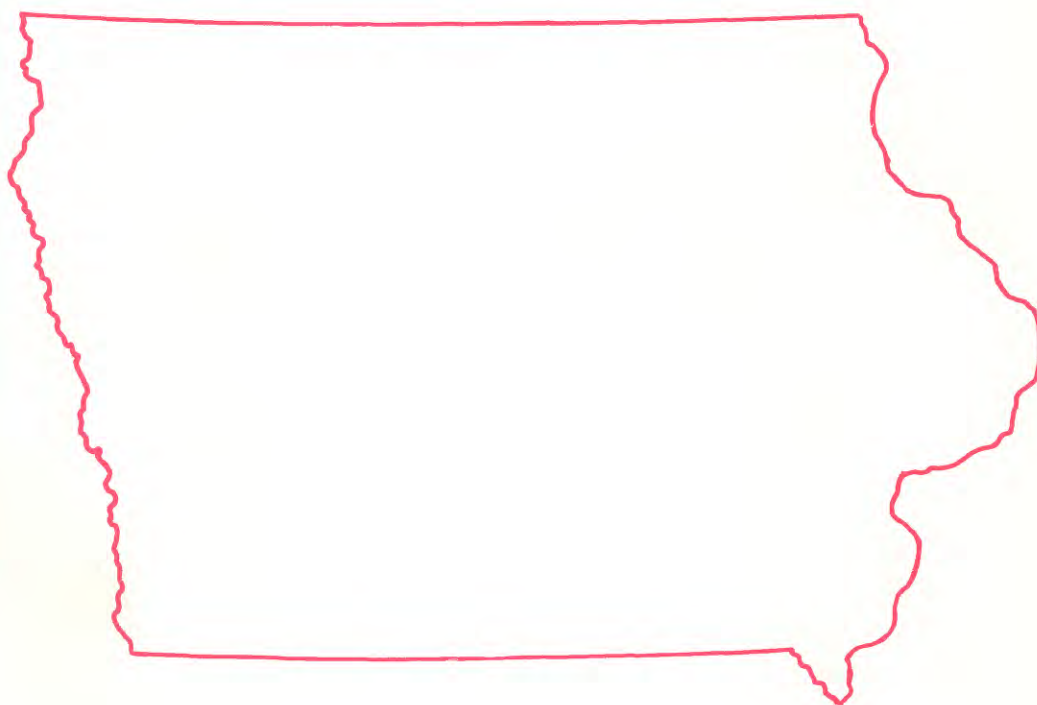




Water Resources Data Iowa Water Year 1987



U.S. GEOLOGICAL SURVEY WATER DATA REPORT IA-87-1
Prepared in cooperation with the Iowa Department of
Natural Resources (Geological Survey Bureau), Iowa
Department of Transportation and with Federal agencies

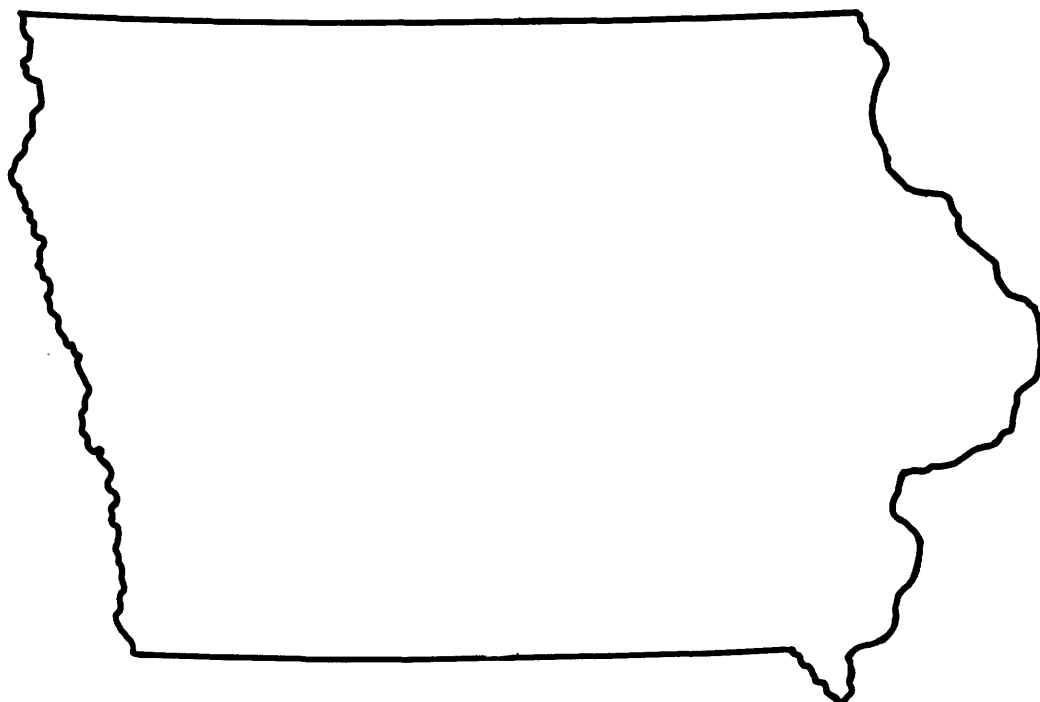
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Water Resources Data Iowa

Water Year 1987

by N.B. Melcher, R.W. Baebenroth, M.G. Detroy,
R.A. Karsten, and W.J. Matthes



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT IA-87-1
Prepared in cooperation with the Iowa Department of
Natural Resources (Geological Survey Bureau), Iowa
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DEPARTMENT OF THE INTERIOR
DONALD PAUL HODEL, Secretary

U.S. GEOLOGICAL SURVEY
Dallas L. Peck, Director

For information on the water program in Iowa write to:

District Chief, Water Resources Division
U.S. Geological Survey
P.O. Box 1230
Iowa City, Iowa 52244

1988

PREFACE

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

This report is the culmination of a concerted effort by dedicated personnel of the U.S. Geological Survey who collected, compiled, analyzed, verified, and organized the data, and who typed, edited, and assembled the report. The authors had primary responsibility for assuring that the information contained herein is accurate, complete, and adheres to Geological Survey policy and established guidelines. Most of the data were collected, computed, and processed from area field offices. Personnel in charge of the field offices are:

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This report was prepared in cooperation with the State of Iowa and with other agencies under the general supervision of R.A. Engberg, District Chief, Iowa.

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FOR WHICH RECORDS ARE PUBLISHED

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(c) chemical, (m) microbiological, (t) water temperature,
(s) sediment]

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<u>PLYMOUTH COUNTY</u>			
Well 424850096074801	Local number	92-45-02 CBCB1.....	303
Well 424833096324701	Local number	92-48-06 DDDA1.....	303
Well 425249096125001	Local number	93-46-12 DDDD1.....	304
<u>POTTAWATTAMIE COUNTY</u>			
Well 411246095502001	Local number	74-43-18 BCCC1.....	304
<u>SAC COUNTY</u>			
Well 422500095084801	Local number	88-37-22 CCCC1.....	305
Well 423013095175301	Local number	89-38-26 ABAA1.....	305
Well 422850095171501	Local number	89-38-36 CBCC1.....	305
<u>SCOTT COUNTY</u>			
Well 413544090212901	Local number	78-5E-3 AADA1.....	306
<u>SIOUX COUNTY</u>			
Well 430140095573101	Local number	95-43-07 AAAA1.....	306
Well 430913096033201	Local number	96-44-08 ADA1.....	306
<u>STORY COUNTY</u>			
Well 420130093362201	Local number	83-24-02 DCAA1.....	307
<u>WASHINGTON COUNTY</u>			
Well 411300091320701	Local number	74-06-15 BDAC1.....	307
Well 411244091323501	Local number	74-06-15 CBDD1.....	307
Well 421829091304701	Local number	75-06-14 ABBA1.....	308
Well 412037091564701	Local number	76-09-31 CBBC1.....	308
Well 412754091494701	Local number	77-09-24 AADA1.....	309
<u>WEBSTER COUNTY</u>			
Well 421550094041001	Local number	86-28-14 ADAB1.....	309
Well 421837094083601	Local number	87-28-29 CCCD1.....	310
Well 423018094214701	Local number	89-30-23 CCBB1.....	310
<u>WOODBURY COUNTY</u>			
Well 422058095573701	Local number	87-44-15 CBBA1.....	311
Well 422830096000511	Local number	88-44-06 BAAB11.....	311
Well 423015096034601	Local number	89-44-20 DCDC1.....	311
Well 422910096135811	Local number	89-46-36 BBDC11.....	312

WATER RESOURCES DATA - IOWA, 1987

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

This report contains records for water discharge at 112 gaging stations, stage or contents for 8 lakes and reservoirs, water quality records for 8 gaging stations, sediment records for 10 gaging stations, and water levels for 112 observation wells. Also included are data for 113 crest-stage partial-record stations and water-quality data from 197 municipal wells. Additional water data were collected at various sites not involved in the systematic data-collection program and are published as miscellaneous measurements and analyses. These data represent that part of the National Water Data System operated by the U.S. Geological Survey and cooperating State, local, and Federal agencies in Iowa.

Records of discharge and stage of streams, and contents or stage of lakes and reservoirs were first published in a series of U.S. Geological Survey water-supply papers entitled, "Surface Water Supply of the United States." Through September 30, 1960, these water-supply papers were in an annual series and then in a 5-year series for 1961-65 and 1966-70. Records of chemical quality, water temperatures, and suspended sediment were published from 1941 to 1970 in an annual series of water-supply papers entitled, "Quality of Surface Waters of the United States." Records of ground-water levels were published from 1935 to 1974 in a series of water-supply papers entitled, "Ground-Water Levels in the United States." Water-supply papers may be consulted in the libraries of the principal cities in the United States or may be purchased from Branch of Distribution, U.S. Geological Survey, 604 South Pickett Street, Alexandria, Virginia, 22304.

For water years 1961 through 1970, streamflow data were released by the Geological Survey in annual reports on a State-boundary basis. Water-quality records for water years 1964 through 1970 were similarly released either in separate reports or in conjunction with streamflow records.

Beginning with the 1971 water year, water data for streamflow, water quality, and ground water are published in official Survey reports on a State-boundary basis. These official Survey reports carry an identification number consisting of the two-letter State abbreviation, the last two digits of the water year, and the volume number. For example, this report is identified as "U.S. Geological Survey Water-Data Report IA-87-1." 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, Virginia 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, (319) 337-4191.

COOPERATION

The U.S. Geological Survey and organizations in the State of Iowa have had cooperative agreements for the systematic collection of streamflow records since 1914, for ground water levels since 1935, and for water-quality records since 1943. Organizations that assisted in collecting data through cooperative agreement with the Survey in water year 1987 are:

Iowa Department of Natural Resources (Geological Survey Bureau),
Donald L. Koch, Bureau Chief and State Geologist

University of Iowa, Institute of Hydraulic Research, Robert
G. Hering, Dean of College of Engineering and John F. Kennedy,
Director

University of Iowa, Hygienics Laboratory, W.J. Hausler, Jr.,
Director

Iowa Department of Transportation, Highway Division, Robert
Humphrey, Director, and Vernon J. Marks, Research Engineer

Iowa State University, Richard E. Hasbrook, Contracts and Grants
Officer, and Iowa State Water Resources Research Institute,
T. Al Austin, Director

City of Cedar Rapids, Donald Canney, Mayor

City of Des Moines, John Dorrian, Mayor

City of Fort Dodge, Micheal D. McCarville, Mayor

Assistance in the form of funds or services was given by the Corps of Engineers, U.S. Army, in collecting flow records for 77 gaging stations. Assistance was also furnished by NOAA-National Weather Service, U.S. Department of Commerce.

