is 820 ft (250 m). Measuring point: Top of casing, 0.70 ft (0.21 m) above land-surface datum.
PERIOD OF RECORD.--October 1980 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 41.70 ft (12.71 m) below land-surface datum, Sept. 3, 1985; lowest, 44.19 ft (13.47 m) below land-surface datum, June 8, 1983.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

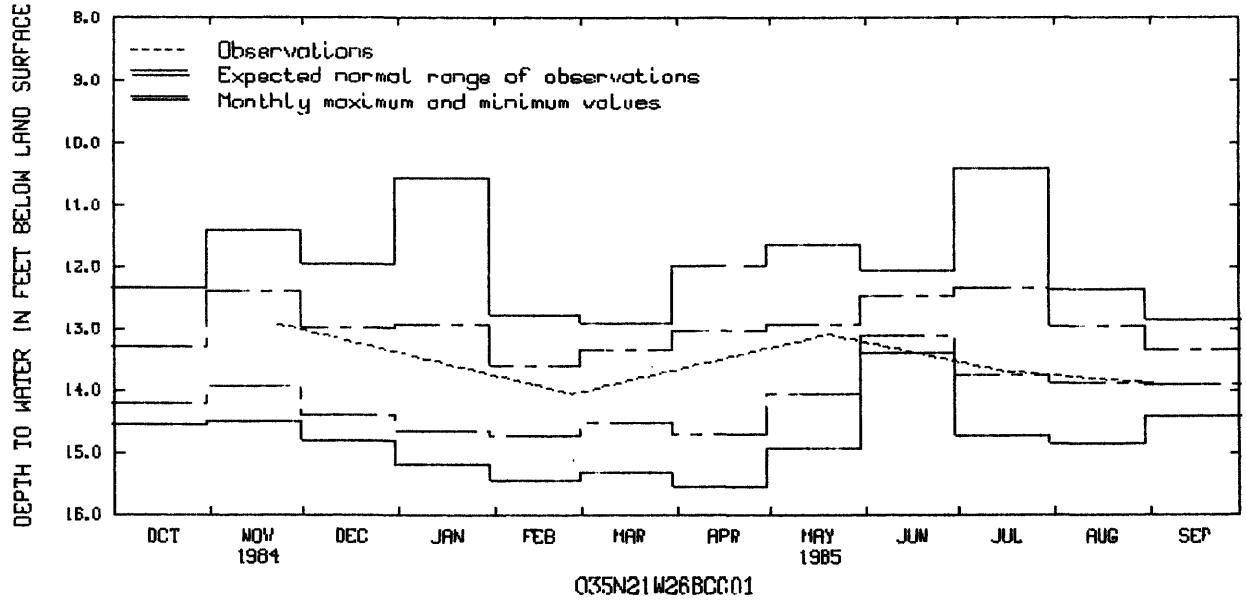
DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 23	41.80	MAY 20	42.82	JUL 16	41.74	SEP 3	41.70



452936092561901. Local number, 035N21W26BCC01.
LOCATION.--Lat 45°29'36", long 92°56'19", in SW¼SW¼NW¼ sec.26, T.35 N., R.21 W., Hydrologic Unit 07030005, southeast of North Branch.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial outwash sand of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 26 ft (7.9 m), screened 24 to 26 ft (7.3 to 7.9 m).
DATUM.--Altitude of land-surface datum is 894 ft (272 m). Measuring point: Top of casing, 2.00 ft (0.61 m) above land-surface datum.
PERIOD OF RECORD.--September 1968 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 10.42 ft (3.18 m) below land-surface datum, July 11, 1975; lowest, 15.54 ft (4.74 m) below land-surface datum, Apr. 4, 1975.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 23	12.92	FEB 26	14.05	MAY 20	13.09	JUL 16	13.69	SEP 3	13.88

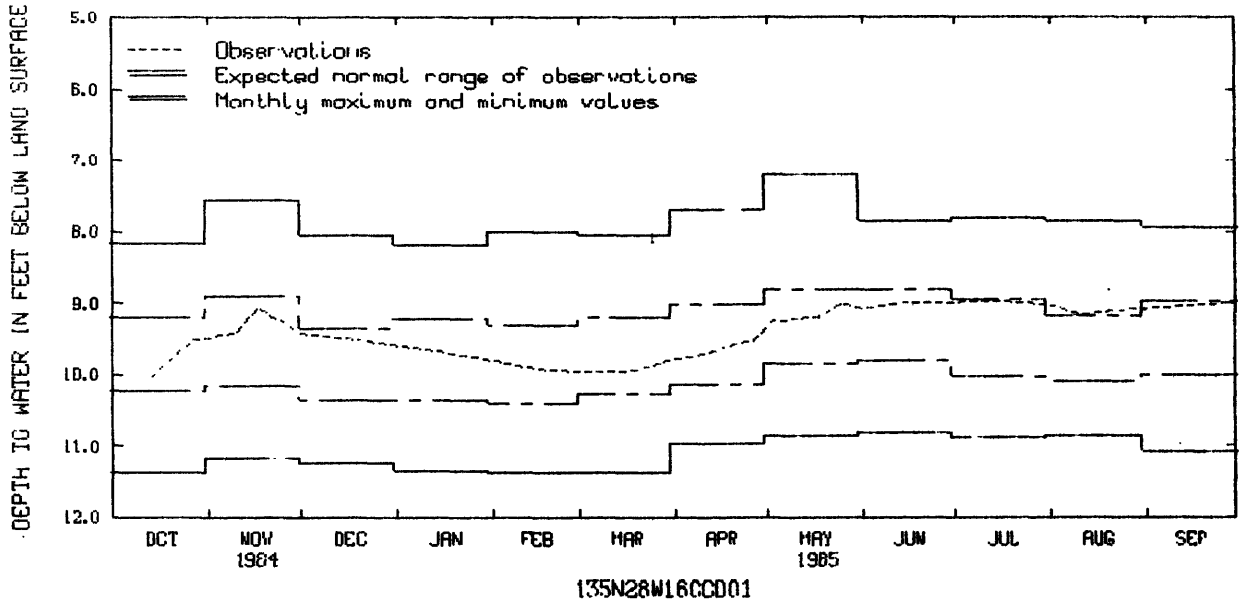


CROW WING COUNTY

463006094131201. Local number, 135N28W16CCD01.
LOCATION.--Lat 46°30'06", long 94°13'12", in SE¼SW¼SW¼ sec.16, T.135 N., R.28 W., Hydrologic Unit 07010106, northwest of Merrifield.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial sand of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 18 ft (5.5 m), screened 16 to 18 ft (4.9 to 5.5 m).
DATUM.--Altitude of land-surface datum is 1,212 ft (369 m). Measuring point: Top of casing, 2.00 ft (0.61 m) above land-surface datum.
PERIOD OF RECORD.--October 1970 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 7.20 ft (2.19 m) below land-surface datum, May 1, 1982; lowest, 11.38 ft (3.47 m) below land-surface datum, Oct. 16, 1970, Mar. 11, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 13	10.05	DEC 22	9.53	MAR 23	9.90	MAY 18	9.19	JUN 21	9.00	AUG 2	9.04
27	9.52	JAN 26	9.76	31	9.79	25	9.00	29	9.00	10	9.15
NOV 10	9.42	FEB 15	9.92	APR 8	9.75	JUN 1	9.08	JUL 6	8.97	16	9.14
17	9.06	23	9.95	27	9.52	8	9.03	12	8.97	24	9.10
DEC 1	9.43	MAR 16	9.96	MAY 3	9.25	15	9.00	20	8.99		



DAKOTA COUNTY

445044093102401. Local number, 027N23W09ABD01.
LOCATION.--Lat 44°50'44", long 93°10'24", in SE¼NW¼NE¼ sec.9, T.27 N., R.23 W., Hydrologic Unit 07020012, at Eagan.
Owner: City of Eagan, Timberline Addition.
AQUIFER.--Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled public-supply artesian well, diameter 10 in (0.25 m), depth 503 ft (153 m), cased to 401 ft (122 m).
DATUM.--Altitude of land-surface datum is 900 ft (274 m). Measuring point: Hole in well cap, 2.60 ft (0.79 m) above land-surface datum.
REMARKS.--Water-level affected by pumping.
PERIOD OF RECORD.--December 1965, April 1966, December 1966, March 1967, December 1970, August 1971, August 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 141.4 ft (43.10 m) below land-surface datum, Apr. 5, 1966; lowest, 164.7 ft (50.20 m) below land-surface datum, Sept. 9, 1985.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

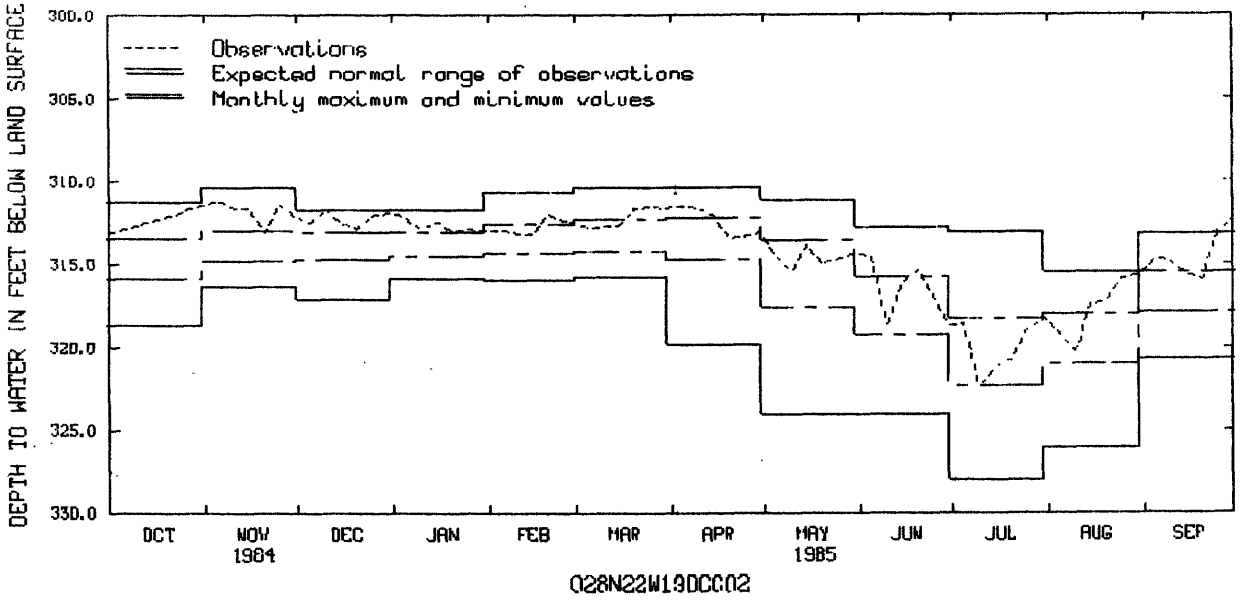
DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 7	149.90	JAN 8	146.82	MAR 7	148.44	APR 30	150.67	JUL 15	160.40	SEP 9	164.74

445330093054301. Local number, 028N22W19DCC02.
LOCATION.--Lat 44°53030", long 93°05'43", in SW¼SW¼SE¼ sec.19, T.28 N., R.22 W., Hydrologic Unit 07010206, in West St. Paul.
Owner: U.S. Geological Survey, 2-N.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age.
WELL CHARACTERISTICS.--Drilled observation artesian well, diameter 6 in (0.15 m), depth 539 ft (164 m), cased to 407 ft (124 m).
DATUM.--Land-surface datum is 1,036 ft (316.0 m) National Geodetic Vertical Datum of 1929. Measuring point: Top of casing, 2.60 ft (0.79 m) above land-surface datum.
REMARKS.--Water-level affected by regional pumping.
PERIOD OF RECORD.--January 1971 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 309.8 ft (94.43 m) below land-surface datum, Mar. 7, 1983; lowest, 328.0 ft (99.97 m) below land-surface datum, July 31, 1975.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	.....	311.20	312.55	312.23	313.00	312.77	311.51	314.56	314.64	318.61	319.16	314.73
10	.....	311.63	311.69	312.94	313.17	312.75	311.67	315.45	318.61	322.35	320.24	314.88
15	.....	311.64	312.58	312.51	313.22	312.67	312.14	313.83	316.09	321.20	317.45	315.61
20	.....	313.10	312.85	313.03	312.00	311.64	313.46	315.02	315.39	320.79	317.26	315.95
25	.....	311.41	312.10	312.91	312.42	311.57	313.32	314.69	317.00	319.02	315.88	313.15
EOM	.....	312.16	311.97	313.04	312.54	311.62	313.11	314.43	318.63	318.25	315.59	312.35

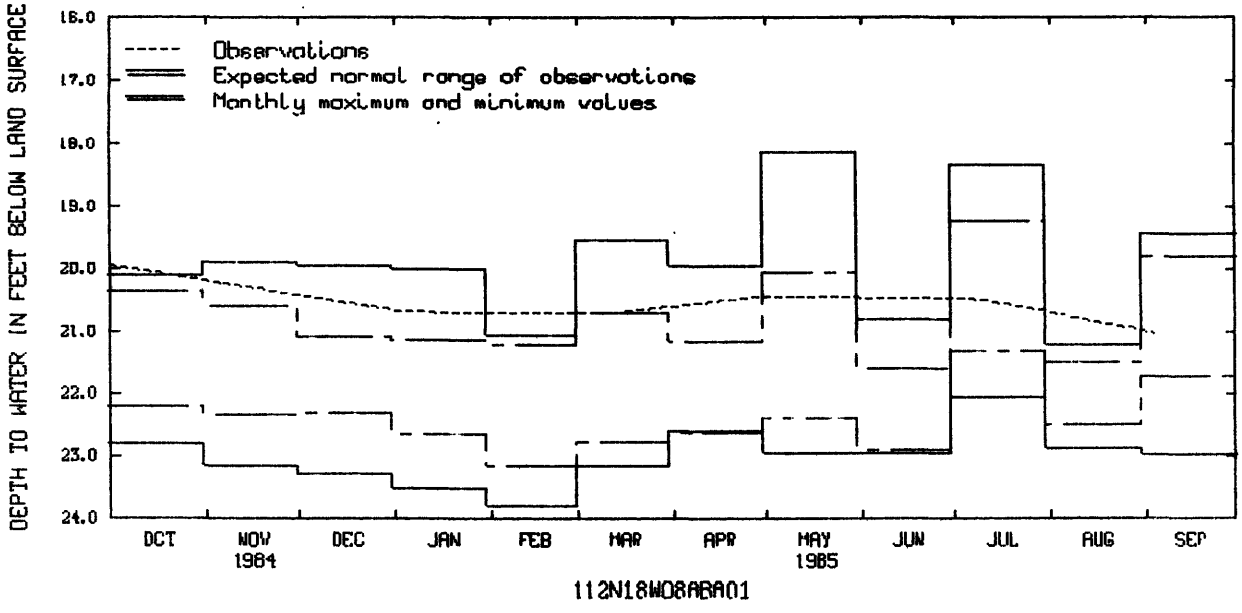
WTR YEAR 1985 HIGHEST 310.35 MAR 27, 1985 LOWEST 322.96 JUL 13, 1985



443146093002201. Local number, 112N18W08ABA01.
LOCATION.--Lat 44°31046", long 93°00'22", in NE¼NW¼NE¼ sec.8, T.112 N., R.18 W., Hydrologic Unit 07040002, northeast of Randolph.
Owner: U.S. Geological Survey
AQUIFER.--Surficial outwash sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 44 ft (13.4 m), screened 42 to 44 ft (12.8 to 13.4 m).
DATUM.--Altitude of land-surface datum is 880 ft (268 m). Measuring point: Top of casing, 3.40 ft (1.04 m) above land-surface datum.
PERIOD OF RECORD.--April 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 18.13 ft (5.53 m) below land-surface datum, May 3, 1983; lowest, 23.80 ft (7.25 m) below land-surface datum, Feb. 21, 1979.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 30	20.18	JAN 4	20.68	MAR 12	20.70	APR 30	20.43	JUL 10	20.48	SEP 4	21.02



443134093010601. Local number, 112N18W08BBC01.
LOCATION.--Lat 44°31'34", long 93°01'06", in SW¼NW¼NW¼ sec.8, T.112 N., R.18 W., Hydrologic Unit 07040002, at Randolph Fire Station.
Owner: City of Randolph.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age.
WELL CHARACTERISTICS.--Drilled fire protection artesian well, diameter 10 in (0.25 m), depth 150 ft (45.7 m), cased to 64 ft (19.5 m).
DATUM.--Altitude of land-surface datum is 883 ft (269 m). Measuring point: Top of 3/4-inch (0.02 m) breather pipe, 2.20 ft (0.67 m) above land-surface datum.
PERIOD OF RECORD.--July 1973 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 10.47 ft (3.19 m) below land-surface datum, May 3, 1983; lowest, 19.70 ft (6.00 m) below land-surface datum, Aug. 11, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 30	13.25	JAN 4	12.80	MAR 12	12.17	APR 30	12.80	JUL 10	18.67	SEP 4	14.15

442830093085201. Local number, 112N19W30DBD01.
LOCATION.--Lat 44°28'30", long 93°08'52", in SE¼NW¼SE¼ sec.30, T.112 N., R.19 W., Hydrologic Unit 07040002, at Northfield waste treatment plant.
Owner: City of Northfield.
AQUIFER.--Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled domestic artesian well, diameter 6 in (0.15 m), depth 275 ft (83.8 m), cased to 212 ft (64.6 m).
DATUM.--Altitude of land-surface datum is 890 ft (271 m). Measuring point: Center of pressure guage, 2.05 ft (0.62 m) above land-surface datum.
PERIOD OF RECORD.--May 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 18.54 ft (5.65 m) above land-surface datum, July 12, 1983; lowest, 9.19 ft (2.80 m) above land-surface datum, July 10, 1985.

WATER LEVEL, IN FEET ABOVE LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 30	12.53	JAN 4	12.41	MAR 12	12.41	MAY 8	12.18	JUL 10	9.19	SEP 4	11.03

443645093014701. Local number, 113N18W07BAC01.
LOCATION.--Lat 44°36'45", long 93°01'47", in SW¼NE¼NW¼ sec.7, T.113 N., R.18 W., Hydrologic Unit 07040001, west of Hampton.
Owner: Eugene Dohmen.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age and Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled irrigation artesian well, diameter 16 in (0.41 m), depth 325 ft (99.1 m), cased to 65 ft (19.8 m).
DATUM.--Altitude of land-surface datum is 915 ft (217 m). Measuring point: Hole in pump base, 1.60 ft (0.49 m) above land-surface datum.
PERIOD OF RECORD.--April 1977 to August 1977, January 1978, June 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 25.57 ft (7.79 m) below land-surface datum, Jan. 4, 1985; lowest, 33.19 ft (10.12 m) below land-surface datum, Aug. 12, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

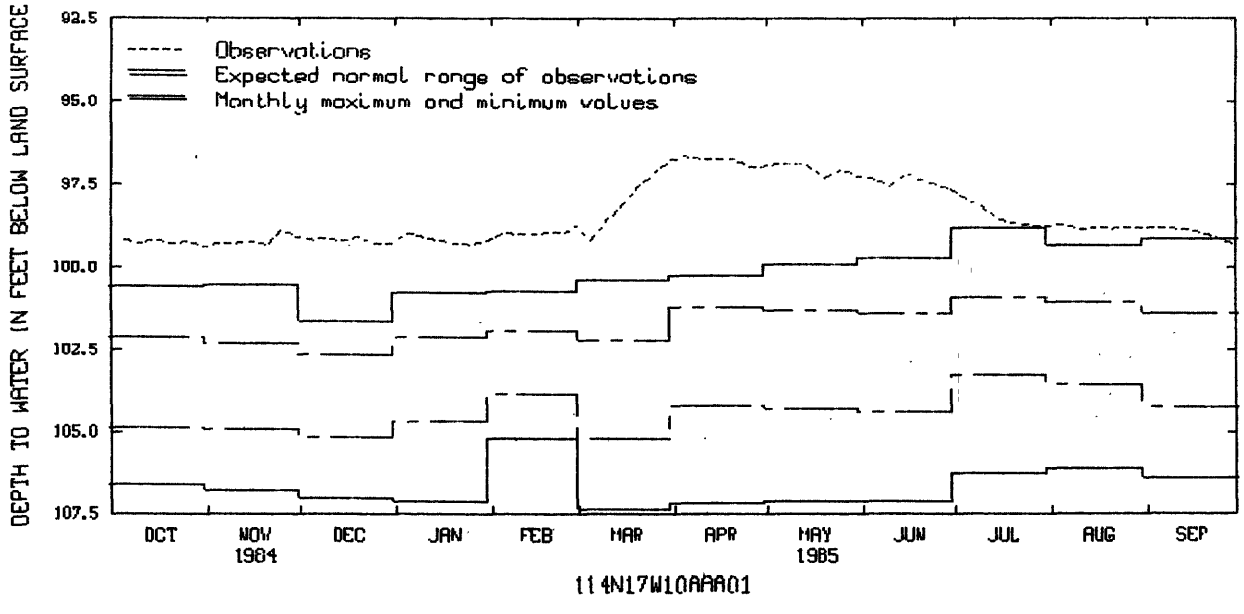
DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 30	25.63	JAN 4	25.57	MAR 12	26.21	APR 30	25.67	SEP 11	27.75

444205092500001. Local number, 114N17W10AAA01.
LOCATION.--Lat 44°42'05", long 92°50'00", in NE¼NE¼NE¼ sec.10, T.114 N., R.17 W., Hydrologic Unit 07040001, southeast of Hastings.
Owner: John Conzemius.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 4 in (0.10 m), depth 151 ft (46.0 m), depth of casing unknown.
DATUM.--Altitude of land-surface datum is 827 ft (252 m). Measuring point: Top of platform, 2.50 ft (0.76 m) above land-surface datum.
PERIOD OF RECORD.--April 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 96.36 ft (29.37 m) below land-surface datum, Mar. 31, 1985; lowest, 107.4 ft (32.74 m) below land-surface datum, Mar. 12, 1978.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	99.21	99.28	99.18	98.98	98.96	99.19	96.66	96.89	97.34	97.96	98.70	98.78
10	99.30	99.28	99.13	99.11	99.00	98.56	96.74	96.85	97.56	98.14	98.86	.....
15	99.15	99.23	99.20	99.20	99.00	98.15	96.74	96.96	97.21	98.56	98.79	98.86
20	99.29	99.36	99.11	99.29	98.94	97.59	96.74	97.32	97.35	98.67	98.83	.....
25	99.24	98.87	99.30	99.32	98.96	97.21	96.95	97.07	97.49	98.73	98.82	.....
EOM	99.39	99.09	99.26	99.19	98.74	96.74	96.95	97.28	97.65	98.74	98.80	.....

WTR YEAR 1985 HIGHEST 96.36 MAR 31, 1985 LOWEST 99.45 OCT 23, 1984



444047092521901. Local number, 114N17W16CBB01.
LOCATION.--Lat 44°40'47", long 92°52'19", in NW¼NW¼SW¼ sec.16, T.114 N., R.17 W., Hyrologic Unit 07040001, Kirby Avenue, 0.5 mi (0.8 km) north of 190th Street.
Owner: Jim Huneke Construction Company.
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled domestic water-table well, diameter 4 in (0.10 m), depth 170 ft (51.8 m), screened 164 to 170 ft (50.0 to 51.8 m).
DATUM.--Altitude of land-surface datum is 823 ft (251 m). Measuring point: Top of casing, 1.10 ft (0.34 m) above land-surface datum.
PERIOD OF RECORD.--March 1976, March 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 76.99 ft (23.46 m) below land-surface datum, Apr.30, 1985; lowest, 87.75 ft (26.75 m) below land-surface datum, June 27, 1978.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 30	79.07	JAN 4	78.29	MAR 12	77.99	APR 30	76.99	JUL 11	77.58	SEP 4	79.10

443827092521801. Local number, 114N17W33BBC01.
LOCATION.--Lat 44°38'27", long 92°52'18", in SW¼NW¼NW¼ sec.33, T.114 N., R.17 W., Hydrologic Unit 07040001, 39 ft (11.9 m) south of irrigation well.
Owner: Rainer Kimmes.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age.
WELL CHARACTERISTICS.--Drilled unused water-table well, diameter 16 in (0.41 m), depth 290 ft (88.4 m), cased to 25 ft (7.6 m).
DATUM.--Altitude of land-surface datum is 862 ft (263 m). Measuring point: Hole in plate over well, 2.00 ft (0.61 m) above land-surface datum.
PERIOD OF RECORD.--August 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 55.44 ft (16.89 m) below land-surface datum, Jan. 4, 1985; lowest, 79.20 ft (24.14 m) below land-surface datum, July 11, 1985.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 30	55.84	JAN 4	55.44	MAR 12	55.87	APR 30	55.53	JUL 11	79.20	SEP 4	62.13

444117092595701. Local number, 114N18W17AAB01.
LOCATION.--Lat 44°41'17", long 92°59'57", in NW¼NE¼NE¼ sec.17, T.114 N., R.18 W., Hydrologic Unit 07040001, 180th Street, 0.25 mi (0.40 km) west of Emery Avenue.
Owner: Joe Ries.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age and Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled irrigation artesian well, diameter 16 in (0.41 m), depth 280 ft (85.3 m), cased to 39 ft (11.9 m).
DATUM.--Altitude of land-surface datum is 905 ft (276 m). Measuring point: Edge of vent pipe, 1.40 ft (0.43 m) above land-surface datum.
PERIOD OF RECORD.--June 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 61.62 ft (18.78 m) below land-surface datum, Apr. 30, 1985; lowest, 73.52 ft (22.41 m) below land-surface datum, Sept. 13, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 30	63.30	JAN 4	62.55	MAR 12	62.44	APR 30	61.62	SEP 4	69.00

443801092571301. Local number, 114N18W35CCB01.
LOCATION.--Lat 44°38'01", long 92°57'13", in NW¼SW¼SW¼ sec.35, T.114 N., R.18 W., Hydrologic Unit 07040001, Goodwin Avenue, 1.1 mi (1.8 km) south of Northfield Boulevard.
Owner: Al Wagner, Jr.
AQUIFER.--Buried gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Driled irrigation artesian well, diameter 12 in (0.30 m), depth 203 ft (61.9 m), screened 173 to 203 ft (52.7 to 61.9 m).
DATUM.--Altitude of land-surface datum is 898 ft (274 m). Measuring point: Hole in pump base, 1.25 ft (0.38 m) above land-surface datum.
PERIOD OF RECORD.--June 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 21.85 ft (6.65 m) below land-surface datum, Jan. 4, 1985; lowest, 38.28 ft (11.67 m) below land-surface datum, Sept. 13, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 30	22.25	JAN 4	21.85	MAR 12	22.73	APR 30	22.43	SEP 4	28.69

444220093055001. Local number, 114N19W04DAC01.
LOCATION.--Lat 44°42'20", long 93°05'50", in SW¼NE¼SE¼ sec.4, T.114 N., R.19 W., Hydrologic Unit 07040001, 2.1 mi (3.4 km) southeast of Rosemount.
Owner: University of Minnesota Agricultural Experiment Station (Plant Pathology).
AQUIFER.--Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled irrigation artesian well, diameter 6 in (0.15 m), depth 415 ft (126 m), cased to 355 ft (108 m).
DATUM.--Altitude of land-surface datum is 947 ft (289 m). Measuring point: Top of 1-inch breather pipe, 2.10 ft (0.64 m) above land-surface datum.
PERIOD OF RECORD.--August 1970 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 57.84 ft (17.62 m) below land-surface datum, Apr. 30, 1985; lowest, 65.23 ft (19.88 m) below land-surface datum, Nov. 27, 1970.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 1	58.52	JAN 8	58.50	APR 8	58.46	APR 30	57.84	JUN 11	58.05	SEP 16	58.07

443934093043201. Local number, 114N19W22DDD01.
LOCATION.--Lat 44°39'34", long 93°04'32", in SE¼SE¼SE¼ sec.22, T.114 N., R.19 W., Hydrologic Unit 07040001, west of Empire.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial outwash sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 24 ft (7.3 m), screened 22 to 24 ft (6.7 to 7.3 m).
DATUM.--Altitude of land-surface datum is 875 ft (267 m). Measuring point: Top of casing, 3.00 ft (0.91 m) above land-surface datum.
PERIOD OF RECORD.--April 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 5.87 ft (1.78 m) below land-surface datum, May 15,1984; lowest, 9.08 ft (2.76 m) below land-surface datum, Sept.12, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

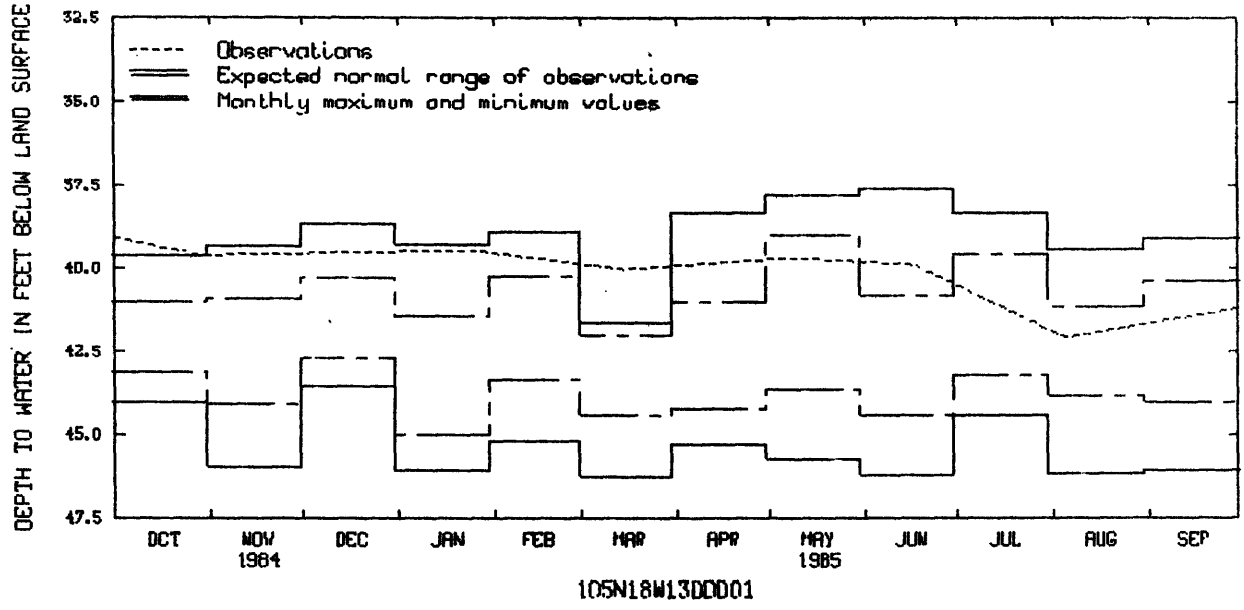
DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 30	6.50	JUN 7	7.22	JUL 11	7.91	SEP 4	8.35

DODGE COUNTY

435336092553201. Local number, 105N18W13DDD01.
LOCATION.--Lat 43°53'36", long 92°55'32", in SE¼SE¼SE¼ sec.13, T.105 N., R.18 W., Hydrologic Unit 07080201, 3 mi (4.8 km) west of Hayfield.
Owner: James Barry.
AQUIFER.--Buried sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 5 in (0.13 m), depth 82 ft (25.0 m), screen information not available.
DATUM.--Altitude of land-surface datum is 1,288 ft (393 m). Measuring point: Top of casing, 1.80 ft (0.55 m) above land-surface datum.
PERIOD OF RECORD.--June 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 37.61 ft (11.46 m) below land-surface datum, June 6, 1984; lowest, 46.25 ft (14.10 m) below land-surface datum, Mar. 30, 1978.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 29	39.61	JAN 25	39.46	MAR 15	40.04	MAY 7	39.69	JUN 17	39.89	AUG 5	42.09
DEC 13	39.53										



440448092485501. Local number, 107N17W13BBA01.
LOCATION.--Lat 44°04'48", long 92°48'55", in NE¼NW¼NW¼ sec.13, T.107 N., R.17 W., Hydrologic Unit 07040004, in city of Wasioja.
Owner: Wasioja Township Garage.
AQUIFER.--Galena Formation of Middle Ordovician Age.
WELL CHARACTERISTICS.--Drilled maintenance artesian well, diameter 6 in (0.15 m), depth 100 ft (30.5 m), cased to 52 ft (15.8 m).
DATUM.--Altitude of land-surface datum is 1,185 ft (361 m). Measuring point: Top of casing, 1.60 ft (0.49 m) above land-surface datum.
PERIOD OF RECORD.--January 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 12.94 ft (3.94 m) below land-surface datum, May 23, 1983; lowest, 26.88 ft (8.19 m) below land-surface datum, Jan. 5, 1978.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 26	18.35	JAN 25	19.09	MAR 15	19.63	MAY 7	17.70	JUN 21	18.72	AUG 5	20.52
DEC 13	18.74										

FARIBAULT COUNTY

434237094082901. Local number, 103N28W24BDC01.
LOCATION.--Lat 43°42'37", long 94°08'29", in SW¼SE¼NW¼ sec.24, T.103 N., R.28 W., Hydrologic Unit 07020009, 4.5 mi (7.2 km) south of Winnebago.
Owner: Riverside Town and Country Club.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age.
WELL CHARACTERISTICS.--Drilled irrigation artesian well, diameter 8 in (0.20 m), depth 352 ft (107 m), cased to 291 ft (88.7 m).
DATUM.--Altitude of land-surface datum is 1,085 ft (331 m). Measuring point: Top of coupling, 1.50 ft (0.46 m) above land-surface datum.
PERIOD OF RECORD.--July 1979, April 1980, May 1981 to current year.
EXTREMES FOR PERIODS OF RECORD.--Highest water level, 34.82 ft (10.61 m) below land-surface datum, May 10, 1983; lowest, 39.30 ft (11.98 m) below land-surface datum, July 31, 1979.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL
MAR 19	37.31

434558093540001. Local number, 104N26W36CAC01.
LOCATION.--Lat 43°45'58", long 93°54'00", in SW¼NE¼SW¼ sec.36, T.104 N., R.26 W., Hydrologic Unit 07020011, at Easton Creamery.
Owner: City of Easton.
AQUIFER.--Platteville Formation of Middle Ordovician Age.
WELL CHARACTERISTICS.--Drilled public supply artesian well, diameter 6 in (0.15 m), depth 145 ft (44.2 m), cased to 120 ft (36.6 m).
DATUM.--Altitude of land-surface datum is 1,060 ft (323 m). Measuring point: Top of well cap, 1.20 ft (0.37 m) above land-surface datum.
PERIOD OF RECORD.--August 1979, April 1980, May 1981 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 29.97 ft (9.13 m) below land-surface datum, May 10, 1983; lowest, 35.25 ft (10.74 m) below land-surface datum, Aug. 1, 1979.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 8	32.02	JAN 15	32.55	MAR 19	32.62	MAY 14	32.03	JUL 10	33.53	SEP 11	32.62

434902094042901. Local number, 104N27W16ABA01.
LOCATION.--Lat 43°49'02", long 94°04'29", in NE¼NW¼NE¼ sec.16, T.104 N., R.27 W., Hydrologic Unit 07020011, at Bass Lake Baptist Camp.
Owner: Baptist Church.
AQUIFER.--St. Peter Sandstone of Middle Ordovician Age.
WELL CHARACTERISTICS.--Drilled domestic artesian well, diameter 4 in (0.10 m), depth 240 ft (73.2 m), cased to 190 ft (57.9 m).
DATUM.--Altitude of land-surface datum is 1,050 ft (320 m). Measuring point: Hole in well cap, 0.90 ft (0.27 m) above land-surface datum.
PERIOD OF RECORD.--September 1981 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 27.48 ft (8.38 m) below land-surface datum, May 10, 1983; lowest, 29.92 ft (9.11 m) below land-surface datum, Sept. 11, 1985.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 8	29.56	JAN 15	29.16	MAR 19	29.10	MAY 14	28.74	SEP 11	29.92

FREEBORN COUNTY

433434093331201. Local number, 101N23W02DAC01.
LOCATION.--Lat 43°34'34", long 93°33'12", in SW¼NE¼SE¼ sec.2, T.101 N., R.23 W., Hydrologic Unit 07080203, 3 mi (4.8 km) southwest of Conger.
Owner: Richard Steele.
AQUIFER.--Upper Carbonates of Devonian and Ordovician Age.
WELL CHARACTERISTICS.--Drilled irrigation artesian well, diameter 16 in (0.41 m), depth 373 ft (114 m), cased to 156 ft (47.6 m).
DATUM.--Aaltitude of land-surface datum is 1,280 ft (390 m). Measuring point: Vent pipe, 1.50 ft (0.46 m) above land-surface datum.
PERIOD OF RECORD.--July 1981 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 65.58 ft (19.99 m) below land-surface datum, Mar. 8, 1983; lowest, 69.83 ft (21.28 m) below land-surface datum, Sept. 11, 1985.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 8	67.84	JAN 15	67.36	MAR 19	67.66	MAY 14	67.73	SEP 11	69.83

433846093220601. Local number, 102N21W09CCB01.
LOCATION.--Lat 43°38'46", long 93°22'06", in NW¼SW¼SW¼ sec.9, T.102 N., R.21 W., Hydrologic Unit 07080202, at Freeborn County Courthouse.
Owner: Freeborn County.
AQUIFER.--Cedar Valley Formation of Middle Devonian Age.
WELL CHARACTERISTICS.--Drilled public supply artesian well, diameter 5 in (0.13 m), depth 150 ft (45.7 m), cased to 138 ft (42.1 m).
DATUM.--Altitude of land-surface datum is 1,240 ft (378 m). Measuring point: Top of casing, 1.00 ft (0.30 m) above land-surface datum.
PERIOD OF RECORD.--November 1981 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 40.50 ft (12.34 m) below land-surface datum, Mar. 8, 1983; lowest, 48.82 ft (14.88 m) below land-surface datum, July 10, 1985.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 8	43.80	JAN 15	42.88	MAR 19	42.67	MAY 14	42.75	JUL 10	48.82	SEP 11	47.32

FREEBORN COUNTY--Continued

434032093111801. Local number, 103N20W36CCB01.
LOCATION.--Lat 43°40'32", long 93°11'18", in NE¼SW¼SW¼ sec.36, T.103 N., R.20 W., Hydrologic Unit 07080201, at Pillsbury Grain Station.
Owner: Pillsbury Co.
AQUIFER.--Cedar Valley Formation of Middle Devonian Age.
WELL CHARACTERISTICS.--Drilled domestic artesian well, diameter 5 in (0.13 m), depth 231 ft (70.4 m), cased to 136 ft (41.4 m).
DATUM.--Altitude of land-surface datum is 1,255 ft (383 m). Measuring point: Top of casing, 1.80 ft (0.55 m) above land-surface datum.
PERIOD OF RECORD.--July 1981 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 48.40 ft (14.75 m) below land-surface datum, May 10, 1984; lowest, 52.82 ft (16.09 m) below land-surface datum, July 10, 1985.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 8	50.68	JAN 15	50.25	MAR 19	50.36	MAY 14	50.26	JUL 10	52.82	SEP 11	52.72

434308093322001. Local number, 103N23W13CDA01.
LOCATION.--Lat 43°43'08", long 93°32'20", in NE¼SE¼SW¼ sec.13, T.103 N., R.23 W., Hydrologic Unit 07020011, 3.3 mi (5.3 km) northeast of Alden.
Owner: Oakview Golf Course.
AQUIFER.--Galena Formation of Middle Ordovician Age.
WELL CHARACTERISTICS.--Drilled irrigation artesian well, diameter 6 in (0.15 m), depth 270 ft (82.3 m), cased to 158 ft (48.2 m).
DATUM.--Altitude of land-surface datum is 1,250 ft (381 m). Measuring point: Hole in well cap, 1.90 ft (0.58 m) above land-surface datum.
PERIOD OF RECORD.--July 1981 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 42.00 ft (12.80 m) below land-surface datum, May 10, 1983; lowest, 46.53 ft (14.18 m) below land-surface datum, July 10, 1985.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 8	44.20	JAN 15	43.47	MAR 19	43.68	MAY 14	43.75	JUL 10	46.53	SEP 11	46.39

GOODHUE COUNTY

441737092400501. Local number, 110N15W31BBD01.
LOCATION.--Lat 44°17'37", long 92°40'05", in SE¼NW¼NW¼ sec.31, T.110 N., R.15 W., Hydrologic Unit 07040004, at Zumbrota Fire Station.
Owner: City of Zumbrota, well 3.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 12 in (0.30 m), depth 210 ft (64.0 m), cased to 50 ft (15.2 m).
DATUM.--Altitude of land-surface datum is 1,000 ft (305 m). Measuring point: Hole in pump base, 2.20 ft (0.67 m) above land-surface datum.
PERIOD OF RECORD.--June 1973 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 18.04 ft (5.50 m) below land-surface datum, May 3, 1984; lowest, 27.00 ft (8.23 m) below land-surface datum, Jan. 5, 1978.