The following organizations aided in collecting records:

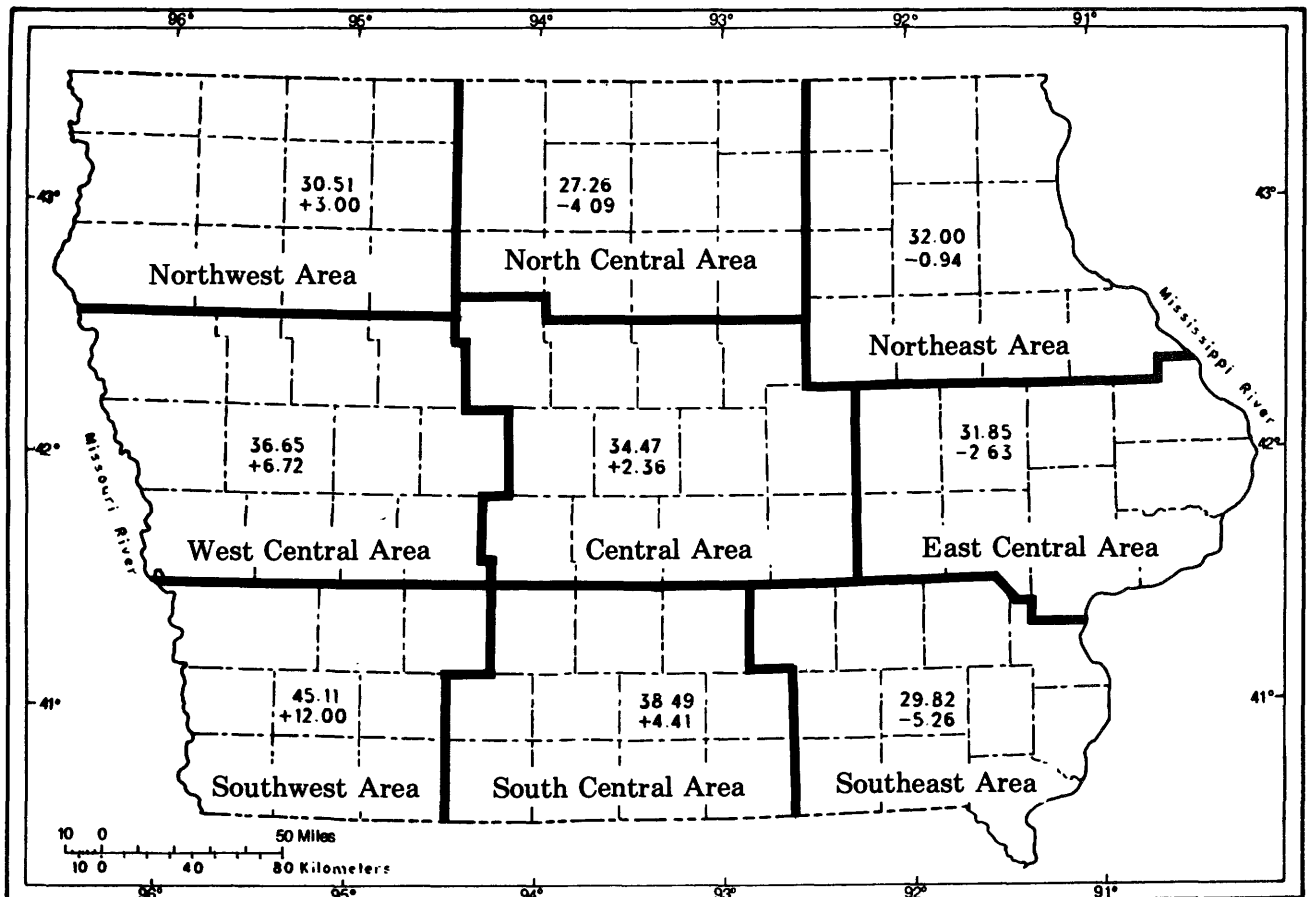
Union Electric Co; Des Moines Water Works; Waterloo Sewage Treatment plant; University of Iowa; West Central Iowa Rural Water Association; and cities of, Charles City, Clear Lake, Denison, Iowa City, Marshalltown, Sioux City and Waterloo.

Organizations that supplied data are acknowledged in station descriptions.

SUMMARY OF HYDROLOGIC CONDITIONS

Surface Water

Water year 1987 (October 1, 1986 to September 30, 1987) was characterized by variable statewide precipitation and runoff. Recorded precipitation for the year (fig. 1) varied from 5.26 inches less than average in the Southeast to 12.00 inches greater than average in the Southwest climatological area. In general, precipitation was deficient in the climatological areas in the North Central and the East Central and excessive in the Central, South Central, and West Central. Average annual precipitation for water year 1987 ranged from 27.26 inches in the North Central to 45.11 inches in the Southwest climatological area. The statewide average during the water year was 33.81 inches or 105 percent of the 1951-80 average (table 1).



EXPLANATION

38.49 Precipitation, in inches

+4.41 Deviation from long-term average (1951-80), in inches

Figure 1.--Precipitation record in the National Weather Service's designated climatological areas for water year 1987. (Source: P.J. Waite, State Climatologist, written commun., 1988).

Table 1.--Water year 1987 precipitation as percentage of normal monthly and annual precipitation.

Climatological area	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Year
Northwest	152	111	34	38	20	227	37	101	43	217	104	134	111
North Central	198	96	58	32	10	100	59	61	44	129	116	75	87
Northeast	144	101	52	59	15	102	56	89	62	104	198	79	97
West Central	210	84	76	8	34	194	69	125	50	195	190	85	123
Central	164	95	92	38	27	140	71	79	48	141	230	63	107
East Central	131	54	73	45	18	128	50	81	60	64	256	55	93
Southwest	171	71	160	17	50	170	67	203	77	155	237	82	136
South Central	132	50	87	34	64	136	66	137	76	143	234	58	113
Southeast	172	48	80	41	44	119	60	62	72	55	148	74	85
State	163	78	77	36	31	145	60	103	58	133	190	79	105

(Source: P.J. Waite, State Climatologist, written commun., 1988)

Water year 1987 followed a 12-month period that recorded the second highest statewide average annual precipitation on record (P.J. Waite, State Climatologist, written commun., 1988). This sustained wet period contributed to greater than average runoff conditions during the early part of water year 1987. Mean monthly discharge at three index stations in Iowa on the Nishnabotna River above Hamburg, the Des Moines River at Fort Dodge and the Cedar River at Cedar Rapids (fig. 2) were in the excessive flow range (75-percent quartile of median daily discharges during water years 1951-80 for the specified month) during the first five months of water year 1987 and, except during the month of June, were in the excessive or normal flow range (75- to 25-percent quartile of median daily discharges during water years 1951-80 for the specified month) during the last seven months of water year 1987. In June, the Cedar River at Cedar Rapids was the only index station to recede into the deficient flow range (25-percent quartile of median daily discharges during water years 1951-80 for the specified month) during the water year.

Runoff during water year 1987 was generally greater than average (based on period of record) at all representative streamflow stations except for a few stations in the northeastern part of the State. Runoff was excessive at those stations located in the Southwest climatological area of the State. A record high water year runoff of 20.2 inches was recorded on the Tarkio River at Stanton.

Statewide precipitation during October was 163 percent of normal (table 1). As a result, discharge at all three index stations was in the excessive flow range (fig. 2) and set record highs for October mean flows. Figure 3 shows the statewide average monthly precipitation during water year 1987 compared to normal statewide monthly precipitation, 1951-80. Previous maximum daily discharges were exceeded on the Nishnabotna River above Hamburg on October 12, and on the Des Moines River at Fort Dodge on October 13.

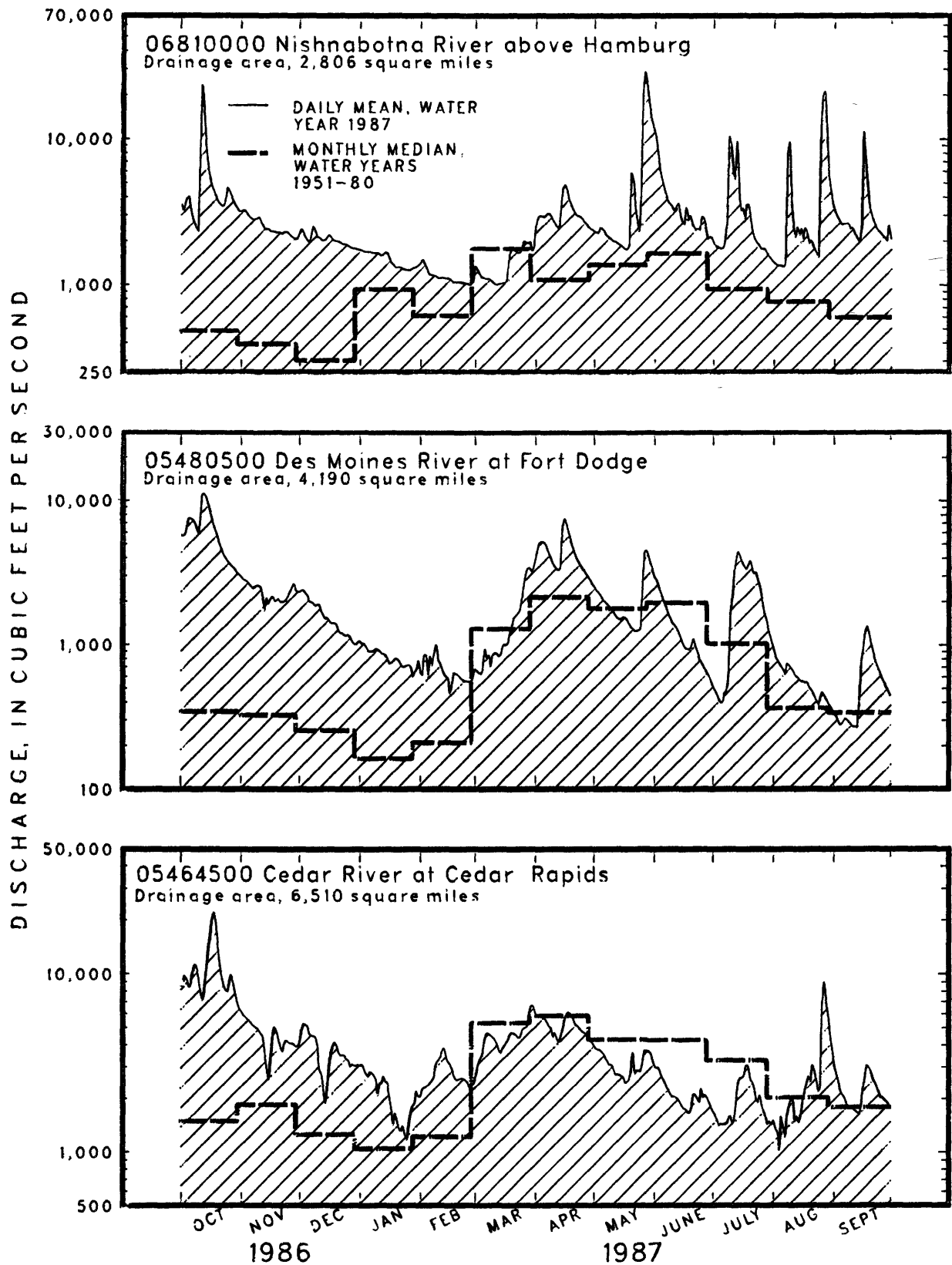


Figure 2.--Daily mean discharge for water year 1987 compared with monthly median discharges for water years 1951-80 for three index stations.

During November and December, precipitation was about 78-percent of normal for the State (table 1). Temperatures averaged about five degrees Fahrenheit below normal during November and were above average in December. By the end of December, general snow cover and ice cover on streams was limited to the Northern one-third of the State. Discharge at index stations continued to recede but was still in the excess flow range for the period (fig. 2).