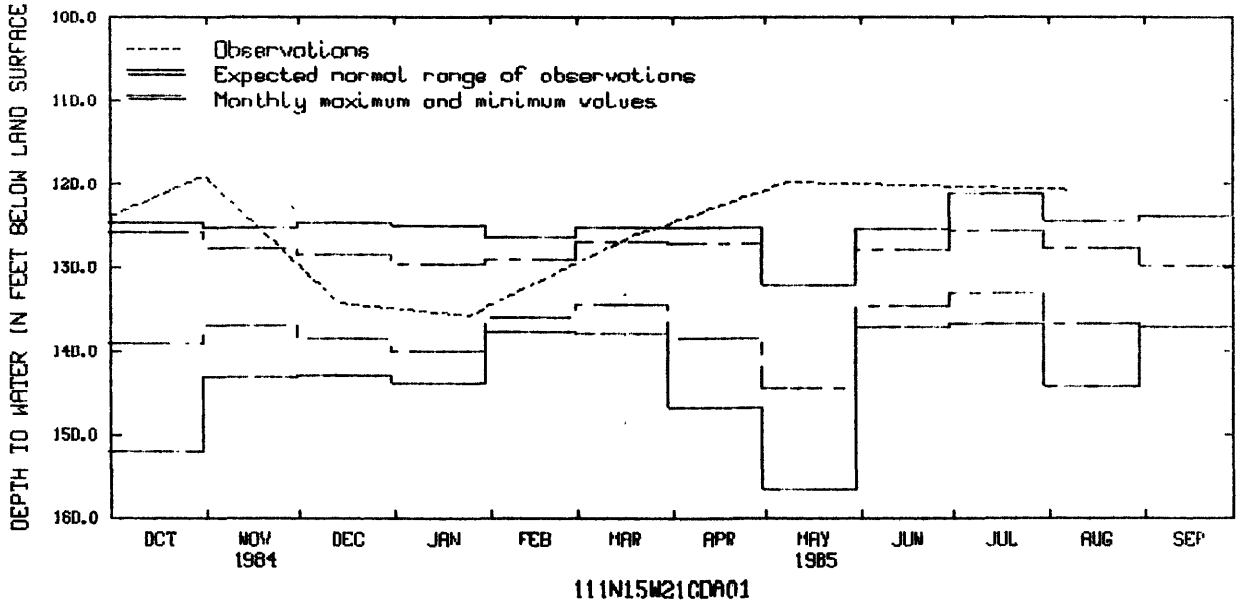
WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 31	19.63	JAN 25	19.65	MAR 19	19.14	MAY 9	20.95	JUN 20	20.10	AUG 8	23.72
DEC 14	19.42										

442401092372501. Local number, 111N15W21CDA01.
LOCATION.--Lat 44°24'01", long 92°37'25", in NE¼SE¼SW¼ sec.21, T.111 N., R.15 W., Hydrologic Unit 07040004, in Goodhue clerk's office.
Owner: City of Goodhue, creamery well.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age and Jordan Sandstone of Late Cambrian age.
WELL CHARACTERISTICS.--Drilled public-supply artesian well, diameter 12 in (0.30 m), depth 310 ft (94.5 m), cased to 175 ft (53.3 m).
DATUM.--Altitude of land-surface datum is 1,125 ft (343 m). Measuring point: Top of 1¼ in (0.03 m) elbow, 1.50 ft (0.46 m) above land-surface datum.
PERIOD OF RECORD.--June 1973 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 119.0 ft (36.27 m) below land-surface datum, Oct. 31, 1984; lowest, 156.5 ft (47.70 m) below land-surface datum, May 26, 1983.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 31	119.05	JAN 25	135.79	MAR 19	126.25	MAY 9	119.83	AUG 8	120.71
DEC 14	134.32								



443012092362201. Local number, 113N15W27BAB01.
LOCATION.--Lat 44°30'12", long 92°26'22", in NWSNESNWS sec.27, T.113 N., R.15 W., Hydrologic Unit 07040002, at Red Wing.
Owner: City of Red Wing, Anderson Park.
AQUIFER.--Eau Claire-Mount Simon Sandstones of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 12 in (0.30 m), depth 560 ft (171 m), cased to 243 ft (74.1 m).
DATUM.--Altitude of land-surface datum is 800 ft (244 m). Measuring point: Edge of casing, 2.70 ft (0.82 m) above land-surface datum.
PERIOD OF RECORD.--April 1976, June 1978 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 100.5 ft (30.63 m) below land-surface datum, Apr. 20, 1983; lowest, 108.2 ft (32.98 m) below land-surface datum, Sept. 14, 1978.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 16	103.01	JAN 21	103.32	MAR 11	102.40	APR 30	102.12	JUN 10	102.53	JUL 25	105.87
DEC 10	102.23										

HENNEPIN COUNTY

444815093194901. Local number, 027N24W30AAA01.
LOCATION.--Lat 44°48'15", long 93°19'49", in NE¼NE¼NE¼ sec.30, T.27 N., R.24 W., Hydrologic Unit 07020012, at 4001 West 110th Street, Bloomington.
Owner: Transfiguration Church.
AQUIFER.--Buried Sand of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled domestic artesian well, diameter 4 in (0.10 m), depth 139 ft (42.4 m), screened 135 to 139 ft (41.2 to 42.4 m).
DATUM.--Altitude of land-surface datum is 832 ft (254 m). Measuring point: Top of casing, 0.50 ft (0.15 m) above land-surface datum.
PERIOD OF RECORD.--March 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 63.97 ft (19.50 m) below land-surface datum, Mar. 2, 1979; lowest, 69.86 ft (21.29 m) below land-surface datum, Sept. 9, 1985.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

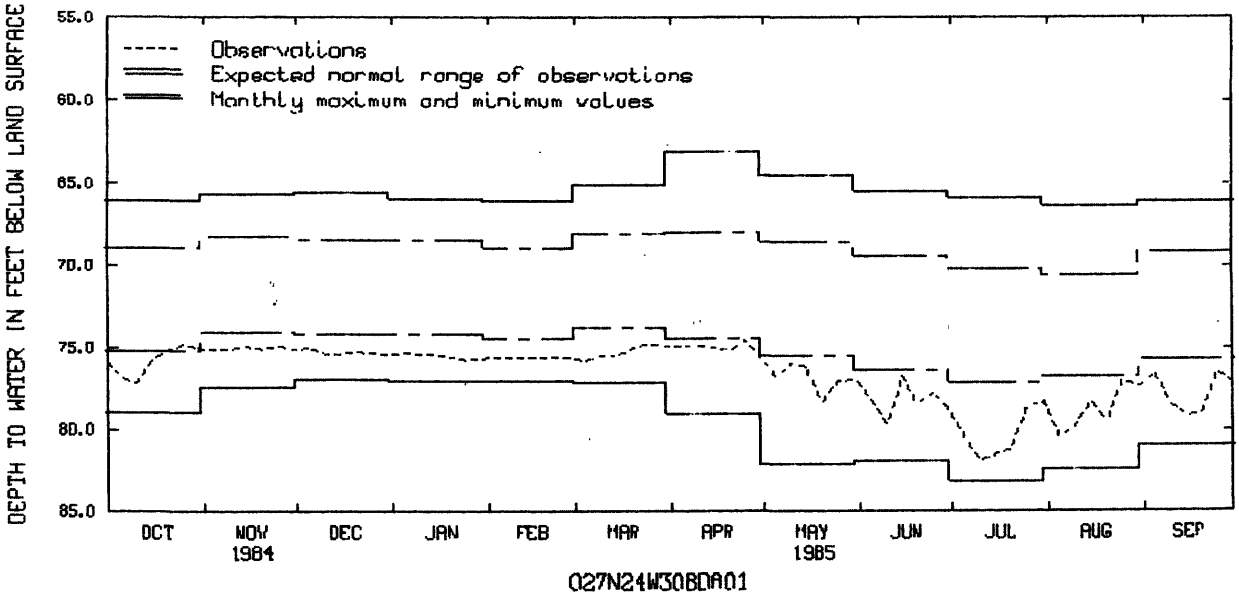
DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 1	68.37	MAR 7	68.40	MAY 7	68.87	JUL 16	69.64	SEP 9	69.86
JAN 9	68.30								

444801093202801. Local number, 027N24W30BDA01.
LOCATION.--Lat 44°48'01", long 93°20'28", in NE¼SE¼NW¼ sec.30, T.27 N., R.24 W., Hydrologic Unit 07020012, in Bloomington.
Owner: City of Bloomington, at Southwood Terrace.
AQUIFER.--Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 12 in (0.30 m), depth 330 ft (101 m), cased to 269 ft (82.0 m).
DATUM.--Altitude of land-surface datum is 815 ft (248 m). Measuring point: Top of recorder platform, 2.20 ft (0.67 m) above land-surface datum.
REMARKS.--Water level affected by pumping.
PERIOD OF RECORD.--March 1969 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 63.05 ft (19.22 m) below land-surface datum, Apr. 15, 1969; lowest, 83.24 ft (25.37 m) below land-surface datum, July 5-6, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	76.83	75.09	75.03	75.32	75.56	75.83	74.90	76.79	78.17	80.40	80.52	76.56
10	77.13	75.16	75.38	75.42	75.58	75.52	74.93	76.01	79.69	81.86	79.77	78.43
15	75.82	74.94	75.41	75.44	75.60	75.48	75.01	76.16	76.72	81.58	78.32	79.16
20	75.22	75.10	75.23	75.58	75.56	75.00	75.18	78.29	78.47	81.28	79.41	78.95
25	74.83	74.91	75.31	75.76	75.62	74.79	74.57	77.09	77.76	78.75	77.08	76.50
EOM	75.07	75.13	75.40	75.66	75.61	74.92	75.46	76.96	78.71	78.33	77.36	77.16

WTR YEAR 1985 HIGHEST 74.36 APR 29, 1985 LOWEST 82.58 JUL 13, 1985



445356093145301. Local number, 028N24W23ADD01.
LOCATION.--Lat 44°53'56", long 93°14'53", in SE¼SE¼NE¼ sec.23, T.28 N., R.24 W., Hydrologic Unit 07010206, at 5728 Cedar Avenue, Minneapolis.
Owner: Hope Lutheran Church.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age.
WELL CHARACTERISTICS.--Drilled irrigation artesian well, diameter 6 in (0.15 m), depth 245 ft (74.7 m), cased to 172 ft (52.4 m).
DATUM.--Altitude of land-surface datum is 835 ft (254 m). Measuring point: Top of casing, 0.30 ft (0.09 m) above land-surface datum.
PERIOD OF RECORD.--April 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 36.89 ft (11.24 m) below land-surface datum, Mar. 8, 1984; lowest, 52.90 ft (16.12 m) below land-surface datum, July 15, 1983.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 5	38.08	MAR 18	38.58	MAY 3	41.47	JUL 16	52.08	SEP 17	42.93
JAN 9	38.52								

450116093205301. Local number, 029N24W06CCC01.
LOCATION.--Lat 45°01'16", long 93°20'53", in SW¼SW¼SW¼ sec.6, T.29 N., R.24 W., Hydrologic Unit 07010206, at 3610 Unity Avenue North, Robbinsdale.
Owner: Minnesota Department of Transportation.
AQUIFER.--St. Peter Sandstone of Middle Ordovician Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 5 in (0.13 m), depth 200 ft (61.0 m), cased to 152 ft (46.3 m).
DATUM.--Altitude of land-surface datum is 870 ft (265 m). Measuring point: Top of casing, 3.50 ft (1.07 m) above land-surface datum.
REMARKS.--Water level affected by pumping.
PERIOD OF RECORD.--March 1973 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 24.54 ft (7.48 m) below land-surface datum, Dec. 28-29, 1975; lowest, 50.11 ft (15.27 m) below land-surface datum, July 14, 1976.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	32.25	28.62	29.29	.....	29.81	30.17	28.02	34.33	35.94	41.34	39.96	35.71
10	31.62	29.04	.....	29.93	30.22	29.60	28.05	36.56	38.69	47.54	37.47	34.80
15	31.45	29.15	.....	29.54	31.00	30.38	29.07	33.60	36.08	45.78	37.26	33.23
20	30.10	28.27	.....	29.62	30.85	30.16	33.56	34.98	37.07	39.41	35.82	36.31
25	29.69	27.55	.....	30.06	29.64	29.06	31.85	36.84	38.87	41.37	34.66	32.11
EOM	29.23	29.18	.....	30.71	30.17	28.90	33.03	34.47	38.41	38.40	35.00	30.03

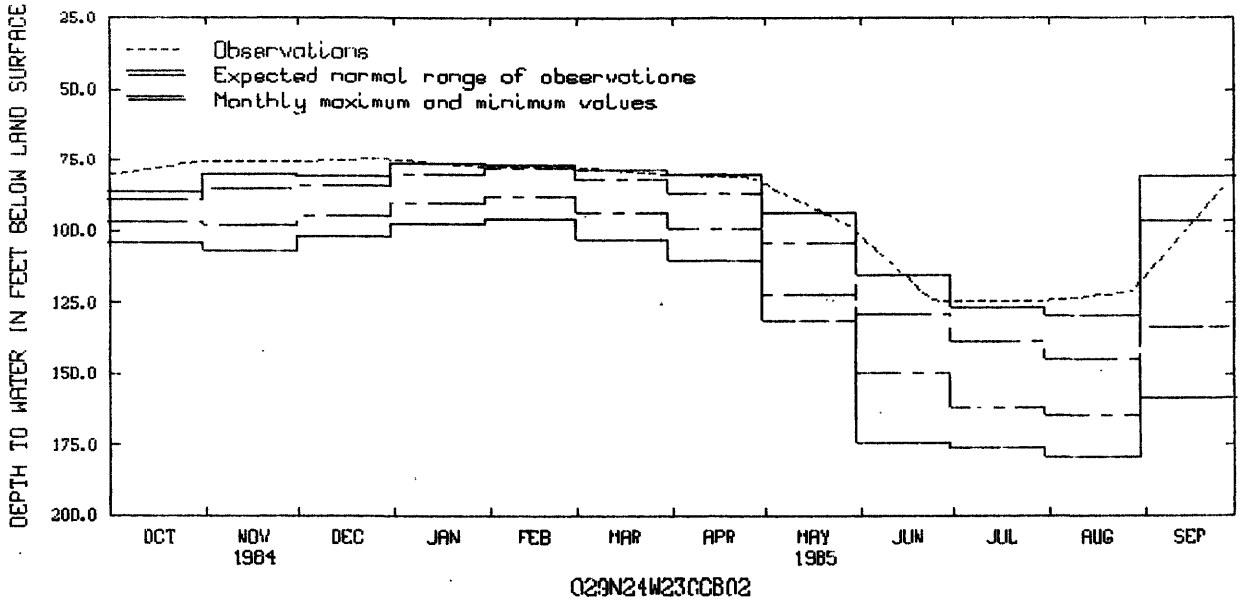
WTR YEAR 1985 HIGHEST 26.47 NOV 26, 1984 LOWEST 47.63 JUL 12, 1985

HENNEPIN COUNTY--Continued

445849093155802. Local number, 029N24W23CCB02.
LOCATION.--Lat 44°58'49", long 93°15'58", in NW¼SW¼SW¼ sec.23, T.29 N., R.24 W., Hydrologic Unit 07010206, at 245 Marquette Avenue, Minneapolis.
Owner: IBM Corporation.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age and Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 10 in (0.25 m), depth 430 ft (131 m), cased to 250 ft (76.2 m).
DATUM.--Altitude of land-surface datum is 840 ft (256 m). Measuring point: Edge of 2 in (0.05 m) vent pipe, 9.60 ft (2.93 m) below land-surface datum.
REMARKS.--Water level affected by pumping of nearby wells.
PERIOD OF RECORD.--July 1970 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 74.40 ft (22.67 m) below land-surface datum, Dec. 27, 1984; lowest, 179.6 ft (54.74 m) below land-surface datum, Aug. 16, 1972.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 29	75.50	DEC 27	74.40	FEB 27	77.20	APR 26	80.90	JUN 24	124.05	AUG 28	121.10
NOV 29	75.55	JAN 29	77.14	MAR 27	79.70	MAY 28	97.85	JUL 29	124.50	SEP 26	85.05



445833093154301. Local number, 029N24W26BAB01.
LOCATION.--Lat 44°58'33", long 93°15'43", in NW¼NE¼NW¼ sec.26, T.29 N., R.24 W., Hydrologic Unit 07010206, at 425 Portland Avenue.
Owner: Minneapolis Star and Tribune.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age and Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 16 in (0.41 m), depth 445 ft (136 m), cased to 252 ft (76.8 m).
DATUM.--Altitude of land-surface datum is 835 ft (254 m). Measuring point: Top of steel cover, 7.60 ft (7.90 m) below land-surface datum.
REMARKS.--Water level affected by pumping.
PERIOD OF RECORD.--June 1981 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 56.45 ft (17.21 m) below land-surface datum, Jan. 10, 1983; lowest, 145.2 ft (44.26 m) below land-surface datum, July 22, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	96.83	.....	69.96	.....	70.89	.....	69.83	77.35	101.82	117.91	122.95	124.89
10	103.87	66.63	68.24	68.93	65.58	.....	78.26	122.62	110.01	125.86	103.82	111.28
15	.....	71.61	.....	70.43	70.68	.....	87.93	97.58	91.61	121.91	118.06	87.90
20	.....	69.29	.....	64.85	.....	75.25	93.30	96.09	115.66	110.32	104.53	110.86
25	.....	65.52	.....	70.57	.....	71.25	84.86	93.49	124.40	125.59	93.19	79.87
EOM	.....	69.09	.....	70.61	.....	66.30	108.08	103.73	80.82	120.80	100.60	72.13

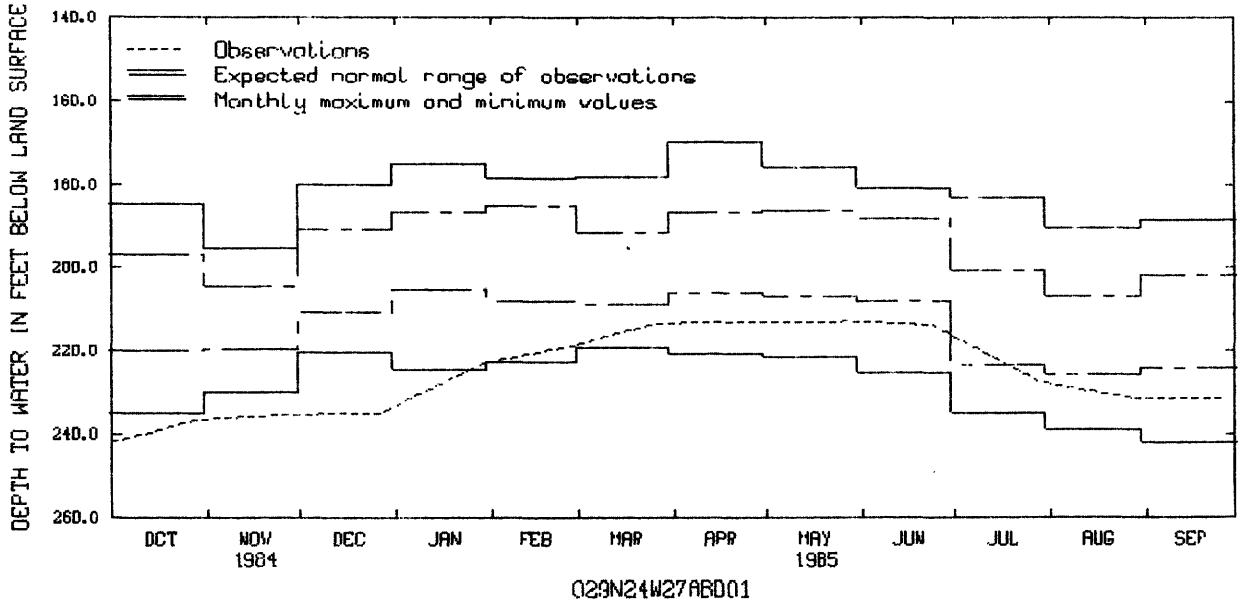
WTR YEAR 1985 HIGHEST 61.70 NOV 23, 1984 LOWEST 132.13 JUL 18, 1985

HENNEPIN COUNTY--Continued

445829093162901. Local number, 029N24W27ABD01.
LOCATION.--Lat 44°58'29", long 93°16'29", in SE¼NW¼NE¼ sec.27, T.29 N., R.24 W., Hydrologic Unit 07010206, at 911 LaSalle Avenue, Minneapolis.
Owner: American Linen Supply Co.
AQUIFER.--Mount Simon Sandstone of Late Cambrian Age and Hinckley Sandstone of Late Precambrian Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 16 in (0.41 m), depth 1,094 ft (333 m), cased to 812 ft (248 m).
DATUM.--Altitude of land-surface datum is 850 ft (259 m). Measuring point: Hole in pump base, 22.00 ft (6.71 m) below land-surface datum.
REMARKS.--Water level affected by regional pumping.
PERIOD OF RECORD.--July 1970 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 169.8 ft (51.76 m) below land-surface datum, Apr. 15, 1980; lowest, 242.0 ft (73.76 m) below land-surface datum, Sept. 27, 1984.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 29	236.56	DEC 27	235.05	FEB 27	218.82	APR 26	213.17	JUN 24	213.96	AUG 28	231.54
NOV 29	235.34	JAN 29	223.26	MAR 27	213.38	MAY 28	212.92	JUL 29	227.75	SEP 26	231.69



445158093225101. Local number, 116N21W07DAD01.
LOCATION.--Lat 44°51'58", long 93°22'51", in SE¼NE¼SE¼ sec.7, T.116 N., R.21 W., Hydrologic Unit 07020012, at Braemer Golf Course.
Owner: City of Edina, well 14.
AQUIFER.--Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled public-supply artesian well, diameter 16 in (0.41 m), depth 420 ft (128 m), cased to 325 ft (99.1 m).
DATUM.--Altitude of land-surface datum is 848 ft (258 m). Measuring point: Vent pipe at land-surface datum.
PERIOD OF RECORD.--April 1965 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 31.26 ft (9.53 m) below land-surface datum, Apr. 4, 1966; lowest, 63.20 ft (19.26 m) below land-surface datum, July 21, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 5	47.45	JAN 9	49.02	MAR 7	49.12	MAY 3	54.82	SEP 9	50.46

HENNEPIN COUNTY--Continued

445615093212301. Local number, 117N21W16CCA01.
LOCATION.--Lat 44°56'15", long 93°21'23", in NE¼SW¼SW¼ sec.16, T.117 N., R.21 W., Hydrologic Unit 07010206, at 6021 36th Street West by water tower.
Owner: City of St. Louis Park, old well 1.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age and Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 16 in (0.41 m), depth 421 ft (128 m), cased to 280 ft (85.3 m).
DATUM.--Land-surface datum is 917.4 ft (279.6 m), revised, National Geodetic Vertical Datum of 1929. Measuring point: Top of well cover, 0.70 ft (0.21 m) above land-surface datum.
REMARKS.--Water level affected by pumping of nearby wells.
PERIOD OF RECORD.--February 1953 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 66.0 ft (20.11 m) below land-surface datum, Mar. 23, 1953; lowest, 110.5 ft (33.68 m) below land-surface datum, July 31, 1959.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	86.89	80.15	81.82	81.21	82.94	81.92	83.12	89.12	87.94	96.98	93.92	.....
10	86.97	80.72	81.05	82.17	81.76	81.77	82.86	92.51	94.75	103.40	95.24	.....
15	86.06	82.80	81.67	81.50	83.61	83.26	84.31	89.12	89.52	100.81	90.01	.....
20	82.71	81.12	82.11	81.34	83.53	83.07	88.58	87.27	89.11	97.98	.....	.....
25	82.23	78.23	79.25	82.62	82.41	82.49	86.84	89.38	91.88	98.38	.....	.....
EOM	81.95	81.58	79.39	82.51	83.42	81.81	87.50	89.62	90.89	91.75	WELL	DESTROYED

WTR YEAR 1985 HIGHEST 77.46 NOV 25, 1984 LOWEST 103.54 JUL 11, 1985

445180093211801. Local number, 117N21W16CDB01.
LOCATION.--Lat 44°56'18", long 93°21'18", in NW¼SE¼SW¼ sec.16, T.117 N., R.21 W., Hydrologic Unit 07010206, at 2565 Wooddale Avenue South, St. Louis Park.
Owner: D-A Lubricant Co.
AQUIFER.--Ironton-Galesville Sandstones of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled observation artesian well, diameter 4 in (0.10 m), depth 691 ft (211 m), screened 651 to 661 ft (198 to 202 m).
DATUM.--Altitude of land-surface datum is 917.2 ft (279.6 m), National Geodetic Vertical Datum of 1929. Measuring point: Hole in well seal, 3.60 ft (1.10 m) above land-surface datum.
REMARKS.--Water level affected by pumping.
PERIOD OF RECORD.--April 1980 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 131.8 ft (40.17 m) below land-surface datum, Apr. 16, 1982; lowest, 146.7 ft (44.71 m) below land-surface datum, Aug. 31, 1982.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 5	140.35	JAN 9	135.27	MAR 7	133.20	MAY 3	133.24	JUL 16	139.02	SEP 9	142.17

445347093213901. Local number, 117N21W32DAD01.
LOCATION.--Lat 44°53'47", long 93°21'39", in SE¼NE¼SE¼ sec.32, T.117 N., R.21 W., Hydrologic Unit 07010206, at Hanson Road and Benton Avenue.
Owner: City of Edina, well 9.
AQUIFER.--Hinckley Sandstone of Late Precambrian Age.
WELL CHARACTERISTICS.--Drilled public-supply artesian well, diameter 16 in (0.41 m), depth 1,130 ft (344 m), cased to 1,010 ft (308 m).
DATUM.--Land-surface datum is 933.3 ft (284.5 m) National Geodetic Vertical Datum of 1929. Measuring point: Hole in east side of pump base, 2.00 ft (0.61 m) above land-surface datum.
REMARKS.--Water level affected by pumping.
PERIOD OF RECORD.--August 1961 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 230.8 ft (70.35 m) below land-surface datum, Apr. 20, 1962; lowest, 379.0 ft (115.5 m) below land-surface datum, Sept. 25, 1985.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

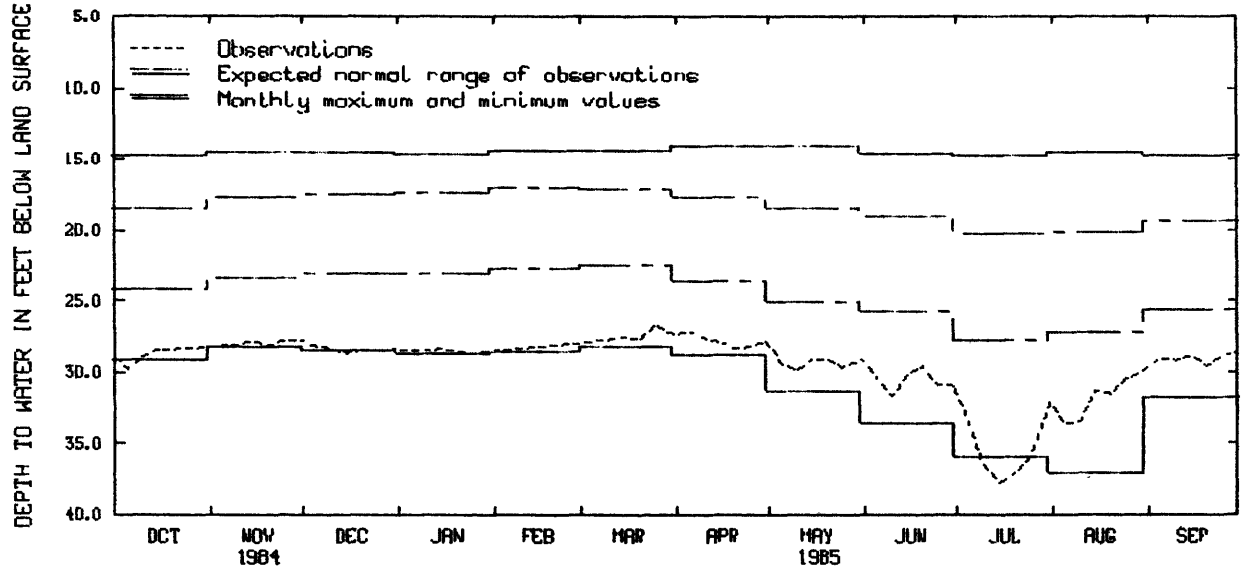
DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 5	341.84	MAR 7	314.57	MAY 3	310.35	SEP 25	379.00
JAN 9	335.92						

445740093333001. Local number, 117N23W11BBD01.
LOCATION.--Lat 44°57'40", long 93°33'30", in SE¼NW¼NW¼ sec.11, T.117 N., R.23 W., Hydrologic Unit 07010206, 2 mi (3.2 km) southwest of Wayzata, at Lake Minnetonka.
Owner: Minnetonka Boat Works, Inc., Orono.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age and Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled observation artesian well, diameter 6 in (0.15 m), depth 437 ft (133 m), cased to 270 ft (82.3 m).
DATUM.--Altitude of land-surface datum is 930.8 ft (283.7 m) National Geodetic Vertical Datum of 1929. Measuring point: Wood floor of instrument shelter, 3.30 ft (1.01 m) above land-surface datum.
REMARKS.--Water level affected by pumping.
PERIOD OF RECORD.--August 1942 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 14.05 ft (4.33 m) below land-surface datum, Apr. 30, 1954; lowest, 37.82 ft (11.52 m) below land-surface datum, July 16, 1985.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	29.76	28.18	28.22	28.47	.....	.....	27.17	29.36	30.41	33.62	33.70	29.13
10	28.90	28.09	28.40	28.48	.....	27.76	27.62	29.94	31.75	36.54	33.46	29.20
15	28.46	27.87	28.66	28.37	.....	27.61	27.92	29.08	30.12	37.75	31.34	28.91
20	28.44	28.12	28.50	28.51	.....	27.75	28.36	29.09	29.63	37.13	31.63	29.57
25	.....	27.80	28.50	28.67	.....	26.67	28.26	29.65	30.94	35.98	30.53	28.91
EOM	.....	27.82	28.39	.....	.....	27.40	27.84	29.15	31.00	32.15	29.86	28.62

WTR YEAR 1985 HIGHEST 27.01 APR 12, 1985 LOWEST 37.82 JUL 16, 1985



450223093231801. Local number, 118N21W07DCB01.
LOCATION.--Lat 45°02'23", long 93°23'18", in NW¼SW¼SE¼ sec.7, T.118 N., R.21 W., Hydrologic Unit 07010206, at 47th Avenue North and Aquila Avenue.
Owner: City of New Hope.
AQUIFER.--Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 16 in (0.41 m), depth 422 ft (129 m), cased to 339 ft (103 m).
DATUM.--Altitude of land-surface datum is 933 ft (284 m). Measuring point: Top of wood platform, 3.00 ft (0.91 m) above land-surface datum.
REMARKS.--Water level affected by pumping.
PERIOD OF RECORD.--October 1965 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 60.46 ft (18.43 m) below land-surface datum, Dec. 17, 1967; lowest, 77.56 ft (23.64 m) below land-surface datum, July 11, 1985.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	63.09	.....	63.41	63.08	63.29	63.29	63.08	64.63	64.59	67.00	66.19	64.61
10	63.37	.....	63.23	63.42	63.40	.....	63.08	65.28	66.14	77.52	67.18	64.72
15	62.93	.....	63.66	63.19	63.56	63.56	63.17	64.54	65.21	72.58	65.79	64.51
20	63.34	.....	63.34	63.44	63.37	63.43	64.18	64.30	64.96	68.13	65.19	65.58
25	62.82	.....	63.06	63.60	63.26	63.10	64.11	64.96	65.37	68.06	65.16	64.17
EOM	63.20	.....	63.10	63.53	63.59	63.32	64.11	64.87	65.70	66.27	65.58	63.52

WTR YEAR 1985 HIGHEST 62.08 NOV 27, 1984 LOWEST 77.56 JUL 11, 1985

445905093224401. Local number, 118N21W32CBB01.
LOCATION.--Lat 44°59'05", long 93°22'44", in NW¼NW¼SW¼ sec.32, T.118 N., R.21 W., Hydrologic Unit 07010206, at Winnetka Avenue and Highway 55, Golden Valley.
Owner: Red Owl Store.
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled unused water-table well, diameter 6 in (0.16 m), depth 95 ft (29.0 m), screened 87 to 95 ft (26.5 to 29.0 m).
DATUM.--Altitude of land-surface datum is 895 ft (273 m). Measuring point: Top of well cap, 0.80 ft (0.24 m) above land-surface datum.
PERIOD OF RECORD.--May 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 17.94 ft (5.47 m) below land-surface datum, May 21, 1984; lowest, 21.05 ft (6.42 m) below land-surface datum, May 5, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 1	18.18	JAN 10	18.46	MAR 8	18.85	MAY 3	18.40	JUL 16	19.09	SEP 17	18.59

445857093223101. Local number, 118N21W32CBD01.
LOCATION.--Lat 44°58'57", long 93°22'31", in SE¼NW¼SW¼ sec.32, T.118 N., R.21 W., Hydrologic Unit 07010206, at 760 Harold Avenue, Golden Valley.
Owner: Golden Valley Methodist Church.
AQUIFER.--St. Peter Sandstone of Middle Ordovician Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 6 in (0.15 m), depth 265 ft (80.8 m), cased to 200 ft (61.0 m).
DATUM.--Altitude of land-surface datum is 890 ft (271 m). Measuring point: Top of well cap, 0.70 ft (0.21 m) above land-surface datum.
PERIOD OF RECORD.--February 1971 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 31.40 ft (9.57 m) below land-surface datum, May 3, 1984; lowest, 37.51 ft (11.43 m) below land-surface datum, Aug. 24, 1971.

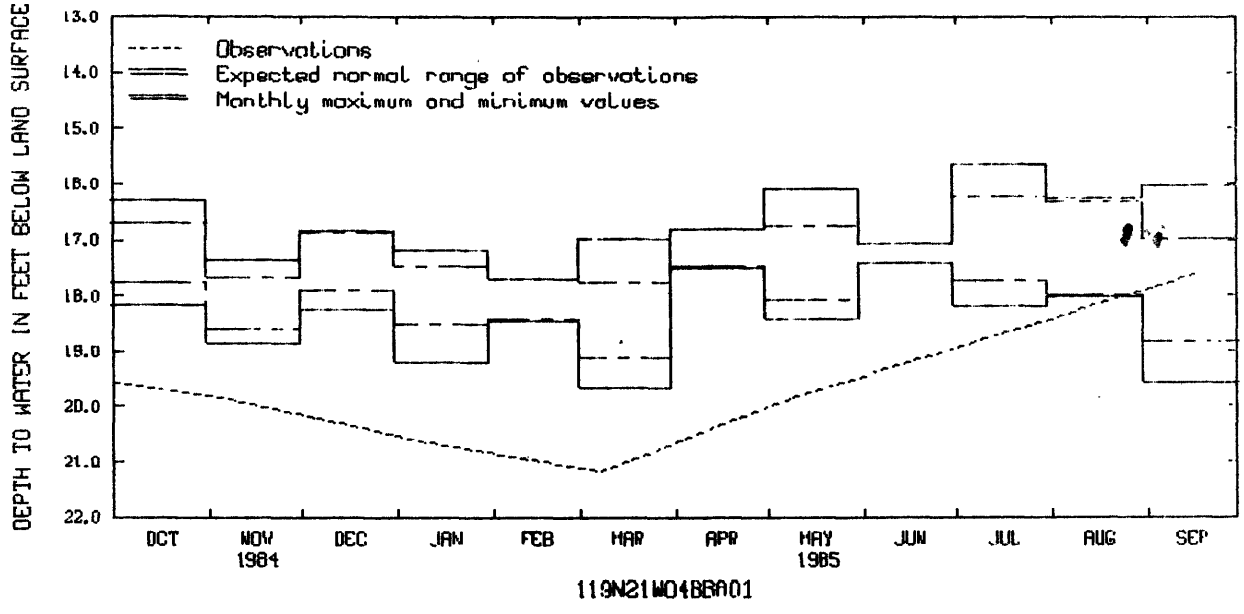
WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 1	31.87	MAR 8	32.48	MAY 3	32.75	JUL 16	34.96	SEP 17	32.70
JAN 10	32.25								

450854093212801. Local number, 119N21W04BBA01.
LOCATION.--Lat 45°08'54", long 93°21'28", in NE¼NW¼NW¼ sec.4, T.119 N., R.21 W., Hydrologic Unit 07010206, 109th Avenue North, 0.15 mi (0.24 km) east of Zane Avenue North, Brooklyn Park.
Owner: Walter Tessman.
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled irrigation water-table well, diameter 12 in (0.30 m), depth 80 ft (24.4 m), screened 62 to 80 ft (18.9 to 24.4 m).
DATUM.--Altitude of land-surface datum is 876 ft (267 m). Measuring point: Hole in pump base, 1.00 ft (0.30 m) above land-surface datum.
PERIOD OF RECORD.--September 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 15.66 ft (4.77 m) below land-surface datum, July 26, 1978; lowest, 21.18 ft (6.45 m) below land-surface datum, Mar. 8, 1985.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

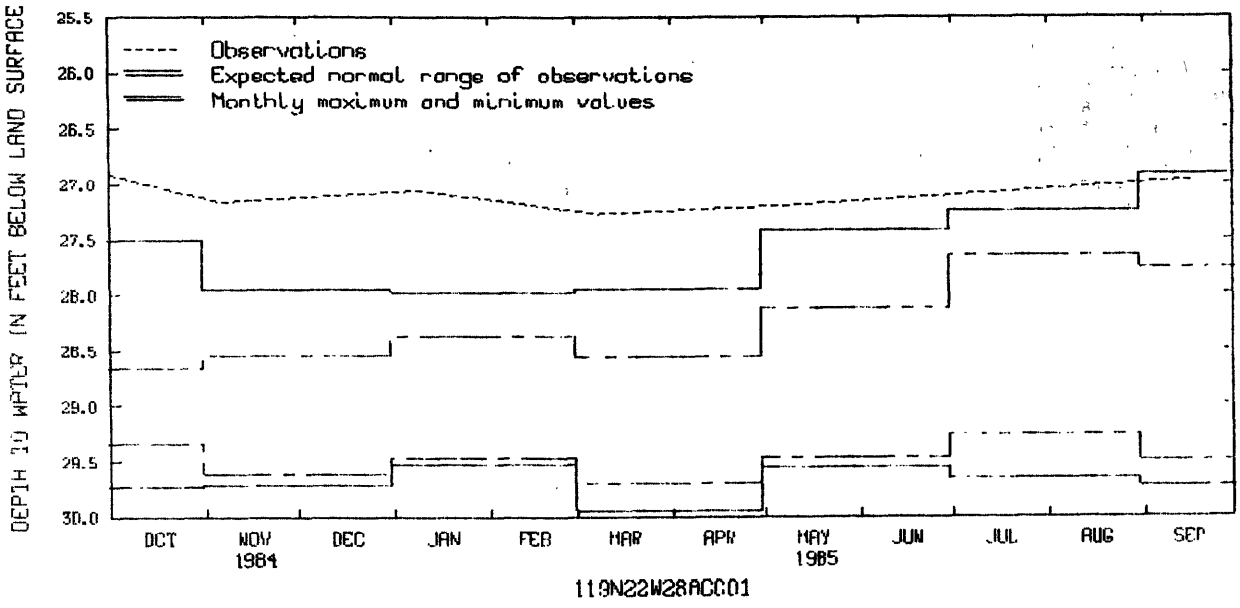
DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 5	19.85	JAN 10	20.65	MAR 8	21.18	MAY 7	19.89	SEP 17	17.62



450519093281401. Local number, 119N22W28ACC01.
LOCATION.--Lat 45°05'19", long 93°28'14", in SW¼SW¼NE¼ sec.28, T.119 N., R.22 W., Hydrologic Unit 07010206, at 7349 Mariner Drive, Maple Grove.
Owner: Cliff Lake.
AQUIFER.--Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 4 in (0.10 m), depth 192 ft (58.5 m), cased to 187 ft (57.0 m).
DATUM.--Altitude of land-surface datum is 925 ft (288 m). Measuring point: Top of well cap, 1.80 ft (0.55 m) above land-surface datum.
PERIOD OF RECORD.--October 1980 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 26.92 ft (8.21 m) below land-surface datum, Sept. 12, 1984; lowest, 29.94 ft (9.13 m) below land-surface datum, Mar. 11, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 5	27.16	JAN 10	27.06	MAR 8	27.27	MAY 7	27.20	SEP 17	26.97



HOUSTON COUNTY

433953091251801. Local number, 102N05W03DCC01.
LOCATION.--Lat 43°39'53", long 91°25'18", in SW¼SW¼SE¼ sec.3, T.102 N., R.5 W., Hydrologic Unit 07060001, 3 mi (4.8 km) east of Caledonia.
Owner: U.S. Geological Survey.
AQUIFER.--Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled observation water-table well, diameter 4 in (0.10 m), depth 360 ft (110 m), cased to 309 ft (94.2 m).
DATUM.--Altitude of land-surface datum is 1,210 ft (369 m). Measuring point: Top of casing, 2.50 ft (0.76 m) above land-surface datum.
PERIOD OF RECORD.--June 1981 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 213.8 ft (65.16 m) below land-surface datum, July 17, 1985; lowest, 245.5 ft (74.83 m) below land-surface datum, June 4, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 2	216.06	MAR 14	215.59	MAY 9	213.77	JUL 17	213.76	SEP 12	215.18
JAN 16	215.27								

433935091252001. Local number, 102N05W03DCC02.
LOCATION.--Lat 43°39'35", long 91°25'20", in SW¼SW¼SE¼ sec.3, T.102 N., R.5 W., Hydrologic Unit 07060001, 3 mi (4.8 km) east of Caledonia.
Owner: U.S. Geological Survey.
AQUIFER.--Ironton-Galesville Sandstones of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled observation artesian well, diameter 4 in (0.10 m), depth 650 ft (198 m), cased to 614 ft (187 m).
DATUM.--Altitude of land-surface datum is 1,210 ft (369 m). Measuring point: Top of casing, 2.50 ft (0.76 m) above land-surface datum.
PERIOD OF RECORD.--November 1980 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 441.5 ft (134.6 m) below land-surface datum, June 4, 1981; lowest, 448.5 ft (136.7 m) below land-surface datum, Nov. 25, 1980.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 2	441.59	MAR 14	443.81	MAY 9	442.84	JUL 17	443.06	SEP 12	443.05
JAN 16	443.53								

443935091252901. Local number, 102N05W03DCC03.
LOCATION.--Lat 44°39'35", long 91°25'19", in SW¼SW¼SE¼ sec.3, T.102 N., R.5 W., Hydrologic Unit 07060001, 3 mi (4.8 km) east of Caledonia.
Owner: U.S. Geological Survey
AQUIFER.--Mount Simon Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled observation artesian well, diameter 4 in (0.10 m), depth 888 ft (271 m), cased to 858 ft (262 m).
DATUM.--Altitude of land-surface datum is 1,210 ft (369 m). Measuring point: Top of casing, 2.00 ft (0.61 m) above land-surface datum.
PERIOD OF RECORD.--July 1982 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 522.0 ft (159.1 m) below land-surface datum, Nov. 10, 1983; lowest, 524.6 ft (159.9 m) below land-surface datum, Sept. 20, 1983.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

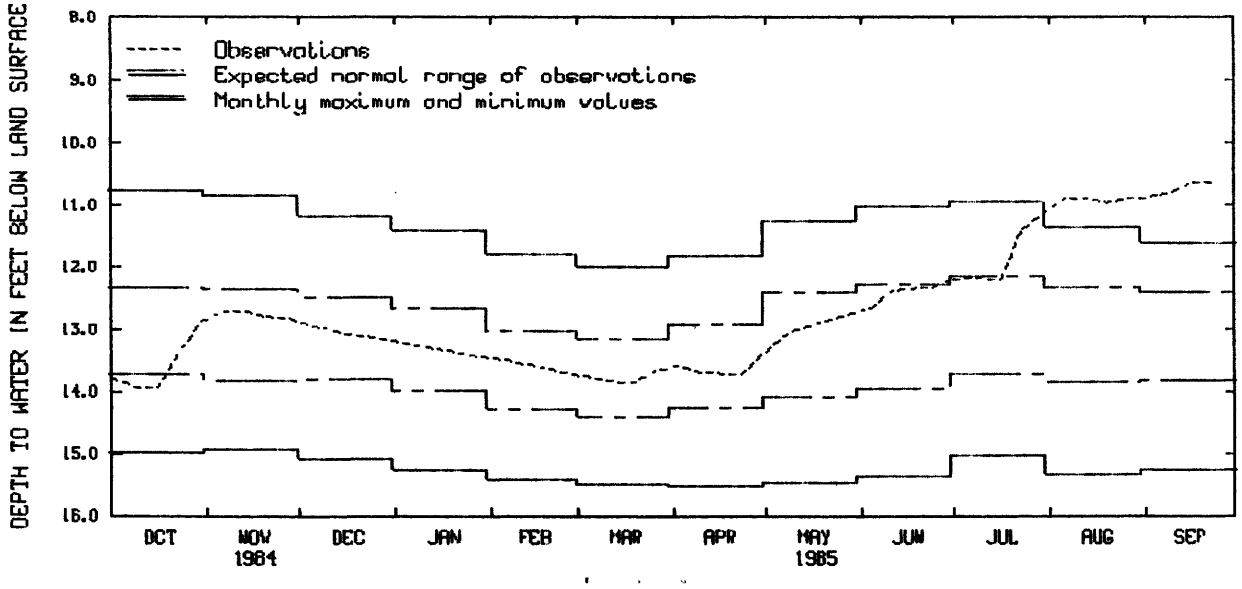
DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 2	523.85	MAR 14	523.48	MAY 9	522.15	JUL 17	524.20	SEP 12	524.58
JAN 16	523.30								

HUBBARD COUNTY

465142094433201. Local number, 139N32W16AAA01.
LOCATION.--Lat 46°51'42", long 94°43'32", in NE¼NE¼NE¼ sec.16, T.139 N., R.32 W., Hydrologic Unit 07010106, at Badoura Nursery.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial outwash sand of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 21 ft (6.4 m), screened 19 to 21 ft (5.8 to 6.4 m).
DATUM.--Altitude of land-surface datum is 1,419 ft (433 m). Measuring point: Top of casing, 2.00 ft (0.61 m) above land-surface datum.
REMARKS.--Measured weekly by Archie Hakala.
PERIOD OF RECORD.--September 1970 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 10.63 ft (3.24 m) below land-surface datum, Sept. 24, 1985; lowest, 15.51 ft (4.73 m) below land-surface datum, Apr. 12, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 9	13.93	DEC 18	13.09	FEB 13	13.58	APR 9	13.69	JUN 4	12.67	AUG 6	10.90
16	13.94	24	13.12	19	13.64	16	13.71	11	12.39	13	10.89
23	13.34	31	13.19	26	13.71	23	13.73	18	12.35	20	10.97
30	12.89	JAN 8	13.27	MAR 5	13.78	30	13.39	24	12.33	26	10.91
NOV 7	12.71	15	13.32	12	13.83	MAY 7	13.10	JUL 1	12.20	SEP 3	10.88
13	12.72	22	13.39	19	13.86	14	12.96	9	12.19	10	10.80
20	12.81	29	13.45	26	13.68	21	12.87	16	12.22	17	10.64
27	12.82	FEB 5	13.50	APR 2	13.60	28	12.78	23	11.40	24	10.63
DEC 4	12.94										



GROUND-WATER LEVLES

ISANTI COUNTY

453125093181101. Local number, 035N24W14BCD01.
LOCATION.--Lat 45°31'25", long 93°18'11", in SE¼SW¼NW¼ sec.14, T.35 N., R.24 W., Hydrologic Unit 07010207, northwest of Isanti.
Owner: Allen Kluck.
AQUIFER.--Eau Claire - Mount Simon Formations of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled irrigation artesian well, diameter 12 in (0.30 m), depth 300 ft (91.4 m), cased to 105 ft (32.0 m).
DATUM.--Altitude of land-surface datum is 940 ft (287 m). Measuring point: Hole in pump base, 0.10 ft (0.03 m) above land-surface datum.
PERIOD OF RECORD.--February 1968 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 11.92 ft (3.63 m) below land-surface datum, Sept. 3, 1985; lowest, 15.72 ft (4.79 m) below land-surface datum, Apr. 4, 1968.

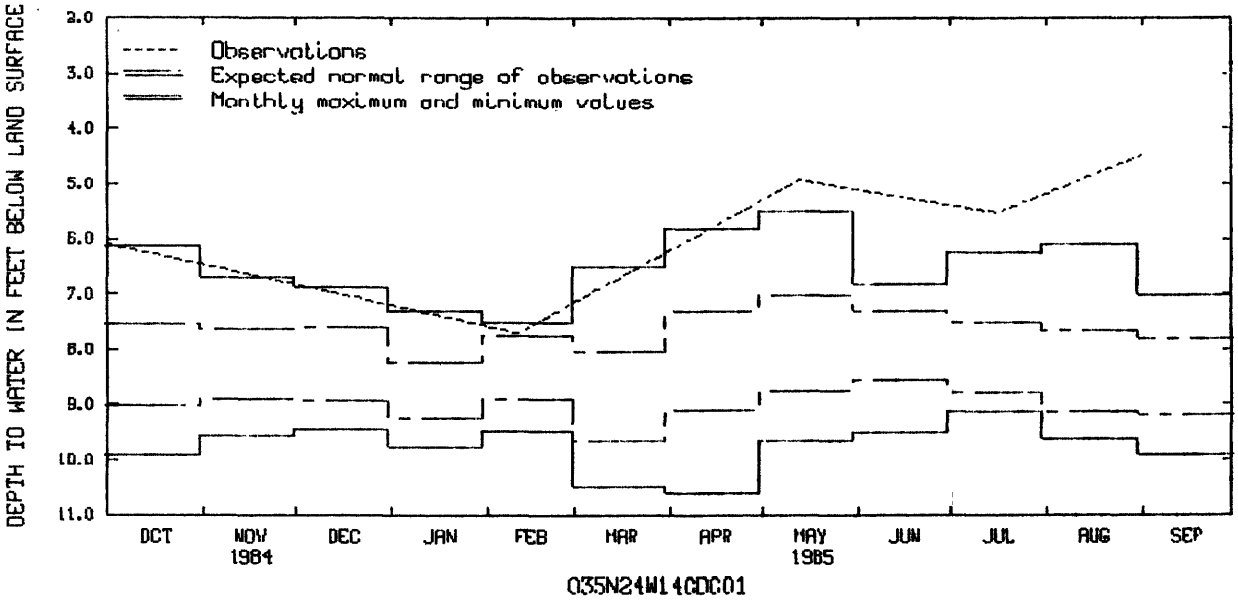
WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
MAY 13	12.78	JUL 16	12.12	SEP 3	11.92

453058093175901. Local number, 035N24W14CDC01.
LOCATION.--Lat 45°30'58", long 93°17'59", in SW¼SE¼SW¼ sec.14, T.35 N., R.24 W., Hydrologic Unit 07010207, northwest of Isanti.
Owner: Ernest Kluck.
AQUIFER.--Surficial outwash sand of Pleistocene Age.
WELL CHARACTERISTICS.--Driven unused water-table well, diameter 1¼ in (0.03 m), depth 17 ft (5.18 m), screen information not available.
DATUM.--Altitude of land-surface datum is 930 ft (283 m). Measuring point: Top of casing, 3.00 ft (0.91 m) above land-surface datum.
PERIOD OF RECORD.--March 1968 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 4.44 ft (1.35 m) below land-surface datum, Sept. 3,1985; lowest, 10.60 ft (3.23 m) below land-surface datum, Apr. 4, 1968.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
FEB 11	7.70	MAY 13	4.92	JUL 16	5.53	SEP 3	4.44

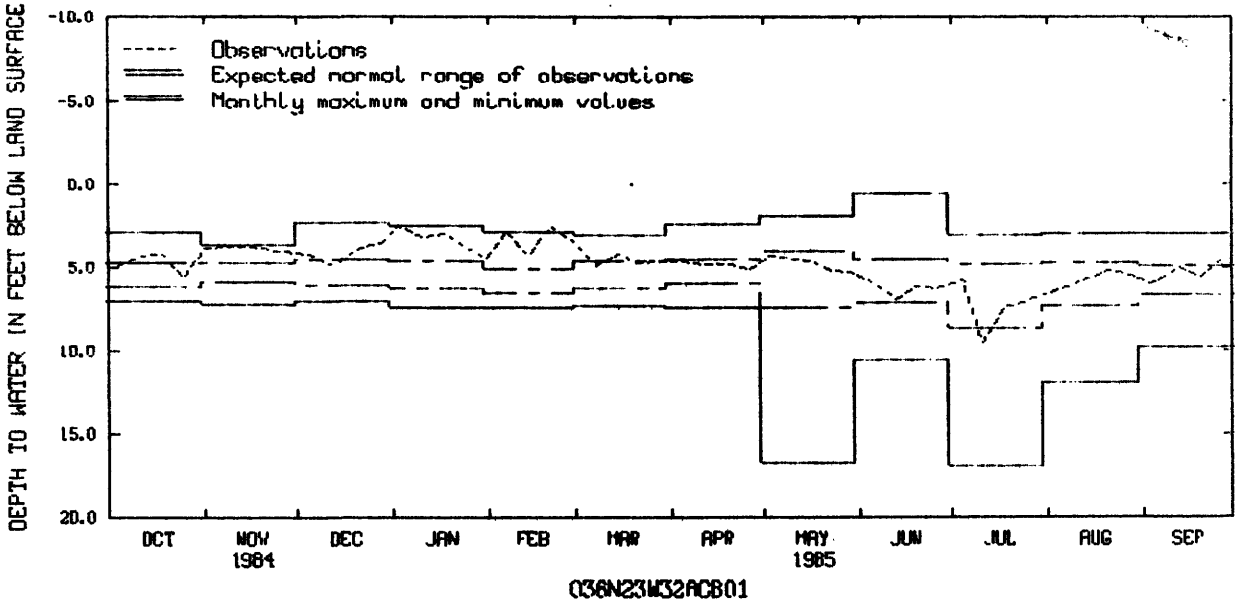


ISANTI COUNTY--Continued

453410093140001. Local number, 036N23W32ACB01.
LOCATION.--Lat 45°34'10", long 93°14'00", in NW¼SW¼NE¼ sec.32, T.36 N., R.23 W., Hydrologic Unit 07010207, in Cambridge.
Owner: City of Cambridge, well 4.
AQUIFER.--Hinckley Sandstone of Late Precambrian Age.
WELL CHARACTERISTICS.--Drilled public-supply artesian well, diameter 20 in (0.51 m), depth 630 ft (192 m), cased to 352 ft (107 m).
DATUM.--Altitude of land-surface datum is 960 ft (293 m). Measuring point: Edge of vent pipe, 3.00 ft (0.91 m) above land-surface datum.
REMARKS.--Measured weekly by Thomas Minar. Water level affected by pumping.
PERIOD OF RECORD.--July 1972 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 0.60 ft (0.18 m) below land-surface datum, June 21, 1984; lowest, 16.95 ft (5.17 m) below land-surface datum, July 11, 1974.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 4	4.88	DEC 6	4.30	FEB 7	2.86	APR 5	4.63	MAY 31	5.40	JUL 25	7.09
12	4.31	13	4.96	14	4.35	12	4.86	JUN 3	6.08	AUG 22	5.18
18	4.16	20	4.03	21	2.54	19	4.80	13	6.97	29	5.57
25	5.64	28	3.56	27	3.27	26	5.20	20	6.13	SEP 4	6.00
NOV 1	3.84	JAN 3	2.51	MAR 8	4.87	MAY 3	4.30	27	6.29	13	5.05
15	3.73	10	3.20	15	4.25	9	4.44	JUL 5	5.75	20	5.60
23	4.00	18	3.00	21	4.72	17	4.70	11	9.54	26	4.59
29	4.13	31	4.55	28	4.65	23	5.20	18	7.43		



ITASCA COUNTY

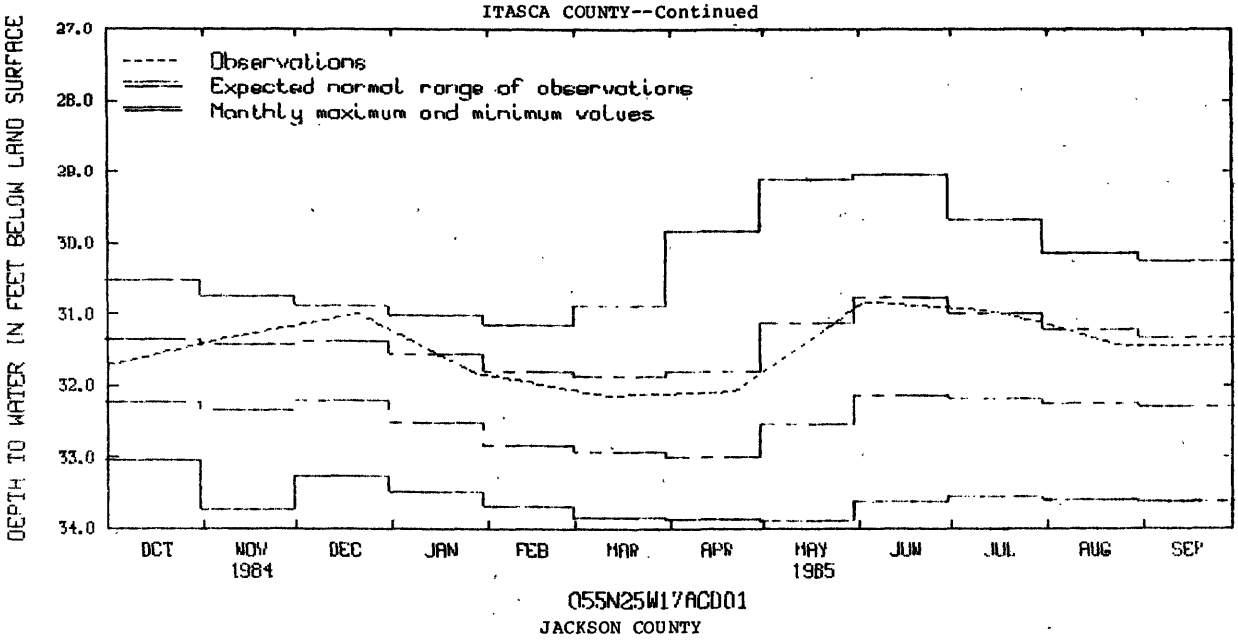
471450093322001. Local number, 055N25W17ACD01.
LOCATION.--Lat 47°14'50", long 93°32'20", in SE¼SW¼NE¼ sec.17, T.55 N., R.25 W., Hydrologic Unit 07010103, at west end of 13th Street NW, Grand Rapids.
Owner: U.S. Geological Survey.
AQUIFER.--Buried sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled observation water-table well, diameter 4 in (0.10 m), depth 147 ft (44.8 m), screened 143 to 147 ft (43.6 to 44.8 m).
DATUM.--Altitude of land-surface datum is 1,318 ft (402 m). Measuring point: Top of platform, 1.60 ft (0.49 m) above land-surface datum.
PERIOD OF RECORD.--April 1962 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 29.04 ft (8.85 m) below land-surface datum, June 1, 1966; lowest, 33.92 ft (10.34 m) below land-surface datum, May 17, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 5	31.37	JAN 28	31.83	APR 22	32.08	JUL 16	30.97	AUG 26	31.45
DEC 21	31.00	MAR 11	32.14	JUN 3	30.83				

GROUND-WATER LEVELS

ITASCA COUNTY--Continued

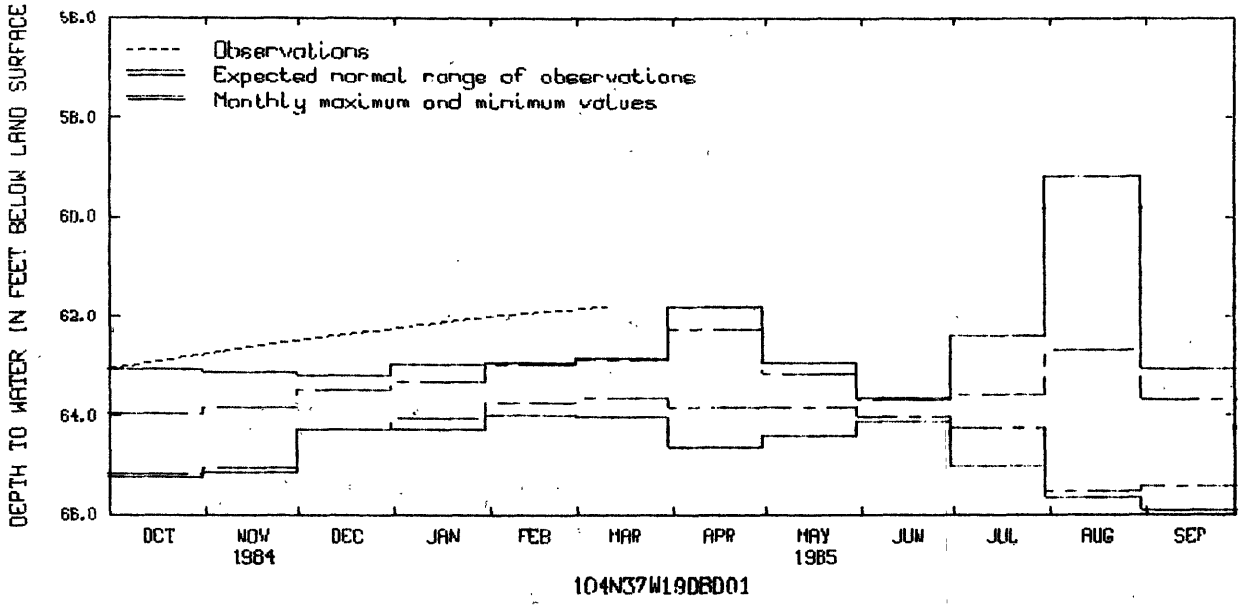


055N25W17ACD01
JACKSON COUNTY

434742095191501. Local number, 104N37W19DBD01.
LOCATION.--Lat 43°47'42", long 95°19'15", in SE¼NW¼SE¼ sec.19, T.104 N., R.37 W., Hydrologic Unit 07100001, at Heron Lake.
Owner: City of Heron Lake, old railroad well.
AQUIFER.--Sioux Quartzite of Late Precambrian Age.
WELL CHARACTERISTICS.--Drilled public-supply artesian well, diameter 16 in (0.41 m), depth 323 ft (98.4 m), screened 205 to 225 ft (62.5 to 68.6 m).
DATUM.--Altitude of land-surface datum is 1,420 ft (433 m). Measuring point: Edge of breather pipe, 2.60 ft (0.79 m) above land-surface datum.
PERIOD OF RECORD.--August 1972, July 1973, September 1976, July 1978 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 59.16 ft (18.03 m) below land-surface datum, Aug. 11, 1972; lowest, 66.10 ft (20.15 m) below land-surface datum, July 14, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 21	62.55	JAN 31	62.00	MAR 12	61.79



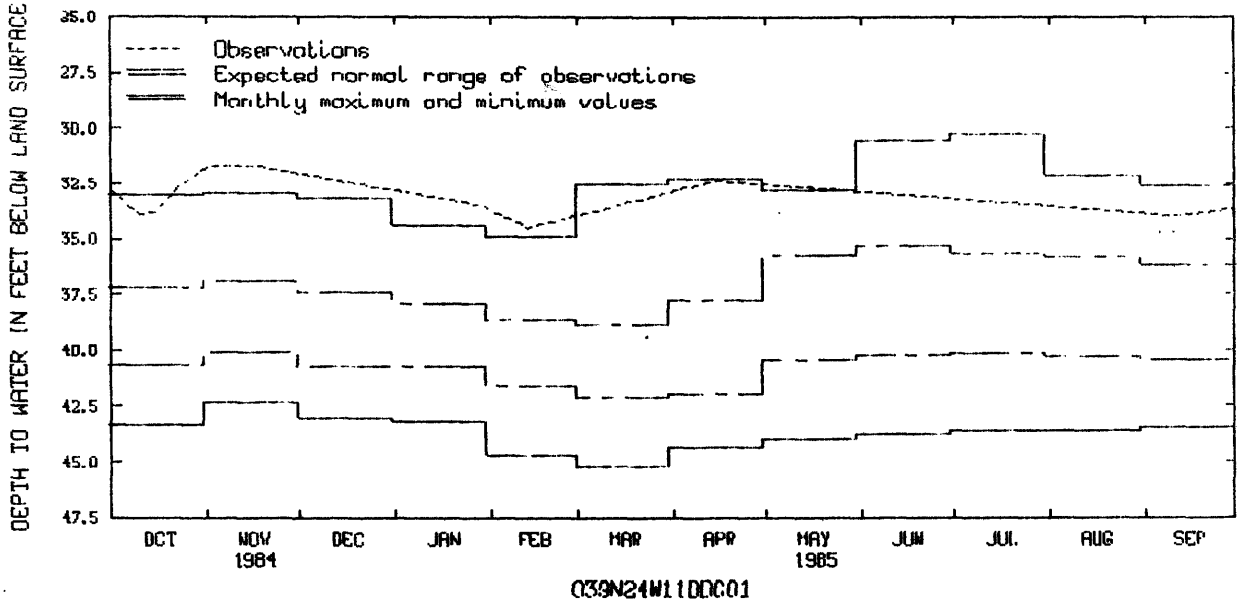
104N37W19DBD01

KANABEC COUNTY

455236093172301. Local number, 039N24W11DDC01.
LOCATION.--Lat 45°52'36", long 93°17'23", in SW¼SE¼SE¼ sec.11, T.39 N., R.24 W., Hydrologic Unit 07030004, intersection of Forest Avenue and U.S. Highway 65.
Owner: City of Mora, well 3.
AQUIFER.--Buried sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled public-supply artesian well, diameter 12 in (0.30 m), depth 170 ft (51.8 m), screened 150 to 170 ft (45.7 to 51.8 m).
DATUM.--Altitude of land-surface datum is 1,011 ft (308 m). Measuring point: Edge of vent pipe, 2.40 ft (0.73 m) above land-surface datum.
PERIOD OF RECORD.--March 1968 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 30.26 ft (9.22 m) below land-surface datum, July 5, 1984; lowest, 45.18 ft (13.77 m) below land-surface datum, Mar. 15, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	33.87	OCT 23	32.64	NOV 5	31.69	JAN 29	33.47	APR 15	32.36	SEP 11	33.96
15	33.79	NOV 1	31.76	16	31.70	FEB 13	34.50				



KANDIYOHI COUNTY

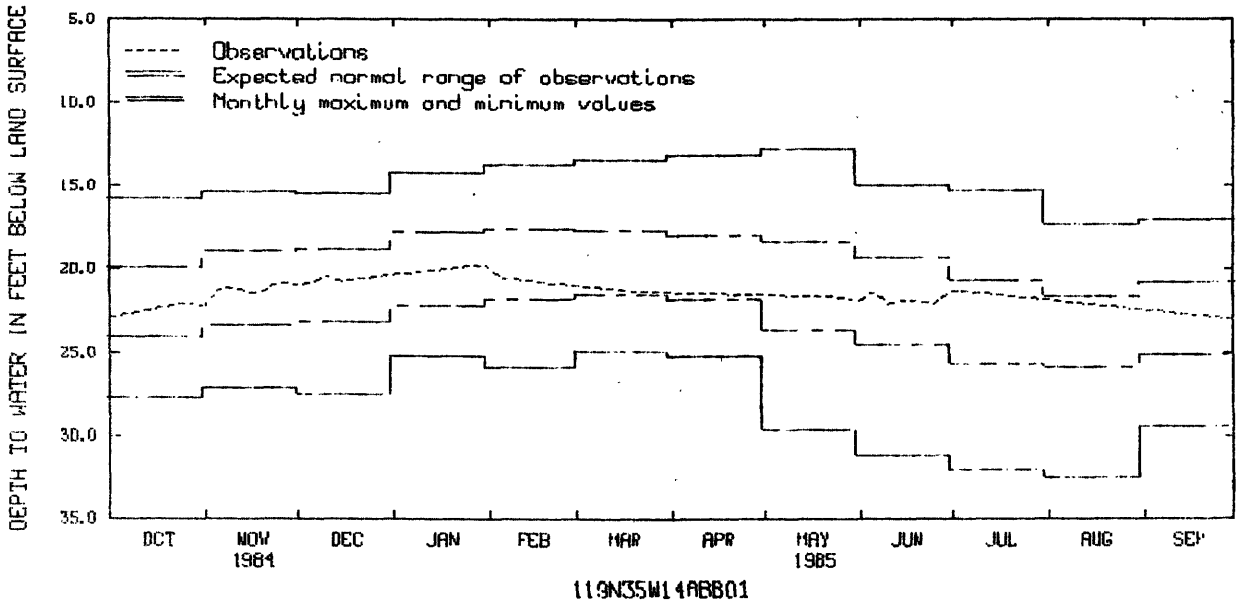
450730095014801. Local number, 119N35W14ABB01.
LOCATION.--Lat 45°07'30", long 95°01'48", in NW¼NW¼NE¼ sec.14, T.119 N., R.35 W., Hydrologic Unit 07020004, at Willmar.
Owner: Burlington Northern, Inc.
AQUIFER.--Buried sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 10 in (0.25 m), depth 320 ft (97.5 m), screened 297 to 320 ft (89.9 to 97.5 m).
DATUM.--Altitude of land-surface datum is 1,140 ft (347 m). Measuring point: Wood floor of recorder shelter, 1.00 ft (0.30 m) above land-surface datum.
REMARKS.--Water level affected by pumping.
PERIOD OF RECORD.--December 1967 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 12.78 ft (3.90 m) below land-surface datum, May 12, 1969; lowest, 32.50 ft (9.91 m) below land-surface datum, Aug. 27, 1976.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	.....	21.25	20.92	.....	20.55	.....	.....	.....	21.43	21.35	.....	.....
10	.....	21.16	20.74	.....	.....	.....	.....	.....	22.10	.....	.....	26.00
15	.....	21.49	20.75	.....	.....	.....	.....	.....	21.90	.....	.....	.....
20	.....	21.34	.....	.....	.....	21.43	.....	.....	21.96	.....	.....	23.57
25	22.08	20.83	.....	19.86	.....	.....	.....	21.70	22.10	.....	.....	22.49
EOM	22.28	20.98	.....	19.81	.....	.....	.....	22.03	21.40	.....	.....	21.75

WTR YEAR 1985 HIGHEST 19.28 FEB 3, 1985 LOWEST 26.41 SEP 11, 1985

KANDIYOHI COUNTY--Continued



LE SUEUR COUNTY

442522093543901. Local number, 111N26W14ADA01.
LOCATION.--Lat 44°25'22", long 93°54'39", in NE¼SE¼NE¼ sec.14, T.111 N., R.26 W., Hydrologic Unit 07020012, 0.85 mi (1.37 km) south of Le Sueur.
Owner: Merle Moser.
AQUIFER.--Buried gravel of Pleistocene Age and Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled irrigation artesian well, diameter 16 in (0.41 m), depth 242 ft (73.8 m), screened 212 to 242 ft (64.6 to 73.8 m).
DATUM.--Altitude of land-surface datum is 855 ft (261 m). Measuring point: Edge of vent pipe, 1.20 ft (0.37 m) above land-surface datum.
PERIOD OF RECORD.--January 1980 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 73.90 ft (22.52 m) below land-surface datum, May 13, 1985; lowest, 84.55 ft (25.77 m) below land-surface datum, Mar. 9, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 7	74.66	JAN 14	74.28	MAR 18	74.50	MAY 13	73.90	SEP 10	74.55

443234093333501. Local number, 112N23W02BAB01.
LOCATION.--Lat 44°32'34", long 93°33'35", in NW¼NE¼NW¼ sec.2, T.112 N., R.23 W., Hydrologic Unit 07020012, just east of New Prague.
Owner: Holy Trinity Lutheran Church.
AQUIFER.--St. Lawrence Formation of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled domestic artesian well, diameter 4 in (0.10 m), depth 180 ft (54.9 m), cased to 155 ft (47.2 m).
DATUM.--Altitude of land-surface datum is 1,005 ft (306 m). Measuring point: Top of casing, 1.00 ft (0.30 m) above land-surface datum.
PERIOD OF RECORD.--April 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 94.30 ft (28.74 m) below land-surface datum, Mar. 12, 1985; lowest, 99.42 ft (30.30 m) below land-surface datum, July 26, 1979.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 30	95.02	MAR 12	94.30	JUL 11	96.40	SEP 4	95.60
JAN 4	94.90	MAY 8	94.54				

443147093374501. Local number, 112N23W06DDD01.
LOCATION.--Lat 44°31'47",long 93°37'45", in SE¼SE¼SE¼ sec.6, T.112 N., R.23 W., Hydrologic Unit 07020012, 3 mi (4.8 km) southwest of New Prague.
Owner: Friedens Lutheran Church.
AQUIFER.--St. Lawrence Formation of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled domestic artesian well, diameter 5 in (0.13 m), depth 265 ft (80.8 m), cased to 209 ft (63.7 m).
DATUM.--Altitude of land-surface datum is 1,019 ft (311 m). Measuring point: Top of casing, 1.70 ft (0.52 m) above land-surface datum.
PERIOD OF RECORD.--April 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 150.8 ft (45.96 m) below land-surface datum, Mar. 18, 1981; lowest, 152.0 ft (46.33 m) below land-surface datum, Sept. 5, 1984.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

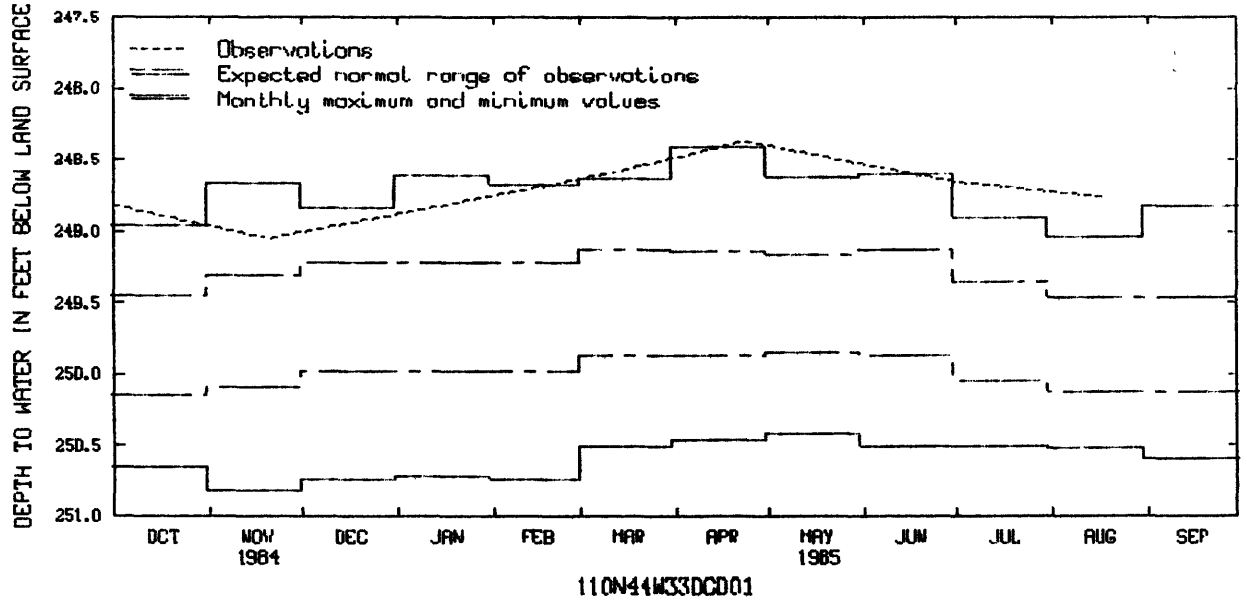
DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 30	151.55	JAN 4	151.52	MAR 12	150.85	MAY 8	150.92	JUL 11	151.68	SEP 4	51.47

LINCOLN COUNTY

441705096084501. Local number, 110N44W33DCD01.
LOCATION.--Lat 44°17'05", long 96°08'45", in SE¼SW¼SE¼ sec.33, T.110 N., R.44 W., Hydrologic Unit 07020006, at Tyler.
Owner: U.S. Geological Survey.
AQUIFER.--Dakota Sandstone of Early Cretaceous Age.
WELL CHARACTERISTICS.--Drilled observation artesian well, diameter 8 in (0.20 m), depth 967 ft (295 m), screened 890 to 900 ft (271 to 274 m).
DATUM.--Altitude of land-surface datum is 1,738 ft (530 m). Measuring point: Top of recorder platform, 3.50 ft (1.07 m) above land-surface datum.
PERIOD OF RECORD.--November 1969 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 248.4 ft (75.71 m) below land-surface datum, Apr. 20, 1970; lowest, 250.8 ft (76.44 m) below land-surface datum, Nov. 12, 1976.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 20	249.05	MAR 12	248.59	APR 23	248.37	JUL 2	248.66	AUG 19	248.76



GROUND WATER LEVELS

MARTIN COUNTY

434359094422201. Local number, 103N32W08CCD01.
LOCATION.--Lat 43°43'59", long 94°42'22", in SE¼SW¼SW¼ sec.8, T.103 N., R.32 W., Hydrologic Unit 07020009, 1.5 mi (2.4 km) south of Trimont.
Owner: Robert Olson.
AQUIFER.--Sandstone of Cretaceous Age.
WELL CHARACTERISTICS.--Drilled irrigation artesian well, diameter 16 in (0.41 m), depth 412 ft (126 m), screened 372 to 412 ft (113 to 126 m).
DATUM.--Altitude of land-surface datum is 1,242 ft (379 m). Measuring point: Vent pipe, 0.50 ft (0.15 m) above land-surface datum.
PERIOD OF RECORD.--July 1981 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 90.72 ft (27.65 m) below land-surface datum, May 9, 1984; lowest, 95.17 ft (29.01 m) below land-surface datum, Nov. 15, 1984.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 7	91.20	JAN 14	91.16	MAR 18	90.80	MAY 13	91.00	JUL 9	91.17	SEP 10	92.50

434725094483001. Local number, 104N33W28BAB01.
LOCATION.--Lat 43°47'25", long 94°48'30", in NW¼NE¼NW¼ sec.28, T.104 N., R.33 W., Hydrologic Unit 07020009, 6.6 mi (10.6 km) northwest of Trimont.
Owner: Kenneth Schafer.
AQUIFER.--Sioux Quartzite of Late Precambrian Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 5 in (0.13 m), depth 178 ft (54.2 m), cased to 121 ft (36.9 m).
DATUM.--Altitude of land-surface datum is 1,290 ft (393 m). Measuring point: Top of casing, 1.30 ft (0.40 m) above land-surface datum.
PERIOD OF RECORD.--September 1981 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 83.15 ft (25.35 m) below land-surface datum, Nov. 7, 1984; lowest, 85.17 ft (25.96m) below land-surface datum, Nov. 9, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 7	83.15	JAN 14	83.52	MAR 18	83.26	MAY 13	83.47	JUL 9	83.53	SEP 10	83.90

MC LEOD COUNTY

444630094021601. Local number, 115N27W14ABA01.
LOCATION.--Lat 44°46'30", long 94°02'16", in NE¼NW¼NE¼ sec.14, T.115 N., R. 27 W., Hydrologic Unit 07010205, in city of Plato.
Owner: Kenny's Garage. Formerly Plato Creamery.
AQUIFER.--Buried sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 6 in (0.15 m), depth 67 ft (20.4 m).
DATUM.--Altitude of land-surface datum is 990 ft (302 m). Measuring point: Edge of pump base, 0.70 ft (0.21 m) above land-surface datum.
REMARKS.--Water level affected by pumping.
PERIOD OF RECORD.--September 1978 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 23.17 ft (7.06 m) below land-surface datum, Nov. 15, 1984; lowest, 34.58 ft (10.54 m) below land-surface datum, July 12, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 3	28.13	NOV 15	23.17

MC LEOD COUNTY--Continued

444758094132101. Local number, 115N28W05ACC01.
LOCATION.--Lat 44°47'58", long 94°13'21", in SW¼SW¼NE¼ sec.5, T.115 N., R.28 W., Hydrologic Unit 07010205, northwest of Glencoe.
Owner: Graupmann Farms, Inc.
AQUIFER.--Mount Simon Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled irrigation artesian well, diameter 12 in (0.30 m), depth 472 ft (144 m), screened 432 to 472 ft (132 to 144 m).
DATUM.--Altitude of land-surface datum is 1,036 ft (316 m). Measuring point: Edge of vent pipe, 2.00 ft (0.61 m) above land-surface datum.
PERIOD OF RECORD.--September 1978 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 80.50 ft (24.54 m) below land-surface datum, Aug. 20, 1979; lowest, 109.6 ft (33.41 m) below land-surface datum, Oct. 1, 1979.

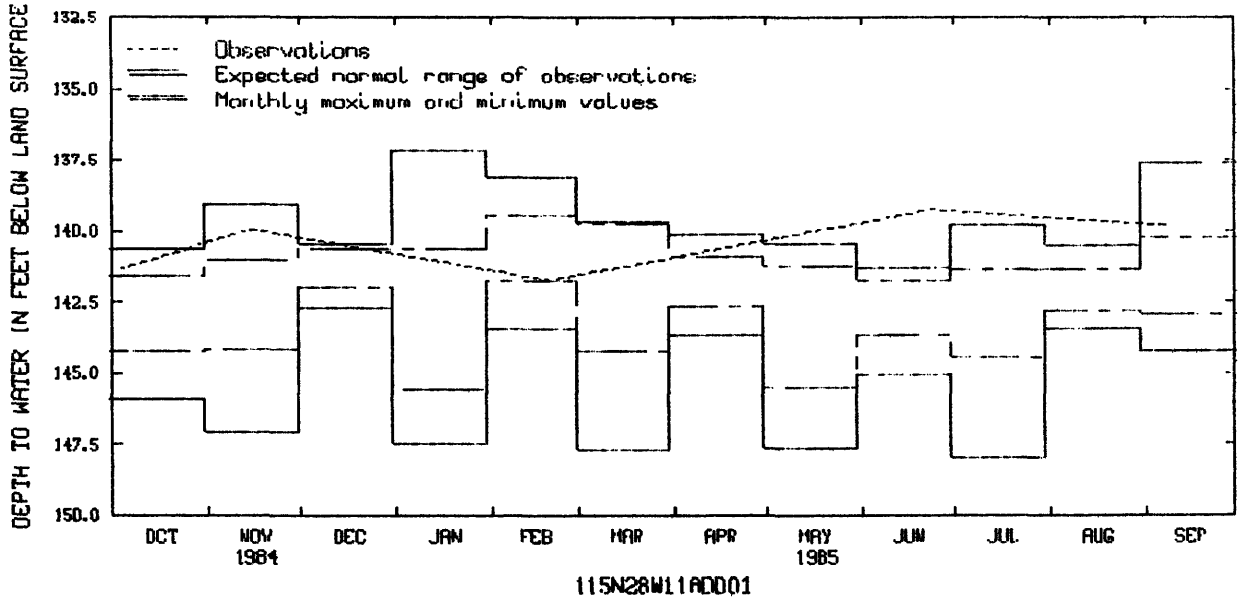
WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 3	94.00	FEB 20	88.40	JUN 24	90.05	SEP 9	95.26
NOV 15	87.59						

444704094090801. Local number, 115N28W11ADD01.
LOCATION.--Lat 44°47'04", long 94°09'08", in SE¼SE¼NE¼ sec.11, T.115 N., R.28 W., Hydrologic Unit 07010205, 0.4 mi (0.6 km) north of Glencoe.
Owner: McLeod County Highway Department.
AQUIFER.--Mount Simon Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled domestic artesian well, diameter 5 in (0.13 m), depth 500 ft (152 m), cased to 446 ft (136 m).
DATUM.--Altitude of land-surface datum is 1,020 ft (311 m). Measuring point: Top of casing, 1.00 ft (0.30 m) above land-surface datum.
PERIOD OF RECORD.--November 1972 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 137.2 ft (41.82 m) below land-surface datum, Jan. 7, 1982; lowest, 148.0 ft (45.10 m) below land-surface datum, July 18, 1979.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 3	141.38	FEB 20	141.75	JUN 24	139.25	SEP 9	139.83
NOV 15	139.95						



MC LEOD COUNTY--Continued

444819094164701. Local number, 116N29W35DDC01.
LOCATION.--Lat 44°48'19", long 94°16'47", in SW¼SE¼SE¼ sec.35, T.116 N., R.29 W., Hydrologic Unit 07010205, 1.3 mi (2.1 km) south of Biscay.
Owner: Charles Johnson.
AQUIFER.--Buried sand of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled irrigation artesian well, diameter 12 in (0.30 m), depth 269 ft (82.0 m), screened 229 to 269 ft (69.8 to 82.0 m).
DATUM.--Altitude of land-surface datum is 1,050 ft (320 m). Measuring point: Edge of vent pipe, 1.00 ft (0.30 m) above land-surface datum.
PERIOD OF RECORD.--September 1978 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 24.40 ft (7.44 m) below land-surface datum, June 8, 1983; lowest, 29.93 ft (9.12 m) below land-surface datum, Sept. 9, 1980.