January and February were unseasonably warm and dry. Statewide precipitation was about 31 to 36 percent of normal (table 1), the second driest January and February on record. Temperatures during January and February were also the second warmest on record. Snowfall was about 50 percent of the normal for the month. Discharges at all three index stations continued their normal winter recession but remained in the excessive flow range (fig. 2).

March averaged 145 percent of normal precipitation (table 1) with most of the precipitation occurring during the last half of the month. Precipitation that occurred during the last few days of March did not significantly affect the March mean monthly discharge at the index stations. As a result, the mean monthly discharge at all three index stations receded into the normal flow range (fig. 2) for the first time in several months. Significant increases in discharge did occur on streams in the Floyd, Little Sioux and Rock River basins in western Iowa.

Recorded precipitation during April was 60 percent of normal for the State (table 1). Discharge at two of the index stations continued in the normal flow range. Excessive runoff, from large quantities of precipitation recorded during the last few days of March, caused the mean monthly discharge at the index station on the Nishnabotna River at Hamburg to increase into the excessive flow range (fig. 2).

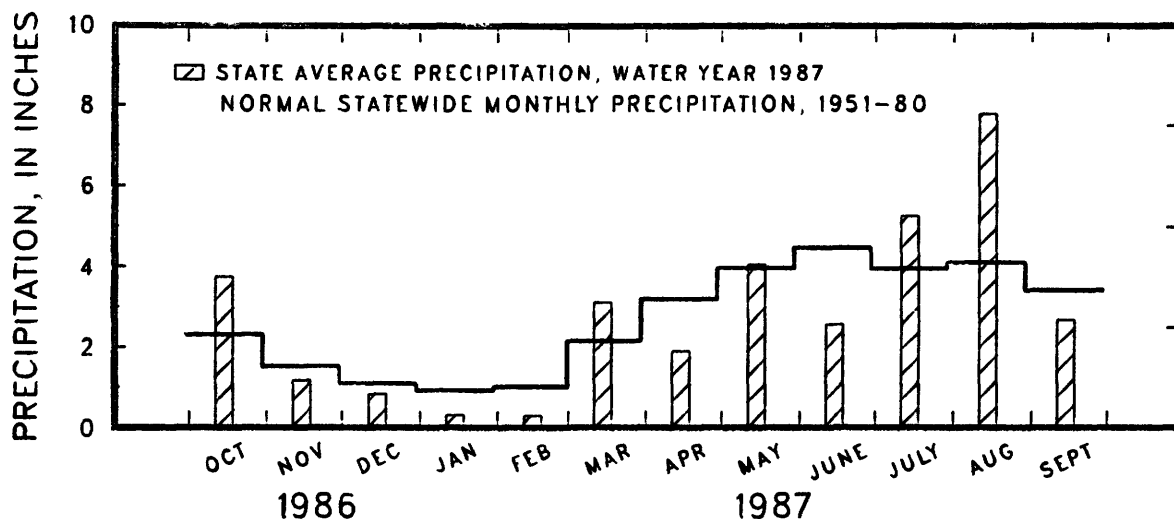


Figure 3.--Statewide average precipitation, during water year 1987 compared to normal statewide monthly precipitation, 1951-80 (Source: P.J. Waite, State climatologist, oral commun., 1987)

During May, recorded precipitation varied from 203 percent of normal in the Southwest climatological area to 61 percent of normal in the North Central area (table 1). The statewide average was 103 percent of normal. Greater than normal precipitation was recorded in the climatological areas in Western and South Central Iowa and less than normal was recorded in all other areas. Mean monthly discharge at the index stations on the Cedar River at Cedar Rapids and the Des Moines River at Fort Dodge continued in the normal flow range and the index station on the Nishnabotna River above Hamburg continued in the excessive flow range (fig. 2). The gaging station on the Nishnabotna River above Hamburg exceeded the previous maximum daily discharge during the month of May by 5,800 cubic feet per second on May 27, setting a new record high stage of 28.14 feet. A new maximum discharge for period of record was recorded on the West Nishnabotna River at Randolph with 40,800 cubic feet per second on May 26. Regionally intense rainfall in Mills, Montgomery, Fremont, and Page Counties in southwest Iowa produced peak discharges at the following stream-gaging stations:

Station number	Stream	Drainage area (square miles)	Date (1987)	Gage height (feet)	Discharge (cubic feet per second)	Approximate recurrence interval (years)
06808500	West Nishnabotna R at Randolph	1,326	5/26	24.50	40,800	50
06809500	East Nishnabotna R at Red Oak	894	5/26	17.08	9,820	2
06811840	Tarkio River at Stanton	49.3	5/26	19.86	10,100	10
06817000	Nodaway River at Clarinda	762	5/26	17.87	27,800	20
06810000	Nishnabotna River above Hamburg	2,806	5/27	28.14	31,400	20

Recorded statewide precipitation during June was 58 percent of normal (table 1). Moderate increases in discharge occurred on some streams in south-central Iowa as a result of local rainstorms. Statewide, streamflow generally receded during the month. The index station on the Nishnabotna River above Hamburg remained in the excessive flow range and the Des Moines River at Fort Dodge remained in the normal flow range during June (fig. 2). The index station on the Cedar River at Cedar Rapids receded to the deficient flow range (fig. 2) for the first time in 22 months.

Precipitation recorded during July varied from 217 percent of normal in Northwest Iowa to 55 percent of normal in Southeast Iowa (table 1). Streams in the eastern one-third of the State continued their normal recession. Annual peak discharges were recorded on streams in the Little Sioux, Monona-Harrison Ditch, Soldier, Boyer, Platte and Grand River basins during July. Discharge at the index station on the Cedar River at Cedar Rapids increased into the normal flow range during the month (fig. 2). Discharge at the index station on the Nishnabotna River above Hamburg continued in the excessive flow range and the index station on the Des Moines River at Fort Dodge continued in the normal flow range (fig. 2).

During August, precipitation was greater than normal in all areas of the State and was 190 percent of normal statewide (table 1). The index station on the Nishnabotna River above Hamburg continued in the excessive flow range (fig. 2). It exceeded its previous maximum daily August discharge by 9,200 cubic feet per second on August 27 and set a new high maximum monthly mean discharge for August. The Des Moines River at Fort Dodge and the Cedar River at Cedar Rapids continued in the normal flow range (fig. 2). The peak discharges for 1987 were recorded at stream-gaging stations on the East Fork One Hundred and Two River at Bedford, the Thompson River at Davis City and the Weldon River near Leon. A record peak discharge of 8,580 cubic feet per second occurred at the streamflow-gaging station on the Platte River near Diagonal. This flood had an approximate recurrence interval of 25 years.

Statewide precipitation recorded during September was 79 percent of normal (table 1). Less than average precipitation was recorded in all areas except the Northwest climatological area. The discharge at the index stations on the Cedar River at Cedar Rapids and the Des Moines River at Fort Dodge remained in the normal range and the Nishnabotna River above Hamburg remained in the excessive range during September (fig. 2).

Suspended-Sediment

The discharge of suspended-sediment at the seven daily sediment stations reflected the generally variable precipitation patterns during water year 1987. Suspended-sediment discharge exceeded the yearly mean at 3 of the 7 stations. The annual suspended-sediment load for the Mississippi River at McGregor for 1987 was the largest load for the period of record. This was due to sustained late summer and fall precipitation in 1986 which caused extended high water discharge during the early part of water year 1987. Excessive precipitation in the spring of 1987, occurring in northern Iowa, Minnesota and Wisconsin, also contributed to high suspended-sediment discharge on the Mississippi River at McGregor.

The Southwest part of the State was affected by a series of summer thunder storms and this is reflected by greater than normal suspended-sediment discharge at the sediment station on the Nodaway River at Clarinda. The annual suspended-sediment load for this station is the fifth largest for 12 years of record.

The gage on the Iowa River at Iowa City had a greater than average annual suspended-sediment discharge for the year. This was due to the late 1986 summer and fall precipitation. The Coralville Reservoir, located upstream from Iowa City, released water at greater than normal flow rates throughout the fall and into the early summer of 1987 which accounted for most of the sediment-discharge.

Ralston Creek at Iowa City had the sixth lowest annual suspended-sediment discharge in 35 years of record. The low sediment yield was probably caused by the effects of a recently constructed flood control structure and the relatively infrequent storm events in the basin this year. The station was discontinued at the end of water year 1987.

The Des Moines River near Saylorville, located in the central part of the State, is regulated by Saylorville Dam. The total annual suspended-sediment load was the fourth lowest since the dam began operating in April 1977. The mean sediment-discharge for the period since April 1977 is 246,000 tons per day and the annual sediment-discharge for the year was 208,000 tons per day.

The two stations in the Southeast part of the State, the Iowa River at Wapello and the Skunk River at Augusta had the second lowest annual sediment-discharge for nine years and 12 years of record. This was caused by drier than normal conditions during the spring and summer of 1987 in this part of the State.

Surface Water-Quality

The chemical quality of surface water in Iowa, as indicated by samples collected at seven stations on major rivers, was not significantly different than that for previous years. Samples collected at these stations indicate that water in the major streams generally is suitable for public water supply and most industrial uses when properly treated. None of the samples analyzed had concentrations of constituents that were in excess of environmental standards. Dissolved-oxygen concentrations were near or greater than saturation at all stations. This generally indicates, with respect to dissolved oxygen, stream quality has not been significantly affected by oxygen-demanding substances such as nutrients, or organic matter.

A comparison between selected water-quality data for water year 1987 and data for the period of record is shown for three stations in figures 4, 5 and 6. Daily mean discharge for water year 1987 is shown so that a general relation can be seen between flow conditions and water-quality data. Dissolved-solids and nitrate data, collected at selected National Stream-Quality Accounting Network (NASQAN) stations, were used to demonstrate temporal variability of water quality for the Iowa, Skunk and Nishnabotna Rivers.

Concentrations of dissolved-solids for the stations on the Iowa River at Wapello (fig. 4), the Skunk River at Augusta (fig. 5), and the Nishnabotna River above Hamburg (fig. 6), for water year 1987, were variable when compared to historical monthly means for the period of record. Dissolved-solids concentrations for the Iowa River at Wapello (fig. 4) were near the historical monthly mean for five of six samples analyzed. Dissolved-solids concentrations for the Skunk River at Augusta (fig. 5) exceeded the historical monthly mean for two samples and were less than the historical mean for three of six samples analyzed. Dissolved-solids concentrations for the station on the Nishnabotna River above Hamburg (fig. 6) were less than the historical monthly mean for three samples and exceeded the historical mean for one of the four samples analyzed.

Nitrate concentrations reported as nitrogen (analysis for nitrite plus nitrate as nitrogen, but nitrite concentration assumed to be negligible) for the Iowa River at Wapello (fig. 4) exceeded the historical monthly mean for five of six samples analyzed. Samples collected in October and March exceeded the historical monthly mean by more than 2 milligrams per liter. Nitrate concentrations for the station on the Skunk River at Augusta (fig. 5) exceeded the historical monthly mean for two samples and were less than the historical mean for three of six samples analyzed. The analysis which were near the mean are not detailed elsewhere. Nitrate concentrations for the Nishnabotna River above Hamburg (fig. 6) exceeded the historical monthly mean for three samples and were below the historical monthly mean for one of the four samples analyzed. The November sample exceeded the historical monthly mean by 3 milligrams per liter.