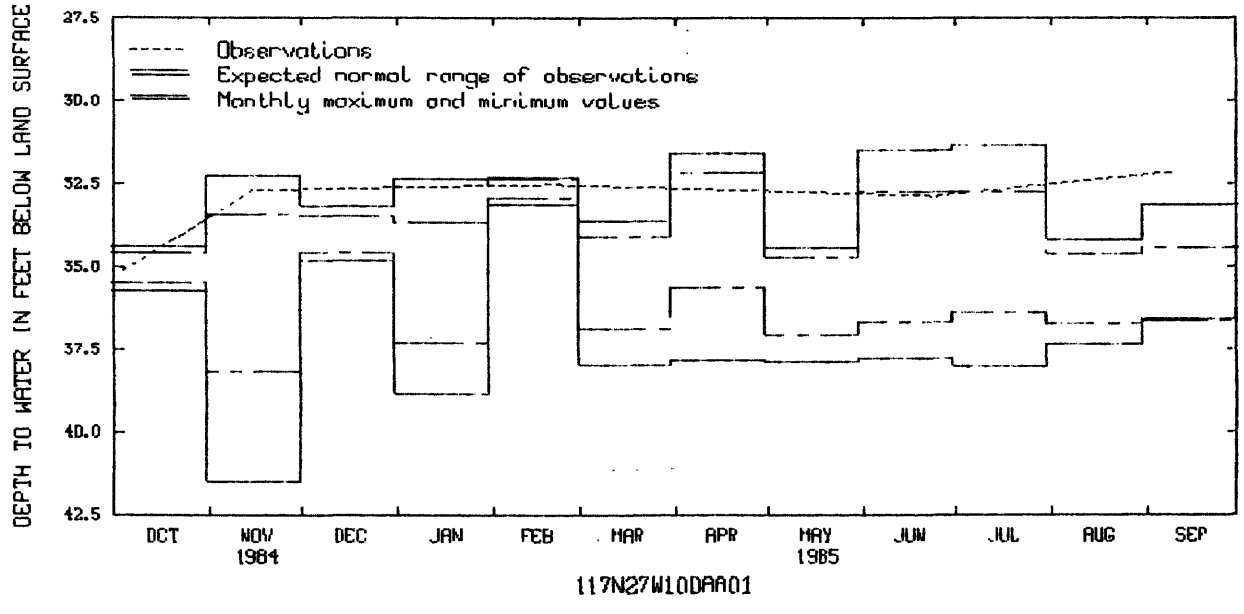
WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 3	27.68	FEB 20	26.02	SEP 9	25.86
NOV 15	26.73	JUN 24	24.96		

445721094031201. Local number 117N27W10DAA01.
LOCATION.--Lat 44°57'21", long 94°03'12", in NE¼NE¼SE¼ sec.10, T.117 N., R.27 W., Hydrologic Unit 07010205, 0.1 mi (0.2 km) south of Winsted.
Owner: Winsted Farmers Coop.
AQUIFER.--Buried sand of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled industrial artesian well, diameter 4 in (0.10 m), depth 129 ft (39.3 m), screened 125 to 129 ft (38.1 to 39.3 m).
DATUM.--Altitude of land-surface datum is 1,015 ft (309 m). Measuring point: Top of casing, 1.40 ft (0.43 m) above land-surface datum.
PERIOD OF RECORD.--November 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 31.35 ft (9.56 m) below land-surface datum, July 6, 1984; lowest, 41.52 ft (12.66 m) below land-surface datum, Nov. 3, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 3	35.16	FEB 20	32.52	JUN 24	32.87	SEP 9	32.15
NOV 15	32.70						

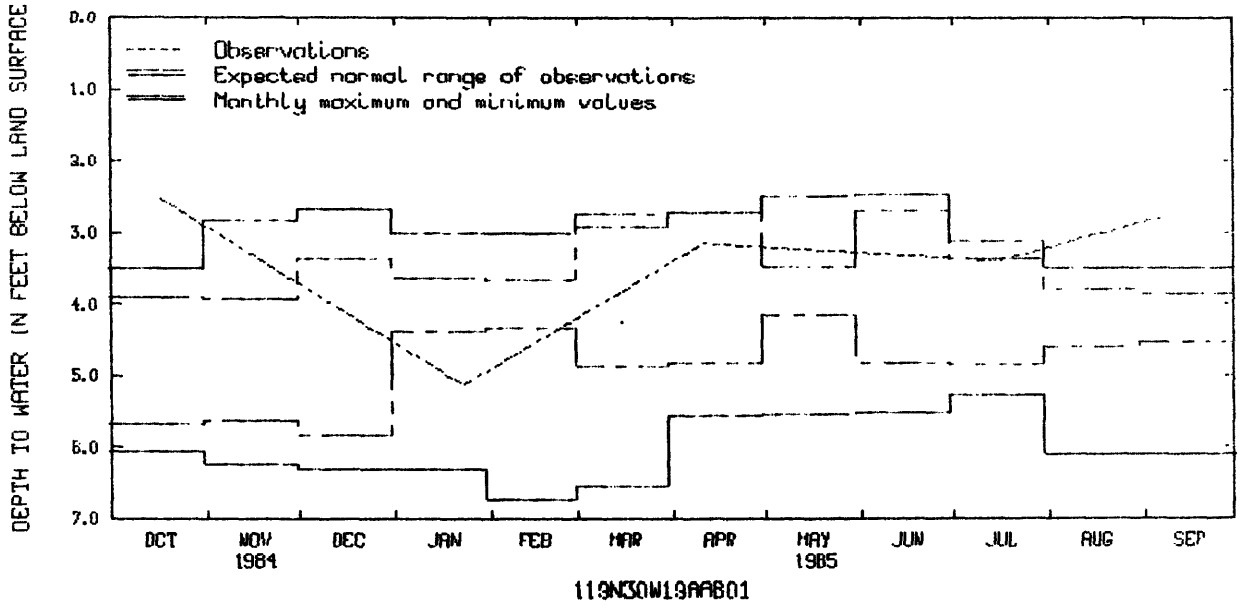


MEEKER COUNTY

450632094290801. Local number, 119N30W19AAB01.
LOCATION.--Lat 45°06'32", long 94°29'08", in NW¼NE¼NE¼ sec.19, T.119 N., R.30 W., Hydrologic Unit 07010204, on Ted Carlson farm.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial sand of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.04 m), depth 26 ft (7.9 m), screened 24 to 26 ft (7.3 to 7.9 m).
DATUM.--Altitude of land-surface datum is 1,130 ft (344 m). Measuring point: Top of casing, 3.30 ft (1.01 m) above land-surface datum.
PERIOD OF RECORD.--November 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 2.47 ft (1.75 m) below land-surface datum, June 14, 1983; lowest 6.74 ft (2.05 m) below land-surface datum, Feb. 3, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	2.53	JAN 23	5.13	APR 11	3.15	JUL 16	3.40	SEP 6	2.80

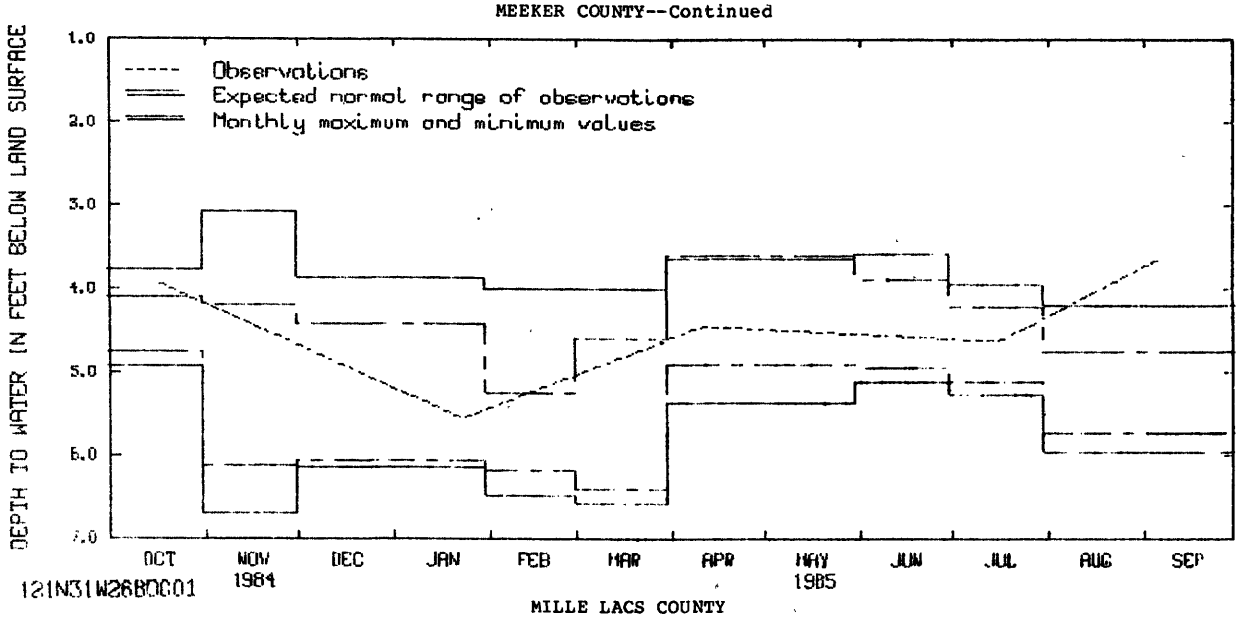


451542094322301. Local number, 121N31W26BDC01.
LOCATION.--Lat 45°15'42", long 94°32'23", in SW¼SE¼NW¼ sec.26, T.121 N., R.31 W., Hydrologic Unit 07010204, on Keith Langmo farm.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial sand of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.04 m), depth 16 ft (4.9 m), screened 14 to 16 ft (4.3 to 4.9 m).
DATUM.--Altitude of land-surface datum is 1,112 ft (339 m). Measuring point: Top of casing, 3.00 ft (0.91 m) above land-surface datum.
PERIOD OF RECORD.--November 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 3.05 ft (0.93 m) below land-surface datum, May 4, 1984; lowest, 6.59 ft (2.01 m) below land-surface datum, Mar. 12, 1979.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	3.94	JAN 23	5.56	APR 11	4.45	JUL 16	4.63	SEP 6	3.64

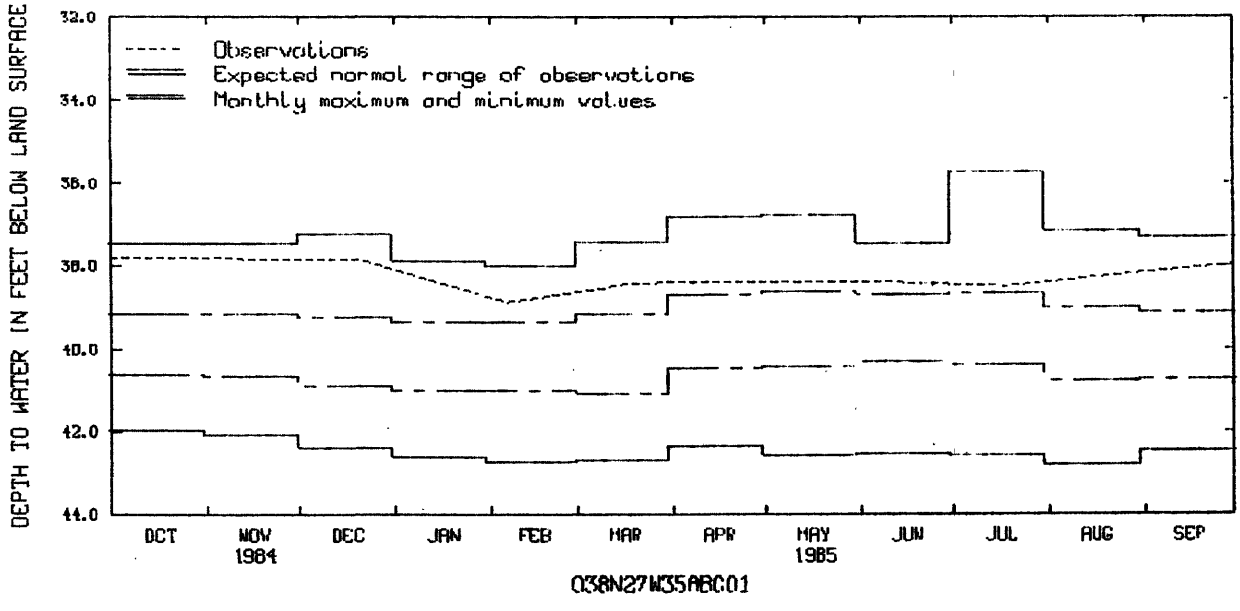
MEEKER COUNTY--Continued



454450093395701. Local number, 038N27W35ABC01.
LOCATION.--Lat 45°44'50", long 93°39'57", in SW¼NW¼NE¼ sec.35, T.38 N., R.27 W., Hydrologic Unit 07010207, in Milaca.
Owner: City of Milaca, creamery well.
AQUIFER.--Buried sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 12 in (0.30 m), depth 82 ft (25.0 m), screened 67 to 82 ft (20.4 to 25.0 m).
DATUM.--Land-surface datum is 1,082.2 ft (329.8 m) National Geodetic Vertical Datum of 1929. Measuring point: Top of platform, 3.00 ft (0.91 m) above land-surface datum.
REMARKS.--Water level affected by pumping.
PERIOD OF RECORD.--September 1967 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 35.72 ft (10.89 m) below land-surface datum, July 20, 1984; lowest, 42.81 ft (13.05 m) below land-surface datum, Aug. 27, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 19	37.84	FEB 6	38.89	MAR 20	38.41	JUN 5	38.39	JUL 18	38.49

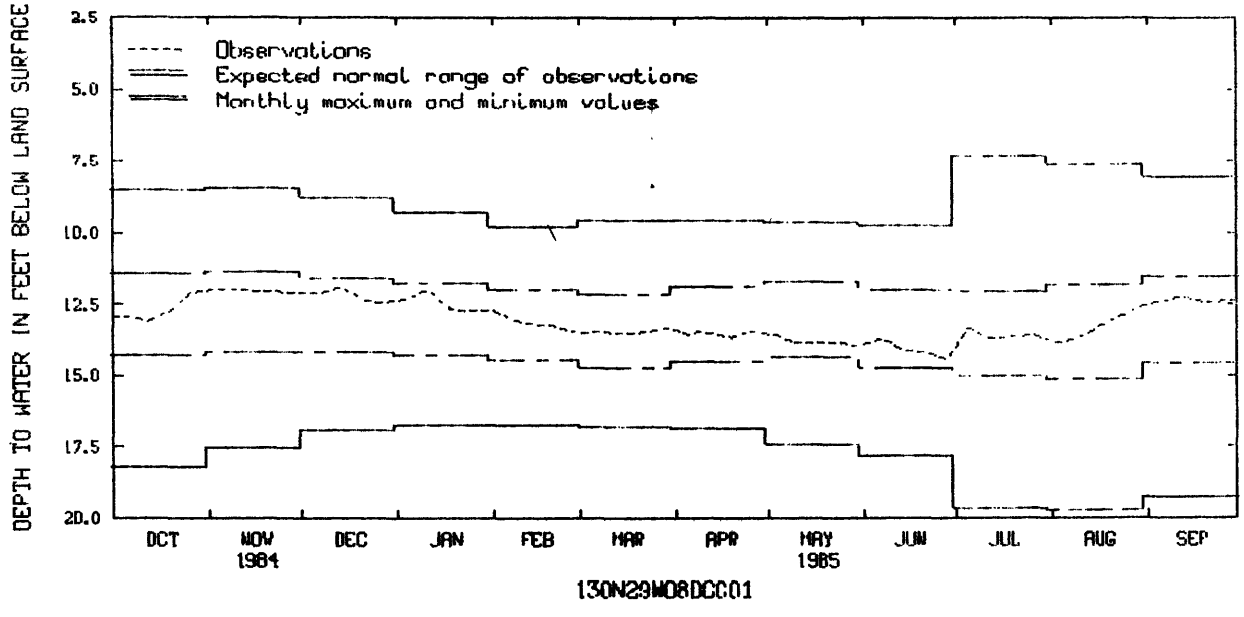


MORRISON COUNTY

460444094212501. Local number, 130N29W08DCC01.
LOCATION.--Lat 46°04'44", long 94°21'25", in SW¼SW¼SE¼ sec.8, T.130 N., R.29 W., Hydrologic Unit 07010104, at Camp Ripley.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial outwash sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled observation water-table well, diameter 2 in (0.05 m), depth 59 ft (18.0 m), screened 56 to 59 ft (17.1 to 18.0 m).
DATUM--Land-surface datum is 1,149.0 ft (350.2 m) National Geodetic Vertical Datum of 1929. Measuring point: Top of casing, 2.10 ft (0.64 m) above land-surface datum.
REMARKS.--Water levels used in monthly Water Resources Review.
PERIOD OF RECORD.--April 1949 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 7.35 ft (2.24 m) below land-surface datum, July 28, 1972; lowest, 19.75 ft (6.02 m) below land-surface datum, Aug. 4, 1961.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 5	12.95	DEC 14	11.92	FEB 15	13.19	APR 10	13.45	JUN 7	13.69	AUG 2	13.85
12	13.10	21	12.36	22	13.29	19	13.65	14	14.11	9	13.74
19	12.76	28	12.45	MAR 1	13.51	26	13.45	21	14.17	16	13.30
26	12.12	JAN 4	12.31	8	13.45	MAY 3	13.57	28	14.43	23	12.96
NOV 2	12.00	11	12.02	15	13.52	10	13.84	JUL 5	13.32	30	12.59
9	12.00	18	12.68	22	13.47	17	13.84	12	13.69	SEP 6	12.40
16	12.02	25	12.71	29	13.31	24	13.84	19	13.64	13	12.24
30	12.11	FEB 1	12.72	APR 5	13.57	31	13.97	26	13.56	20	12.45
DEC 7	12.10	8	13.08								



MOWER COUNTY

434010093010801. Local number, 102N18W05ACB01.
LOCATION.--Lat 43°40'10", long 93°01'08", in NW¼SW¼NE¼ sec.5, T.102 N., R.18 W., Hydrologic Unit 07080201, in Austin.
Owner: Church of Latter Day Saints.
AQUIFER.--Cedar Valley Formation of Middle Devonian Age.
WELL CHARACTERISTICS.--Drilled domestic artesian well, diameter 5 in (0.13 m), depth 100 ft (30.5 m), cased to 77 ft (23.5 m).
DATUM.--Altitude of land-surface datum is 1,230 ft (375 m). Measuring point: Top of casing, 0.80 ft (0.24 m) above land-surface datum.
PERIOD OF RECORD.--July 1981 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 33.69 ft (10.27 m) below land-surface datum, May 10, 1984; lowest, 38.44 ft (11.71 m) below land-surface datum, July 10, 1985.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 8	36.45	MAR 19	36.45	MAY 14	36.36	JUL 10	38.44	SEP 11	37.85
JAN 15	36.48								

MOWER COUNTY--Continued

434417093521001. Local number, 103N17W09DAA01.
LOCATION.--Lat 43°44'17", long 93°52'10", in NE¼NE¼SE¼ sec.9, T.103 N., R.17 W., Hydrologic Unit 07080201, in Brownsdale.
Owner: Land O'Lakes, creamery well.
AQUIFER.--Cedar Valley Formation of Middle Devonian Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 4 in (0.10 m), depth 130 ft (39.6 m), casing information not available.
DATUM.--Altitude of land-surface datum is 1,280 ft (390 m). Measuring point: Top of well cap, 0.40 ft (0.12 m) above land-surface datum.
REMARKS.--Water level affected by pumping.
PERIOD OF RECORD.--February 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 35.97 ft (10.96 m) below land-surface datum, May 2, 1984; lowest, 45.20 ft (13.78 m) below land-surface datum, Mar. 30, 1978.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

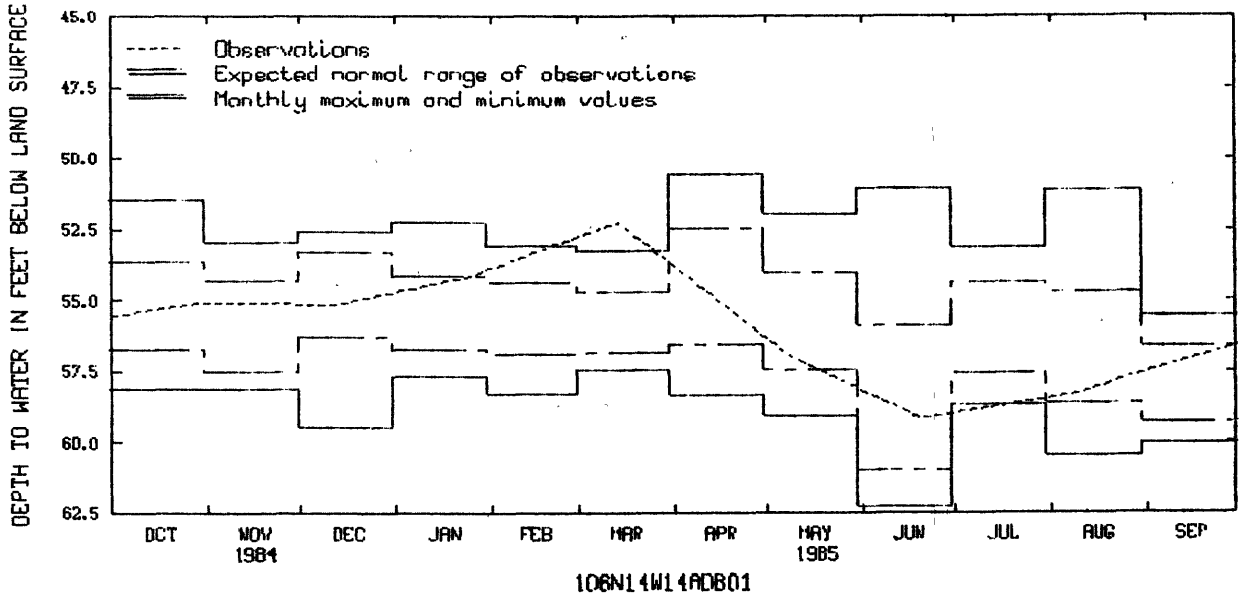
DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 29	36.86	JAN 24	38.08	MAR 15	37.89	MAY 7	37.58	JUN 18	37.53	AUG 5	38.44
DEC 13	36.98										

OLMSTED COUNTY

435920092273801. Local number, 106N14W14ADB01.
LOCATION.--Lat 43°59'20", long 92°27'38", in NW¼SE¼NE¼ sec.14, T.106 N., R.14 W., Hydrologic Unit 07040004, in Rochester.
Owner: Colden Hill School Dist. #1371.
AQUIFER.--Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 6 in (0.15 m), depth 478 ft (146 m), cased to 397 ft (121 m).
DATUM.--Altitude of land-surface datum is 1,065 ft (325 m). Measuring point: Edge of well cap, 1.80 ft (0.55 m) above land-surface datum.
REMARKS.--Water level affected by pumping.
PERIOD OF RECORD.--August 1974 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 50.58 ft (15.42 m) below land-surface datum, Apr. 12, 1983; lowest, 62.30 ft (18.99 m) below land-surface datum, June 8, 1976.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 30	55.09	JAN 24	54.19	MAR 14	52.26	MAY 8	56.94	JUN 20	59.19	AUG 8	58.34
DEC 13	55.15										

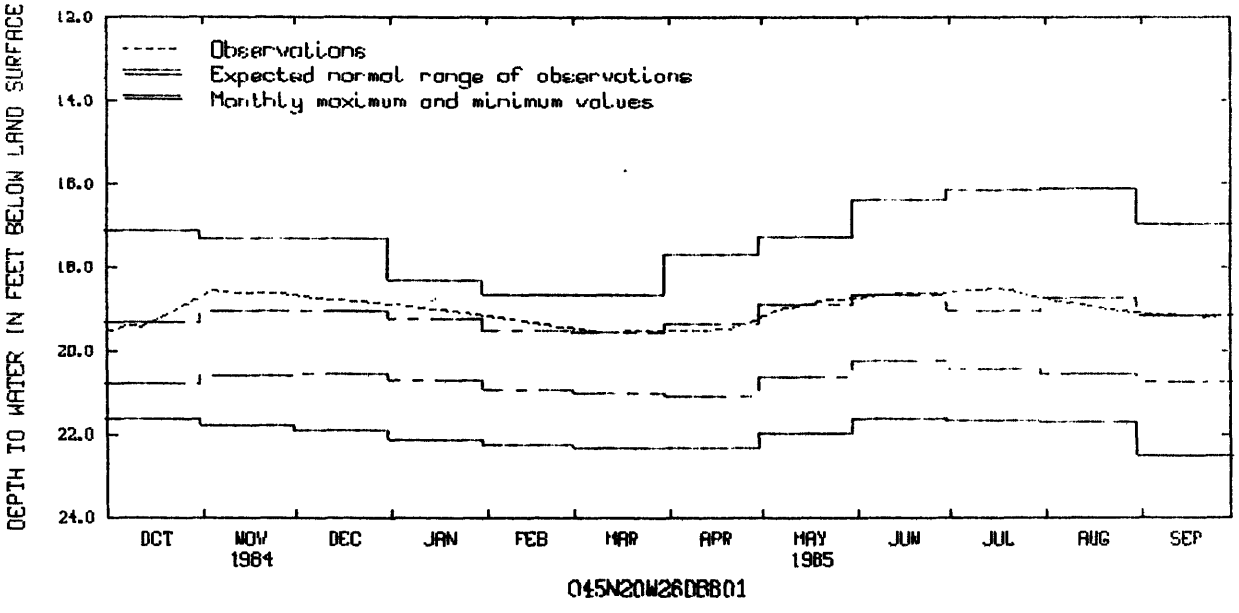


PINE COUNTY

462112092495801. Local number, 045N20W26DBB01.
LOCATION.--Lat 46°21'12", long 92°49'58", in NW¼NW¼SE¼ sec.26, T.45 N., R.20 W., Hydrologic Unit 07030003, at General Andrews Nursery.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Driven observation water-table well, diameter 1¼ in (0.03 m), depth 28 ft (8.5 m), screened 26 to 28 ft (7.9 to 8.5 m).
DATUM.--Altitude of land-surface datum is 1,060 ft (323 m). Measuring point: Top of casing, 0.50 ft (0.15 m) above land-surface datum.
REMARKS.--Measured weekly by Ralph Nelson.
PERIOD OF RECORD.--August 1968 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 16.10 ft (4.91 m) below land-surface datum, Aug. 12, 1974; lowest, 22.49 ft (6.85 m) below land-surface datum, Sept. 26, 1980.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	19.38	JAN 6	18.92	APR 13	19.49	MAY 30	18.75	JUL 7	18.55	AUG 25	19.04
12	19.42	26	19.10	21	19.47	JUN 9	18.66	18	18.51	SEP 1	19.10
28	18.84	FEB 9	19.25	30	19.24	12	18.64	28	18.71	8	19.12
NOV 4	18.56	18	19.35	MAY 5	19.05	18	18.63	AUG 3	18.78	15	19.15
10	18.60	24	19.42	23	18.78	30	18.61	13	18.90	24	19.20
23	18.61	MAR 10	19.54								
DEC 7	18.73	APR 7	19.49								



RAMSEY COUNTY

445648093053402. Local number, 028N22W06ABD02.
LOCATION.--Lat 44°56'48", long 93°05'34", in SE¼NW¼NE¼ sec.6, T.28 N., R.22 W., Hydrologic Unit 07010206, at 55 East 5th Street, St. Paul.
Owner: Northwestern National Bank.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age and Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled air-conditioning artesian well, diameter 16 in (0.41 m), depth 355 ft (108 m), cased to 212 ft (64.6 m).
DATUM.--Altitude of land-surface datum is 770 ft (235 m). Measuring point: Edge of vent pipe, 7.50 ft (2.29 m) below land-surface datum.
REMARKS.--Water level affected by pumping of nearby wells.
PERIOD OF RECORD.--May 1971 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 56.00 ft (17.07 m) below land-surface datum, Apr. 5, 1979; lowest, 134.0 ft (40.84 m) below land-surface datum, Aug. 16, 1972.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 29	65.40	JAN 2	64.30	MAR 5	75.40	JUN 4	80.50

RAMSEY COUNTY--Continued

445955093011001. Local number, 029N22W14CAB01.
LOCATION.--Lat 44°59'55", long 93°01'10", in NW¼NE¼SW¼ sec.14, T.29 N., R.22 W., Hydrologic Unit 07010206, at Goodrich Golf Course.
Owner: Ramsey County.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age and Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled irrigation artesian well, diameter 12 in (0.30 m), depth 523 ft (159 m), cased to 303 ft (92.4 m).
DATUM.--Altitude of land-surface datum is 969 ft (295 m). Measuring point: Edge of vent pipe, 2.50 ft (0.76 m) above land-surface datum.
PERIOD OF RECORD.--May 1965, April 1966 to August 1966, August 1971, May 1980 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 126.2 ft (38.47 m) below land-surface datum, May 4, 1984; lowest, 140.6 ft (42.85 m) below land-surface datum, Apr. 6, 1966.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 31	127.65	MAR 15	126.85	APR 29	128.50	JUL 15	134.60	SEP17	126.85
JAN 8	128.30								

445955093011002. Local number, 029N22W14CAB02.
LOCATION.--Lat 44°59'55", long 93°01'10", in NW¼NE¼SW¼ sec.14, T.29 N., R.22 W., Hydrologic Unit 07010206, at Goodrich Golf Course.
Owner: U.S. Geological Survey.
AQUIFER.--Buried gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation artesian well, diameter 2 in (0.05 m), depth 81 ft (24.7 m), screened 78 to 81 ft (23.8 to 24.7 m).
DATUM.--Altitude of land-surface datum is 970 ft (296 m). Measuring point: Top of casing, 1.30 ft (0.40 m) above land-surface datum.
PERIOD OF RECORD.--October 1966 to August 1971, August 1977, June 1980 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 32.24 ft (9.83 m) below land-surface datum, June 27, 1984; lowest, 45.36 ft (13.83 m) below land-surface datum, June 3, 1968.

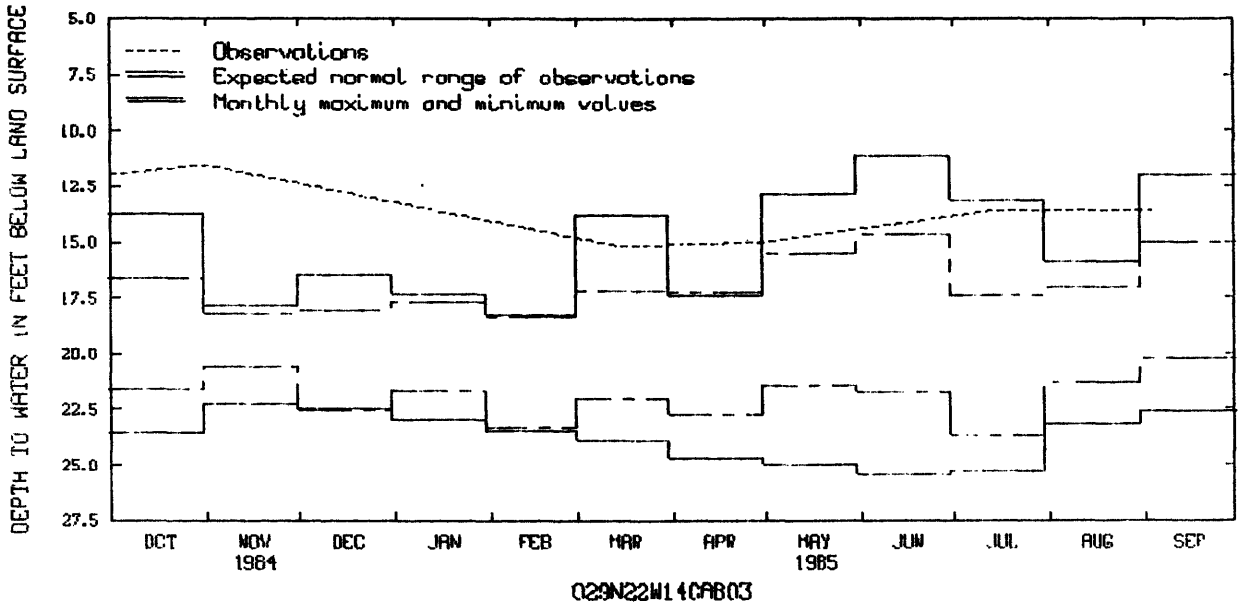
WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 31	32.54	MAR 15	34.77	APR 29	34.66	JUL 15	33.92	SEP 3	33.88
JAN 8	33.19								

445955093011003. Local number, 029N22W14CAB03.
LOCATION.--Lat 44°59'55", long 93°01'10", in NW¼NE¼SW¼ sec.14, T.29 N., R.22 W., Hydrologic Unit 07010206, at Goodrich Golf Course.
Owner: U.S. Geological Survey.
AQUIFER.--Buried gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 2 in (0.05 m), depth 52 ft (15.8 m), screened 49 to 52 ft (14.9 to 15.8 m).
DATUM.--Altitude of land-surface datum is 970 ft (296 m). Measuring point: Top of casing, 1.80 ft (0.55 m) above land-surface datum.
PERIOD OF RECORD.--October 1966 to August 1971, June 1980 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 11.12 ft (3.39 m) below land-surface datum, June 27, 1984; lowest, 25.43 ft (7.75 m) below land-surface datum, June 3, 1968.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 31	11.53	JAN 8	13.42	MAR 15	15.20	APR 29	15.03	JUL 15	13.59	SEP 3	13.60



450001093024701. Local number, 029N22W16ADD01.
LOCATION.--Lat 45°00'01", long 93°02'47", in SE¼SE¼NE¼ sec.16, T.29 N., R.22 W., Hydrologic Unit 07010206, at 1955 English St.
Owner: Maplewood Bowl.
AQUIFER.--Buried sand of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 4 in (0.10 m), depth 163 ft (49.7 m), screened 158 to 163 ft (48.2 to 49.7 m).
DATUM.--Altitude of land-surface datum is 900 ft (274 m). Measuring point: Top of well cap, 1.00 ft (0.30 m) above land-surface datum.
PERIOD OF RECORD.--January 1981 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 69.15 ft (21.07 m) below land-surface datum, Sept. 3, 1985; lowest, 73.18 ft (22.31 m) below land-surface datum, Jan. 14, 1983.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 31	70.00	JAN 7	69.60	MAR 6	69.43	APR 29	69.07	JUL 15	69.36	SEP 3	69.15

445918092590901. Local number, 029N22W24ADA01.
LOCATION.--Lat 44°59'18", long 92°59'09", in NE¼SE¼NE¼ sec.24, T.29 N., R.22 W., Hydrologic Unit 07010206, at 1555 Century Avenue.
Owner: Northern States Power Co., Maplewood Gas Plant.
AQUIFER.--Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled fire protection artesian well, diameter 12 in (0.30 m), depth 523 ft (159 m), cased to 420 ft (128 m).
DATUM.--Land-surface datum is 996.5 ft (303.7 m) National Geodetic Vertical Datum of 1929. Measuring point: Edge of 2 in (0.05 m) breather pipe, 2.40 ft (0.73 m) above land-surface datum.
REMARKS.--Water level affected by pumping.
PERIOD OF RECORD.--August 1970 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 133.3 ft (40.63 m) below land-surface datum, Apr. 30, 1984; lowest, 151.0 ft (46.02 m) below land-surface datum, May 14, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 31	134.45	JAN 8	134.02	MAR 11	134.40	JUN 12	137.22	SEP 30	135.94

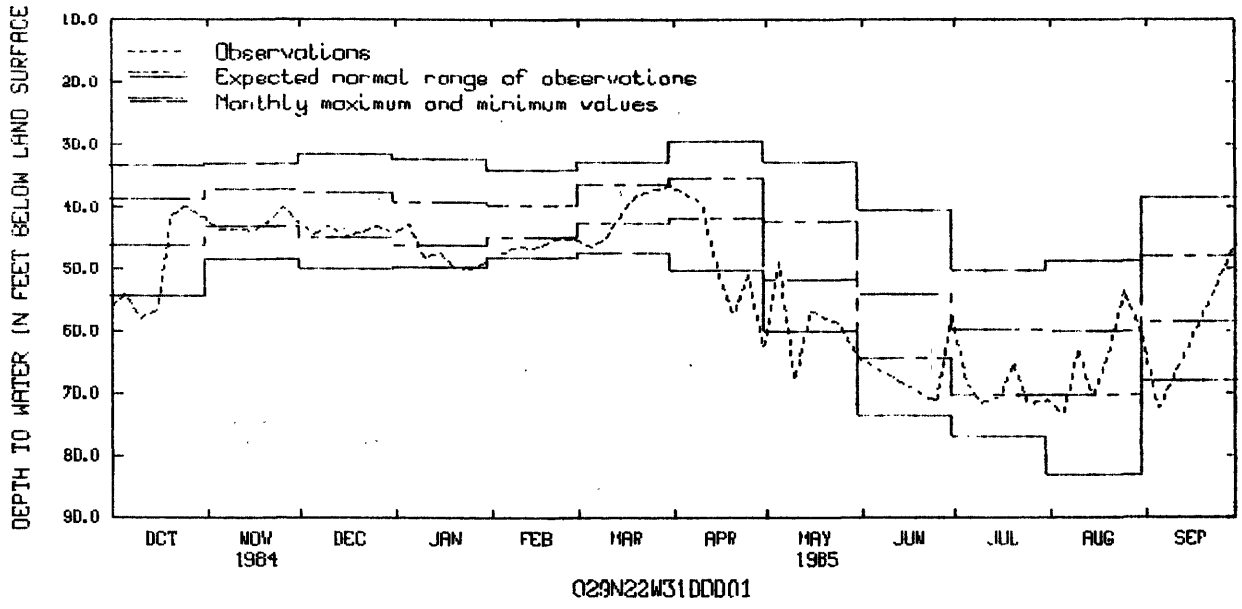
RAMSEY COUNTY--Continued

445700093051001. Local number, 029N22W31DDD01.
LOCATION.--Lat 44°57'00", long 93°05'10", in SE¼SE¼SE¼ sec.31, T.29 N., R.22 W., Hydrologic Unit 07010206, at 261 East 5th Street, St. Paul.
Owner: Control Data Corp.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age and Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 12 in (0.30 m), depth 298 ft (91 m), cased to 151 ft (46.0 m).
DATUM.--Altitude of land-surface datum is 750 ft (229 m). Measuring point: Top of recorder platform, 9.00 ft (2.74 m) below land-surface datum.
REMARKS.--Water level affected by pumping of nearby wells.
PERIOD OF RECORD.--December 1971 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 28.79 ft (8.78 m) below land-surface datum, Apr. 24, 1983; lowest, 83.06 ft (25.32 m) below land-surface datum, Aug. 16, 1972.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	54.11	43.72	44.39	42.82	47.39	46.40	37.98	49.08	.....	68.51	73.38	72.47
10	57.91	43.54	43.01	48.29	46.39	44.81	39.43	68.03	.....	71.66	62.97	.....
15	56.80	43.97	44.93	47.39	46.79	40.95	49.97	56.86	.....	70.84	70.41	.....
20	41.34	42.64	44.13	49.80	45.27	38.19	57.36	57.88	.....	65.20	63.29	.....
25	39.96	39.97	43.00	50.14	.....	37.31	51.02	59.08	71.48	71.63	53.50	.....
EOM	41.88	42.43	44.15	.....	45.24	36.73	62.67	64.45	57.23	71.19	61.11	46.07

WTR YEAR 1985 HIGHEST 33.17 MAR 22, 1985 LOWEST 74.88 AUG 9, 1985

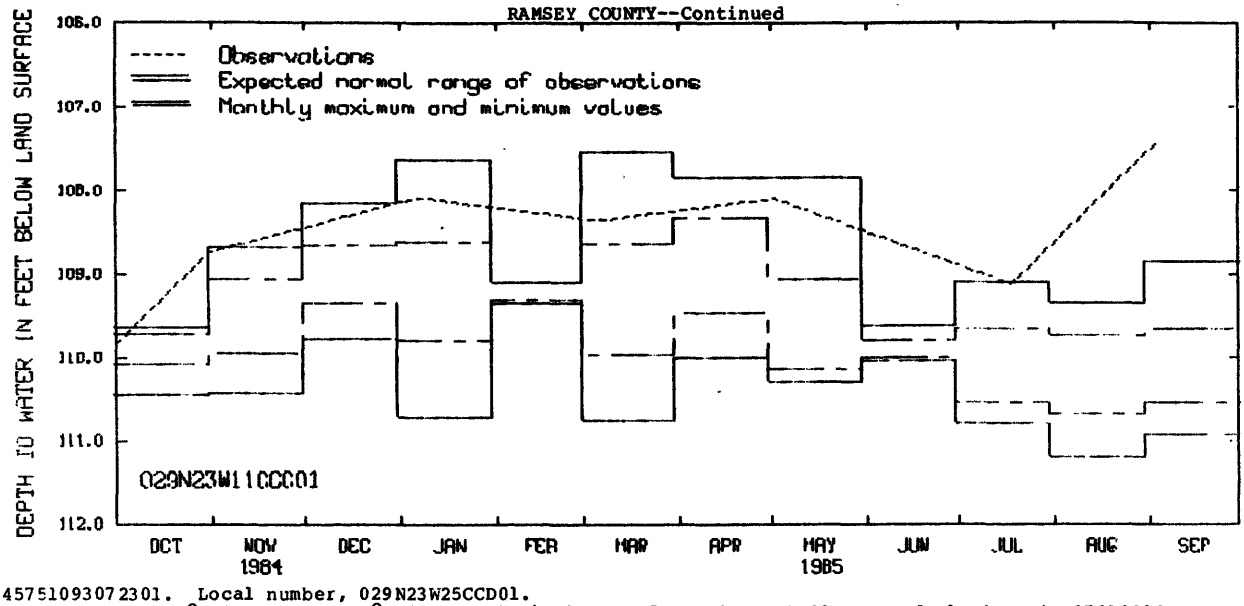


450026093084201. Local number, 029N23W11CCC01.
LOCATION.--Lat 45°00'26", long 93°08'42", in SW¼SW¼SW¼ sec.11, T.29 N., R.23 W., Hydrologic Unit 07010206, at 2204 North Lexington Avenue, Roseville.
Owner: Lexington Court Apartments.
AQUIFER.--St. Peter Sandstone of Middle Ordovician Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 6 in (0.15 m), depth 325 ft (99.1 m), cased to 192 ft (58.5 m).
DATUM.--Altitude of land-surface datum is 945 ft (288 m). Measuring point: Top of well cap, 1.40 ft (0.43 m) above land-surface datum.
PERIOD OF RECORD.--January 1971 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 107.4 ft (32.73 m) below land-surface datum, Sept. 3, 1985; lowest, 111.2 ft (33.89 m) below land-surface datum, Aug. 18, 1975.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 31	108.74	JAN 7	108.09	MAR 6	108.36	MAY 2	108.10	JUL 18	109.12	SEP 3	107.45

RAMSEY COUNTY--Continued

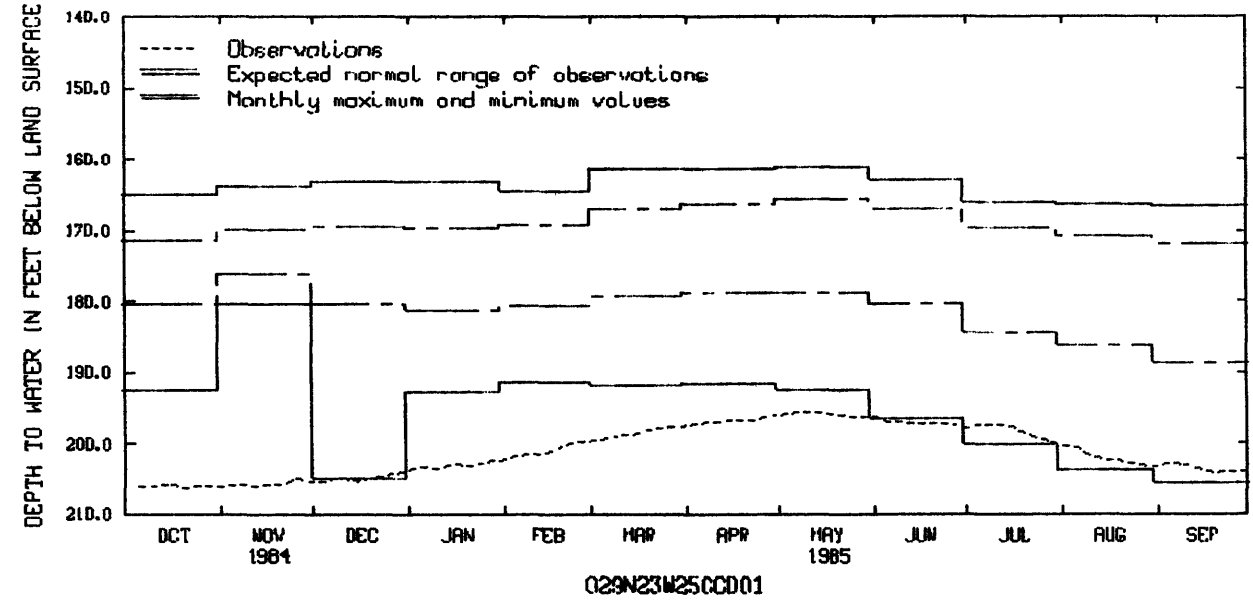


445751093072301. Local number, 029N23W25CCD01.
LOCATION.--Lat 44°57'51", long 93°07'23", SE¼SW¼SW¼ sec.25, T.29 N., R.23 W., Hydrologic Unit 07010206, at 760 North Dale Street, St. Paul.
Owner: Burlington Northern, Inc., Dale Street Shops.
AQUIFER.--Hinckley Sandstone of Late Precambrian Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 8 in (0.20 m), depth 999 ft (304 m), cased to 955 ft (291 m).
DATUM.--Land-surface datum is 859.5 ft (262.0 m) National Geodetic Vertical Datum of 1929. Measuring point: Top of recorder floor, 4.60 ft (1.40 m) above land-surface datum.
REMARKS.--Water level affected by pumping.
PERIOD OF RECORD.--December 1970, November 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 161.0 ft (49.07 m) below land-surface datum, May 10, 1980; lowest, 206.4 ft (62.91 m) below land-surface datum, Nov. 2, 1984.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	205.96	205.69	205.27	203.38	201.77	199.43	197.43	195.81	196.95	197.53	200.51	202.69
10	206.09	205.91	204.83	203.46	201.56	198.96	197.02	195.77	197.12	197.45	201.88	203.20
15	205.66	205.89	205.27	202.86	201.35	198.73	196.83	195.79	197.31	197.69	202.33	203.84
20	206.24	205.82	204.81	203.15	200.29	198.08	196.85	196.01	197.21	198.73	202.52	204.20
25	206.06	204.94	204.48	202.81	199.66	197.83	196.57	196.39	197.36	199.36	203.04	203.88
EOM	206.05	205.34	203.86	202.32	199.71	197.62	196.17	196.39	198.00	200.26	203.41	203.89

WTR YEAR 1985 HIGHEST 195.43 MAY 6, 1985 LOWEST 206.36 NOV 2, 1984



445739093081201. Local number, 029N23W35BAD01.
LOCATION.--Lat 44°57'39", long 93°08'12", in SE¼NE¼NW¼ sec.35, T.29 N., R.23 W., Hydrologic Unit 07010206, Victoria Street, 0.35 mi (0.56 km) north of University Avenue.
Owner: City of St. Paul.
AQUIFER.--St. Peter Sandstone of Middle Ordovician Age.
WELL CHARACTERISTICS.--Drilled unused water-table well, diameter 16 in (0.41 m), depth 234 ft (71.3 m), screened 174 to 234 ft (53.0 to 71.3 m).
DATUM.--Altitude of land-surface datum is 888 ft (261 m). Measuring point: Top of coupling, 0.50 ft (0.15 m) above land-surface datum.
PERIOD OF RECORD.--May 1981 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 121.1 ft (36.91 m) below land-surface datum, Sept. 3, 1985; lowest, 133.0 ft (40.54 m) below land-surface datum, May 5, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 1	122.05	JAN 2	121.87	MAR 5	121.67	APR 26	121.17	JUL 8	121.20	SEP 3	121.13

450414093012701. Local number, 030N22W23CBB01.
LOCATION.--Lat 45°04'14", long 93°01'27", in NW¼NW¼SW¼ sec.23, T.30 N., R.22 W., Hydrologic Unit 07010206, Hoffman Road, 0.85 mi (1.4 km) southwest of Highway 61.
Owner: White Bear Town Hall.
AQUIFER.--Buried sand of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled domestic artesian well, diameter 4 in (0.10 m), depth 96 ft (29.3 m), screened 91 to 96 ft (27.7 to 29.3 m).
DATUM.--Altitude of land-surface datum is 928 ft (283 m). Measuring point: Top of casing, 1.00 ft (0.30 m) above land-surface datum.
PERIOD OF RECORD.--April 1980 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 19.32 ft (5.88 m) below land-surface datum, May 2, 1985; lowest, 22.80 ft (6.95 m) below land-surface datum, Sept. 8, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

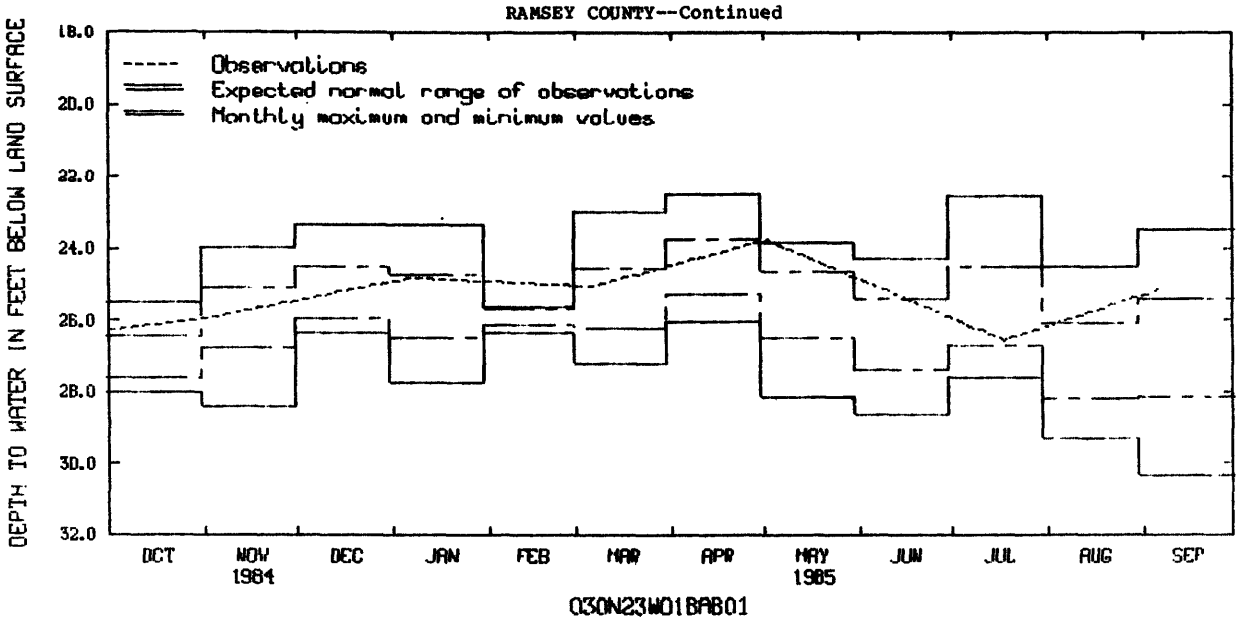
DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 6	19.52	JAN 7	19.68	MAR 15	19.95	MAY 2	19.32	JUL 12	20.33	SEP 6	19.57

450723093071801. Local number, 030N23W01BAB01.
LOCATION.--Lat 45°07'23", long 93°07'18", in NW¼NE¼NW¼ sec.1, T.30 N., R.23 W., Hydrologic Unit 07010206, at Bucher Playground.
Owner: City of Shoreview.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age.
WELL CHARACTERISTICS.--Drilled recreation artesian well, diameter 8 in (0.20 m), depth 155 ft (47.2 m), cased to 101 ft (30.8 m).
DATUM.--Altitude of land-surface datum is 900 ft (274 m). Measuring point: Top of breather pipe, 2.40 ft (0.73 m) above land-surface datum.
PERIOD OF RECORD.--August 1970 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 22.47 ft (6.85 m) below land-surface datum, Apr. 19, 1976; lowest, 30.35 ft (9.25 m) below land-surface datum, Sept. 8, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 6	25.88	JAN 7	24.82	MAR 6	25.06	MAY 2	23.77	JUL 18	26.56	SEP 6	25.16

RAMSEY COUNTY--Continued

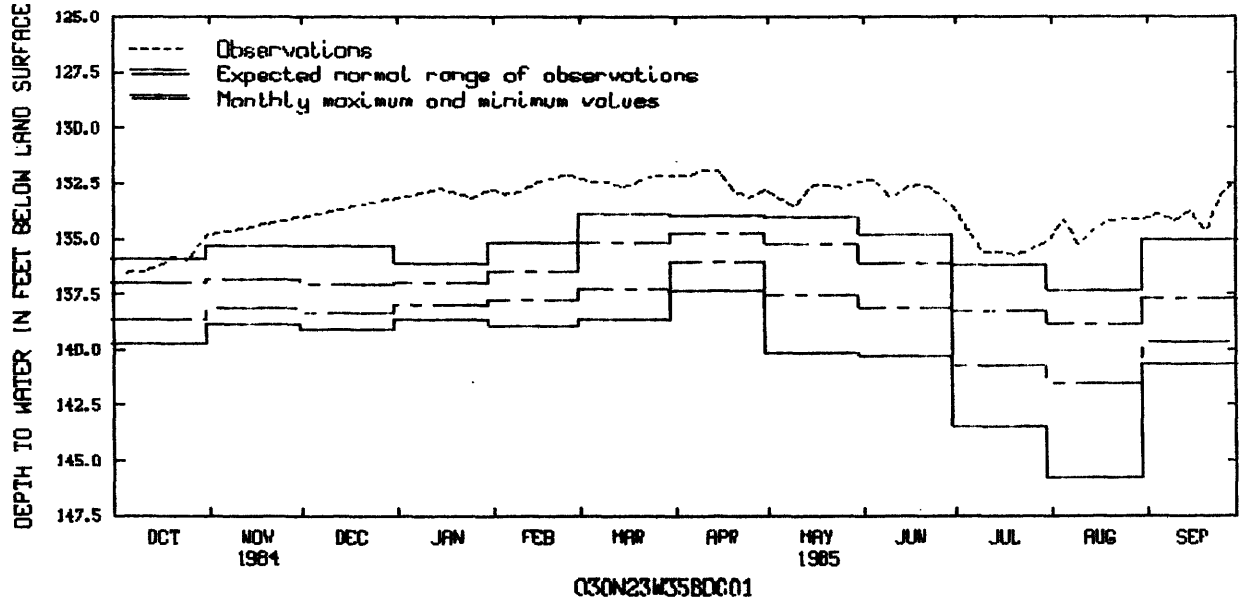


450238093082501. Local number, 030N23W35BDC01.
LOCATION.--Lat 45°02'38", long 93°08'25", in SW¼SE¼NW¼ sec.35, T.30 N., R.23 W., Hydrologic Unit 07010206, southeast corner of Arbogast Street and Richmond Avenue.
Owner: City of Shoreview.
AQUIFER.--Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 12 in (0.30 m), depth 510 ft (155 m), cased to 465 ft (142 m).
DATUM.--Altitude of land-surface datum is 960 ft (293 m). Measuring point: Hole in shelter floor, 1.50 ft (0.46 m) above land-surface datum.
PERIOD OF RECORD.--April 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 131.3 ft (40.02 m) below land-surface datum, Mar. 4, 1985; lowest, 145.9 ft (44.47 m) below land-surface datum, Aug. 21, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	136.52	.....	.....	.....	132.99	132.44	132.18	133.20	132.36	134.57	134.14	133.88
10	136.49	.....	.....	132.92	132.84	132.43	131.93	133.54	133.16	135.64	135.27	134.19
15	136.25	.....	.....	132.70	132.53	132.70	131.92	132.65	132.70	135.59	134.61	133.71
20	135.81	.....	.....	132.98	132.26	132.44	132.87	132.54	132.56	135.75	134.15	134.63
25	135.96	.....	.....	133.18	132.15	132.18	133.15	132.70	132.93	135.54	134.12	133.01
EOM	134.85	.....	.....	132.80	132.24	132.18	132.76	132.41	133.53	135.09	134.12	132.33

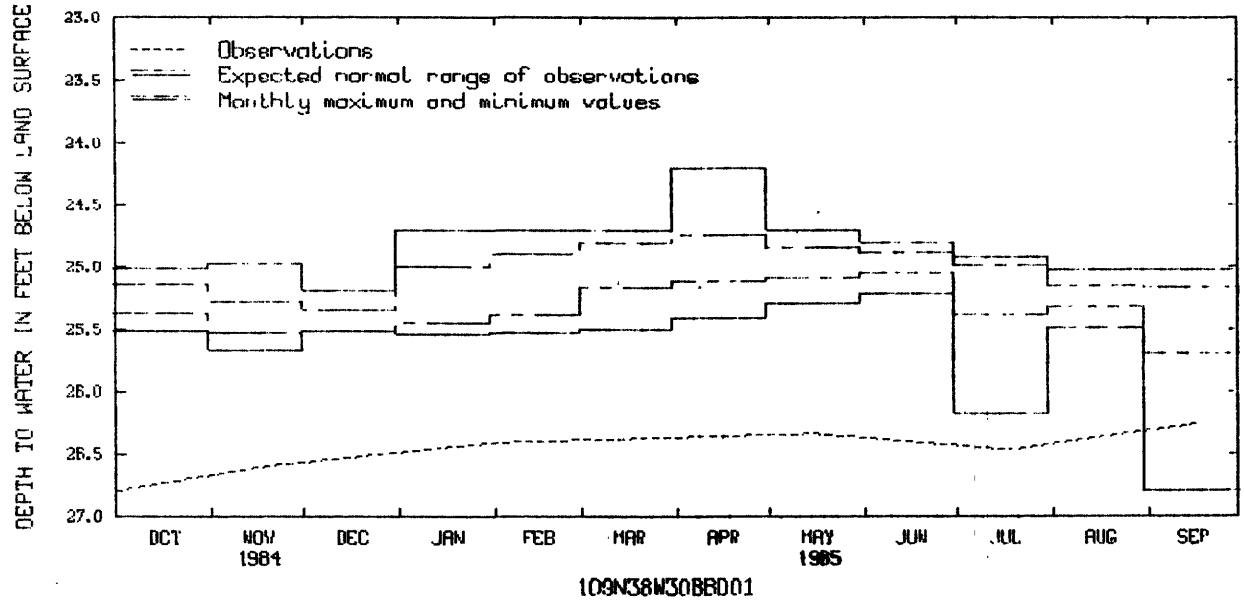
WTR YEAR 1985 HIGHEST 131.32 MAR 4, 1985 LOWEST 136.76 OCT 13, 1984



441323095280701. Local number, 109N38W30BBD01.
LOCATION.--Lat 44°13'23", long 95°28'07", in SE¼NW¼NW¼ sec.30, T.109 N., R.38 W., Hydrologic Unit 07020008, at city of Walnut Grove.
Owner: Plum Creek Cheese Co.
AQUIFER.--Sandstone of Cretaceous Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 5 in (0.13 m), depth 240 ft (73.2 m), casing depth not available.
DATUM.--Altitude of land-surface datum is 1,218 ft (371 m). Measuring point: Top of well seal, 0.55ft (0.17 m) above land-surface datum.
PERIOD OF RECORD.--August 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 24.20 ft (7.37 m) below land-surface datum, April 3, 1984; lowest, 26.80 ft (8.16 m) below land-surface datum, Sept. 26, 1984.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 21	26.59	JAN 31	26.41	MAR 19	26.38	MAY 15	26.34	JUL 18	26.47	SEP 17	26.26

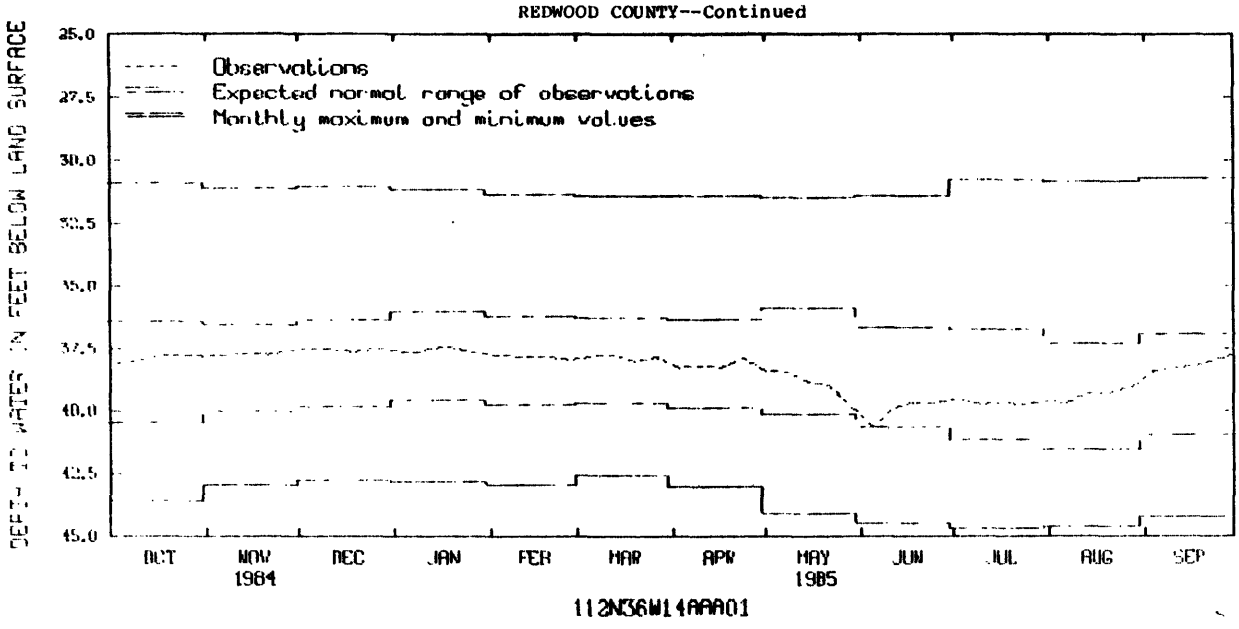


443051095074201. Local number, 112N36W14AAA01.
LOCATION.--Lat 44°30'51", long 95°07'42", in NE¼NE¼NE¼ sec.14, T.112 N., R.36 W., Hydrologic Unit 07020007, 2 mi (3.2 km) south of Redwood Falls.
Owner: Frank Boots.
AQUIFER.--Buried sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 4 in (0.10 m), measured depth 214 ft (65.2 m), reported screened 213 to 218 ft (64.9 to 66.4 m).
DATUM.--Land-surface datum is 1,038.9 ft (316.7 m) National Geodetic Vertical Datum of 1929. Measuring point: Top of casing, 2.00 ft (0.61 m) above land-surface datum.
REMARKS.--Measured weekly by Michael Goebel Water level affected by regional pumping.
PERIOD OF RECORD.--July 1952 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 30.72 ft (9.36 m) below land-surface datum, Sept. 10, 1953; lowest, 44.68 ft (13.62 m) below land-surface datum, July 16, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 3	38.10	DEC 5	37.51	FEB 6	37.75	APR 10	38.19	JUN 12	39.87	AUG 7	39.68
10	38.03	13	37.55	13	37.85	17	38.28	19	39.66	14	39.30
17	37.79	19	37.64	20	37.80	24	37.90	26	39.66	20	39.34
24	37.73	26	37.49	27	38.00	MAY 1	38.39	JUL 3	39.53	28	39.05
31	37.82	JAN 2	37.60	MAR 6	37.79	8	38.46	10	39.73	SEP 4	38.43
NOV 9	37.72	9	37.63	12	37.74	15	38.84	17	39.70	11	38.28
15	37.68	17	37.44	20	38.00	22	39.03	24	39.74	18	38.22
21	37.74	23	37.55	27	37.86	29	39.85	31	39.64	25	37.91
28	37.62	30	37.73	APR 3	38.25	JUN 5	40.63				

REDWOOD COUNTY--Continued



442906095064101. Local number, 112N36W24DDC01.
LOCATION.--Lat 44°29'06", long 95°06'41", in SW¼SE¼SE¼ sec.24, T.112 N., R.36 W., Hydrologic Unit 07020007, 3.6 mi (5.8 km) south of Redwood Falls.
Owner: City of Redwood Falls.
AQUIFER.--Buried sand of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled observation artesian well, diameter 2 in (0.05 m), depth 144 ft (43.9 m), screened 141 to 144 ft (43.0 to 43.9 m).
DATUM.--Altitude of land-surface datum is 1,041 ft (317 m). Measuring point: Top of casing, 2.50 ft (0.76 m) above land-surface datum.
REMARKS.--Water level affected by pumping from nearby well field.
PERIOD OF RECORD.--December 1967 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 39.52 ft (12.05 m) below land-surface datum, Mar. 13, 1971; lowest, 51.21 ft (15.61 m) below land-surface datum, July 16, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 3	43.40	DEC 5	42.69	FEB 6	42.95	APR 10	43.36	JUN 12	45.55	AUG 7	45.06
10	43.20	13	42.97	13	43.06	17	43.49	19	45.19	14	44.56
17	42.90	19	42.96	20	43.02	24	43.14	26	45.26	20	44.52
24	42.83	26	42.73	27	43.12	MAY 1	43.54	JUL 3	45.20	28	43.61
31	42.85	JAN 2	42.68	MAR 6	42.97	8	44.00	10	45.54	SEP 4	43.60
NOV 9	42.80	9	42.73	12	42.86	15	44.33	17	45.38	11	43.40
15	42.75	17	42.72	20	43.08	22	44.56	24	45.60	18	43.34
21	42.84	23	42.86	27	43.13	29	46.15	31	445.10	25	43.08
28	42.74	30	42.86	APR 3	43.24	JUN 5	46.87				

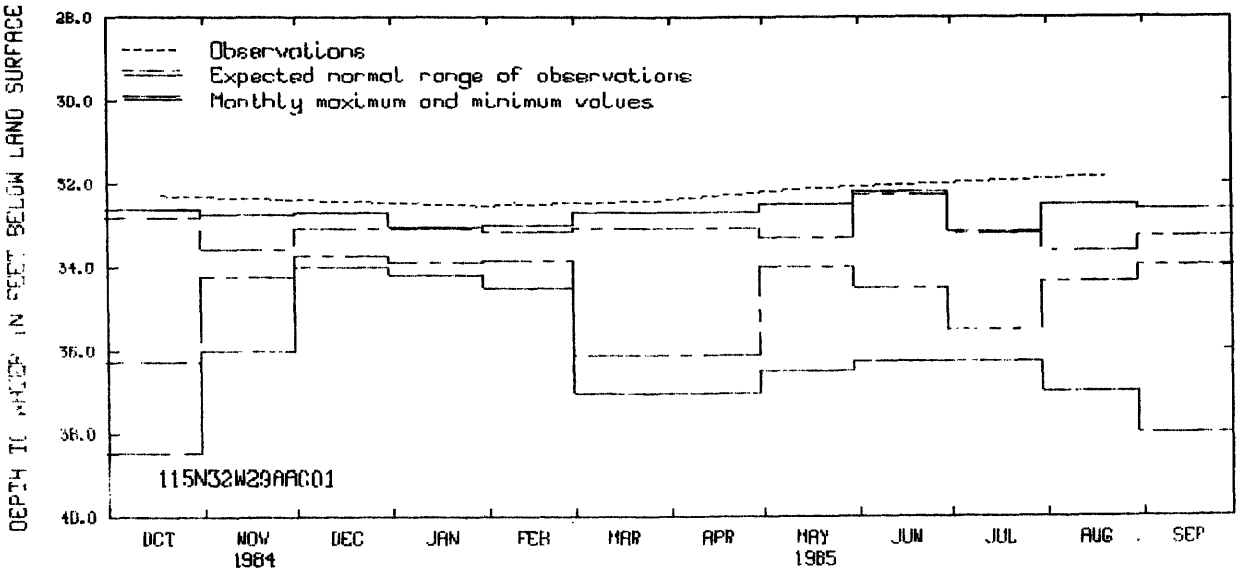
RENVILLE COUNTY

444437094425001. Local number, 115N32W29AAC01.
LOCATION.--Lat 44°44'37", long 94°42'50", in SW¼NE¼NE¼ sec.29, T.115 N., R.32 W., Hydrologic Unit 07010205, in Hector.
Owner: Hector Creamery.
AQUIFER.--Sandstone of Cretaceous Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 8 in (0.20 m), depth 370 ft (109 m), screened 360 to 370 ft (110 to 113 m).
DATUM.--Altitude of land-surface datum is 1,080 ft (329 m). Measuring point: Top of casing, 1.50 ft (0.46 m) above land-surface datum.
PERIOD OF RECORD.--March 1978 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 31.83 ft (9.70 m) below land-surface datum, Aug. 20, 1985; lowest, 38.48 ft (11.73 m) below land-surface datum, Oct. 24, 1978.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 18	32.29	MAR 27	32.42	MAY 16	32.13	AUG 20	31.83
JAN 31	32.53						

RENVILLE COUNTY--Continued

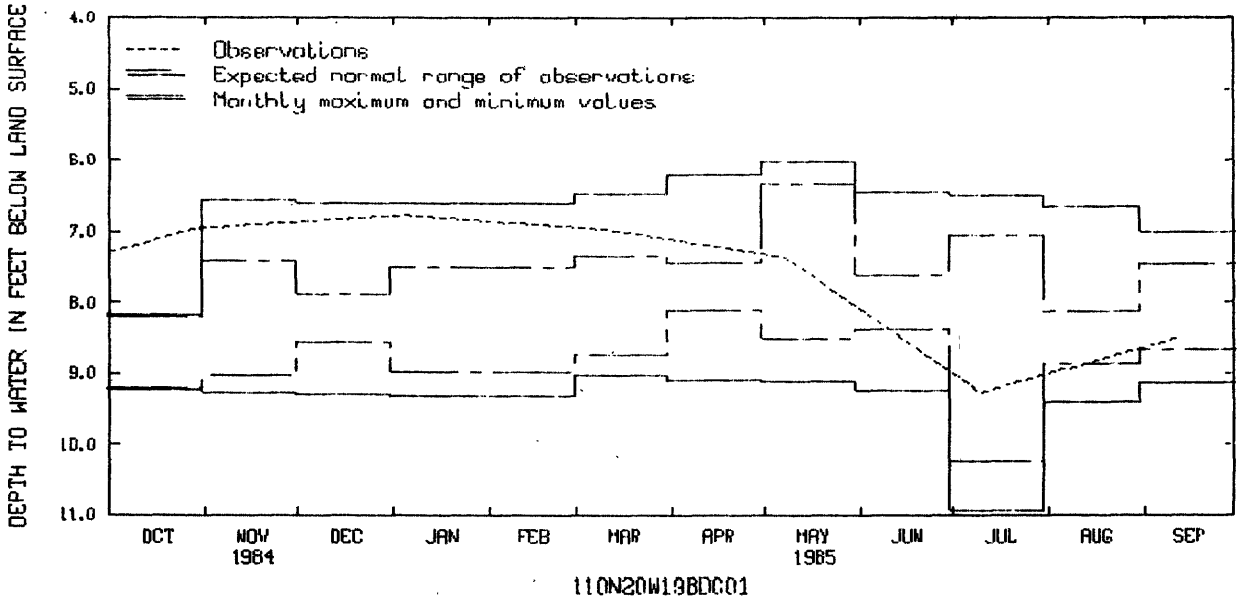


RICE COUNTY

441912093162901. Local number, 110N20W19BDC01.
LOCATION.--Lat 44°19'12", long 93°16'29", in SW¼SE¼NW¼ sec.19, T.110 N., R.20 W., Hydrologic Unit 07040002, just north of Faribault.
Owner: St. Lawrence Cemetery Assn.
AQUIFER.--Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled domestic artesian well, diameter 4 in (0.10 m), depth 400 ft (122 m), cased to 357 ft (110 m).
DATUM.--Altitude of land-surface datum is 985 ft (300 m). Measuring point: Top of casing, 1.60 ft (0.49 m) above land-surface datum.
PERIOD OF RECORD.--June 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 6.02 ft (1.83 m) below land-surface datum, May 2, 1984; lowest, 10.94 ft (3.33 m) below land-surface datum, July 10, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 30	6.95	JAN 4	6.77	MAR 12	6.97	MAY 8	7.37	JUL 10	9.28	SEP 11	8.52



RICE COUNTY--Continued

442543093113701. Local number, 111N20W11CDC01.
LOCATION.--Lat 44°25'43", long 93°11'37", in SW¼SE¼SW¼ sec.11, T.111 N., R.20 W., Hydrologic Unit 07040002, Highway 218 at Dundas.
Owner: Rollie Green.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age.
WELL CHARACTERISTICS.--Drilled commercial artesian well, diameter 4 in (0.10 m), depth 158 ft (48.2 m), cased to 101 ft (30.8 m).
DATUM.--Altitude of land-surface datum is 950 ft (290 m). Measuring point: Top of casing, 2.00 ft (0.61 m) above land-surface datum.
PERIOD OF RECORD.--October 1980 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 22.32 ft (6.80 m) below land-surface datum, May 2, 1984; lowest, 27.24 ft (8.30 m) below land-surface datum, Jan. 12, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 30	23.27	JAN 4	23.02	MAR 12	22.69	MAY 8	23.30	JUL 10	24.28	SEP 11	24.06

442751093240701. Local number, 112N21W31CBB01.
LOCATION.--Lat 44°27'51", long 93°24'07", in NW¼NW¼SW¼ sec.31, T.112 N., R.21 W., Hydrologic Unit 07040002, 1.0 mi (1.6 km) south of Highway 19.
Owner: Trondhjem Church.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age.
WELL CHARACTERISTICS.--Drilled domestic artesian well, diameter 4 in (0.10 m), depth 276 ft (84.1 m), cased to 232 ft (70.7 m).
DATUM.--Altitude of land-surface datum is 1,130 ft (344 m). Measuring point: Top of casing, 1.10 ft (0.34 m) above land-surface datum.
PERIOD OF RECORD.--June 1980 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 138.2 ft (42.12 m) below land-surface datum, May 8, 1985; lowest, 141.8 ft (43.22 m) below land-surface datum, Oct. 30, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

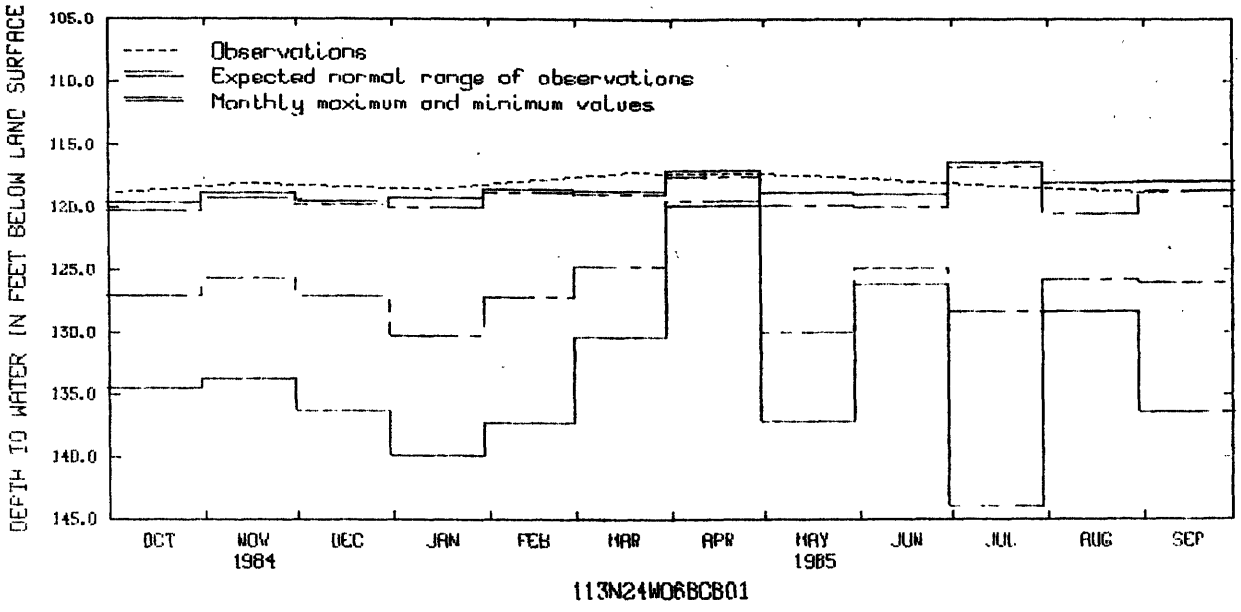
DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 30	138.40	JAN 4	138.28	MAR 12	138.24	MAY 8	138.20	JUL 11	138.66	SEP 4	138.50

SCOTT COUNTY

443732093460301. Local number, 113N24W06BCB01.
LOCATION.--Lat 44°37'32", long 93°46'03", in NW¼SW¼NW¼ sec.6, T.113 N., R.24 W., Hydrologic Unit 07020012, in Belle Plaine.
Owner: Creative Tool and Engineering. Formerly Belle Plaine Coop Creamery.
AQUIFER.--Buried sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled unused water-table well, diameter 12 in (0.30 m), depth 272 ft (82.9 m), screen information not available.
DATUM.--Altitude of land-surface datum is 840 ft (256 m). Measuring point: Top of well cap, 2.30 ft (0.70 m) above land-surface datum.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 116.8 ft (35.60 m) below land-surface datum, July 11, 1983; lowest, 144.0 ft (43.89 m) below land-surface datum, July 9, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	LEVEL	DATE	LEVEL
OCT 3	118.87	JAN 14	118.55	MAY 13	117.41	JUL 9	118.25	SEP 10	118.93
NOV 15	118.07	MAR 18	117.22						



443352093423001. Local number, 113N24W28DAA01.
LOCATION.--Lat 44°33'52", long 93°42'30", in NE¼NE¼SE¼ sec.28, T.113 N., R.24 W., Hydrologic Unit 07020012, at Michelle Wildlife Area.
Owner: U.S. Geological Survey.
AQUIFER.--Ironton-Galesville Sandstones of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled observation artesian well, diameter 6 in (0.15 m), depth 450 ft (137 m), cased to 219 ft (66.8 m).
DATUM.--Altitude of land-surface datum is 990 ft (302 m). Measuring point: Top of well seal, 2.30 ft (0.70 m) above land-surface datum.
PERIOD OF RECORD.--August 1981 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 131.7 ft (40.14 m) below land-surface datum, May 2, 1984; lowest, 136.5 ft (41.60 m) below land-surface datum, July 11, 1985.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	LEVEL
JUN 13	136.00	JUL 11	136.53	SEP 4	136.02

443352093423002. Local number, 113N24W28DAA02.
LOCATION.--Lat 44°33'52", long 93°42'30", in NE¼NE¼SE¼ sec.28, T.113 N., R.24 W., Hydrologic Unit 07020012, at Michelle Wildlife Area.
Owner: U.S. Geological Survey.
AQUIFER.--Mount Simon Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled observation artesian well, diameter 2 in (0.05 m), depth 655 ft (200 m), screened 650 to 655 ft (198 to 200 m).
DATUM.--Altitude of land-surface datum is 990 ft (302 m). Measuring point: Top of casing, 3.00 ft (0.91 m) above land-surface datum.
PERIOD OF RECORD.--August 1981 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 221.1 ft (67.39 m) below land-surface datum, May 3, 1983; lowest, 222.8 ft (67.90 m) below land-surface datum, Sept. 4, 1985.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
JUN 21	222.35	JUL 11	222.40	SEP 4	222.76

443715093480801. Local number, 113N25W02CAC01.
LOCATION.--Lat 44°37'15", long 93°48'08", in SW¼NE¼SW¼ sec.2, T.113 N., R.25 W., Hydrologic Unit 07020012, 0.75 mi (1.21 km) west of Belle Plaine at Shep's Gravel Pit.
Owner: U.S. Geological Survey.
AQUIFER.--Ironton-Galesville Sandstones of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled observation artesian well, diameter 4 in (0.04 m), depth 323 ft (98.4 m), cased to 193 ft (58.8 m).
DATUM.--Altitude of land-surface datum is 750 ft (229 m). Measuring point: Top of casing, 0.25 ft (0.08 m) above land-surface datum.
PERIOD OF RECORD.--October 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 5.83 ft (1.77 m) below land-surface datum, May 9, 1984; lowest, 10.35 ft (3.15 m) below land-surface datum, Jan. 8, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 7	7.99	JAN 14	8.32	MAR 18	7.13	MAY 13	6.91	JUL 9	7.87	SEP 10	8.59

444025093220801. Local number, 114N21W20BAA01.
LOCATION.--Lat 44°40'25", long 93°22'08", in NE¼NE¼NW¼ sec.20, T.114 N., R.21 W., Hydrologic Unit 07020012, 0.5 mi (0.8 km) east of Credit River.
Owner: Credit River Town Hall.
AQUIFER.--Buried sand of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled domestic artesian well, diameter 4 in (0.10 m), depth 98 ft (29.9 m), screened 93 to 98 ft (28.4 to 29.9 m).
DATUM.--Altitude of land-surface datum is 946 ft (288 m). Measuring point: Top of casing, 1.10 ft (0.34 m) above land-surface datum.
PERIOD OF RECORD.--September 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 35.13 ft (10.70 m) below land-surface datum, Mar. 12, 1985; lowest, 40.72 ft (12.41 m) below land-surface datum, July 16, 1981.