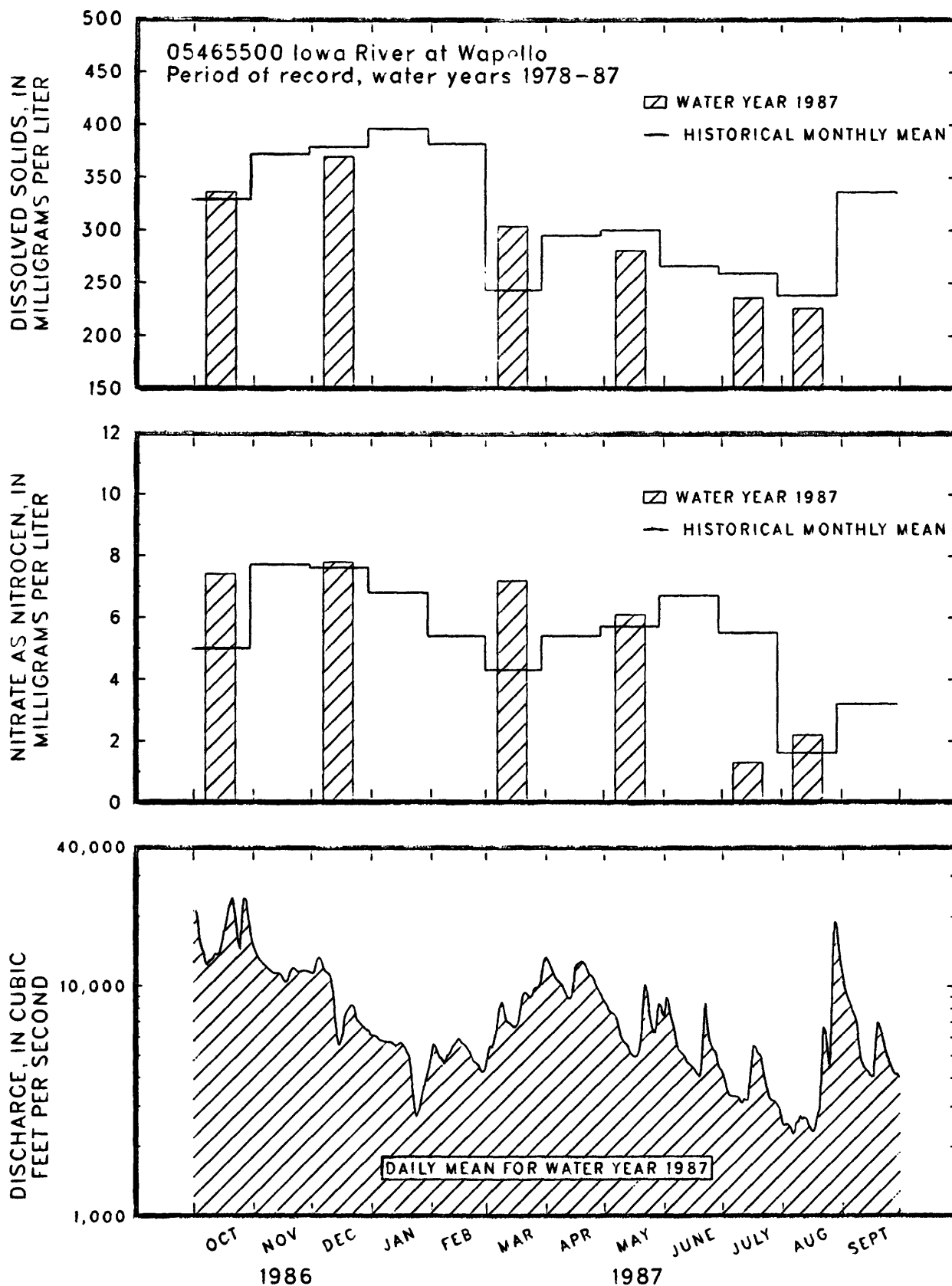


Figure 4.--Comparison of dissolved solids and nitrate concentration for water year 1987 with historical monthly mean values at the NASQAN station on the Iowa River at Wapello.

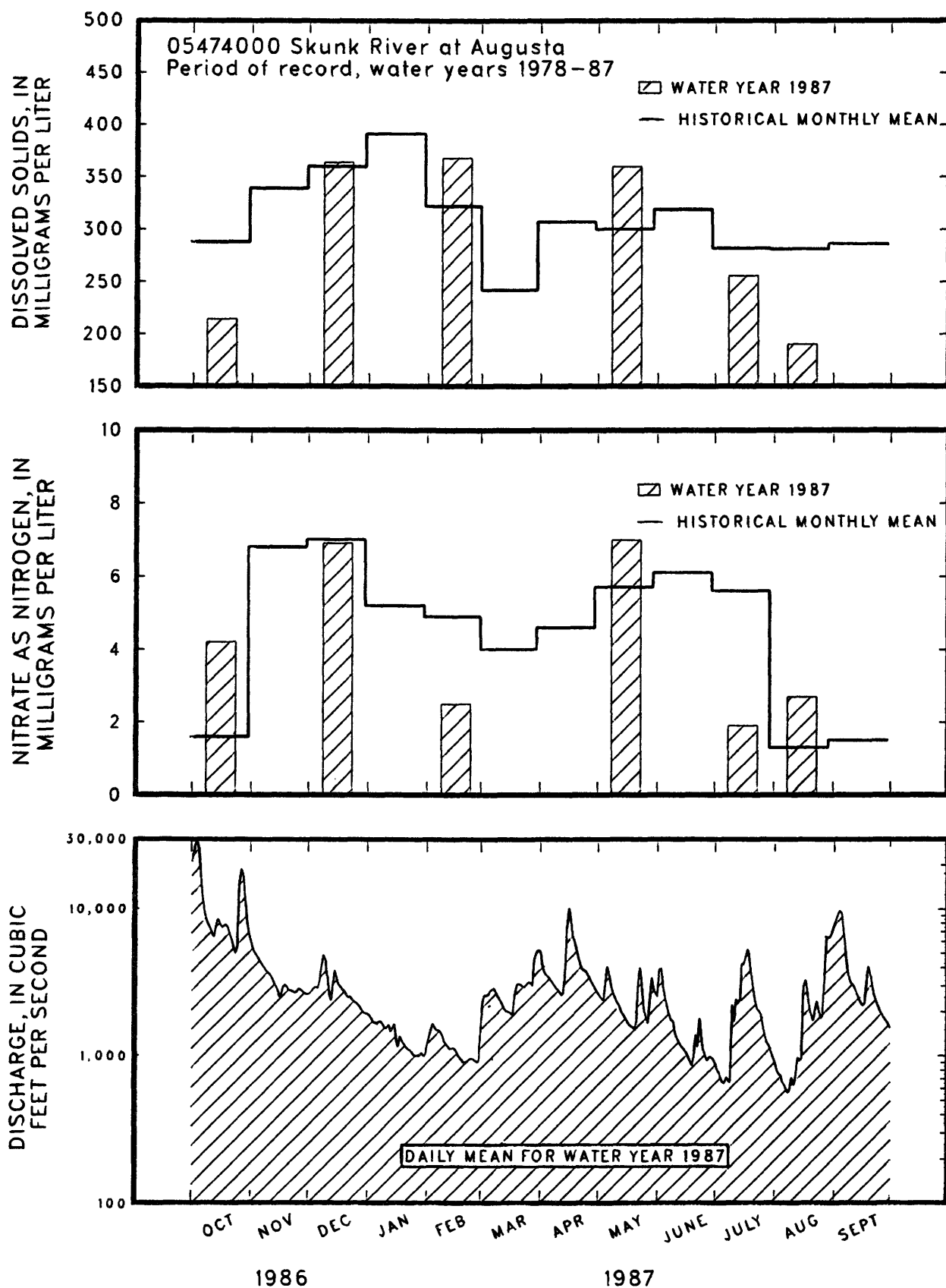


Figure 5.--Comparison of dissolved solids and nitrate concentration for water year 1987 with historical monthly mean values at the NASQAN station on the Skunk River at Augusta.

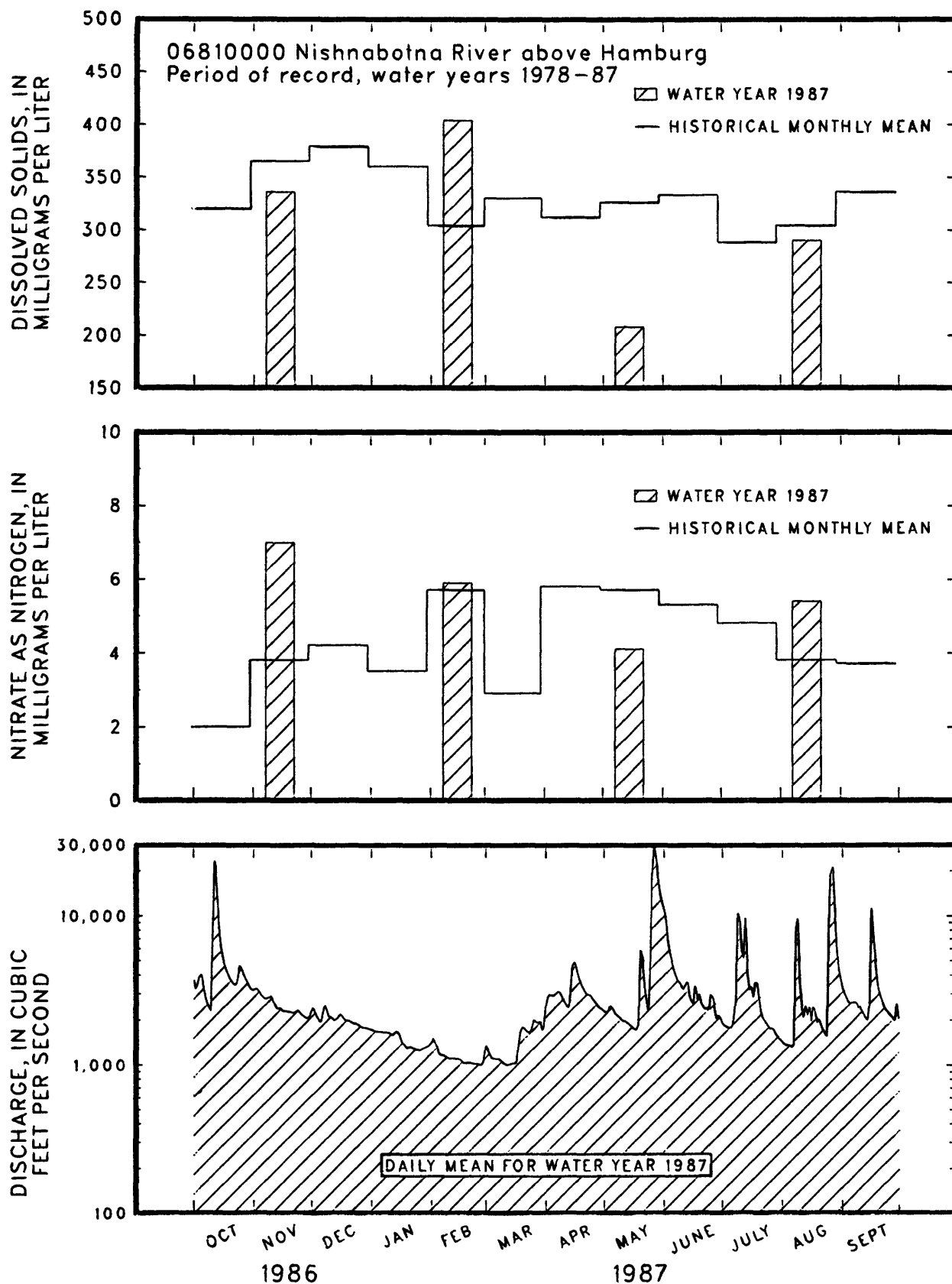


Figure 6.--Comparison of dissolved solids and nitrate concentration for water year 1987 with historical monthly mean values at the NASQAN station on the Nishnabotna River above Hamburg.