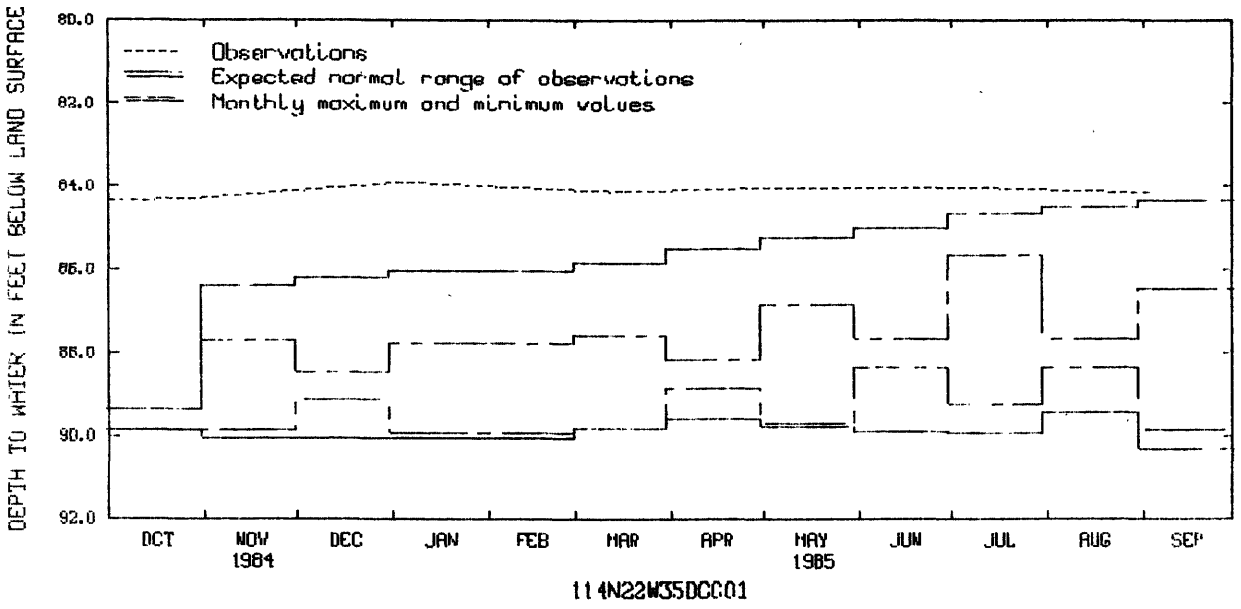
WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 30	35.93	MAR 12	35.13	MAY 8	35.16	JUL 11	36.45	SEP 4	35.69
JAN 4	35.26								

443752093254401. Local number, 114N22W35DCC01.
LOCATION.--Lat 44°37'52", long 93°25'44", in SW¼SW¼SE¼ sec.35, T.114 N., R.22 W., Hydrologic Unit 07020012, southwest of Credit River.
Owner: St. Catherine's Church.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age.
WELL CHARACTERISTICS.--Drilled domestic artesian well, diameter 4 in (0.10 m), depth 235 ft (71.6 m), cased to 194 ft (59.1 m).
DATUM.--Altitude of land-surface datum is 1,015 ft (309 m). Measuring point: Top of casing, 1.20 ft (0.37 m) above land-surface datum.
PERIOD OF RECORD.--September 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 83.92 ft (25.57 m) below land-surface datum, Jan. 4, 1985; lowest, 90.30 ft (27.52 m) below land-surface datum, Sept. 6, 1979.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

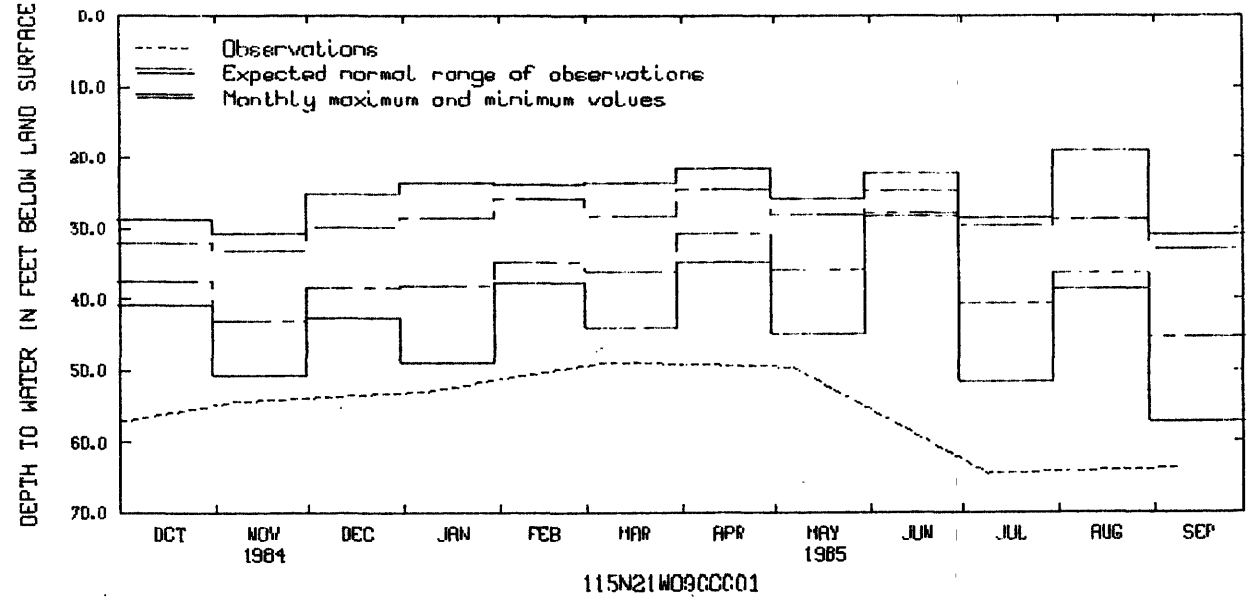
DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 30	84.30	JAN 4	83.92	MAR 12	84.14	MAY 8	84.03	JUL 11	84.05	SEP 4	84.17



444633093212901. Local number, 115N21W09CCC01.
LOCATION.--Lat 44°46'33", long 93°21'29", in SW¼SW¼SW¼ sec.9, T.115 N., R.21 W., Hydrologic Unit 07020012, at Savage waste treatment plant.
Owner: City of Savage, well 2.
AQUIFER.--Mount Simon Sandstone of Late Cambrian Age and Hinckley Sandstone of Late Precambrian Age.
WELL CHARACTERISTICS.--Drilled public-supply artesian well, depth 846 fOt (258 m), 16 in (0.41 m) casing 0 ft to 280 ft (85.3 m), 10 in (0.25 m) casing 250 ft to 660 ft (85.3 m to 201 m).
DATUM.--Land-surface datum is 730 ft (222.5 m). Measuring point: Edge of vent pipe 0.75 ft (0.23 m) above land-surface datum.
PERIOD OF RECORD.--February 1971 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 18.98 ft (5.79 m) below land-surface datum, Aug. 9, 1979; lowest, 64.55 ft (19.67 m) below land-surface datum, July 9, 1985.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

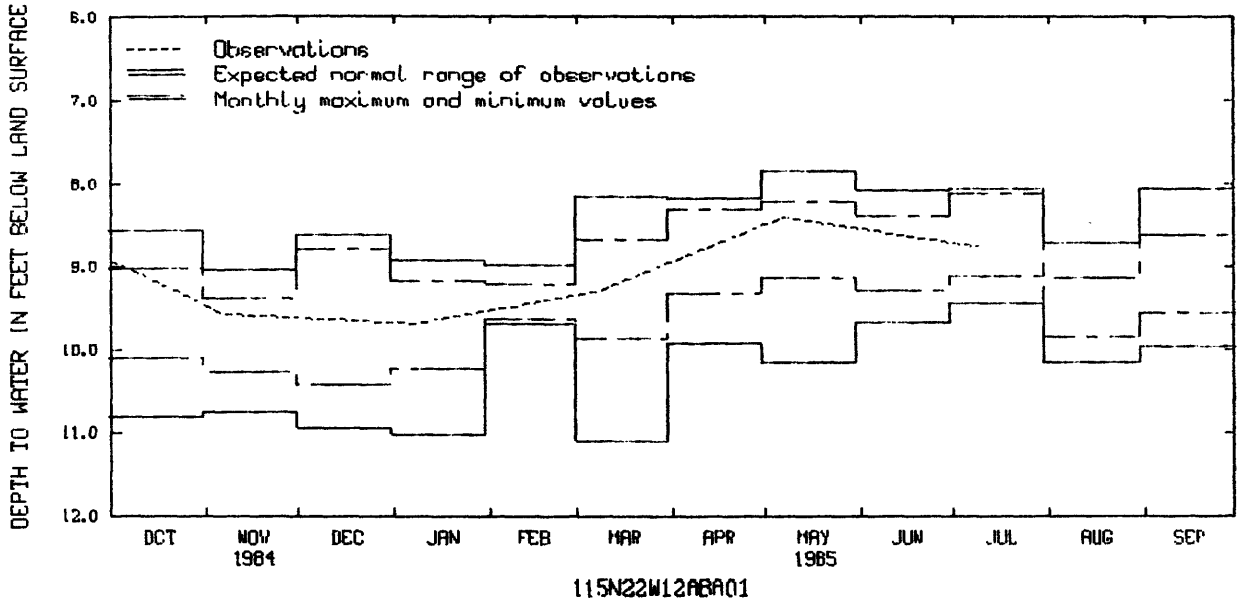
DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 7	54.40	JAN 8	52.95	MAR 8	48.84	MAY 7	49.59	JUL 9	64.55	SEP 10	63.77



444720093241801. Local number, 115N22W12ABA01.
LOCATION.--Lat 44°47'20", long 93°24'18", in NE¼NW¼NE¼ sec.12, T.115 N., R.22 W., Hydrologic Unit 07020012, west of Savage at Wilkie State Park.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial sand of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1¼ in (0.03 m), depth 21 ft (6.4 m), screened 19 to 21 ft (5.8 to 6.4 m).
DATUM.--Altitude of land-surface datum is 725 ft (221 m). Measuring point: Top of casing, 2.40 ft (0.73 m) above land-surface datum.
PERIOD OF RECORD.--August 1974 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 7.85 ft (2.39 m) below land-surface datum, May 5, 1983; lowest, 11.10 ft (3.38 m) below land-surface datum, Mar. 4, 1975.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 7	9.58	JAN 8	9.69	MAR 8	9.30	MAY 7	8.40	JUL 9	8.76



444442093351001. Local number, 115N23W28AAC01.
LOCATION.--Lat 44°44'42", long 93°35'10", in SW¼NE¼NE¼ sec.28, T.115 N., R.23 W., Hydrologic Unit 07020012, 2.75 mi (6.03 km) south of Shakopee.
Owner: Leonard Granzow.
AQUIFER.--Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled irrigation artesian well, diameter 8 in (0.20 m), depth 150 ft (45.7 m), cased to 116 ft (35.4 m).
DATUM.--Altitude of land-surface datum is 801 ft (244 m). Measuring point: Top of casing, 0.40 ft (0.12 m) above land-surface datum.
PERIOD OF RECORD.--April 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 80.25 ft (24.46 m) below land-surface datum, Sept. 7, 1984; lowest, 87.98 ft (26.82 m) below land-surface datum, Mar. 8, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 7	80.80	JAN 9	81.30	MAR 8	81.40	MAY 13	80.28	JUL 9	81.14	SEP 10	81.74

SCOTT COUNTY--Continued

444427093353901. Local number, 115N23W28BDD01.
LOCATION.--Lat 44°44'27", long 93°43'53", in SE¼SE¼NW¼ sec.28, T.115N., R.23 W., Hydrologic Unit 07020012, Merriam Junction.
Owner: Chicago and Northwestern Transportation Company.
AQUIFER.--Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled observation artesian well, diameter 16 in(0.40 m), depth 140ft (42.7m), cased to 75 ft (22.9m).
DATUM.--Altitude of land-surface datum is 758 ft (231m).
Measuring point: Top of casing, 0.90 ft (0.27 m) above land-surface datum.
PERIOD OF RECORD.--November 1984 to September 1985.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 25.75ft (7.84 m) below land-surface datum, Mar. 8, 1985; lowest, 37.83 ft (11.53m) below land-surface datum, Sept.18, 1985.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 14	30.65	MAR 8	25.75	MAY 13	29.92	JUN 14	32.65	JUL 9	33.83	SEP 18	37.83
JAN 9	27.06										

444427093353902. Local number, 115N23W28BDD02.
LOCATION.--Lat 44°44'27", long 93°35'39", in SE¼SE¼NW¼ sec.28, T.115N., R.23 W., Hydrologic Unit 07020012, Merrriam Junction.
Owner: Chicago and Northwestern Transportation Company.
AQUIFER.--Ironton-Galesville Sandstones of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled obersvation artesian well, diameter 4 in (0.10 m), depth 355 ft (108 m), screened 350 to 355 ft (107 to 108 m).
DATUM.--Altitude of land-surface datum is 758 ft (231 m). Measuring point: Top of casing, 1.00 ft (0.30 m) above land-surface datum.
REMARKS.--Water level affected by pumping.
PERIOD OF RECORD.--November 1984 to September 1985.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 24.52ft (7.47 m) below land-surface datum, Mar. 8, 1985; lowest, 38.80 ft (9.99 m) below land-surface datum, July 9, 1985.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 14	29.96	MAR 8	24.52	JUN 14	31.63	JUL 9	32.80	SEP 18	30.12
JAN 9	25.63	MAY 13	28.90						

444427093353903. Local number, 115N23W28BDD03.
LOCATION.--Lat 44°44'27", long 93°35'39", in SE¼SE¼NW¼ sec.28, T.115N., R.23 W., Hydrologic Unit 07020012, Merriam Junction.
Owner: Chicago and Northwestern Transportation Company.
AQUIFER.--Mount Simon Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled observation artesian well, diameter 4 in (0.10 m), depth 525 ft (160 m), screened 520 to 525ft (158 to 160 m).
DATUM.--Altitude of land-surface datum is 758 ft (231 m). Measuring point: Top of casing, 1.00 ft (0.30m) above land-surface datum.
PERIOD OF RECORD.--November 1984 to September 1985.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 33.85 ft (10.31m)below land-surface datum, Mar. 8, 1985; lowest, 44.53 ft (13.57m) below land-surface datum, Sept.9, 1985.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 14	35.06	MAR 8	33.85	JUN 14	41.05	JUL 9	42.45	SEP 18	44.53
JAN 9	34.44	MAY 13	37.50						

SHERBURNE COUNTY

452938093432702. Local number, 035N27W29BDD02.
LOCATION.--Lat 45°29'38", long 93°43'27", in NW¼NW¼SE¼ sec.29, T.35 N., R.27 W., Hydrologic Unit 07010203, 3.2 mi (5.2 km) north of Orrock in Sherburne National Wildlife Refuge.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 2¼ in (0.05 m), depth 15 ft (4.6 m), screened 13 to 15 ft (4.0 to 4.6 m).
DATUM.--Altitude of land-surface datum is 987 ft (301 m). Measuring point: Top of casing, 1.70 ft (0.52 m) above land-surface datum.
PERIOD OF RECORD.--October 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 3.63 ft (1.11 m) below land-surface datum, Nov. 21, 1984; lowest, 8.48 ft (2.58 m) below land-surface datum, Nov. 30, 1976.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 23	3.66	JAN 16	4.70	MAR 29	4.07	MAY 20	4,27	JUL 30	5.40
NOV 21	3.63	FEB 14	5.04	APR 20	3.99	JUL 3	4.38	AUG 29	5.03
DEC 19	3.73								

STEELE COUNTY

435742093164001. Local number, 106N20W30BAD01.
LOCATION.--Lat 43°57'42", long 93°16'40", in SE¼NE¼NW¼ sec.30, T.106 N., R.20 W., Hydrologic Unit 07040002, at Hope.
Owner: Hope Elevator.
AQUIFER.--Galena Formation of Middle Ordovician Age.
WELL CHARACTERISTICS.--Drilled commerical artesian well, diameter 5 in (0.13 m), depth 215 ft (65.5 m), cased to 108 ft (32.9 m).
DATUM.--Altitude of land-surface datum is 1,198 ft (365 m). Measuring point: Top of casing, 1.00 ft (0.30 m) above land-surface datum.
PERIOD OF RECORD.--November 1981 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 29.90 ft (9.11 m) below land-surface datum, May 10, 1984; lowest, 34.48 ft (10.50 m) below land-surface datum, July 10, 1985.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 8	32.85	JAN 15	32.36	MAR 19	32.60	MAY 14	31.67	JUL 10	34.48	SEP 11	33.95

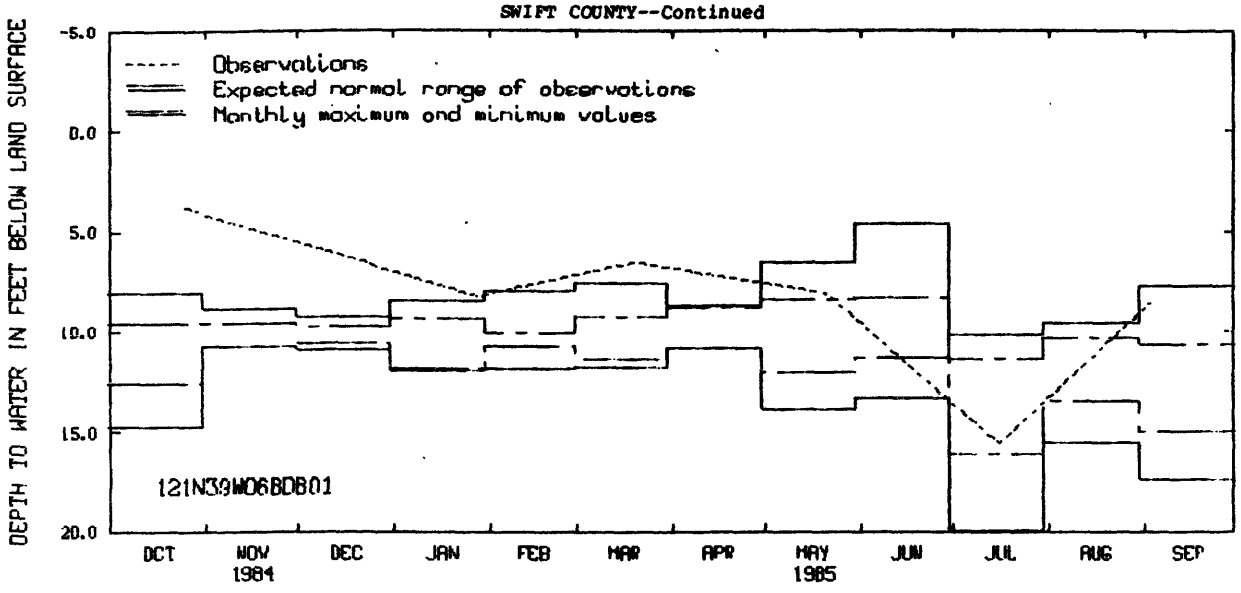
SWIFT COUNTY

451913095370201. Local number, 121N39W06BDB01.
LOCATION.--Lat 45°19'13", long 95°37'02", in NW¼SE¼NW¼ sec.6, T.121 N., R.39 W., Hydrologic Unit 07020005, in Ambush Park.
Owner: City of Benson.
AQUIFER.--Buried sand of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled observation artesian well, diameter 3 in (0.08 m), depth 143 ft (43.6 m), screened 123 to 143 ft (37.5 to 43.6 m).
DATUM.--Altitude of land-surface datum is 1,030 ft (314 m). Measuring point: Top of casing 3.00 ft (0.91 m) above land-surface datum.
REMARKS.--Water level affected by pumping.
PERIOD OF RECORD.--May 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 3.85 ft (1.17 m) below land-surface datum, Oct. 25, 1984; lowest, 19.90 ft (6.07 m) below land-surface datum, July 24, 1980.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 25	3.85	JAN 28	8.25	MAR 20	6.54	MAY 21	8.08	JUL 16	15.56	SEP 3	8.62

SWIFT COUNTY--Continued

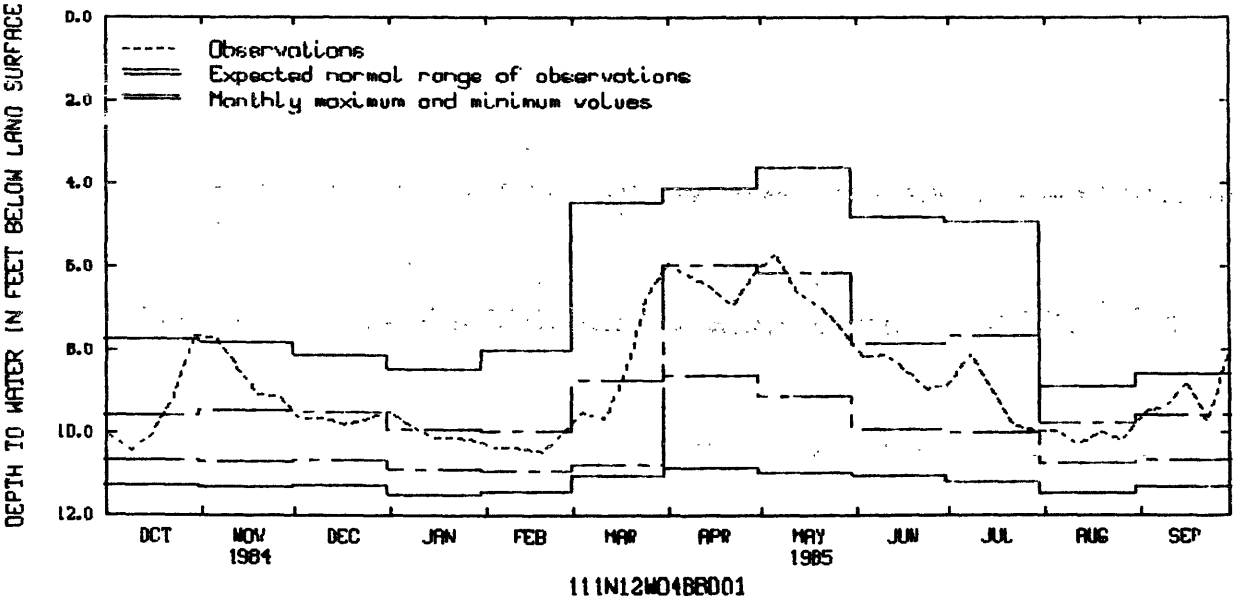


WABASHA COUNTY

442708092155401. Local number, 111N12W04BBD01.
LOCATION.--Lat 44°27'08", long 92°15'54", in SE¼NW¼NW¼ sec.04, T.111 N., R.12 W., Hydrologic Unit 07040001, at Lake City.
Owner: City of Lake City, well 3.
AQUIFER.--Mount Simon Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 16 in (0.41 m), depth 430 ft (131 m), cased to 258 ft (78.6 m).
DATUM.--Altitude of land-surface datum is 685 ft (209 m). Measuring point: Top of casing, 1.00 ft (0.30 m) above land-surface datum.
REMARKS.--Measured weekly by David Finley.
PERIOD OF RECORD.--August 1974 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 3.63 ft (1.11 m) below land-surface datum, May 5, 1975; lowest, 11.50 ft (3.51 m) below land-surface datum, Jan. 31, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 2	10.08	DEC 3	9.67	FEB 4	10.37	APR 8	6.24	JUN 10	8.13	AUG 12	10.29
9	10.42	10	9.67	11	10.37	15	6.51	17	8.49	19	10.00
15	10.09	17	9.80	19	10.47	22	6.95	24	8.96	26	10.20
22	9.19	DEC 24	9.69	25	10.06	29	6.15	JUL 1	8.82	SEP 3	9.50
29	7.66	31	9.49	MAR 4	9.52	MAY 6	5.70	8	8.11	9	9.40
NOV 5	7.69	JAN 7	9.80	11	9.68	13	6.63	22	9.84	16	8.78
13	8.49	14	10.11	18	8.51	20	6.95	29	9.99	23	9.72
19	9.07	21	10.11	25	6.72	28	7.58	AUG 5	9.98	30	7.95
26	9.14	28	10.19	APR 1	5.94	JUN 3	8.19				

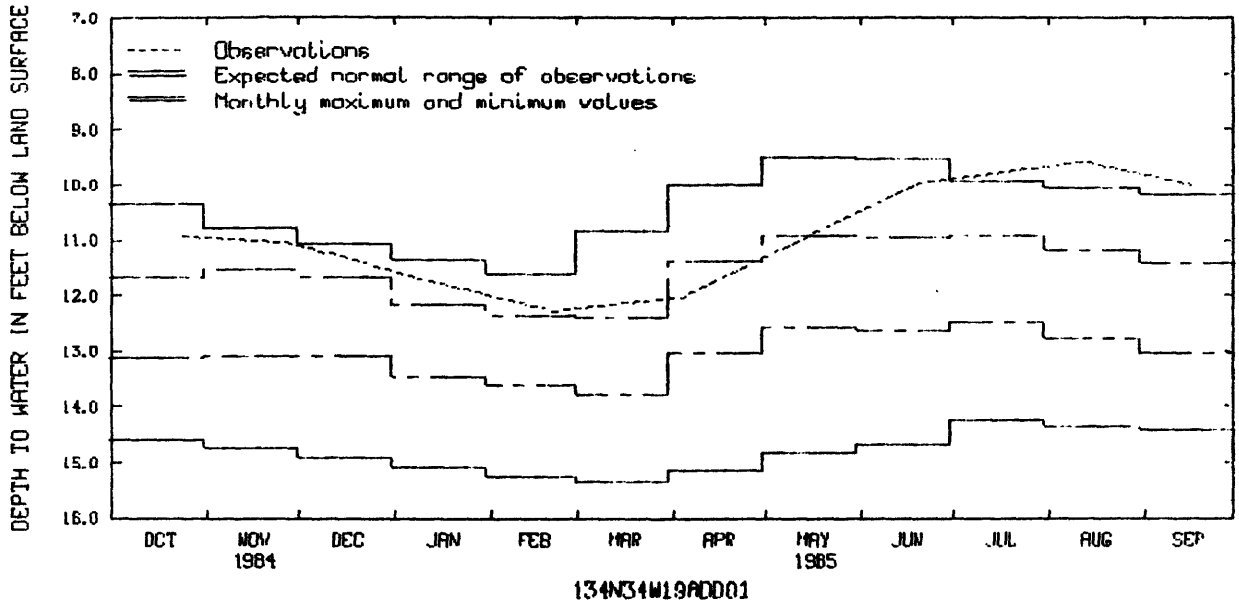


WADENA COUNTY

462415095003001. Local number, 134N34W19ADD01.
LOCATION.--Lat 46°24'21", long 95°00'36", in SE¼SE¼NE¼ sec.19, T.134 N., R.34 W., Hydrologic Unit 07010107, 0.05 mi (0.08 km) north of Verndale.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial outwash sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 2 in (0.05 m), depth 37 ft (11.3 m), screened 34 to 37 ft (10.4 to 11.3 m).
DATUM.--Altitude of land-surface datum is 1,342 ft (409 m). Measuring point: Top of casing, 1.00 ft (0.30 m) above land-surface datum.
PERIOD OF RECORD.--September 1966 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 9.48 ft (2.89 m) below land-surface datum, June 2, 1972; lowest, 15.33 ft (4.41 m) below land-surface datum, Mar. 10-11, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	WATER LEVEL	DAY	WATER LEVEL	DAY	WATER LEVEL	DAY	WATER LEVEL	DAY	WATER LEVEL	DAY	WATER LEVEL
OCT 24	10.92	JAN 9	11.70	APR 4	12.04	JUN 20	9.98	AUG 12	9.59	SEP 16	9.99
NOV 28	11.06	FEB 21	12.28	MAY 16	10.90						



WASHINGTON COUNTY

445125092464001. Local number, 027N20W02BCC01.
LOCATION.--Lat 44°51'25", long 92°46'40", in SW¼SW¼NW¼ sec.2, T.27 N., R.20 W., Hydrologic Unit 07030005, in Afton State Park by Afton Alps.
Owner: U.S. Geological Survey.
AQUIFER.--St. Lawrence Formation and Franconian Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled observation artesian well, diameter 6 in (0.15 m), depth 285 ft (86.9 m), cased to 105 ft (32.0 m).
DATUM.--Altitude of land-surface datum is 695 ft (212 m). Measuring point: Center of pressure guage, 3.80 ft (1.16 m) above land-surface datum.
PERIOD OF RECORD.--March 1980 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 33.94 ft (10.38 m) above land-surface datum, May 2, 1980; lowest, 19.67 ft 5.99 m) above land-surface datum, Jan.8, 1985.

WATER LEVEL, IN FEET ABOVE LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 6	27.95	MAR 20	27.03	APR 29	26.80	JUL 12	26.80	AUG 16	27.72	SEP 3	27.49
JAN 8	19.67	APR 11	28.18	JUN 5	27.95						

445125092464002. Local number, 027N20W02BCC02.
LOCATION.--Lat 44°51'25", long 92°46'40", in SW¼SW¼NW¼ sec.2, T.27 N., R.20 W., Hydrologic Unit 07030005, in Afton State Park by Afton Alps.
Owner: U.S. Geological Survey.
AQUIFER.--Ironton-Galesville Sandstones of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled observation artesian well, diameter 4 in (0.10 m), depth 385 ft (117 m), cased to 365 ft (111 m).
DATUM.--Altitude of land-surface datum is 695 ft (212 m). Measuring point: Center of pressure guage, 3.80 ft (1.16 m) above land-surface datum.
PERIOD OF RECORD.--March 1980 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 42.35 ft (12.91 m) above land-surface datum, May 2, 1980; lowest, 23.81 ft (7.25 m) above land-surface datum, Jan. 8, 1985.

WATER LEVEL, IN FEET ABOVE LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 6	34.39	MAR 20	32.09	APR 29	32.44	JUL 12	32.55	AUG 16	33.70	SEP 3	33.59
JAN 8	23.81	APR 11	34.28	JUN 5	34.16						

445125092464003. Local number, 027N20W02BCC03.
LOCATION.--Lat 44°51'25", long 92°46'40", in SW¼SW¼NW¼ sec.2, T.27 N., R.20 W., Hydrologic Unit 07030005, in Afton State Park by Afton Alps.
Owner: U.S. Geological Survey.
AQUIFER.--Mount Simon Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled observation artesian well, diameter 1½ in (0.04 m), depth 535 ft (163 m), screened 530 to 535 ft (162 to 163 m).
DATUM.--Altitude of land-surface datum is 695 ft (212 m). Measuring point: Center of pressure guage, 3.40 ft (1.04 m) above land-surface datum.
PERIOD OF RECORD.--March 1980 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 22.05 ft (6.72 m) above land-surface datum, May 2, 1980; lowest, 6.62 ft (2.01 m) above land-surface datum, Aug. 16, 1985.

WATER LEVEL, IN FEET ABOVE LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 6	9.15	APR 11	8.46	JUN 5	8.23	JUL 12	9.38	AUG 16	6.62	SEP 3	7.54
MAR 20	7.66	29	8.23								

444751092563101. Local number, 027N21W28BCC01.
LOCATION.--Lat 44°47'51", 92°56'31", in SW¼SW¼NW¼ sec.28, T.27 N., R.21 W., Hydrologic Unit 07010206, 0.1 mi (0.2 km) east of Ideal Avenue South.
Owner: Eugene Smallidge.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age and Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled irrigation water-table well, diameter 16 in (0.41 m), depth 345 ft (105 m), cased to 60 ft (18.3 m).
DATUM.--Altitude of land-surface datum is 807 ft (246 m). Measuring point: Hole in pump base, 2.10 ft (0.64 m) above land-surface datum.
PERIOD OF RECORD.--August 1977, January 1978, December 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 62.34 ft (19.00 m) below land-surface datum, Dec. 10, 1979; lowest, 81.87 ft (24.95 m) below land-surface datum, Aug. 3, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 29	65.54	JAN 2	65.80	MAR 12	66.82	APR 26	65.66	SEP 4	69.66

WASHINGTON COUNTY--Continued

445536092462401. Local number, 028N20W11CAA01.
LOCATION.--Lat 44°55'36", long 92°46'24", in NE¼NE¼SW¼ sec.11, T.28 N., R.20 W., Hydrologic Unit 07030005, at Lake St. Croix Beach.
Owner: Lower St. Croix Valley Fire Department.
AQUIFER.--Franconian Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled domestic water-table well, diameter 4 in (0.10 m), depth 94 ft (28.6 m), cased to 78 ft (23.8 m).
DATUM.--Altitude of land-surface datum is 720 ft (220 m). Measuring point: Top of electrical housing, 1.70 ft (0.52 m) above land-surface datum.
PERIOD OF RECORD.--June 1978 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 31.46 ft (9.59 m) below land-surface datum, June 27, 1984; lowest, 38.65 ft (11.78 m) below land-surface datum, Mar. 3, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 31	36.12	JAN 8	37.26	MAR 13	37.96	APR 29	34.06	JUL 12	34.83	SEP 3	37.23

445220092465901. Local number, 028N20W34ADA01.
LOCATION.--Lat 44°52'20", long 92°46'59", in NE¼SE¼NE¼ sec.34, T.28 N., R.20 W., Hydrologic Unit 07030005, in Afton State Park.
Owner: State of Minnesota.
AQUIFER.--Franconia Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 4 in (0.10 m), depth 306 ft (93.2 m), cased to 276 ft (84.1 m).
DATUM.--Altitude of land-surface datum is 970 ft (296 m). Measuring point: Top of casing, 0.90 ft (0.27 m) above land-surface datum.
PERIOD OF RECORD.--August 1979 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 240.4 ft (73.27 m) below land-surface datum, June 27, 1984; lowest, 245.2 ft (74.74 m) below land-surface datum, Jan. 6, 1982.

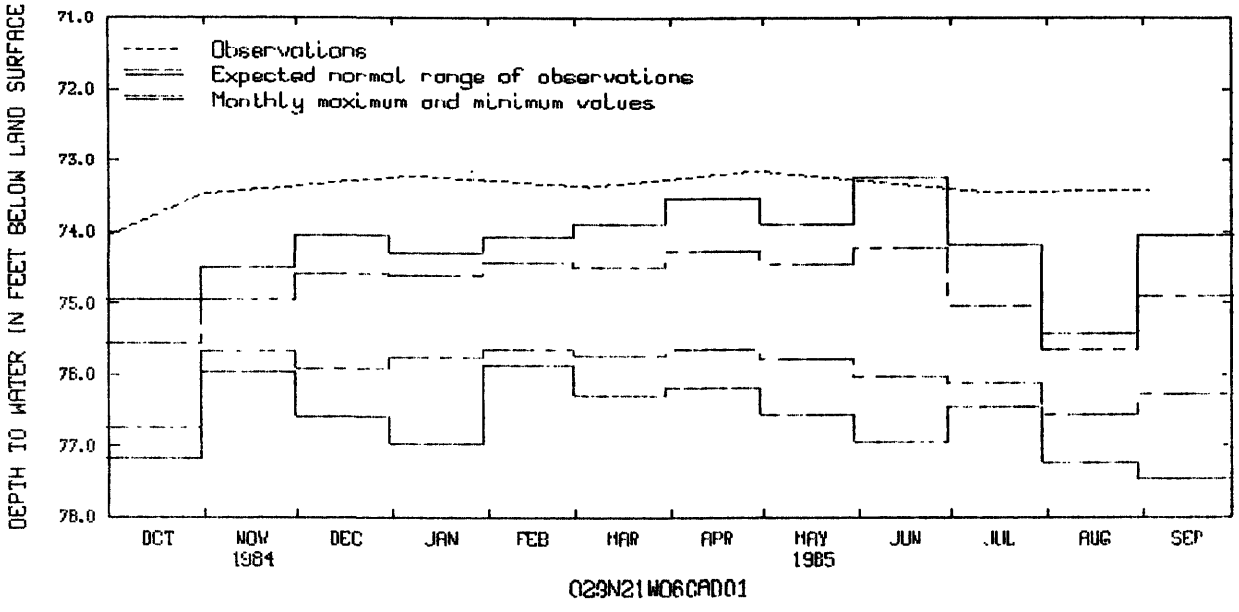
WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 31	241.55	MAR 20	242.25	JUL 12	242.85	SEP 3	242.30
JAN 8	243.22	APR 29	241.65				

450134092583101. Local number, 029N21W06CAD01.
LOCATION.--Lat 45°01'34", long 92°58'31", in SE¼NE¼SW¼ sec.6, T.29 N., R.21 W., Hydrologic Unit 07010206, at 6488 North Highway 36 Boulevard.
Owner: Twenty Nine Pines Trailer Park.
AQUIFER.--St. Peter Sandstone of Middle Ordovician Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 6 in (0.15 m), depth 210 ft (64.0 m), cased to 141 ft (43.0 m).
DATUM.--Altitude of land-surface datum is 980 ft (299 m). Measuring point: Hole in pump base, 2.20 ft (0.67 m) above land-surface datum.
PERIOD OF RECORD.--April 1974 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 73.15 ft (22.29 m) below land-surface datum, Apr. 29, 1985; lowest, 77.47 ft (23.61 m) below land-surface datum, Sept. 13, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 31	73.48	JAN 7	73.22	MAR 6	73.37	APR 29	73.15	JUL 12	73.45	SEP 3	73.42



450027092552101. Local number, 029N21W10CCC01.
LOCATION.--Lat 45°00'27", long 95°55'21", in SW¼SW¼SW¼ sec.10, T.29 N., R.21 W., Hydrologic Unit 07010206, Lake Jane Road, 0.7 mi (1.1 km) north of Highway 212.
Owner: City of Lake Elmo.
AQUIFER.--Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 6 in (0.15 m), depth 348 ft (106 m), cased to 280 ft (85.3 m).
DATUM.--Altitude of land-surface datum is 935 ft (285 m). Measuring point: Top of well cap, 1.20 ft (0.37 m) above land-surface datum.
PERIOD OF RECORD.--September 1977, February 1978, February 1980 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 35.58 ft (10.84 m) below land-surface datum, Sept. 3, 1985; lowest, 45.65 ft (13.91 m) below land-surface datum, Sept. 28, 1977.

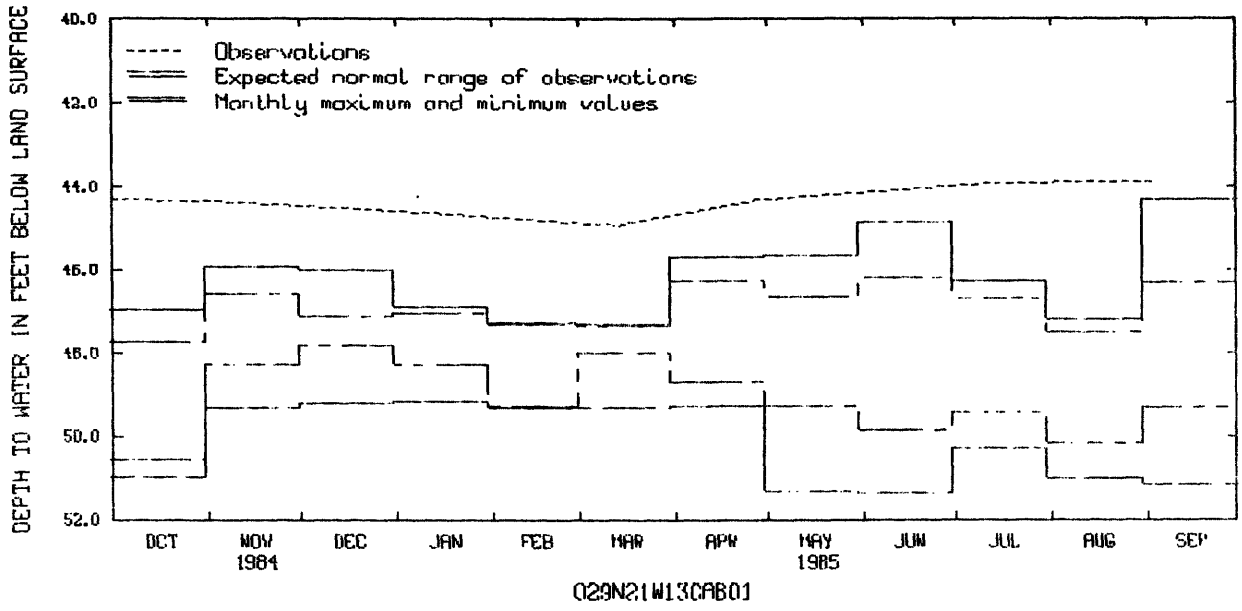
WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 31	36.47	JAN 8	37.17	MAR 6	37.22	APR 29	36.30	JUL 12	36.08	SEP 3	35.58

445958092523901. Local number, 029N21W13CAB01.
LOCATION.--Lat 44°59'58", long 92°52'39", in NW¼NE¼SW¼ sec.13, T.29 N., R.21 W., Hydrologic Unit 07010206, in City of Lake Elmo.
Owner: Elmo Lumber and Plywood. Formerly Lake Elmo Creamery.
AQUIFER.--Buried sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 12 in (0.30 m), depth 122 ft (37.2 m), screened 106 to 122 ft (32.3 to 37.2 m).
DATUM.--Altitude of land-surface datum is 938 ft (286 m). Measuring point: Hole in pump base, 1.30 ft (0.40 m) above land-surface datum.
PERIOD OF RECORD.--August 1977 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 43.87 ft (13.37 m) below land-surface datum, Sept. 3, 1985; lowest, 51.37 ft (15.66 m) below land-surface datum, June 12, 1978.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 31	44.34	JAN 8	44.61	MAR 13	44.92	APR 29	44.32	JUL 12	43.93	SEP 3	43.87



450858092575001. Local number, 031N21W28ABD01.
LOCATION.--Lat 45°08'58", long 92°57'50", in SE¼NW¼NE¼ sec.28, T.31 N., R.21 W., Hydrologic Unit 07010206, County Road 8A, 1.65 mi (2.6 km) east of Highway 61.
Owner: White Bear Gun Club.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age.
WELL CHARACTERISTICS.--Drilled domestic artesian well, diameter 4 in (0.10 m), depth 142 ft (43.3 m), cased to 94 ft (28.6 m).
DATUM.--Altitude of land-surface datum is 939 ft (28.6 m). Measuring point: Top of well cap, 1.30 ft (0.40 m) above land-surface datum.
PERIOD OF RECORD.--September 1977, February 1978, February 1980 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 8.45 ft (2.57m) below land-surface datum , May 2, 1985; lowest, 13.17 ft (4.01 m) below land-surface datum, Sept. 30, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 6	8.70	MAR 15	9.20	MAY 2	8.45	JUL 12	9.37	SEP 6	9.42
JAN 7	8.88								

451355092532601. Local number, 032N20W30BCD01.
LOCATION.--Lat 45°13'55", long 92°53'26", in SE¼SW¼NW¼ sec.30, T.32 N., R.20 W., Hydrologic Unit 07030005, 0.25 mi (0.4 km) north of 192nd Street.
Owner: Arno Birr.
AQUIFER.--Prairie du Chien Group of Early Ordovician Age and Jordan Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled irrigation artesian well, diameter 12 in (0.30 m), depth 260 ft (79.2 m), cased to 141 ft (43.0 m).
DATUM.--Altitude of land-surface datum is 990 ft (302 m). Measuring point: Vent pipe, 1.00 ft (0.30 m) above land-surface datum.
PERIOD OF RECORD.--March 1981 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 51.99 ft (16.04 m) below land-surface datum, July 11, 1984; lowest, 53.97 ft (16.43 m) below land-surface datum, Mar. 9, 1983.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

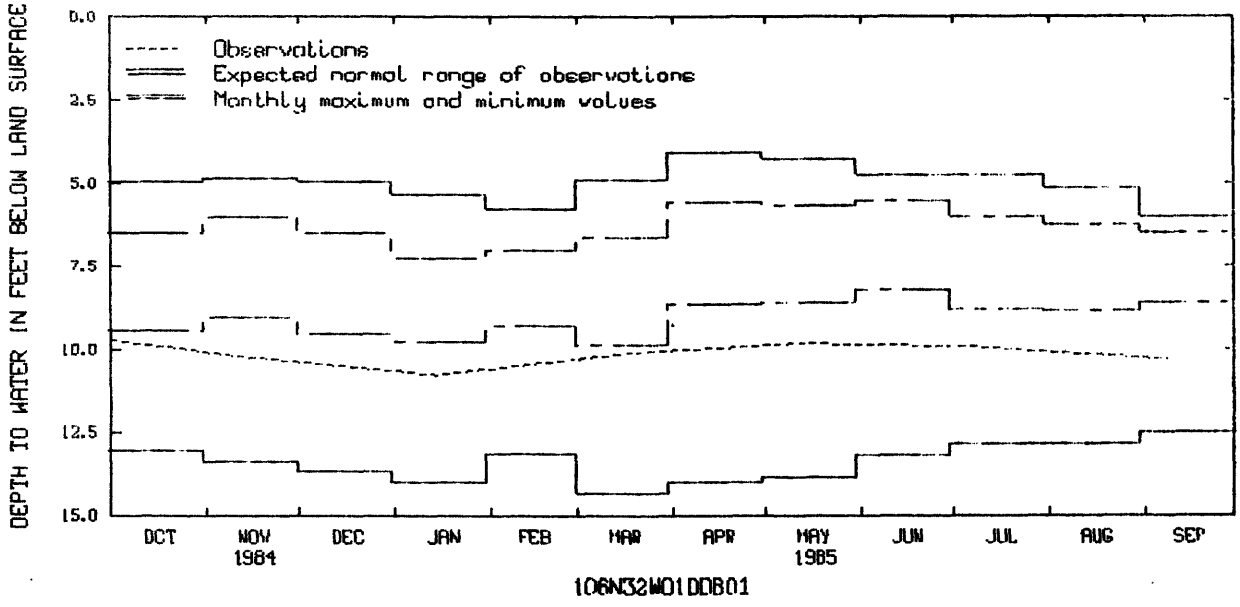
DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 6	52.06	JAN 7	52.02	MAR 15	52.10	MAY 2	52.54	SEP 6	52.74

WATONWAN COUNTY

440037094372601. Local number, 106N32W01DDB01.
LOCATION.--Lat 44°00'37", long 94°37'26", in NW¼SE¼SE¼ sec.1, T.106 N., R.32 W., Hydrologic Unit 07020010, north of St. James.
Owner: U.S. Geological Survey.
AQUIFER.--Surficial outwash sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Bored observation water-table well, diameter 2 in (0.05 m), depth 22 ft (6.7 m), screened 19 to 22 ft (5.8 to 6.7 m).
DATUM.--Altitude of land-surface datum is 1,056.2 ft (321.9 m) National Geodetic Vertical Datum of 1929. Measuring point: Top of wood platform, 0.80 ft (0.24 m) above land-surface datum.
PERIOD OF RECORD.--November 1965 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 4.11 ft (1.25 m) below land-surface datum, Apr. 27, 1969; lowest, 14.34 ft (4.37 m) below land-surface datum, Mar. 1, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 7	10.17	JAN 14	10.76	MAR 18	10.11	MAY 13	9.82	JUL 9	9.93	SEP 10	10.33



440409094304901. Local number, 107N31W14DAC01.
LOCATION.--Lat 44°04'09", long 94°30'49", in SW¼NE¼SE¼ sec.14, T.107 N., R.31 W., Hydrologic Unit 07020010, 2.75 mi (4.4 km) east of LaSalle.
Owner: William Lassas.
AQUIFER.--Sandstone of Cretaceous Age.
WELL CHARACTERISTICS.--Drilled irrigation artesian well, diameter 12 in (0.30 m), depth 150 ft (45.7 m), screened 100 to 135 ft (30.5 to 41.2 m).
DATUM.--Altitude of land-surface datum is 1,008 ft (307 m). Measuring point: Vent pipe, 1.80 ft (0.55 m) above land-surface datum.
PERIOD OF RECORD.--September 1981 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 10.44 ft (3.18 m) below land-surface datum, May 9, 1983; lowest, 14.65 ft (4.36 m) below land-surface datum, July 9, 1985.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 7	12.96	JAN 14	13.22	MAR 18	12.00	MAY 13	12.37	JUL 9	14.65	SEP 10	13.60

440133094312501. Local number, 107N31W35CAC01.
LOCATION.--Lat 44°01'33", long 94°31'25", in SW¼NE¼SW¼ sec.35, T.107 N., R.31 W., Hydrologic Unit 07020010, northeast of St. James.
Owner: Al Guyer.
AQUIFER.--Mount Simon Sandstone of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled irrigation artesian well, diameter 10 in (0.25 m), depth 350 ft (107 m), screened 310 to 350 ft (94.5 to 107 m).
DATUM.--Altitude of land-surface datum is 1,055 ft (322 m). Measuring point: Vent pipe, 1.00 ft (0.30 m) above land-surface datum.
PERIOD OF RECORD.--September 1981 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 29.83 ft (9.09 m) below land-surface datum, May 9, 1983; lowest, 33.70 ft (10.27 m) below land-surface datum, Sept. 15, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 7	31.74	JAN 14	31.83	MAR 18	31.85	MAY 13	31.38	SEP 10	33.65

WINONA COUNTY

435746092034202. Local number, 106N10W19DDA02.
LOCATION.--Lat 43°57'46", LONG 92°03'42", in NE¼SE¼SE¼ sec. 19, T.106N., R.10W., Hydrologic Unit 07040003, at St. Charles.
Owner: City of St. Charles, Well 5.
AQUIFER.--Ironton-Galesville Sandstones of Late Cambrian Age.
WELL CHARACTERISTICS.--Drilled public supply artesian well, diameter 12 in (0.30 m), depth 702 ft (214 m), cased to 645 ft (197 m).
DATUM.--Altitude of land-surface datum is 1,160 ft (354 m); Measuring point: Edge of vent pipe, 1.00 ft (0.30 m) above land-surface datum.
REMARKS.--Water level affected by pumping.
PERIOD OF RECORD.--May 1984 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 223.6 ft (68.15 m) below land-surface datum, May 18, 1984; lowest, 266.8 ft (81.32m) below land-surface datum, July 20, 1985.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

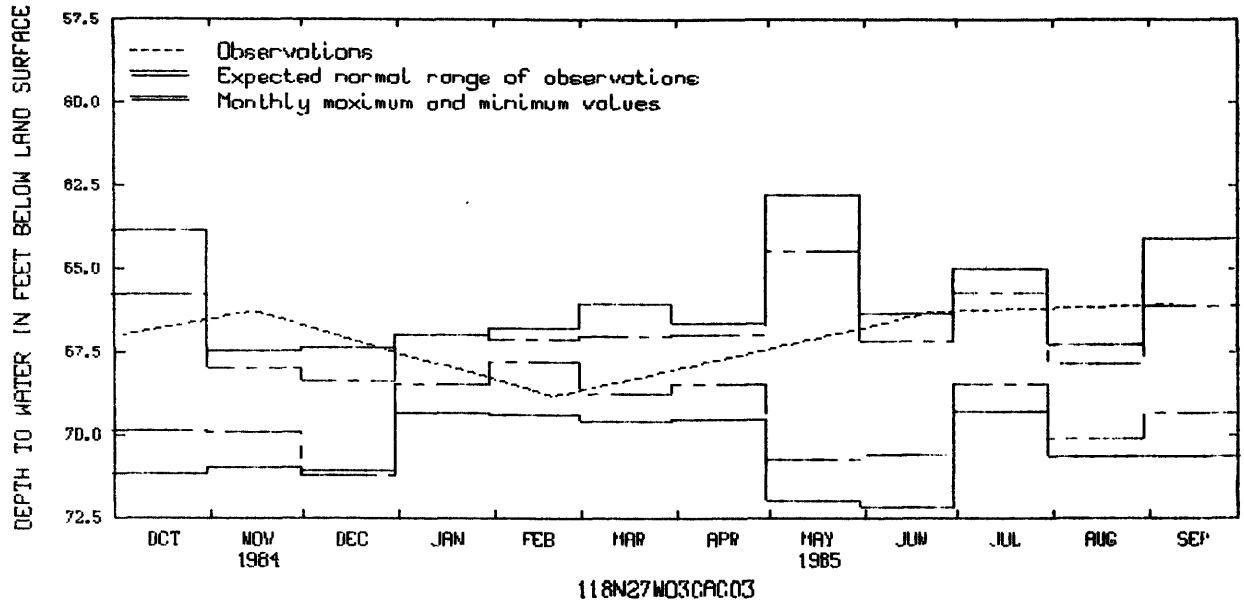
DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 5	229.00	DEC 7	225.83	FEB 1	228.00	APR 5	224.07	MAY 31	256.40	AUG 9	261.05
12	230.00	14	226.00	8	230.80	12	224.20	JUN 7	254.00	16	259.80
19	230.00	21	227.00	15	229.00	19	223.80	18	256.30	23	264.20
26	233.20	28	225.00	22	225.90	26	224.90	28	259.27	30	262.70
NOV 2	230.00	JAN 4	228.00	MAR 1	226.85	MAY 3	246.30	JUL 5	260.10	SEP 13	262.10
9	228.50	11	227.70	8	224.28	17	257.10	20	266.75	23	257.00
23	227.00	18	224.62	22	225.72	24	257.60	26	265.56	30	264.06
30	226.00	25	224.40	29	225.58						

WRIGHT COUNTY

450318094040603. Local number, 118N27W03CAC03.
LOCATION.--Lat 45°03'18", long 94°04'06", in SW¼NE¼SW¼ sec.3, T.118 N., R.27 W., Hydrologic Unit 07010204, at Howard Lake water tower.
Owner: City of Howard Lake, well 3.
AQUIFER.--Buried sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled public-supply artesian well, diameter 12 in (0.30 m), depth 148 ft (45.1 m), screened 138 to 148 ft (42.1 to 45.1 m).
DATUM.--Altitude of land-surface datum is 1,045 ft (319 m). Measuring point: Top of breather pipe, 1.80 ft (0.55 m) above land-surface datum.
PERIOD OF RECORD.--September 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 62.78 ft (19.14 m) below land-surface datum, May 29, 1979; lowest, 72.19 ft (22.00 m) below land-surface datum, June 24, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

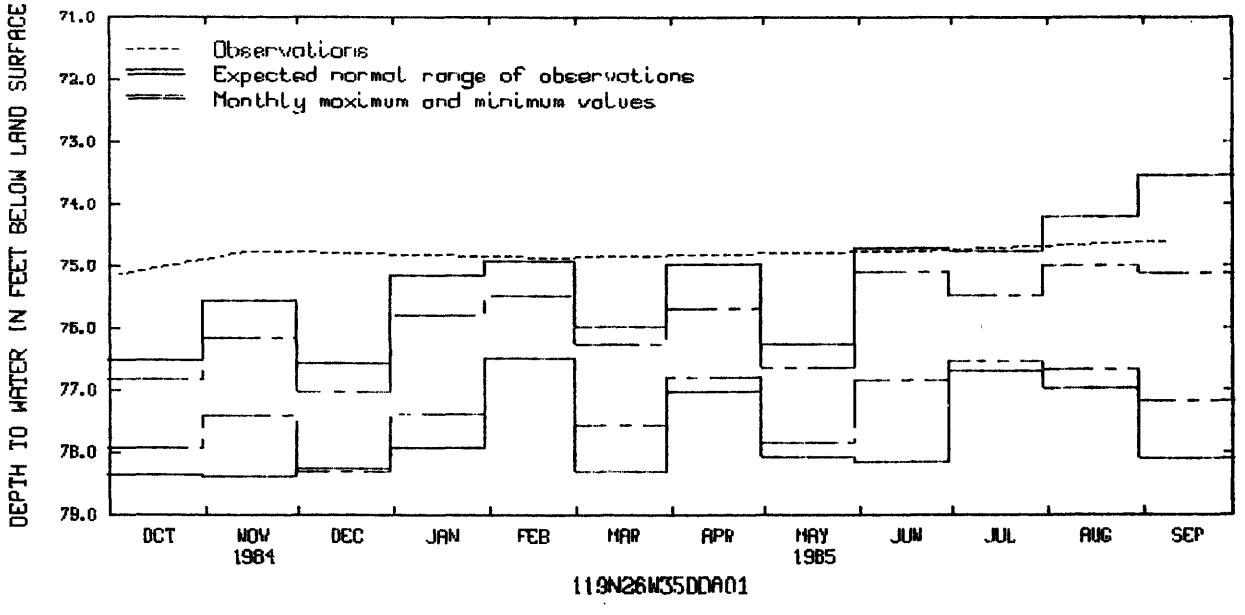
DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 3	67.00	NOV 15	66.29	FEB 20	68.83	JUN 24	66.30	SEP 9	66.07



450403093544501. Local number, 119N26W35DDA01.
LOCATION.--Lat 45°04'03", long 93°54'45", in NE¼SE¼SE¼ sec.35, T.119 N., R.26 W., Hydrologic Unit 07010204, at Montrose.
Owner: City of Montrose, well 1.
AQUIFER.--Mount Simon Sandstone of Late Cambrian Age and Hinckley Sandstone of Late Precambrian Age.
WELL CHARACTERISTICS.--Drilled unused artesian well, diameter 10 in (0.25 m), depth 693 ft (211 m), cased to 526 ft (160 m).
DATUM.--Altitude of land-surface datum is 1,000 ft (305 m). Measuring point: Edge of breather pipe, 1.50 ft (0.46 m) above land-surface datum.
PERIOD OF RECORD.--September 1976 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 73.54 ft (22.41 m) below land-surface datum, Sept. 28, 1981; lowest, 78.38 ft (23.89 m) below land-surface datum, Nov. 3, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 3	75.16	NOV 15	74.76	FEB 20	74.87	JUN 24	74.76	SEP 9	74.61



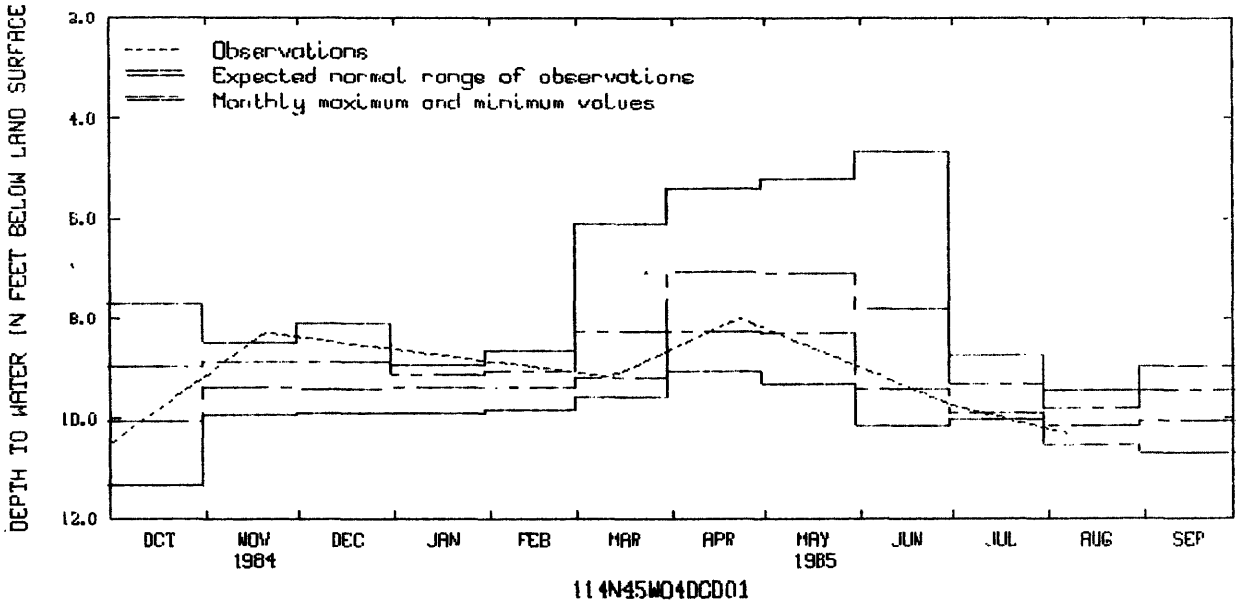
GROUND-WATER LEVELS

YELLOW MEDICINE COUNTY

444219096165501. Local number, 114N45W04DCD01.
LOCATION.--Lat 44°42'19", long 96°16'55", in SE¼SW¼SE¼ sec.4, T.114 N., R.45 W., Hydrologic Unit 07020003, at Canby City Park.
Owner: City of Canby, well 6.
AQUIFER.--Surficial sand and gravel of Pleistocene Age.
WELL CHARACTERISTICS.--Drilled unused water-table well, diameter 12 in (0.30 m), depth 62 ft (18.9 m), screened 44 to 68 ft (13.4 to 20.7 m).
DATUM.--Altitude of land-surface datum is 1,255 ft (382 m). Measuring point: Top of casing, 2.90 ft (0.88 m) above land-surface datum.
PERIOD OF RECORD.--January 1964 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 4.67 ft (1.42 m) below land-surface datum, June 5, 1965; lowest, 11.32 ft (3.45 m) below land-surface datum, Oct. 7, 1976.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 20	8.28	MAR 12	9.16	APR 23	7.99	JUL 2	9.77	AUG 7	10.30



ANOKA COUNTY

STATION NUMBER	LOCAL IDENTIFIER	GEO-LOGIC UNIT	DATE	TIME	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET) (72019)	DEPTH OF WELL, TOTAL (FEET) (72008)	ELEV. OF LAND SURFACE DATUM (FT. ABOVE NGVD) (72000)
451418093122902	032N23W28AAC02MCCANN_HOUSE	112BRDO	12-27-84	1645	--	160	903
451441093271701	032N25W21DAC01PETERSON_S	112OTSH	12-11-84	1430	1.70	7	867
		112OTSH	04-30-85	0830	1.40	7	867
		112OTSH	06-25-85	1300	1.10	7	867
451441093271702	032N25W21DAC02PETERSON_D	112OTSH	12-11-84	1400	1.80	22	867
		112OTSH	04-30-85	0930	1.60	22	867
		112OTSH	06-25-85	1330	1.30	22	867
451442093193201	032N24W22CBC01SLYZUK_S(A1)	112OTSH	12-10-84	1200	14.10	20	891
		112OTSH	06-25-85	0730	13.40	20	891
451442093193202	032N24W22CBC02SLYZUK_D(A2)	112OTSH	12-10-84	1400	13.90	35	891
		112OTSH	06-25-85	0800	13.40	35	891
451442093271503	032N25W21DAC03PETERSON_HOUS	112BRDO	12-11-84	1500	--	250	880
451513093263301	032N25W22BAC01SWANSON_S	112OTSH	12-12-84	1450	--	12	872
451534093263401	032N25W15CAC01FOSSEN_S(A18)	112OTSH	12-12-84	1300	9.20	14	881
		112OTSH	04-30-85	1000	8.50	14	881
		112OTSH	06-25-85	1100	8.70	14	881
451534093263402	032N25W15CAC02FOSSEN_D(A19)	112OTSH	12-12-84	1330	9.30	29	881
		112OTSH	04-30-85	1030	8.60	29	881
		112OTSH	06-25-85	1130	8.80	29	881
451535093263205	032N25W15CAC05FOSSEN_HOUSE	112BRDO	12-12-84	1400	--	160	882
452104093095703	033N23W14ADA03TAFF_HOUSE	112OTSH	12-20-84	1330	--	17	913
452105093100101	033N23W14ADB01TAFF_S(A9)	112OTSH	12-20-84	1230	3.00	9	913
452105093100102	033N23W14ADB02TAFF_D(A10)	112OTSH	12-20-84	1300	3.00	25	913
452132093045301	033N22W10CCB01BROADBENT_FLD	112OTSH	12-06-84	1300	8.70	13	909
		112OTSH	04-30-85	1330	7.60	13	909
		112OTSH	06-24-85	1200	8.50	13	909
452132093045302	033N22W10CCB02BROADBENT_FLD	112OTSH	12-06-84	1400	8.70	28	909
		112OTSH	04-30-85	1400	7.60	28	909
		112OTSH	06-24-85	1230	8.50	28	909
452153093050201	033N22W09ADB01BROADBENT_S	112OTSH	12-07-84	1600	10.80	15	909
		112OTSH	04-30-85	1200	9.90	15	909
		112OTSH	06-24-85	1300	10.70	15	909
452153093050202	033N22W09ADB02BROADBENT_D	112OTSH	12-07-84	1530	--	87	909
		112OTSH	04-30-85	1230	--	87	909
		112OTSH	06-24-85	1330	--	87	909
452401093114801	034N23W27CDC01CEDARCREEK_S	112OTSH	12-19-84	1400	2.00	7	913
		112OTSH	06-24-85	1430	2.80	7	913
452401093114802	034N23W27CDC02CEDARCREEK_D	112OTSH	12-19-84	1500	2.60	22	913
		112OTSH	06-24-85	1500	2.80	22	913
452410093125003	034N23W28CDA03REILING_HOUSE	112OTSH	12-19-84	1630	--	24	923
452410093125201	034N23W28CDA01REILING_S	112OTSH	12-19-84	1530	20.70	24	923
		112OTSH	04-30-85	1500	20.50	24	923
		112OTSH	06-24-85	1530	20.80	24	923
452410093125202	034N23W28CDA02REILING_D	112OTSH	12-19-84	1600	20.70	39	923
		112OTSH	04-30-85	1530	20.50	39	923
		112OTSH	06-24-85	1600	20.80	39	923
452414093140101	934N23W29DBC01WYATT_HOUSE	112OTSH	12-20-84	1430	--	24	929

WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

ANOKA COUNTY--Continued

DATE	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (90095)	PH (STAND-ARD UNITS) (00400)	PH LAB (STAND-ARD UNITS) (00403)	TEMPER-ATURE (DEG C) (00010)	ALKA-LINITY FIELD (MG/L AS CACO3) (00410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)
12-27-84	280	279	7.2	7.5	10.0	102	44	4.2	0.18	0.14
12-11-84	160	146	6.7	7.7	6.0	51	7.9	0.7	4.20	0.03
04-30-85	390	--	7.0	--	9.0	220	--	--	0.39	--
06-25-85	205	207	7.4	7.3	14.5	80	11	1.9	6.30	0.04
12-11-84	--	403	6.7	7.7	10.0	166	19	12	5.90	0.03
04-30-85	375	--	7.8	--	9.5	150	--	--	5.90	--
06-25-85	400	399	7.8	7.8	9.0	150	18	11	5.00	0.04
12-10-84	360	340	6.8	7.7	7.5	155	18	5.6	2.90	0.01
06-25-85	330	337	8.1	7.9	8.5	140	12	8.0	5.10	0.05
12-10-84	350	317	7.7	7.9	7.5	146	19	2.8	<0.10	0.08
06-25-85	300	307	7.8	8.0	9.0	130	20	2.8	<0.10	0.04
12-11-84	380	--	7.2	--	8.5	172	--	--	<0.10	0.11
12-12-84	470	525	7.2	7.5	10.0	265	20	18	4.20	0.08
12-12-84	240	216	7.6	8.3	8.5	90	10	8.1	1.20	0.01
04-30-85	350	--	8.2	--	8.0	80	--	--	1.50	--
06-25-85	300	295	8.2	8.1	10.5	120	7.7	24	1.20	0.07
12-12-84	560	583	7.1	7.7	9.0	269	25	26	6.00	0.05
04-30-85	600	--	7.5	--	10.0	240	--	--	6.40	--
06-25-85	710	719	7.5	7.7	10.0	240	22	47	8.60	0.02
12-12-84	295	330	7.5	7.8	11.0	188	2.6	0.8	<0.10	0.12
12-20-84	260	255	7.6	7.7	11.0	100	22	5.4	1.80	<0.01
12-20-84	110	116	6.7	7.2	8.0	55	6.4	0.5	0.17	0.02
12-20-84	260	257	7.3	7.8	10.5	95	38	2.3	<0.10	0.07
12-06-84	500	329	5.6	6.8	8.0	53	35	5.4	18.0	1.50
04-30-85	330	--	6.2	--	7.0	52	--	--	21.0	--
06-24-85	375	385	6.6	6.5	8.5	74	33	4.1	22.0	1.10
12-06-84	530	445	6.3	7.9	8.5	127	18	38	1.40	0.13
04-30-85	490	--	7.7	--	8.5	170	--	--	2.70	--
06-24-85	430	432	7.7	7.8	8.0	164	16	31	2.70	0.06
12-07-84	150	125	6.5	6.6	9.5	22	8.5	9.0	0.88	0.10
04-30-85	165	--	6.3	--	9.0	46	--	--	1.00	--
06-24-85	180	138	6.3	6.3	10.0	40	9.8	11	1.60	0.13
12-07-84	320	297	6.7	8.0	8.5	121	4.6	1.1	<0.10	0.03
04-30-85	320	--	7.7	--	10.0	170	--	--	<0.10	--
06-24-85	305	308	7.9	7.7	10.5	168	4.9	0.9	<0.10	0.08
12-19-84	180	200	6.2	6.2	7.0	63	47	4.0	<0.10	0.05
06-24-85	150	147	6.3	6.2	10.5	74	11	2.9	0.21	0.14
12-19-84	140	194	7.8	8.0	9.0	92	15	0.7	0.15	0.16
06-24-85	190	198	8.2	7.7	8.0	92	13	0.7	<0.10	0.13
12-19-84	535	625	7.6	7.8	9.5	180	80	25	8.00	0.03
12-19-84	350	399	7.6	7.8	10.0	70	23	12	25.0	0.01
04-30-85	310	--	7.9	--	9.0	60	--	--	17.0	--
06-24-85	260	267	8.2	7.9	9.5	80	15	5.3	8.60	0.03
12-19-84	205	257	8.1	8.1	10.0	94	8.8	21	0.74	0.02
04-30-85	260	--	8.1	--	9.5	100	--	--	0.83	--
06-24-85	260	279	8.3	8.1	9.0	100	13	19	0.84	0.05
12-20-84	230	237	7.3	7.5	12.0	113	17	1.4	0.14	0.17

CHISAGO COUNTY

STATION NUMBER	LOCAL IDENTIFIER	GEO-LOGIC UNIT	DATE	TIME	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET) (72019)	DEPTH OF WELL, TOTAL (FEET) (72008)	ELEV. OF LAND SURFACE DATUM (FT. ABOVE NGVD) (72000)
452836092525603	035N20W31DAB03WHEELER_H(C3)	112OTSH	01-07-85	1630	--	88	873
452837092525901	035N20W31DAB01WHEELER_S(C1)	112OTSH	01-07-85	1530	7.70	13	875
		112OTSH	06-24-85	0830	7.80	13	875
452837092525902	035N20W31DAB02WHEELER_D(C2)	112OTSH	01-07-85	1600	7.80	25	875
		112OTSH	06-24-85	0900	7.90	25	875
452936092561901	035N21W26BCC01GS-NO_BRANCH	112OTSH	01-07-85	1415	13.40	26	892
452942092531401	035N20W30ACB01OLSON_H(C8)	112OTSH	01-08-85	0830	--	30	883
453302092493401	035N20W03BDD01BOUDREAU_S	112OTSH	01-07-85	1200	11.10	15	876
		112OTSH	06-24-85	1030	11.50	15	876
453302092493402	035N20W03BDD02BOUDREAU_D	112OTSH	01-07-85	1300	11.20	29	876
		112OTSH	06-24-85	1100	11.60	29	876
453305092493903	035N20W03BDA03BOUDREAU_H	112OTSH	01-07-85	1330	--	232	865

DATE	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (90095)	PH (STAND-ARD UNITS) (00400)	PH LAB (STAND-ARD UNITS) (00403)	TEMPER-ATURE (DEG C) (00010)	ALKA-LINITY FIELD (MG/L AS CACO3) (00410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)
01-07-85	225	225	8.3	8.1	9.0	20	3.5	0.8	<0.10	0.28
01-07-85	180	182	7.3	6.5	9.0	34	10	6.5	<0.10	0.18
06-24-85	175	184	6.7	6.8	9.0	52	9.6	6.4	8.50	0.19
01-07-85	260	246	8.6	8.1	10.5	12	7.5	1.9	0.69	<0.01
06-24-85	240	236	8.1	7.8	8.5	120	8.2	3.1	1.60	0.04
01-07-85	197	197	8.3	7.8	10.5	78	10	1.3	0.63	<0.01
01-08-85	275	285	7.0	6.9	14.0	58	10	16	13.0	0.09
01-07-85	116	160	6.9	6.0	9.0	9	4.1	19	<0.10	0.07
06-24-85	165	163	6.2	6.3	8.5	8	5.1	20	7.20	0.07
01-07-85	195	200	9.0	8.3	--	49	5.1	14	8.50	<0.01
06-24-85	155	149	8.4	8.1	8.5	48	5.7	9.6	2.80	0.03
01-07-85	225	225	8.9	8.3	9.5	85	2.1	2.8	<0.10	0.04

DOUGLAS COUNTY

STATION NUMBER	LOCAL IDENTIFIER	GEO-LOGIC UNIT	DATE	TIME	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET) (72019)	DEPTH OF WELL, TOTAL (FEET) (72008)	ELEV. OF LAND SURFACE DATUM (FT. ABOVE NGVD) (72000)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
454621095140101	127N36W32BBB LONNIE HOIUM	112BRDO	05-28-85	1230	5.00	56	1370	735
455902095161511	129N36W18CBB11 RAY BEILKE	112OTSH	05-16-85	1400	5.90	30	1365	540
455902095161512	129N36W18CBB12 RAY BEILKE	112OTSH	05-16-85	1430	5.90	10	1365	580
460020095134301	129N36W09BBB01 DARRYL KLIND	112OTSH	05-16-85	1630	1.70	19	1352	600
460020095134302	129N36W09BBB02 DARRYL KLIND	112OTSH	05-16-85	1700	1.70	6	1352	470
460604095134402	130N36W04BCC02 NO.CO.LINE R	112OTSH	05-16-85	1600	2.20	6	1417	640

DATE	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (90095)	PH (STAND-ARD UNITS) (00400)	PH LAB (STAND-ARD UNITS) (00403)	TEMPER-ATURE (DEG C) (00010)	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)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY FIELD (MG/L AS CACO3) (00410)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)
05-28-85	695	7.2	7.2	9.5	88	30	19	3.3	421	388
05-16-85	622	7.4	7.6	8.5	--	--	--	--	369	--
05-16-85	549	7.3	7.5	7.0	--	--	--	--	389	--
05-16-85	597	7.4	7.4	7.0	--	--	--	--	498	--
05-16-85	504	7.0	7.1	7.0	--	--	--	--	369	--
05-16-85	631	7.1	7.2	10.0	--	--	--	--	554	--

DOUGLAS COUNTY--Continued

DATE	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)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS, ORTHO, DIS-SOLVED (MG/L AS P) (00671)
05-28-85	7.6	1.7	0.2	25	414	<0.10	1.40	2.3	0.11	0.06
05-16-85	18	19	--	--	--	17.0	0.06	--	--	--
05-16-85	12	13	--	--	--	7.50	<0.01	--	--	--
05-16-85	23	5.0	--	--	--	<0.10	0.34	--	--	--
05-16-85	15	17	--	--	--	3.80	<0.01	--	--	--
05-16-85	6.8	3.6	--	--	--	2.10	0.04	--	--	--

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	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)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	CYANIDE DIS-SOLVED (MG/L AS CN) (00723)
05-28-85	2	120	<1	<10	<10	1700	120	2	<1	<0.01
05-16-85	--	--	--	--	--	--	--	--	--	--
05-16-85	--	--	--	--	--	--	--	--	--	--
05-16-85	--	--	--	--	--	--	--	--	--	--
05-16-85	--	--	--	--	--	--	--	--	--	--
05-16-85	--	--	--	--	--	--	--	--	--	--

HUBBARD COUNTY

STATION NUMBER	LOCAL IDENTIFIER	GEO-LOGIC UNIT	DATE	TIME	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET) (72019)	DEPTH OF WELL, TOTAL (FEET) (72008)	ELEV. OF LAND SURFACE DATUM (FT. ABOVE NGVD) (72000)
464940094593001	139N34W28BCC01	112OTSH	05-14-85	1500	--	16	--
465035095000001	139N34W20ADC01	112OTSH	05-14-85	1600	--	40	--
465315094554001	139N34W01BCA01	112OTSH	05-14-85	1400	--	80	--
465515094411001	140N32W26ABA01	112OTSH	05-14-85	1200	--	101	--
465515095061501	140N35W28AAA01	112OTSH	05-14-85	1645	--	30	--
465707094400701	140N32W12CAD1 WELL 4	112PLSC	07-24-85	1600	39.40	--	--
465708094403201	140N32W12CBD WELL 6	112PLSC	07-24-85	1500	29.30	--	--
465710094395101	140N32W12DBD1 WELL 8	112PLSC	07-25-85	0800	20.40	--	--
465727094402402	140N32W12BDC OBS WELL	112PLSC	07-10-85	1900	18.50	25	1399
		112PLSC	07-24-85	1515	22.50	25	1399
465724094402601	WILLIAMS LAKE OBS WELL	112PLSC	08-06-85	1430	--	--	--

DATE	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (90095)	PH (STAND-ARD UNITS) (00400)	PH LAB (STAND-ARD UNITS) (00403)	TEMPER-ATURE (DEG C) (00010)	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)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY FIELD (MG/L AS CACO3) (00410)
05-14-85	570	569	7.4	7.7	9.0	--	--	--	--	349
05-14-85	850	831	7.3	7.6	11.5	--	--	--	--	425
05-14-85	500	511	7.4	7.5	11.0	--	--	--	--	389
05-14-85	400	404	7.4	7.8	8.5	--	--	--	--	326
05-14-85	500	495	7.5	7.7	9.0	--	--	--	--	267
07-24-85	417	435	7.4	7.5	10.0	66	13	3.0	3.3	--
07-24-85	410	428	7.7	7.6	9.5	63	16	3.0	0.9	--
07-25-85	404	428	7.6	7.7	7.5	66	16	2.4	1.0	--
07-10-85	438	481	7.3	7.5	9.5	80	11	2.5	1.7	--
07-24-85	469	486	7.4	7.3	9.5	74	11	2.5	1.6	--
08-06-85	495	493	7.5	7.6	10.0	73	19	3.0	1.5	--

HUBBARD COUNTY--Continued

DATE	ALKALINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLORIDE, DIS-SOLVED (MG/L AS CL) (00940)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	NITROGEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITROGEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	MANGANESE, DIS-SOLVED (UG/L AS MN) (01056)
05-14-85	--	18	25	--	9.70	0.01	--	--	--
05-14-85	--	9.5	37	--	29.0	<0.01	--	--	--
05-14-85	--	9.1	5.3	--	5.30	<0.01	--	--	--
05-14-85	--	5.2	3.1	--	2.60	0.01	--	--	--
05-14-85	--	13	15	--	17.0	<0.01	--	--	--
07-24-85	220	4.6	2.7	13	--	--	0.123	110	<1
07-24-85	206	14	0.8	120	--	--	0.011	15	140
07-25-85	211	12	0.6	16	--	--	0.001	3	4
07-10-85	243	1.3	1.1	22	--	--	<0.001	2900	320
07-24-85	275	0.9	1.1	20	--	--	0.032	360	300
08-06-85	249	8.8	0.8	19	--	--	0.017	8	1100

ISANTI COUNTY

STATION NUMBER	LOCAL IDENTIFIER	GEOLOGIC UNIT	DATE	TIME	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET) (72019)	DEPTH OF WELL, TOTAL (FEET) (72008)	ELEV. OF LAND SURFACE DATUM (FT. ABOVE NGVD) (72000)	SPECIFIC CONDUCTANCE (US/CM) (00095)
452545093211901	034N24W17DCC01JENSEN_S(I1)	112OTSH	12-28-84	1330	7.20	12	935	550
		112OTSH	06-14-85	0730	6.40	12	935	395
452545093211902	034N24W17DCC02JENSEN_D(I2)	112OTSH	12-28-84	1400	7.30	18	935	690
		112OTSH	06-14-85	0830	6.40	18	935	810
452548093211903	034N24W17DCC03JENSEN_H(I3)	112OTSH	12-28-84	1430	--	19	935	513
453242093143501	035N23W05CCC01GOLDENWOOD_S	112OTSH	12-28-84	1100	13.80	17	948	880
		112OTSH	06-15-85	0730	13.80	17	948	750
453242093143502	035N23W05CCC02GOLDENWOOD_D	112OTSH	12-28-84	1130	13.80	22	948	740
		112OTSH	06-15-85	0830	13.90	22	948	850
453242093143803	035N23W05CCC03OSLUND_H(I16)	112OTSH	12-28-84	1200	--	145	948	360
453325093114703	035N23W03BAB03MONKBERG_HOUS	112BRDO	12-27-84	1445	--	120	977	620
453328093114701	035N23W03BAB01MONKBERG_S	112OTSH	12-27-84	1400	22.00	26	972	595
		112OTSH	06-15-85	0900	22.10	26	972	570
453328093114702	035N23W03BAB02MONKBERG_D	112OTSH	12-27-84	1430	21.90	41	972	270
		112OTSH	06-15-85	1000	22.10	41	972	255
453559093105803	036N23W23BBC03VAVRE_H(I14)	112OTSH	12-28-84	0900	--	32	972	680
453606093105901	036N23W23BBB01VAVRE_S(I12)	112OTSH	12-28-84	0930	10.20	16	958	710
		112OTSH	06-15-85	1030	10.10	16	958	820
453606093105902	036N23W23BBB02VAVRE_D(I13)	112OTSH	12-28-84	1000	10.40	31	958	415
		112OTSH	06-15-85	1130	10.10	31	958	535
453625093262803	036N25W15CAD03MORAN_H(I6)	112OTSH	12-27-84	1100	--	50	995	265
453626093270101	036N25W15CBB01HAUBENSCHILD	112OTSH	12-27-84	1530	--	42	991	620
453631093263701	036N25W15CAB01MORAN_S(I4)	112OTSH	12-27-84	0900	14.50	21	975	275
		112OTSH	06-14-85	1000	15.30	21	975	258
453631093263702	036N25W15CAB02MORAN_D(I5)	112OTSH	12-27-84	1000	14.80	36	975	410
		112OTSH	06-14-85	1100	15.40	36	975	415

ISANTI COUNTY--Continued

DATE	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	PH (STANDARD UNITS) (00400)	PH LAB (STANDARD UNITS) (00403)	TEMPERATURE (DEG C) (00010)	ALKALINITY FIELD (MG/L AS CACO3) (00410)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P) (00671)
12-28-84	549	6.0	6.2	9.0	20	16	73	0.27	32.0	0.03	<0.01
06-14-85	368	6.4	6.1	10.0	15	13	24	--	28.0	--	--
12-28-84	856	7.3	7.6	10.0	138	33	85	--	41.0	0.03	--
06-14-85	804	7.7	7.2	8.0	120	28	75	--	38.0	--	--
12-28-84	530	6.3	6.5	13.0	106	21	54	--	18.0	0.03	--
12-28-84	835	7.1	7.3	9.5	241	17	100	--	12.0	0.02	--
06-15-85	795	7.4	7.3	8.0	220	15	81	--	11.0	--	--
12-28-84	767	7.2	7.4	10.0	245	17	100	--	11.0	0.02	--
06-15-85	863	7.5	7.3	8.0	240	15	93	--	3.90	--	--
12-28-84	360	7.4	8.0	10.0	221	3.7	1.0	--	<0.10	0.07	--
12-27-84	621	7.2	7.6	9.5	155	57	30	--	20.0	<0.01	--
12-27-84	593	7.0	7.4	9.0	259	42	14	--	4.60	<0.01	--
06-15-85	565	7.6	7.3	9.0	250	34	19	--	12.0	--	--
12-27-84	276	7.7	8.1	9.0	83	17	9.8	--	12.0	0.01	--
06-15-85	262	8.3	7.9	9.0	68	18	8.6	--	10.0	--	--
12-28-84	687	7.3	7.6	9.5	125	45	49	--	35.0	<0.01	--
12-28-84	672	7.3	7.5	10.0	204	48	16	--	24.0	0.04	--
06-15-85	825	7.8	7.4	8.0	190	47	30	--	39.0	--	--
12-28-84	535	7.3	7.7	9.5	211	54	11	--	0.39	<0.01	--
06-15-85	544	7.4	7.4	8.5	240	45	11	--	0.79	--	--
12-27-84	261	7.5	7.7	10.0	114	11	4.2	--	3.30	0.02	--
12-27-84	575	7.1	7.8	9.0	213	9.6	22	--	17.0	0.15	--
12-27-84	286	7.0	7.1	10.0	56	5.2	11	--	17.0	0.03	--
06-14-85	281	7.0	6.9	8.0	48	7.7	12	--	0.38	--	--
12-27-84	399	7.2	7.5	10.5	265	6.6	1.7	--	0.12	0.28	--
06-14-85	400	7.6	7.3	8.5	220	12	4.7	--	19.0	--	--

KANDIYOHI COUNTY

STATION NUMBER	LOCAL IDENTIFIER	GEOLOGIC UNIT	DATE	TIME	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET) (72019)	DEPTH OF WELL, TOTAL (FEET) (72008)	ELEV. OF LAND SURFACE DATUM (FT. ABOVE NGVD) (72000)	SPECIFIC CONDUCTANCE (US/CM) (00095)
451849095012401	121N35W02DDB SIBLEY STATE	112BRDO	05-29-85	1725	7.30	302	1250	700
451942095575501	122N34W33CCA GLEN ERICKSON	112BRDO	05-30-85	1350	--	67	1225	632
451949095030401	122N35W34DAA NORBERT WUERTZ	112BRDO	05-30-85	1150	43.30	221	1258	603
452014095495201	122N33W33ABD MILL FARMS	112BRDO	05-30-85	0940	56.70	183	1250	545
452104094591901	122N34W29BCB1OLETJBRUENS(I)	112OTSH	05-29-85	0830	4.90	20	1225	620
452104094591902	122N34W29BCB2OLETJBRUENS(I)	112OTSH	05-29-85	0900	4.90	9	1225	740
452249094545501	122N34W14ADB GLENN PETERSON	112BRDO	06-04-85	1125	--	160	1231	790
452300095020301	122N35W14AABITHORSON(C)	112OTSH	05-28-85	1700	2.00	21	1240	600
452300095020302	122N35W14AAB2THORSON(C)	112OTSH	05-28-85	1730	2.10	8	1240	540
452338094534401	122N34W12ABC GERALD EVENSON	112BRDO	06-04-85	1315	13.30	150	1231	730

KANDIYOHI COUNTY--Continued

DATE	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	PH (STANDARD UNITS) (00400)	PH LAB (STANDARD UNITS) (00403)	TEMPERATURE (DEG C) (00010)	CALCIUM DISSOLVED (MG/L AS CA) (00915)	MAGNESIUM, DISSOLVED (MG/L AS MG) (00925)	SODIUM, DISSOLVED (MG/L AS NA) (00930)	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	ALKALINITY FIELD (MG/L AS CACO3) (00410)	ALKALINITY LAB (MG/L AS CACO3) (90410)
05-29-85	653	7.1	7.3	11.0	83	28	17	2.2	387	373
05-30-85	605	7.1	7.0	10.0	86	28	2.5	2.0	318	305
05-30-85	574	7.7	7.2	10.0	76	29	5.2	2.7	332	307
05-30-85	537	7.5	7.4	10.0	73	24	4.0	2.1	253	246
05-29-85	636	7.3	7.2	8.5	--	--	--	--	410	--
05-29-85	749	7.2	7.1	8.5	--	--	--	--	520	--
06-04-85	763	8.1	7.3	9.0	89	38	25	2.6	435	419
05-28-85	599	7.2	7.0	7.5	--	--	--	--	530	--
05-28-85	452	6.8	6.2	8.5	--	--	--	--	430	--
06-04-85	710	7.6	7.3	9.5	86	34	20	2.4	409	387

DATE	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)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOSPHORUS, DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P) (00671)
05-29-85	2.3	1.6	0.2	24	397	<0.10	1.00	4.0	0.10	0.03
05-30-85	26	7.9	0.1	26	411	<0.10	0.17	4.4	0.01	<0.01
05-30-85	6.3	1.9	0.2	27	360	<0.10	0.30	--	<0.01	<0.01
05-30-85	45	4.1	0.2	18	385	0.13	0.17	2.6	<0.01	<0.01
05-29-85	18	14	--	--	--	13.0	0.05	--	--	--
05-29-85	16	9.1	--	--	--	17.0	0.47	--	--	--
06-04-85	19	0.5	0.3	25	353	<0.10	1.20	1.8	0.03	<0.01
05-28-85	6.1	4.2	--	--	--	<0.52	0.12	--	--	--
05-28-85	15	10	--	--	--	<0.10	0.16	--	--	--
06-04-85	17	<0.2	0.3	25	333	<0.10	1.20	1.8	0.03	0.01