Ground Water

Normally, water levels at the water table have a moderate autumn rise, a small winter decline, and a rapid spring rise followed by a gradual decline throughout the growing season. This pattern did not generally occur in the early part of water year 1987 because of deficient precipitation during the period of November 1986 through February 1987 (figs. 3 and 7; table 1). Rises in water levels in water-table aquifers are partially a result of recharge by direct infiltration of precipitation. After the growing season begins, precipitation normally is lost to runoff and evapotranspiration so that recharge to the aquifers decreases.

The water level records shown in figure 7 are from three shallow, water-table wells completed in glacial drift of Pleistocene age in Linn, Webster, and Marion Counties. The water levels reflect the precipitation pattern for water year 1987 shown in figure 3. Because of the spatial variability and differences in intensity of precipitation, especially in late spring, summer, and early fall, the yearly hydrographs of water levels in observation wells are not always consistent when compared to each other even though the long-term average hydrographs are similar.

The well in Linn County, in east-central Iowa, had water levels higher than the average monthly levels for all months except April through July when the water levels were approximately average. A new monthly high level for this well was measured in August. The well in Webster County, in central Iowa, had water levels higher than the average monthly levels for all months except May and June. The well in Marion County, in south-central Iowa, had water levels higher than the average monthly levels for all months except February and May when the levels were slightly below average. A new high level for October was measured in this well this year. A well in Johnson County completed in the same aquifer, in east-central Iowa, had monthly water levels during 1987 higher than the average monthly levels for all months except February, April, May, July, and August. A new high level for June was measured in this well even though this climatological area received only 60 percent of the average precipitation for the month (table 1). This high level was caused by 6.40 inches of localized rain that occurred June 18-21 as reported by a local resident. Most of the precipitation fell on June 20 and the well was measured on June 22.

A shallow, water-table well in alluvium of Holocene age in Pottawattamie County in southwest Iowa had water levels above the average monthly levels for the entire water year. This was because the climatological area in which this well is located received 136 percent of the normal precipitation during the water year. A shallow, water-table well completed in alluvium in Lee County in southeast Iowa had a record high water level in November. A well completed in alluvium in Muscatine County in southeast Iowa had a record low water level in August.

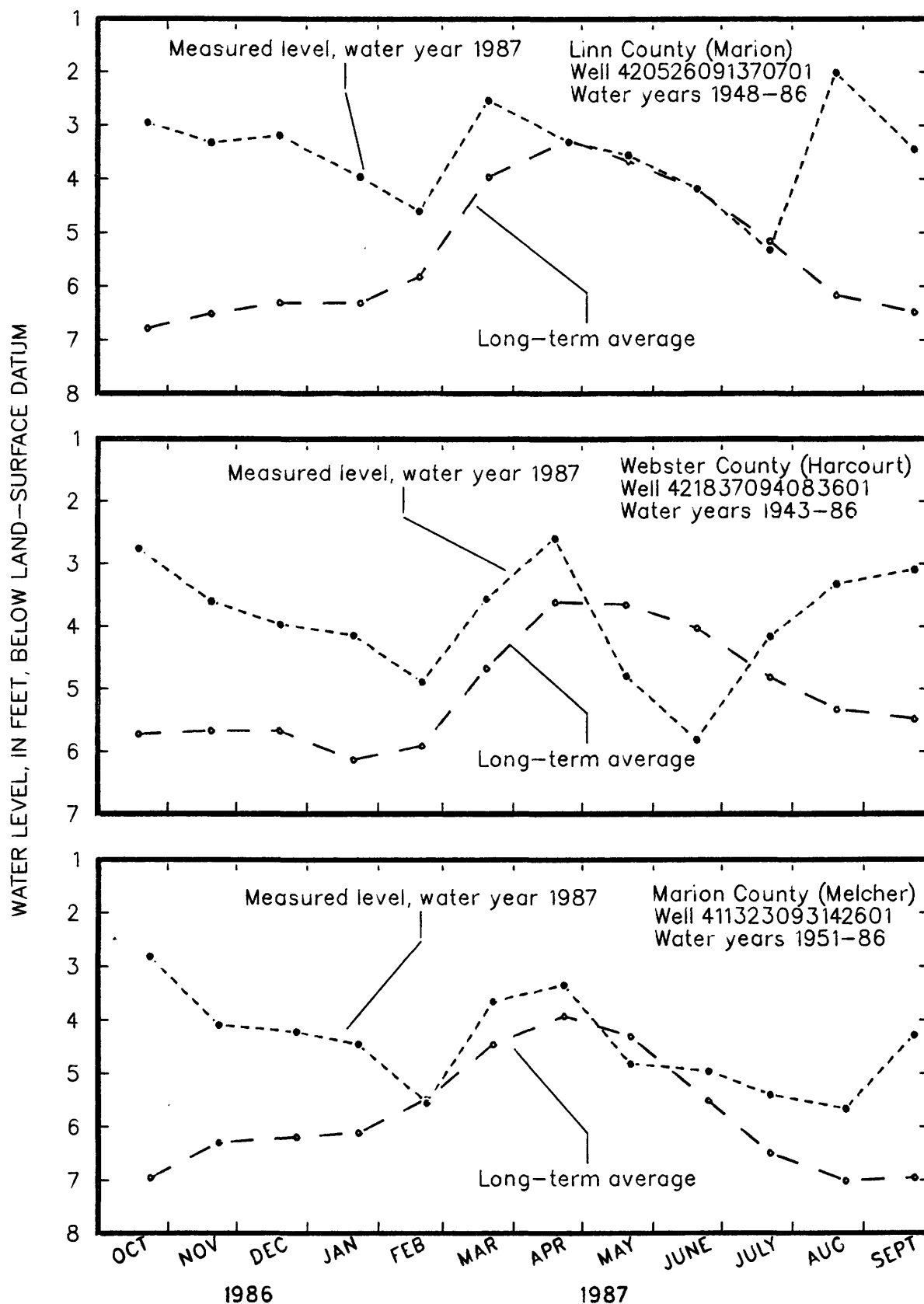


Figure 7.--Monthly water levels during water year 1987 compared to the average monthly level for the period of record.

Twelve artesian wells in Iowa had record high water levels during the water year and 10 artesian wells had record low water levels. This was due to the variability of precipitation during the year. The following artesian wells had record high water levels measured during water year 1987: five wells in the Dakota aquifer in Buena Vista, Lyon and Plymouth Counties, and two in Woodbury County; a well in the Silurian-Ordovician aquifer in Benton County; a well in the Silurian aquifer in Delaware County; a well in the St. Peter aquifer in Des Moines County; a well in the Devonian aquifer in Grundy County; a well in the Mississippian aquifer in Harrison County; a well in the Mt. Simon aquifer in Jackson County; and a well in the Cambrian-Ordovician aquifer in Plymouth County. Also, a water level measured in a well in the Dakota aquifer in O'Brien County equaled the previously recorded high water level. The following artesian wells had record low water levels during water year 1987: four wells in the Dakota aquifer in Buena Vista, Osceola, Sac, and Sioux Counties; two wells in the Jordan aquifer in Henry and Jasper Counties; a well in the Pleistocene glacial drift aquifer in Cerro Gordo County; a well in the Silurian aquifer in Delaware County; a well in the Galena aquifer in Jackson County; a well in the Mississippian aquifer in Madison County; and a well in the Mississippian-Devonian aquifer in Webster County.

Ground Water-Quality

The water-quality data obtained from analyses of ground-water samples indicate that nitrate and numerous pesticides are present in concentrations that may be considered undesirable, and in some cases exceed public-drinking water standards. Water-quality analyses of raw water (untreated, obtained directly from the aquifer or aquifers) from 197 municipal wells throughout the State are listed in this report.

In water year 1987, 197 water samples were collected from wells throughout the State as shown in figure 8 and analyzed by the University of Iowa Hygienic Laboratory for a number of chemical constituents. All ground-water samples were analyzed for common mineral and nutrient constituents. Other analytical schedules used include the following:

- 1) 92 percent -- common herbicides,
- 2) 30 percent -- trace metals, acid herbicides and common insecticides, and
- 3) 20 percent -- radiochemical constituents.

Thirty four samples were also analyzed for synthetic organic chemicals and their results are also listed in this report.

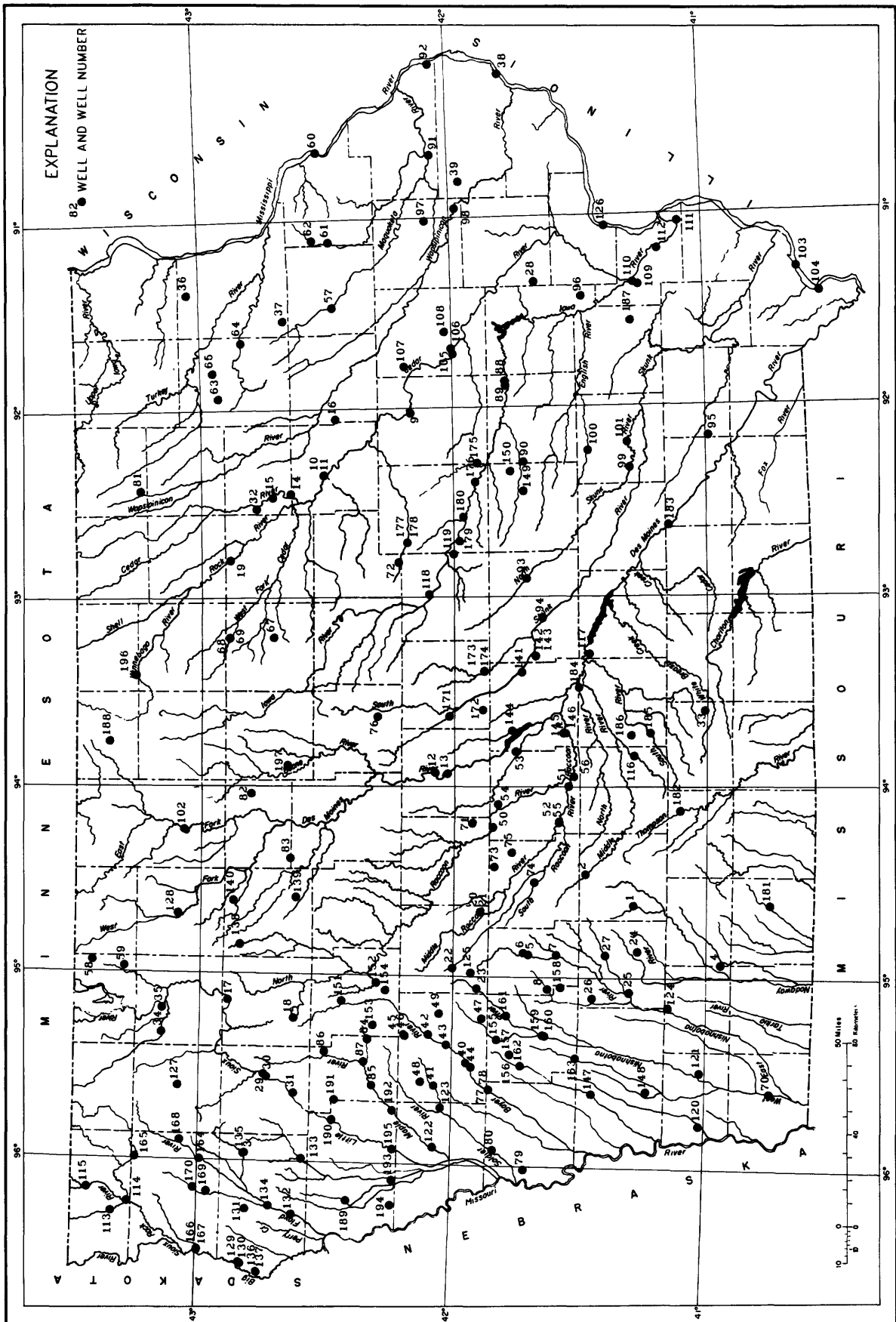


Figure 8.—Location of wells where water samples were collected during water year 1987.

A group of 180 samples were collected from shallow wells completed in aquifers with depths of 200 feet or less. Of particular interest for this category of shallow wells are the concentrations of nitrate and selected pesticides in shallow ground water. About 80 percent of these locations have been sampled in previous years and 40 percent have had detectable herbicides in previous analyses. Of the 180 shallow wells sampled, 36 samples (20 percent) had nitrate concentrations greater than 1 milligram per liter, 40 samples (22 percent) had concentrations greater than 5 milligrams per liter and 22 samples (12 percent) had concentrations greater than the maximum contaminant limit (MCL) for public drinking water of 10 milligrams per liter nitrate as nitrogen. Samples from 55 (31 percent) of these shallow wells had detectable concentrations of at least one pesticide; either atrazine, cyanazine, metribuzin, alachlor, or metolachlor, of which all are herbicides. Atrazine was the most prevalent and was detected in 50 of 180 comprehensive pesticide analyses. Metolachlor was next most prevalent and was detected in 12 samples. Twenty-eight of the 55 samples that contained at least one detectable herbicide also contained nitrate at a concentration greater than 5 milligrams per liter.

Analyses for 17 pesticides that commonly are used in Iowa are listed in this report. Eleven are herbicides (atrazine through silvex) and six are insecticides (carbofuran through terbufos). No detectable concentration of any insecticide was measured.

Synthetic organic chemicals were analyzed in 34 samples. Four samples contained one or more compounds above detection limits. Single detections of tetrachloroethene were measured in two samples; chlorobenzene was detected in one sample and the trihalomethanes- bromodichloromethane, dibromochloromethane, and bromoform were detected along with tetrachloroethene in one sample.

SPECIAL NETWORKS AND PROGRAMS

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

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

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

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

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

EXPLANATION OF THE RECORDS

The surface-water and ground-water records published in this report are for the 1985 water year that began October 1, 1984, and ended September 30, 1985. A calendar of the water year is provided on the inside of the front cover. The records contain streamflow data, stage and content data for lakes and reservoirs, water-quality data for surface and ground water, and ground-water-level data. The locations of the stations and wells where the data were collected are shown in figures 8-12. 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 systems used by the U.S. Geological Survey to assign identification numbers for surface-water stations and for ground-water well sites differ, but both are based on geographic location. The "downstream order" system is used for regular surface-water stations and the "latitude-longitude" system is used for wells.

Downstream Order System

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

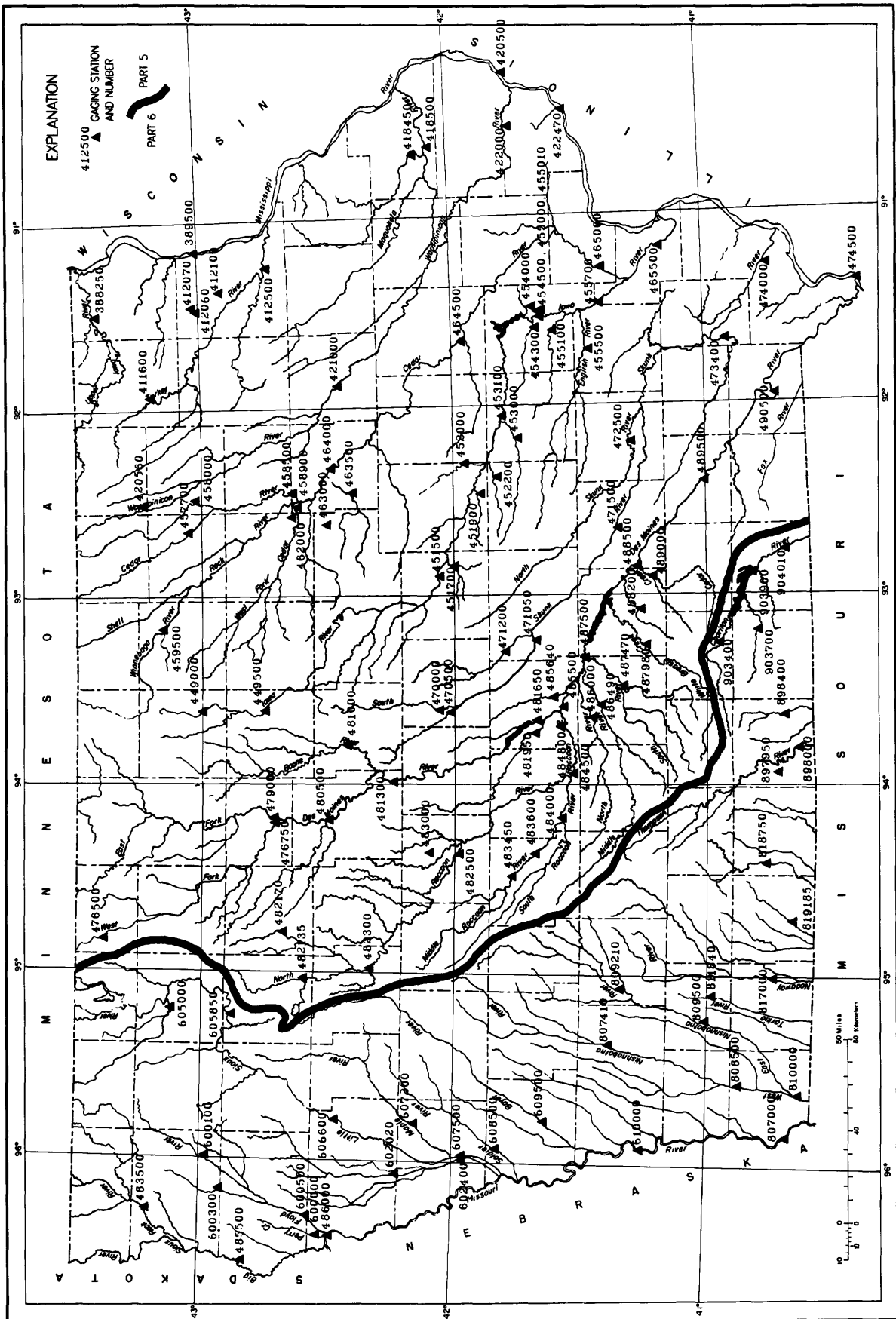


Figure 9. -- Location of active, continuous-record gaging stations.

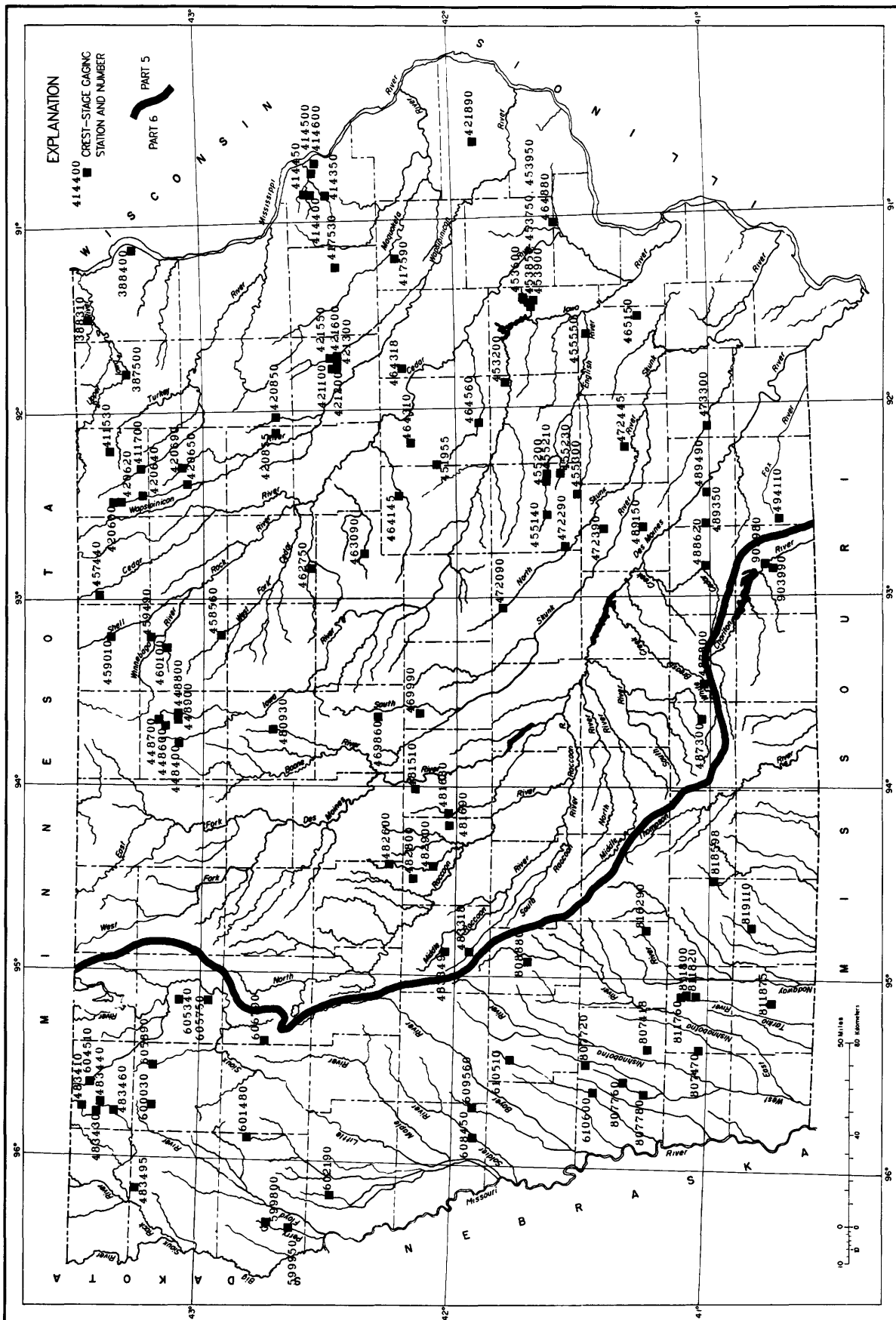


Figure 10.—Location of active, crest-stage gaging stations.