DATE	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BORON, DISSOLVED (UG/L AS B) (01020)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, DISSOLVED (UG/L AS FE) (01046)	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)	CYANIDE DISSOLVED (MG/L AS CN) (00723)
05-29-85	--	50	--	--	4100	74	--	--	--	--
05-30-85	--	<20	--	--	5000	270	--	--	--	--
05-30-85	--	30	--	--	4300	200	--	--	--	--
05-30-85	--	30	--	--	400	120	--	--	--	--
05-29-85	--	--	--	--	--	--	--	--	--	--
05-29-85	--	--	--	--	--	--	--	--	--	--
06-04-85	9	120	<10	<10	5000	140	0.4	9	<1	<0.01
05-28-85	--	--	--	--	--	--	--	--	--	--
05-28-85	--	--	--	--	--	--	--	--	--	--
06-04-85	--	110	--	--	2000	89	--	--	--	--

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

MEEKER COUNTY

STATION NUMBER	LOCAL IDENIFIER	GEO-LOGIC UNIT	DATE	TIME	DEPTH OF WELL, TOTAL (FEET) (72008)	ELEV. OF LAND SURFACE DATUM (FT. ABOVE NGVD) (72000)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (90095)
451927095395301	121N32W02AAB RON LUNZ CONFI	112BRDO	05-29-85	1500	92	1125	705	677

DATE	PH (STAND-ARD UNITS) (00400)	PH LAB (STAND-ARD UNITS) (00403)	TEMPER-ATURE (DEG C) (00010)	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)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY FIELD (MG/L AS CACO3) (00410)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)
05-29-85	7.3	7.2	10.0	91	31	11	2.8	386	372	16

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)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN,AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS, ORTHO, DIS-SOLVED (MG/L AS P) (00671)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)
05-29-85	4.5	0.3	19	422	<0.10	0.62	3.4	0.13	<0.01	<1

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)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	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)	CYANIDE DIS-SOLVED (MG/L AS CN) (00723)
05-29-85	110	<1	<10	<10	3900	230	0.4	2	<1	<0.01

MORRISON COUNTY

STATION NUMBER	LOCAL IDENTIFIER	GEO-LOGIC UNIT	DATE	TIME	DEPTH OF WELL, TOTAL (FEET) (72008)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
455030094191501	039N32W27CBB01	112OTSH	05-16-85	1000	17	340
455215094121501	039N31W16DAC01	112OTSH	05-13-85	1900	25	190
460030094210001	041N32W26BCA01	112OTSH	05-16-85	0830	21	360

DATE	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (90095)	PH (STAND-ARD UNITS) (00400)	PH LAB (STAND-ARD UNITS) (00403)	TEMPER-ATURE (DEG C) (00010)	ALKA-LINITY FIELD (MG/L AS CACO3) (00410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)
05-16-85	347	7.3	7.8	9.0	232	18	5.3	4.20	<0.01
05-13-85	187	7.3	7.8	8.5	139	5.7	1.8	0.74	<0.01
05-16-85	353	7.9	7.9	10.0	218	16	19	3.20	<0.01

OTTER TAIL COUNTY

STATION NUMBER	LOCAL IDENTIFIER	GEO-LOGIC UNIT	DATE	TIME	DEPTH OF WELL, TOTAL (FEET) (72008)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
461235095162501	132N37W25DDC01	112OTSH	05-15-85	1800	20	660

DATE	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (90095)	PH (STAND-ARD UNITS) (00400)	PH LAB (STAND-ARD UNITS) (00403)	TEMPER-ATURE (DEG C) (00010)	ALKA-LINITY FIELD (MG/L AS CACO3) (00410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)
05-15-85	672	7.3	7.5	8.0	478	7.4	10	14.0	<0.01

POPE COUNTY

STATION NUMBER	LOCAL IDENTIFIER	GEO-LOGIC UNIT	DATE	TIME	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET) (72019)	DEPTH OF WELL, TOTAL (FEET) (72008)	ELEV. OF LAND SURFACE DATUM (FT. ABOVE NGVD) (72000)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
452938095081502	123N36W01ACA02 CLINT WELTE	112OTSH	05-17-85	1200	6.60	16	1305	570
452939095081501	123N36W01ACA01 CLINT WELTE	112OTSH	05-17-85	1230	--	37	1305	610
453348095222001	124N37W07CAB MARK PETERSON	112BRDO	06-05-85	1700	--	346	1292	730
453358095203101	124N37W08ACA ROBERT CIHLER	112BRDO	06-05-85	1050	--	277	1317	590
453549095314901	125N39W36BBC DOUG STAPLES	112BRDO	06-05-85	1330	-0.9	175	1140	795
453830095185202	125N37W15ABB02 MIKE SAHLIN	112OTSH	05-17-85	0900	23.30	32	1365	440
453832095185101	125N37W15ABB01 MIKE SAHLIN	112OTSH	05-17-85	1000	--	55	1372	460
453900095210001	125N37W08DAB ROBERT IRGENS	112BRDO	06-05-85	0855	--	156	1395	495
453914095264901	125N38W10BCA DUANE BECKWITH	112BRDO	06-05-85	1530	--	160	1140	990
454004095120502	125N36W04ADA02 LEO MCKIGNEY	112OTSH	05-17-85	1100	--	18	1345	640
454058095141701	126N36W32BCA DENSMORE WORKM	112BRDO	05-28-85	1500	15.40	118	1363	650

DATE	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (90095)	PH (STAND-ARD UNITS) (00400)	PH LAB (STAND-ARD UNITS) (00403)	TEMPER-ATURE (DEG C) (00010)	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)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY FIELD (MG/L AS CACO3) (00410)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)
05-17-85	598	7.5	7.6	7.0	--	--	--	--	261	--	26
05-17-85	607	7.5	7.6	8.0	--	--	--	--	301	--	66
06-05-85	704	7.9	7.3	9.0	64	34	42	2.3	408	398	7.3
06-05-85	589	7.7	7.3	9.0	61	26	31	1.5	336	322	4.4
06-05-85	775	8.0	7.1	10.0	100	38	10	3.7	382	374	66
05-17-85	458	7.4	7.7	9.5	--	--	--	--	323	--	15
05-17-85	478	7.4	7.6	9.0	--	--	--	--	335	--	42
06-05-85	503	7.5	7.3	9.5	68	23	5.3	1.8	246	234	36
06-05-85	986	7.5	7.1	9.0	120	51	27	3.1	418	408	160
05-17-85	630	7.5	7.8	11.5	--	--	--	--	396	--	29
05-28-85	629	7.2	7.2	9.0	83	31	7.3	2.2	382	355	7.7

WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

POPE COUNTY--Continued

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)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN,AMMONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOSPHORUS, DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P) (00671)	ARSENIC DISSOLVED (UG/L AS AS) (01000)
05-17-85	29	--	--	--	23.0	0.05	--	--	--	--
05-17-85	26	--	--	--	7.80	0.05	--	--	--	--
06-05-85	2.6	0.3	29	417	<0.10	2.90	5.1	0.20	0.07	--
06-05-85	<0.2	0.2	25	340	<0.10	1.60	2.5	0.10	0.06	3
06-05-85	<0.2	0.2	30	491	<0.10	0.45	0.9	<0.01	<0.01	16
05-17-85	5.3	--	--	--	6.90	0.04	--	--	--	--
05-17-85	11	--	--	--	0.36	<0.01	--	--	--	--
06-05-85	0.7	0.1	24	276	<0.10	0.26	0.5	0.04	<0.01	7
06-05-85	0.8	0.2	28	671	<0.10	1.60	3.5	0.04	<0.01	2
05-17-85	23	--	--	--	9.60	0.01	--	--	--	--
05-28-85	1.9	0.3	23	381	0.32	0.31	0.8	0.03	<0.01	--

DATE	BORON, DISSOLVED (UG/L AS B) (01020)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, DISSOLVED (UG/L AS FE) (01046)	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)	CYANIDE DISSOLVED (MG/L AS CN) (00723)
05-17-85	--	--	--	--	--	--	--	--	--	--
05-17-85	--	--	--	--	--	--	--	--	--	--
06-05-85	180	--	--	--	3100	24	--	--	--	--
06-05-85	180	<1	20	<10	950	49	0.4	1	<1	<0.01
06-05-85	80	<1	10	<10	2300	140	0.5	3	<1	<0.01
05-17-85	--	--	--	--	--	--	--	--	--	--
05-17-85	--	--	--	--	--	--	--	--	--	--
06-05-85	30	<1	10	<10	2200	240	0.4	3	<1	<0.01
06-05-85	170	<1	10	<10	3200	120	0.2	2	<1	--
05-17-85	--	--	--	--	--	--	--	--	--	--
05-28-85	40	--	--	--	1100	230	--	--	--	--

SHERBURNE COUNTY

STATION NUMBER	LOCAL IDENTIFIER	GEO-LOGIC UNIT	DATE	TIME	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET) (72019)	DEPTH OF WELL, TOTAL (FEET) (72008)	ELEV. OF LAND SURFACE DATUM (FT. ABOVE NGVD) (72000)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
451822093424003	033N27W33CAB03ZIMMERMAN_H	112OTSH	01-15-85	1130	--	60	931	600
451823093424002	033N27W33CAB02ZIMMERMAN_D	112OTSH	01-15-85	1100	--	26	931	950
451825093422101	033N27W33ACC01ZIMMERMAN_S	112OTSH	01-15-85	1000	6.80	11	921	200
		112OTSH	06-25-85	1800	6.60	11	921	600
451954093424801	033N27W21CCA01BROMELING_S	112OTSH	01-15-85	1300	10.00	20	936	410
451954093424802	033N27W21CCA02BROMELING_V	112OTSH	01-15-85	1400	--	52	936	550
451957093412701	033N27W22CBD01HUDSON_S(SH1)	112OTSH	01-14-85	1300	13.80	20	934	470
		112OTSH	06-25-85	1630	12.50	20	934	545
451957093412702	033N27W22CBD02HUDSON_D(SH2)	112OTSH	01-14-85	1400	13.80	35	934	715
		112OTSH	06-25-85	1700	12.50	35	934	750
452030093511401	033N28W20BAC01NSP_S(SH5)	112OTSH	01-11-85	1100	16.60	23	929	535
		112OTSH	06-21-85	1400	16.80	23	929	575
452030093511402	033N28W20BAC02NSP_D(SH6)	112OTSH	01-11-85	1200	16.50	35	929	510
		112OTSH	06-21-85	1500	16.80	35	929	640
452302093573603	033N29W04BBD03GOENNERED_HT	112OTSH	06-30-85	1430	15.00	35	945	750
452309093573701	033N29W04BBA01GOENNERE_S	112OTSH	02-04-85	1000	14.37	20	947	640
		112OTSH	06-30-85	1300	13.10	20	947	580
452309093573702	033N29W04BBA02GOENNERE_D	112OTSH	02-04-85	1100	14.42	35	947	530
		112OTSH	06-30-85	1400	13.10	35	947	540
452545093571002	034N29W21ABB02GOENNERM_D	112OTSH	02-04-85	1400	--	37	985	650
		112OTSH	06-30-85	1700	18.10	37	985	650
452545093571003	034N29W21ABB03GOENNERM_DD	112OTSH	02-04-85	1500	--	111	985	470
		112OTSH	06-30-85	1730	18.10	111	985	445
452545093571004	034N29W21ABB04GOENNERM_S	112OTSH	02-04-85	1300	--	23	985	690
		112OTSH	06-30-85	1600	18.20	23	985	660
452549093571301	034N29W16CDD01GOENNERC_H	112OTSH	02-04-85	1600	--	60	983	670
452720093552201	034N29W10AAD01BERGER_S	112OTSH	02-06-85	0900	10.20	14	970	700
		112OTSH	06-30-85	0800	9.70	14	970	690
452720093552202	034N29W10AAD02BERGER_D	112OTSH	02-06-85	1000	10.30	25	970	670
		112OTSH	06-30-85	0900	9.80	25	970	670
452807093491401	034N28W04ADA02KOB_S(SH29)	112OTSH	12-19-84	1000	4.90	13	998	86
		112OTSH	06-21-85	1300	4.80	13	998	120
452909094045501	035N30W33BAB01AYERS_H(SH20)	112OTSH	01-10-85	1300	--	30	1008	605
452914094045601	035N30W28CDC01AYERS_S(SH18)	112OTSH	01-10-85	1000	4.50	10	1000	620
		112OTSH	06-21-85	0900	4.60	10	1000	620
452914094045602	035N30W28CDC02AYERS_D(SH19)	112OTSH	01-10-85	1100	4.40	23	1000	640
		112OTSH	06-21-85	0930	4.60	23	1000	595
452938093432701	035N27W29DBB02SHERB-NWR3_S	112OTSH	01-29-85	1500	4.60	15	985	460
		112OTSH	06-14-85	1800	4.00	15	985	418
453003094022701	035N30W26BAB01BENSEN_S	112OTSH	01-11-85	0830	10.70	14	995	360
453003094022701	035N30W26BAB01BENSEN_S	112OTSH	06-21-85	1100	11.00	14	995	405
453058093393501	035N27W14DCD01SHERB-NWR4_S	112OTSH	01-29-85	1400	15.00	21	975	450
453121093334401	035N26W15DBB01WEISSENFLUH_D	112OTSH	01-16-85	1130	6.00	56	965	330
		112OTSH	06-14-85	1600	4.90	56	965	325
453121093334402	035N26W15DBB02WEISSENFLUH_D	112OTSH	01-16-85	1030	6.10	15	965	410
		112OTSH	06-14-85	1530	4.90	15	965	305
453121093334403	035N26W15DBB03WEISSENFLUH_S	112OTSH	06-14-85	1500	4.90	9	965	120
453215093315101	035N26W12BCC01UBL_S(SH21)	112OTSH	01-29-85	1100	3.90	11	959	92
		112OTSH	06-14-85	1300	5.60	11	959	120
453215093315102	035N26W12BCC02UBL_D(SH22)	112OTSH	01-29-85	1200	7.00	37	959	260
		112OTSH	06-14-85	1400	5.70	37	959	268
453230093530001	035N29W12AAD01MORTENSEN_D	112OTSH	02-05-85	1100	1.80	28	1012	520

WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

SHERBURNE COUNTY--Continued

DATE	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	PH (STANDARD UNITS) (00400)	PH LAB (STANDARD UNITS) (00403)	TEMPERATURE (DEG C) (00010)	ALKALINITY FIELD (MG/L AS CACO3) (00410)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P) (00671)
01-15-85	568	7.8	7.9	7.5	228	34	17	5.00	0.04	--
01-15-85	813	7.4	7.5	12.0	419	24	16	<0.10	0.04	--
01-15-85	327	7.4	7.2	7.0	87	11	14	9.10	0.11	--
06-25-85	632	6.7	6.8	9.5	120	33	38	25.0	0.24	--
01-15-85	406	7.9	7.7	11.0	170	9.8	12	5.60	0.03	--
01-15-85	538	7.8	7.6	10.5	151	41	33	9.70	0.06	--
01-14-85	578	7.4	7.6	9.5	234	3.8	8.0	7.70	0.02	--
06-25-85	565	7.7	7.6	10.0	190	9.7	54	3.50	0.03	--
01-14-85	717	7.1	7.3	10.5	291	21	68	0.13	0.31	--
06-25-85	748	7.3	7.4	10.0	290	23	62	<0.10	0.24	--
01-11-85	613	7.3	7.4	10.0	173	--	39	17.0	0.02	0.02
06-21-85	563	7.5	7.5	9.0	150	35	29	12.0	0.05	--
01-11-85	602	7.4	7.5	9.0	162	41	37	16.0	0.04	0.02
06-21-85	626	8.0	7.5	9.5	100	41	42	17.0	0.02	--
06-30-85	--	7.3	--	8.5	240	--	--	23.0	--	--
02-04-85	660	7.2	7.3	10.5	212	55	22	22.0	0.07	--
06-30-85	583	7.5	7.2	9.0	210	63	16	7.30	<0.01	--
02-04-85	536	7.5	7.5	10.5	214	66	15	2.00	0.08	--
06-30-85	546	7.6	7.3	9.0	210	64	16	2.10	0.02	--
02-04-85	652	7.3	7.4	10.0	284	19	50	0.50	0.11	--
06-30-85	649	7.4	7.2	9.0	280	21	34	1.00	0.05	--
02-04-85	442	7.6	7.7	10.0	210	48	3.1	0.12	0.09	--
06-30-85	461	7.6	7.4	9.0	210	46	2.8	<0.10	0.09	--
02-04-85	616	7.3	7.3	10.0	287	26	28	3.60	0.07	--
06-30-85	687	7.4	7.2	8.5	300	21	38	4.90	<0.01	--
02-04-85	706	7.4	7.4	9.5	272	22	53	10.0	0.05	--
02-06-85	687	7.2	7.4	9.0	231	29	31	17.0	0.05	--
06-30-85	683	7.4	7.3	9.5	260	24	31	13.0	0.01	--
02-06-85	642	7.2	7.5	10.0	211	56	25	17.0	0.08	--
06-30-85	687	7.4	7.4	8.5	220	52	27	13.0	0.01	--
12-19-84	111	7.8	7.8	9.0	53	16	1.0	<0.10	0.03	--
06-21-85	123	8.2	7.9	8.0	62	3.4	1.2	<0.10	0.03	--
01-10-85	632	6.2	7.2	11.0	319	6.0	17	0.12	0.06	0.01
01-10-85	663	6.5	7.1	7.5	340	1.5	24	<0.10	0.01	0.01
06-21-85	647	7.2	7.2	8.5	310	2.3	22	<0.10	0.05	--
01-10-85	648	6.2	7.1	10.0	337	--	20	1.40	0.05	0.01
06-21-85	603	7.3	7.2	7.0	310	1.2	19	0.11	0.03	--
01-29-85	393	6.8	6.6	7.5	248	2.2	3.5	<0.10	0.16	--
06-14-85	378	6.7	6.6	9.0	200	11	2.8	<0.10	--	--
01-11-85	391	7.1	7.4	8.5	182	26	3.2	<0.10	0.03	0.02
06-21-85	403	7.7	7.5	9.5	200	28	3.5	0.19	0.04	--
01-29-85	492	7.3	7.5	8.5	214	14	12	8.50	0.17	--
01-16-85	334	7.5	7.7	10.0	183	9.3	1.3	<0.10	0.12	--
06-14-85	335	7.6	7.5	10.0	170	15	1.5	<0.10	--	--
01-16-85	415	7.2	7.4	10.0	101	94	7.5	0.53	0.17	--
06-14-85	300	7.0	6.9	9.0	94	49	3.9	0.69	--	--
06-14-85	102	6.1	6.0	10.5	28	21	1.1	<0.10	--	--
01-29-85	112	6.4	6.5	10.0	35	7.5	3.7	3.00	0.04	--
06-14-85	128	6.8	6.7	8.5	38	9.9	2.3	5.30	--	--
01-29-85	246	7.5	7.8	9.5	108	21	6.5	<0.10	0.04	--
06-14-85	269	8.0	7.5	8.0	100	28	8.0	<0.10	--	--
02-05-85	482	--	7.2	10.5	291	<0.2	2.3	<0.10	0.80	--

STEARNS COUNTY

STATION NUMBER	LOCAL IDENTIFIER	GEO-LOGIC UNIT	DATE	TIME	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET) (72019)	DEPTH OF WELL, TOTAL (FEET) (72008)	ELEV. OF LAND SURFACE DATUM (FT. ABOVE NGVD) (72000)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
451955094165601	122N29W36CBC01SCHOOLSCTLK_D	112OTSH	02-13-85	1130	5.30	25	1145	540
		112OTSH	06-18-85	1430	6.10	25	1145	575
451955094165602	122N29W36CBC02SCHOOLSCTLK_D	112OTSH	02-13-85	1030	5.30	17	1145	470
		112OTSH	06-18-85	1530	6.10	17	1145	605
451955094165603	122N29W36CBC03SCHOOLSCTLK_S	112OTSH	02-13-85	0930	5.20	6	1145	570
452146095424901	122N32W21BDD KEN FLANDERS C	112BRDO	05-29-85	1145	28.20	218	1190	515
452245094144601	122N28W18ADC01FOSSUM_S(S31)	112OTSH	02-11-85	1530	19.00	23	1145	590
		112OTSH	06-18-85	1700	18.90	23	1145	530
452245094144602	122N28W18ADC02FOSSUM_D(S32)	112OTSH	02-11-85	1600	19.10	38	1145	540
		112OTSH	06-18-85	1730	18.90	38	1145	475
452543094191902	123N29W27CCC02GRANDLK_S	112OTSH	02-11-85	1500	12.20	20	1121	500
452632094145102	123N28W30ABA02ALBERSMILL_S	112OTSH	02-11-85	1400	12.50	20	1115	530
		112OTSH	06-18-85	1900	11.70	20	1115	595
452750095054001	123N35W09ADC01 HARLAN	112OTSH	05-28-85	1600	15.70	30	1294	880
		112OTSH	06-18-85	1100	15.70	30	1294	740
452750095054002	123N35W09ADC02 HARLAN	112OTSH	06-18-85	1030	17.00	21	1294	495
452843094230501	123N30W12ADD01 LEANDER HANS	112OTSH	05-29-85	1100	6.80	34	1110	690
452843094230502	123N30W12ADD02 LEANDER HANS	112OTSH	05-29-85	1130	6.50	15	1110	750
453055095045301	124N35W28CDA MARLIN ENGEN C	112BRDO	05-30-85	1540	8.80	110	1295	582
453141094091004	124N28W25BBA04TEIGEN_H(S38)	112BRDO	02-11-85	1300	--	80	970	340
453145094091003	124N28W25BBA03TEIGEN_SS	112OTSH	02-11-85	1200	10.20	17	961	705
		112OTSH	06-19-85	1030	12.10	17	961	845
453146094091101	124N28W25BBA01TEIGEN_S(S35)	112OTSH	02-11-85	1000	8.70	17	960	700
		112OTSH	06-19-85	0900	10.30	17	960	845
453146094091102	124N28W25BBA02TEIGEN_D(S36)	112OTSH	02-11-85	1100	8.80	22	960	640
		112OTSH	06-19-85	1000	10.30	22	960	790
453439094140502	124N28W05CBD02STMICHAELS_H	112OTSH	02-07-85	1300	--	100	1062	550
453440094135801	124N28W05CAC01STMICHAELS_S	112OTSH	02-07-85	1100	18.50	22	1061	470
		112OTSH	06-19-85	1230	18.30	22	1061	460
453440094135802	124N28W05CAC02STMICHAELS_D	112OTSH	02-07-85	1200	18.50	37	1061	610
		112OTSH	06-19-85	1300	18.30	37	1061	580
453441094140701	124N28W05CBD01STMICHAELS_C	112OTSH	02-07-85	1500	--	75	1062	530
454320094131401	126N28W16CBC01STEARNSCOPK_D	112OTSH	02-06-85	1400	4.90	42	1023	465
		112OTSH	06-19-85	1500	4.40	42	1023	420
454320094131402	126N28W16CBC02STEARNSCOPK_S	112OTSH	02-06-85	1500	6.40	8	1023	290
		112OTSH	06-19-85	1430	4.50	8	1023	275
454328094135901	126N28W17CAA01HISCOCK_D	112OTSH	02-07-85	0900	17.60	42	1047	500
454428095051701	126N35W09BAD01 GERALD	112OTSH	05-28-85	1300	5.10	26	1312	565
454428095051702	126N35W09BAD02 GERALD	112OTSH	05-28-85	1330	5.10	10	1312	900

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

STEARNS COUNTY--Continued

DATE	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	PH (STANDARD UNITS) (00400)	PH LAB (STANDARD UNITS) (00403)	TEMPERATURE (DEG C) (00010)	CALCIUM DISSOLVED (MG/L AS CA) (00915)	MAGNESIUM, DISSOLVED (MG/L AS MG) (00925)	SODIUM, DISSOLVED (MG/L AS NA) (00930)	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	ALKALINITY FIELD (MG/L AS CACO3) (00410)	ALKALINITY LAB (MG/L AS CACO3) (90410)	SULFATE DISSOLVED (MG/L AS SO4) (00945)
02-13-85	623	7.4	7.4	8.0	--	--	--	--	264	--	18
06-18-85	595	7.4	7.3	9.5	--	--	--	--	250	--	20
02-13-85	622	7.3	7.5	7.5	--	--	--	--	263	--	14
06-18-85	608	7.5	7.3	10.0	--	--	--	--	250	--	17
02-13-85	599	7.2	7.5	4.0	--	--	--	--	262	--	11
05-29-85	502	7.5	7.4	10.0	67	24	4.6	1.7	265	262	20
02-11-85	596	7.3	7.4	9.5	--	--	--	--	78	--	13
06-18-85	541	7.5	7.3	9.0	--	--	--	--	190	--	9.9
02-11-85	558	7.4	7.5	10.0	--	--	--	--	91	--	19
06-18-85	485	8.4	7.9	9.5	--	--	--	--	210	--	19
02-11-85	518	7.4	7.5	10.5	--	--	--	--	102	--	14
02-11-85	537	7.1	7.1	9.5	--	--	--	--	100	--	13
06-18-85	558	7.3	7.2	10.0	--	--	--	--	290	--	13
05-28-85	874	7.3	7.2	10.0	--	--	--	--	410	--	15
06-18-85	727	7.7	7.6	12.0	--	--	--	--	200	--	16
06-18-85	499	7.5	7.3	12.0	--	--	--	--	200	--	28
05-29-85	682	7.3	7.1	9.0	--	--	--	--	470	--	63
05-29-85	761	7.3	7.2	7.0	480	--	--	--	--	--	30
05-30-85	573	7.6	7.4	10.0	59	22	33	2.2	335	326	0.8
02-11-85	386	7.5	7.7	11.0	--	--	--	--	95	--	4.7
02-11-85	804	7.1	7.3	10.0	--	--	--	--	99	--	39
06-19-85	841	7.2	7.2	10.5	--	--	--	--	250	--	40
02-11-85	804	7.1	7.3	9.0	--	--	--	--	102	--	41
06-19-85	830	7.3	7.2	9.0	--	--	--	--	260	--	42
02-11-85	782	7.2	7.4	10.0	--	--	--	--	101	--	44
06-19-85	798	7.3	7.2	9.5	--	--	--	--	270	--	48
02-07-85	525	7.1	7.6	10.0	--	--	--	--	254	--	43
02-07-85	439	7.5	7.6	10.5	--	--	--	--	249	--	6.5
06-19-85	463	7.5	7.5	9.5	--	--	--	--	250	--	8.9
02-07-85	656	7.3	7.5	10.5	--	--	--	--	308	--	24
06-19-85	591	8.1	7.7	10.0	--	--	--	--	220	--	23
02-07-85	546	7.3	7.5	10.5	--	--	--	--	251	--	33
02-06-85	418	7.4	7.5	10.0	--	--	--	--	215	--	17
06-19-85	421	7.5	7.4	9.0	--	--	--	--	210	--	15
02-06-85	260	7.4	7.6	6.0	--	--	--	--	146	--	6.2
06-19-85	273	7.4	7.5	9.0	--	--	--	--	150	--	5.7
02-07-85	430	--	7.8	10.5	--	--	--	--	--	--	5.3
05-28-85	562	7.4	7.2	8.5	--	--	--	--	440	--	33
05-28-85	898	7.4	7.3	7.5	--	--	--	--	290	--	53

WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

STEARNS COUNTY--Continued

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)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOSPHORUS, DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P) (00671)	ARSENIC DISSOLVED (UG/L AS AS) (01000)
02-13-85	25	--	--	--	12.0	0.03	--	--	--	--
06-18-85	20	--	--	--	8.20	0.06	--	--	--	--
02-13-85	25	--	--	--	13.0	0.09	--	--	--	--
06-18-85	23	--	--	--	10.0	0.04	--	--	--	--
02-13-85	22	--	--	--	11.0	0.01	--	--	--	--
05-29-85	1.7	0.2	23	315	<0.10	0.24	1.3	0.07	<0.01	<1
02-11-85	29	--	--	--	16.0	0.08	--	--	--	--
06-18-85	24	--	--	--	12.0	0.22	--	--	--	--
02-11-85	29	--	--	--	1.10	0.09	--	--	--	--
06-18-85	29	--	--	--	0.49	0.10	--	--	--	--
02-11-85	4.7	--	--	--	<0.10	0.15	--	--	--	--
02-11-85	13	--	--	--	<0.10	0.19	--	--	--	--
06-18-85	11	--	--	--	1.10	2.00	--	--	--	--
05-28-85	36	--	--	--	36.0	0.18	--	--	--	--
06-18-85	37	--	--	--	28.0	2.90	--	--	--	--
06-18-85	21	--	--	--	0.63	2.00	--	--	--	--
05-29-85	20	--	--	--	<0.10	0.14	--	--	--	--
05-29-85	18	--	--	--	16.0	0.15	--	--	--	--
05-30-85	1.8	0.3	25	357	<0.10	0.84	0.8	0.03	0.05	--
02-11-85	1.3	--	--	--	0.11	0.47	--	--	--	--
02-11-85	67	--	--	--	3.80	0.04	--	--	--	--
06-19-85	88	--	--	--	5.80	0.14	--	--	--	--
02-11-85	75	--	--	--	4.70	0.02	--	--	--	--
06-19-85	85	--	--	--	5.00	0.10	--	--	--	--
02-11-85	68	--	--	--	3.00	0.03	--	--	--	--
06-19-85	76	--	--	--	3.10	0.10	--	--	--	--
02-07-85	12	--	--	--	<0.10	0.09	--	--	--	--
02-07-85	1.1	--	--	--	2.00	0.05	--	--	--	--
06-19-85	1.9	--	--	--	2.60	0.05	--	--	--	--
02-07-85	41	--	--	--	4.40	0.04	--	--	--	--
06-19-85	46	--	--	--	3.70	0.23	--	--	--	--
02-07-85	19	--	--	--	<0.10	0.08	--	--	--	--
02-06-85	5.8	--	--	--	1.50	0.04	--	--	--	--
06-19-85	5.4	--	--	--	1.60	0.07	--	--	--	--
02-06-85	1.2	--	--	--	0.30	0.07	--	--	--	--
06-19-85	0.8	--	--	--	0.23	0.03	--	--	--	--
02-07-85	2.1	--	--	--	<0.10	0.18	--	--	--	--
05-28-85	7.2	--	--	--	<0.10	0.07	--	--	--	--
05-28-85	43	--	--	--	44.0	0.06	--	--	--	--

STEARNS COUNTY--Continued

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)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	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)	CYANIDE DIS-SOLVED (MG/L AS CN) (00723)
02-13-85	--	--	--	--	--	--	--	--	--	--
06-18-85	--	--	--	--	--	--	--	--	--	--
02-13-85	--	--	--	--	--	--	--	--	--	--
06-18-85	--	--	--	--	--	--	--	--	--	--
02-13-85	--	--	--	--	--	--	--	--	--	--
05-29-85	30	<1	<10	<10	3000	95	0.4	2	<1	<0.01
02-11-85	--	--	--	--	--	--	--	--	--	--
06-18-85	--	--	--	--	--	--	--	--	--	--
02-11-85	--	--	--	--	--	--	--	--	--	--
06-18-85	--	--	--	--	--	--	--	--	--	--
02-11-85	--	--	--	--	--	--	--	--	--	--
02-11-85	--	--	--	--	--	--	--	--	--	--
06-18-85	--	--	--	--	--	--	--	--	--	--
05-28-85	--	--	--	--	--	--	--	--	--	--
06-18-85	--	--	--	--	--	--	--	--	--	--
06-18-85	--	--	--	--	--	--	--	--	--	--
05-29-85	--	--	--	--	--	--	--	--	--	--
05-29-85	--	--	--	--	--	--	--	--	--	--
05-30-85	220	--	--	--	1500	24	--	--	--	--
02-11-85	--	--	--	--	--	--	--	--	--	--
02-11-85	--	--	--	--	--	--	--	--	--	--
06-19-85	--	--	--	--	--	--	--	--	--	--
02-11-85	--	--	--	--	--	--	--	--	--	--
06-19-85	--	--	--	--	--	--	--	--	--	--
02-11-85	--	--	--	--	--	--	--	--	--	--
06-19-85	--	--	--	--	--	--	--	--	--	--
02-07-85	--	--	--	--	--	--	--	--	--	--
02-07-85	--	--	--	--	--	--	--	--	--	--
06-19-85	--	--	--	--	--	--	--	--	--	--
02-07-85	--	--	--	--	--	--	--	--	--	--
06-19-85	--	--	--	--	--	--	--	--	--	--
02-07-85	--	--	--	--	--	--	--	--	--	--
02-06-85	--	--	--	--	--	--	--	--	--	--
06-19-85	--	--	--	--	--	--	--	--	--	--
02-06-85	--	--	--	--	--	--	--	--	--	--
06-19-85	--	--	--	--	--	--	--	--	--	--
02-07-85	--	--	--	--	--	--	--	--	--	--
05-28-85	--	--	--	--	--	--	--	--	--	--
05-28-85	--	--	--	--	--	--	--	--	--	--

SWIFT COUNTY

STATION NUMBER	LOCAL IDENTIFIER	GEO-LOGIC UNIT	DATE	TIME	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET) (72019)	DEPTH OF WELL, TOTAL (FEET) (72008)	ELEV. OF LAND SURFACE DATUM (FT. ABOVE NGVD) (72000)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
452303095181401	122N37W10DCD MILBERT ESPILI	112BRDO	06-04-85	1610	60.70	242	1215	960

DATE	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (90095)	PH (STAND-ARD UNITS) (00400)	PH LAB (STAND-ARD UNITS) (00403)	TEMPER-ATURE (DEG C) (00010)	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)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY FIELD (MG/L AS CACO3) (00410)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)
06-04-85	941	7.6	7.3	9.5	110	53	29	2.4	799	508	51

SWIFT COUNTY--Continued

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)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN,AMMONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOSPHORUS, DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P) (00671)	ARSENIC DISSOLVED (UG/L AS AS) (01000)
06-04-85	<0.2	0.3	24	479	<0.10	3.00	3.6	0.10	0.05	1

DATE	BORON, DISSOLVED (UG/L AS B) (01020)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, DISSOLVED (UG/L AS FE) (01046)	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)	CYANIDE DISSOLVED (MG/L AS CN) (00723)
06-04-85	110	<1	<10	<10	3100	55	0.3	<1	<1	<0.01

WADENA COUNTY

STATION NUMBER	LOCAL IDENTIFIER	GEOLOGIC UNIT	DATE	TIME	DEPTH OF WELL, TOTAL (FEET) (72008)	SPECIFIC CONDUCTANCE (US/CM) (00095)
462215094591501	134N34W32DCB02	112OTSH	05-15-85	1100	42	--
462530095050001	134N35W10CDC01	112OTSH	05-15-85	1000	24	650
462815094532001	135N33W30DCD01	112OTSH	05-15-85	1200	87	510
463000094583001	135N34W16DBC01	112OTSH	05-15-85	1300	65	470

DATE	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	PH (STANDARD UNITS) (00400)	PH LAB (STANDARD UNITS) (00403)	TEMPERATURE (DEG C) (00010)	ALKALINITY FIELD (MG/L AS CACO3) (00410)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)
05-15-85	750	7.2	7.3	8.0	487	30	35	3.90	0.35
05-15-85	631	7.3	7.8	11.0	490	36	13	<0.10	0.09
05-15-85	491	7.7	8.1	9.5	297	14	12	13.0	0.01
05-15-85	460	7.5	7.6	7.5	388	13	2.5	0.76	0.42

CHEMICAL QUALITY OF PRECIPITATION

461458094295000 PRECIPITATION STATION AT CAMP RIPLEY, MN

WATER-QUALITY RECORDS

LOCATION.--Lat 46°14'58", long 94°29'50", in NE¼ sec.18, T.132 N., R.30 W., Morrison County, Hydrologic Unit 07010104, approximately 500 ft southwest of the abandoned Gilgal Church and approximately 5 miles south of the town of Pillager.

PERIOD OF RECORD.--October 1983 to September 1985 (weekly composite).

INSTRUMENTATION.--Samples are collected in a polyethylene bucket by an electrically operated wet/dry collector. A recording rain gage and a standard U.S. Weather Service bulk rain gage measure rainfall quantity.

REMARKS.--An observer collects only the wetfall bucket and services the rain gages every Tuesday around 0900 hours. The observer weighs the bucket and if there is enough wetfall, determines specific conductance and pH. The bucket with its remaining contents is then sent to the Illinois State Water Survey Laboratory for analysis.

CHEMICAL ANALYSIS, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

WEEKLY COMPOSITE

DATE	TIME	PRECIP-ITATION TOTAL INCHES/ WEEK (00046)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (90095)	PH (STAND-ARD UNITS) (00400)	PH LAB (STAND-ARD UNITS) (00403)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)
OCT 02-09	0900	0.15	45	35	4.0	4.3	0.23	0.11
OCT 09-16	0900	3.6	12	10	4.8	4.8	0.03	0.01
OCT 16-23	0730	3.4	9	8	4.5	4.8	0.02	0.01
OCT 23-30	0900	0.35	8	8	4.8	6.2	0.24	0.08
NOV 27-DEC 04	0900	0.05	9	17	5.6	6.7	0.75	0.31
DEC 11-18	0900	0.92	8	6	4.6	5.9	0.32	0.06
DEC 26-JAN 02	0900	0.09	17	12	4.3	5.1	0.48	0.09
JAN 15-22	0900	0.07	10	15	5.0	6.6	1.4	0.33
JAN 22-29	0900	0.07	19	24	5.2	6.7	1.0	0.22
FEB 05-12	0830	0.14	49	39	3.6	4.2	0.49	0.07
MAR 19-26	0900	0.3	23	19	--	4.6	0.16	0.05
MAR 26-APR 02	0900	0.25	6	5	--	5.4	0.09	0.03
APR * 16-23	0900	1.3	17	18	6.0	6.6	1.1	0.20
APR 30-MAY 07	0645	0.1	19	25	6.3	7.0	2.1	0.38
MAY 07-14	0900	1.3	11	12	5.9	6.5	0.65	0.09
MAY 21-28	0900	0.05	26	31	6.3	6.3	1.8	0.42
MAY 28-JUN 04	0900	1.5	8	9	5.5	6.0	0.34	0.06
JUN 04-11	0800	1.1	4	4	5.3	5.4	0.05	0.01
JUN 11-18	0900	1.0	4	4	5.3	5.2	0.05	0.01
JUN 18-25	0830	0.5	10	10	6.7	6.5	0.44	0.09
JUN 25-JUL 02	0830	2.0	6	7	6.2	6.3	0.3	0.07
JUL * 16-23	0830	2.7	14	15	5.6	6.1	0.59	0.13
JUL 30-* AUG 06	0900	0.55	14	13	5.9	6.2	0.48	0.14
AUG 06-13	0800	2.3	7	5	5.0	5.1	0.07	0.02
AUG 20-27	0800	0.33	24	22	4.5	4.5	0.19	0.06
AUG 27-SEP 03	1030	1.5	9	9	5.1	5.1	0.09	0.02
SEP 03-10	0800	1.2	10	8	4.9	5.0	0.16	0.03
SEP 10-17	1000	0.15	42	37	4.6	5.2	0.61	0.11
SEP 17-24	0800	0.9	4	4	5.0	5.6	0.12	0.04
SEP 24-OCT 01	0900	0.54	3	3	5.4	5.4	0.06	0.03

* Bulk sample

CHEMICAL QUALITY OF PRECIPITATION

461458094295000 PRECIPITATION STATION AT CAMP RIPLEY, MN--Continued

CHEMICAL ANALYSIS, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

WEEKLY COMPOSITE

DATE	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	PHOS-PHORUS, ORTHO, DIS-SOLVED (MG/L AS P) (00671)
OCT 02-09	0.16	0.12	4.2	0.2	0.72	1.03	<0.001
OCT 09-16	0.02	0.01	1.2	0.07	0.17	0.30	<0.001
OCT 16-23	0.02	0.01	0.6	0.04	0.10	0.06	<0.001
OCT 23-30	0.16	0.08	0.9	0.18	0.26	0.36	<0.001
NOV 27-DEC 04	0.91	0.52	0.9	1.0	0.32	0.25	<0.001
DEC 11-18	0.12	0.11	0.7	0.14	0.20	0.11	<0.001
DEC 26-JAN 02	0.29	0.12	1.5	0.44	0.38	0.26	<0.001
JAN 15-22	0.49	0.13	1.4	0.41	0.26	0.09	<0.001
JAN 22-29	1.3	1.1	2.3	1.8	0.41	0.59	0.003
FEB 05-12	0.22	0.08	2.4	0.32	1.31	0.45	<0.001
MAR 19-26	0.05	0.03	1.9	0.13	0.34	0.40	<0.001
MAR 26-APR 02	0.13	0.08	0.3	0.26	0.25	0.10	<0.001
APR * 16-23	0.18	0.11	2.4	0.15	0.62	0.27	0.004
APR 30-MAY 07	0.26	0.20	2.6	0.16	0.41	0.06	0.005
MAY 07-14	0.09	0.06	1.5	0.14	0.20	<0.02	0.004
MAY 21-28	0.15	0.15	3.6	0.35	1.19	1.33	<0.001
MAY 28-JUN 04	0.03	0.03	1.0	0.07	0.27	0.27	<0.001
JUN 04-11	<0.01	0.02	0.4	<0.03	0.08	0.13	<0.001
JUN 11-18	<0.01	0.01	0.3	<0.03	0.10	0.07	<0.001
JUN 18-25	0.03	0.08	0.7	0.06	0.25	0.54	0.004
JUN 25-JUL 02	0.08	0.03	0.7	0.12	0.12	0.29	<0.001
JUL * 16-23	0.03	0.09	2.1	0.11	0.25	0.43	0.014
JUL 30-* AUG 06	0.02	0.08	2.0	0.08	0.31	0.57	0.007
AUG 06-13	0.01	0.01	0.5	<0.03	0.10	0.11	<0.001
AUG 20-27	0.09	0.03	2.6	0.15	0.44	0.36	<0.001
AUG 27-SEP 03	0.02	0.01	1.0	0.04	0.15	<0.02	<0.001
SEP 03-10	0.03	0.02	0.7	0.07	0.20	0.05	<0.001
SEP 10-17	0.08	0.10	7.5	0.24	0.87	2.24	<0.001
SEP 17-24	0.02	0.03	0.4	0.04	<0.01	<0.02	<0.001
SEP 24-OCT 01	0.02	0.01	0.2	<0.03	0.03	<0.02	<0.001

* Bulk sample

INDEX

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). This report contains both the inch-pound and SI unit equivalents in the station manuscript descriptions.

Multiply inch-pound units	By	To obtain SI units
	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)
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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