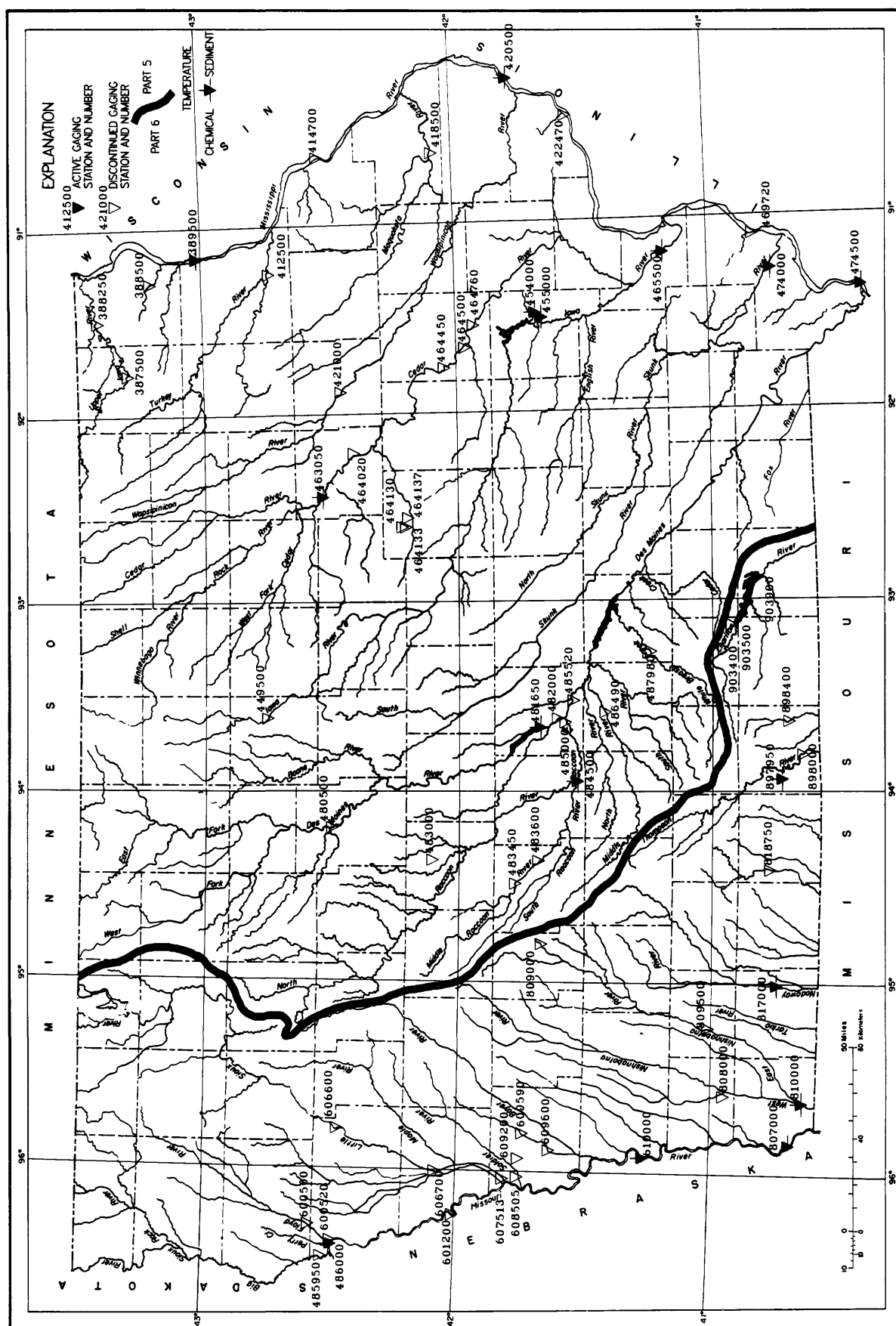


Figure 11. -- Location of active and discontinued water-quality stations.

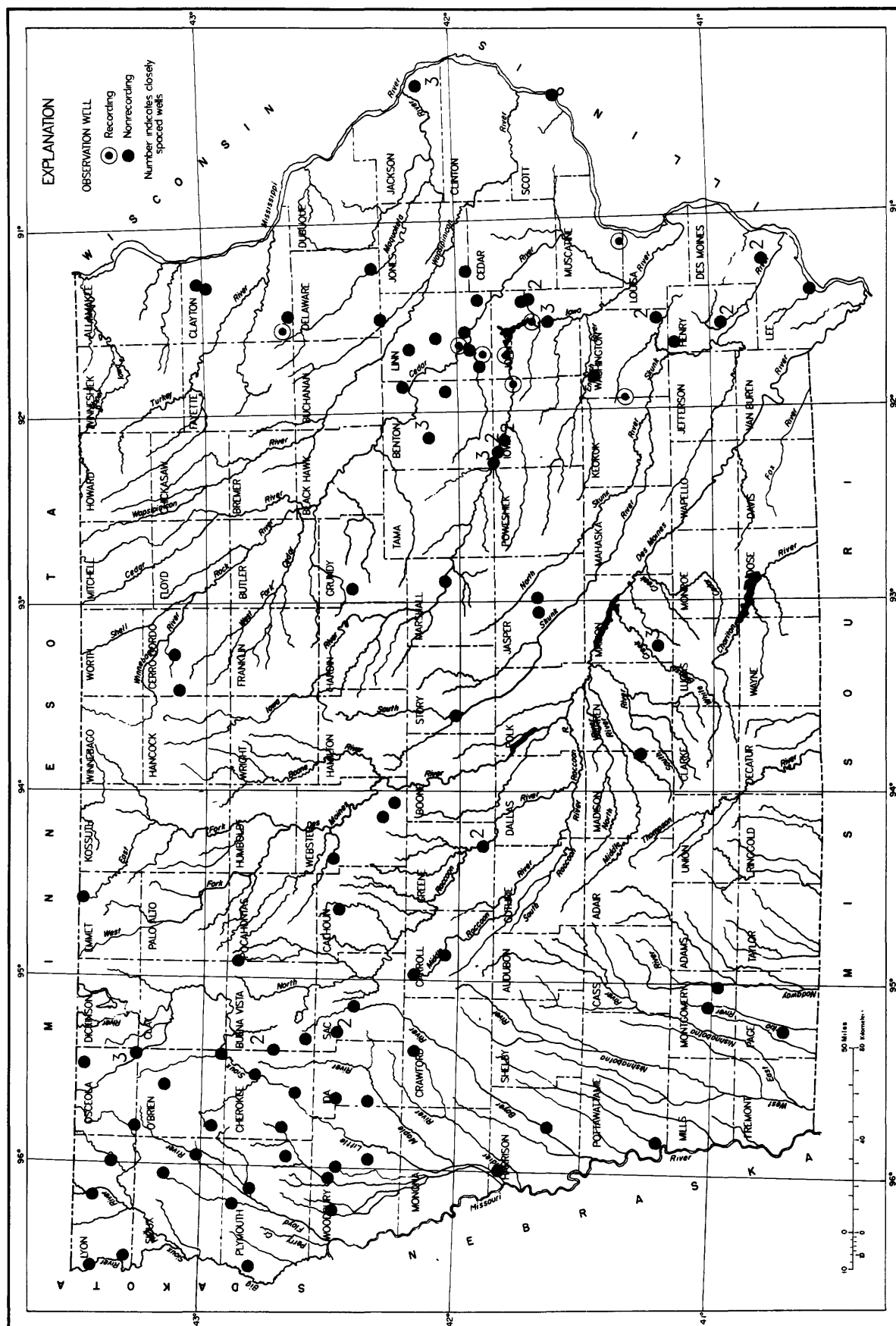


Figure 12.—Location of recording and nonrecording observation wells.

The station-identification number is assigned according to downstream order. In assigning station numbers, no distinction is made between partial-record stations and other stations; therefore, the station number for a partial-record station indicates downstream-order position in a list made up of both types of stations. Gaps are left in the series of numbers to allow for new stations that may be established; hence, the numbers are not consecutive. The complete eight-digit number for each station, such as 05388250, which appears just to the left of the station name, includes the two-digit Part number "05" plus the six-digit downstream-order number "388250." The Part number designates the major river basin; for example, Part "05" is the Mississippi River Basin.

Latitude-Longitude System

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

Latitude and longitude coordinates for wells:

1. 414315N 091252001.
2. 414315N 091252002.
3. 414316N 091251901.

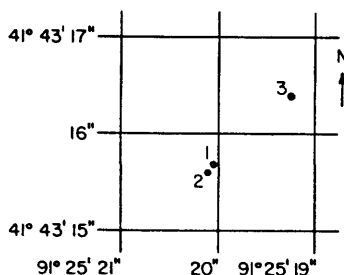


Figure 13.--Latitude-longitude well number.

Numbering System For Wells

Each well is identified by means of (1) a 15-digit number that is based on the grid system of latitude and longitude, and (2) a local number that is provided for continuity with older reports and for other use as dictated by local needs. The former number serves not only to identify the well but also to locate it as a point on a map (fig. 8). For maximum utility, latitude and longitude code numbers are determined to seconds in order that each well may have a unique number. The first six digits denote degrees, minutes, and seconds of north latitude; the next seven digits are degrees, minutes, and seconds of west longitude; and the last two numbers are a sequential number assigned in the order in which the wells are located in a 1-second quadrangle.

The local well numbers are in accordance with the Bureau of Land Management's system of land subdivision. Each well number is made up of three segments. The first segment indicates the township, the second the range, and the third the section in which the well is located (fig. 14). The letters after the section number which are assigned in a counter-clockwise direction (beginning with "A" in the northeast quarter), represent subdivisions of the section. The first letter denotes a 160-acre tract, the second a 40-acre tract, the third a 10-acre tract, and the fourth a 2.5 acre tract. Numbers are added as suffixes to distinguish wells in the same tract. Thus, the number 96-20-3CDBD1 designates the well in the SE 1/4 NW 1/4 SE 1/4 SW 1/4 sec.3, T.96 N., R.20 W.

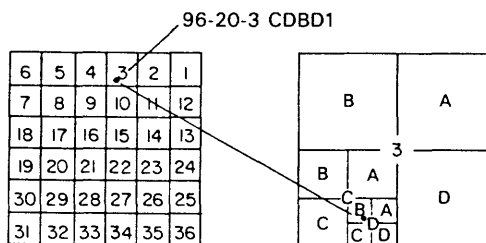


Figure 14.--Local well-numbering system for well 96-20-3CDBD1.

Records of Stage and Water Discharge

Records of stage and water discharge may be complete or partial. Complete records of discharge are those obtained using a continuous stage-recording device through which either instantaneous or mean daily discharges may be computed for any time, or any period of time, during the period of record. Complete records of lake or reservoir content, similarly, are those for which stage or content may be computed or estimated with reasonable accuracy for any time, or period of time. They may be obtained using a continuous stage-recording device, but need not be. Because daily mean discharges and end-of-day contents commonly are published for such stations, they are referred to as "daily stations." Location of all complete-record surface water stations which are given in this report are shown in figure 9.

Partial records are obtained through discrete measurements without using a continuous stage-recording device and generally pertain only to a characteristic of either high, medium or low flow.

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-capacity curves or tables to compute lake storage.

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

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

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 relation changes because of deposition of sediment in a lake or reservoir, periodic resurveys may be necessary to redefine the relation. Even when this is done, the contents computed may become increasingly in error as the lapsed time since the last survey increases. Discharges over lake or reservoir spillways are computed using stage-discharge relations.

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 these periods, the daily discharges are estimated from the recorded range in stage, discharge computed before and after the missing 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 were determined by methods given in "River Mileage Measurement," Bulletin 14, Revision of October 1968, prepared by the Water Resources Council or were provided by the U.S. Army Corps of Engineers.

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

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

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

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

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

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

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

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

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

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

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

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

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

The daily table for stream-gaging stations gives mean discharge for each day and is followed by monthly and yearly summaries. In the monthly summary below the daily table, the line headed "TOTAL" gives the sum of the daily figures. The line headed "MEAN" gives the average flow in cubic feet per second during the month. The lines headed "MAX" and "MIN" give the maximum and minimum daily discharges, respectively, for the month. Discharge for the month also is 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. This section consists of a table of annual maximum stage and discharge for crest-stage stations.

Identifying Estimated Daily Discharge

Estimated daily-discharge values published in the water-discharge tables of annual State data reports are identified by listing the dates of the estimated record in the REMARKS paragraph of the station description.

Accuracy of the Records

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

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

Daily mean discharges in this report are given to the nearest hundredth of a cubic foot per second for values less than 1 ft³/s the nearest tenth between 1.0 and 10 ft³/s; to whole numbers between 10 and 1,000 ft³/s; and to 3 significant figures for more than 1,000 ft³/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.

Other Records Available

Information used in the preparation of the records in this publication, such as discharge-measurement notes, gage-height records, temperature measurements, and rating tables is on file in various field offices of the Iowa District. Also, most of the daily mean discharges are in computer-readable form and have been analyzed statistically. Information on the availability of the unpublished information or on the results of statistical analyses of the published records may be obtained from the offices whose addresses are given on the back of the title page of this report.

Records of Surface-Water Quality

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

Classification of records

Water-quality data for surface-water sites are grouped into one of three classifications. A continuing-record station is a site where data are collected on a regularly scheduled basis. Frequency may be 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 11.

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 measurements and sample collection

In obtaining water-quality data, a major concern needs to be assuring that the data obtained represent the in-situ quality of the water. To assure this, certain measurements, such as water temperature, pH, alkalinity and dissolved oxygen, are made onsite when the samples are taken. To assure that measurements made in the laboratory also represent the in situ water, carefully prescribed procedures are 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 of onsite measurements and for collecting, treating, and shipping samples are given in publications on "Techniques of Water-Resources Investigations," Book 1, Chap. C2; Book 3, Chap. C2; Book 5, Chap. A1, A3, and A4. All of these references are listed on p. 52-53 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 the representative sample needed for an accurate mean concentration and for use in calculating load. All samples obtained for the National Stream Quality Accounting Network are obtained from at least several verticals. Whether samples are obtained from the centroid of flow or from several verticals, depends on flow conditions and other factors which must be evaluated by the collector.

Chemical-quality data published in this report are considered to be the most representative values available for 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.

Water temperature and specific conductance

Water temperatures are measured at most of the water-quality stations. The measurement of temperature and specific conductance is performed during each regular site visit (usually at a six week interval) to stream-gaging stations. Records of stream temperature indicate significant thermal characteristics of the stream when analysed over a long period of record. A summary of monthly maximum, minimum, and mean temperatures were published in the 1974 water data report for gaging stations with 10 or more years of record. Large streams have small daily temperature variations while shallow streams may have a daily range of several degrees and may closely follow the changes in air temperature. Furthermore, some streams may be affected by waste-heat discharge.

Specific conductance can be used as a general indicator of stream quality. This determination is easily made in the field with a portable meter, and the results are very useful as general indicators of dissolved-solids concentration or as a base for extrapolating other analytical data. Records for temperature and specific conductance appear in the section "Analyses of samples collected at miscellaneous sites".

Sediment

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

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

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

In addition to the records of the quantities of suspended-sediment, records of the periodic measurements of the particle-size distribution of the suspended-sediment and bed material are included. Miscellaneous suspended-sediment samples were collected during flood events have been included with the station's water quality data or in the section "Analyses of samples at miscellaneous sites".

Laboratory measurements

Sediment samples, samples for indicator bacteria, and daily samples for specific conductance are analyzed locally. All other samples are analyzed in the U.S. Geological Survey laboratory in Arvada, Colorado and the University of Iowa Hygienic Laboratory. Methods used in analyzing sediment samples and computing sediment records are given in TWRI, Book 5, Chap. C1. Methods used by the U.S. Geological Survey laboratories are given in TWRI, Book 1, Chap. D2, Book 3, Chap. C2; Book 5, Chap. A1, A3, and A4.

Data Presentation

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

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

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

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

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

INSTRUMENTATION.--Information on instrumentation is given only if a water-quality monitor temperature record, 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. Environmental Protection Agency's STORET system. Because the usual volume of updates makes it impractical to document individual changes in the State data-report series or elsewhere, potential users of U.S. Geological Survey water-quality data are encouraged to obtain all required data from the appropriate computer file to insure the most recent updates.

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

Remark Codes

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

PRINTED OUTPUTREMARK

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

Records of Ground-Water Levels

Ground-water level data from a network of observation wells in Iowa are published in this report. These data provide a limited historical record of water-level changes in the State's most important aquifers. Locations of the observation wells in this network in Iowa are shown in figure 12. Information about the availability of the data in the water-level files and reports of the U.S. Geological Survey may be obtained from the Iowa District Office (see address on back of title 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 ensures that measurements at each well are of consistent accuracy and reliability.

Tables of water-level data are arranged alphabetically by counties. The site identification number, based on latitude and longitude, for a given well is the 15-digit numeric value that appears in the upper left corner of the station description. The secondary identification number is the local well number, an alphanumeric value, derived from the township, range, and section location of the well (fig. 14).

Water-level records are obtained from direct measurements with a chalked steel tape, electric line, airline, or from the graph of a water-level recorder. The water-level measurements in this report are in feet with reference to land-surface datum. Land-surface datum is a plane that is approximately at land surface at each well. The elevation of the land-surface datum is given in the well description. The height of the measuring point 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-level measurements are reported to the nearest hundredth of a foot. Estimates, indicated by an "e" may be reported in tenths of a foot. The error of water-level measurements may be, at most, a few hundredths of a foot.

Data Presentation

Each well record consists of two parts, the station description and the table of water levels observed during the water year. The description of the well is presented by headings preceding the tabular data. The following explains the information presented under each heading.

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

AQUIFER.--This entry is the aquifer(s) name (if one exists) and geologic age of the strata open to the well.

WELL CHARACTERISTICS.--This entry describes the well depth, casing diameter, casing depth, opening or screened interval(s), method of construction, and use of water from the well.

INSTRUMENTATION.--This paragraph provides information on the frequency of measurement and the collection method used.

DATUM.--This entry includes the measuring point and the land-surface elevation at the well. The measuring point is described physically and in relation to land surface. The elevation of the land-surface datum is in feet above National Geodetic Vertical Datum of 1929 and its precision is dependent 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 and any information not presented in the other parts of the station description but considered useful.

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 beginning of publication of water-level records by the U.S. Geological Survey.

REVISED RECORDS.--If any revisions of previously published data were made for water-levels, the Water Data Report in which they appeared and year published would appear here.

EXTREMES FOR PERIOD OF RECORD.--This entry contains the highest and lowest water levels for the period of record, below 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. For wells equipped with recorders, only abbreviated tables are published. The highest and lowest water levels of the water year and the 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.

Hydrographs are included for nine wells which are representative of hydrologic conditions in the important aquifers in Iowa.

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 Iowa are shown in figure 12.

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.

The records of ground-water quality in this report were obtained as a part of a statewide ground-water quality monitoring network operated by the Iowa District. All samples were obtained from municipal wells throughout Iowa. This program is conducted in cooperation with the University of Iowa Hygienic Laboratory (UHL) and the Iowa Geological Survey. All samples are collected by USGS personnel, field-preserved and submitted to UHL for analysis. Chemical analyses include common constituents (major ions), nutrients, trace metals, radionuclides and pesticides. Approximately 10 percent of the samples receive additional analyses for about 90 organic priority pollutants, however these analyses are not presented in this report but are on file in the District office.

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

Data Presentation

The records of ground-water quality are published in a section titled GROUND-WATER QUALITY DATA immediately following the ground-water-level records. Data for quality of ground water are listed alphabetically by County, and are identified by station number. The prime identification number for wells sampled is the 15-digit station number derived from the latitude-longitude locations. No descriptive statements are given for ground-water-quality records; however, the station number, date and time of sampling, depth of well, 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.

Explanation of descriptive headings

MAP STATION NUMBER: Reference to illustrations found in "SUMMARY OF HYDROLOGIC CONDITIONS".

STATION NUMBER: 15-digit number based on grid system of latitude and longitude.

LOCAL WELL NUMBER: Refers to the Bureau of Land Management System of land subdivision.

DATE: Date of well construction.

LOCAL WELL NAME: Name used by community to identify well.

GEOLOGIC UNIT: Refers to the lithologic unit in which the well is completed. First two digits of the code refer to the principal unit which is providing the majority of water to the well.

11 = Quaternary	34 = Devonian
21 = Cretaceous	35 = Silurian
32 = Pennsylvanian	36 = Ordovician
33 = Mississippian	37 = Cambrian

Third digit and remaining alphabetic characters refer to the more specific lithologic unit which the well is tapping. The following examples are commonly used units:

<u>CODE</u>	<u>General</u>	<u>Specific</u>
112PLSC	Quaternary	(Pleistocene)
217DKDT	Cretaceous	(Dakota sandstone)
371JRDN	Cambrian	(Jordan sandstone)
325DSMS	Pennsylvanian	(Des Moinesian sandstone)
333STLS	Mississippian	(St. Louis limestone)
344CDVL	Devonian	(Cedar Valley limestone)
335HPKN	Silurian	(Hopkinton dolomite)
364STPR	Ordovician	(St. Peter sandstone)

ACCESS TO WATSTORE DATA

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

WATSTORE can provide a variety of useful products ranging from simple data tables to complex statistical analyses. A minimal fee, plus the actual computer cost incurred in producing a desired product, is charged to the requester. Information about the availability of specific types of data, the acquisition of data or products, and user charges can be obtained locally from the offices whose addresses are given on the back of the title page.

General inquiries about WATSTORE may be directed to:

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

DEFINITION OF TERMS

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

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

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

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

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

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

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

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

Bottom material: See Bed material.

Cubic-foot-per-second 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, about 646,000 gallons, or 2,445 cubic meters.

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

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

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

Cubic foot per second (ft^3/s) is the rate of discharge representing a volume of 1 cubic foot passing a given point during 1 second and is equivalent to 7.48 gallons per second or 448.8 gallons per minute or 0.02832 cubic meters per second.

Cubic 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.

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

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

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

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

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

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

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

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

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

Hardness of water is a physical-chemical characteristic that is commonly recognized by the increased quantity of soap required to produce lather. It is computed as the sum of equivalents of polyvalent cations and is expressed as the equivalent concentration of calcium carbonate (CaCO_3).

Hydrologic 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.

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

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

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

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

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

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

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

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).

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

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

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

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

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

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

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

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

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.

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

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

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

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

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

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

Solute is any substance that is dissolved in water.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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 U.S. Geological Survey reports dealing with surface-water supply is the 12-month period October 1 through September 30. The water year is designated by the calendar year in which it ends and which includes 9 of the 12 months. Thus, the year ending September 30, 1987, is called the "1987 water year."

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

Weighted average is used in this report to indicate discharge-weighted average. It is computed by multiplying the discharge for a sampling period by the concentrations of individual constituents for the corresponding period and dividing the sum of the products by the sum of the discharges. A discharge-weighted average approximates the composition of water that would be found in a reservoir containing all the water passing a given location during the water year after thorough mixing in the reservoir.

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

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

The reports listed below are for sale by the U.S. Geological Survey, Books and Open-File Reports Section, Federal Center, Box 25425, Denver, Colorado 80225 (authorized agent of the Superintendent of Documents, Government Printing Office). Prepayment is required. Remittance should be sent by check or money order payable to the U.S. Geological Survey. Prices are not included because they are subject to change. Current prices can be obtained by writing to the above address. When ordering or inquiring about prices for any of these publications, please give the title, book number, chapter number, and "U.S. Geological Survey Techniques of Water-Resources Investigations."

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

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

DISCONTINUED GAGING STATIONS

The following stream-gaging stations have been discontinued in Iowa. Continuous daily streamflow records were collected and published for the period of record shown for each station.

Discontinued gaging stations

Station name	Station number	Drainage area (sq mi)	Period of record
Upper Iowa River at Decorah, Iowa	05387500	511	1952-83
Upper Iowa River near Decorah, Iowa	05388000	568	1913-14; 1919-27
Paint Creek at Waterville, Iowa	05388500	42.8	1952-73
Yellow River at Ion, Iowa	05389000	221	1934-51
Mississippi River at Clayton, Iowa	05411500	9,200	1930-36
Turkey River at Elkader, Iowa	05412000	891	1932-42
Little Maquoketa River near Durango, Iowa	05414500	130	1934-82
Maquoketa River near Manchester, Iowa	05417000	305	1933-73
Maquoketa River near Delhi, Iowa	05417500	347	1933-40
Bear Creek near Monmouth, Iowa	05417700	61.3	1957-76
Maquoketa River above North Fork Maquoketa River near Maquoketa, Iowa	05418000	938	1913-14
Wapsipinicon River at Stone City, Iowa	05421500	1,324	1903-14
Crow Creek at Eldridge, Iowa	05422420	2.20	1977-82
Crow Creek at Mt. Joy, Iowa	05422450	6.90	1977-82
Pine Creek at Muscatine, Iowa	05448150	38.9	1975-82
Eagle Lake inlet near Britt, Iowa	05448285	3.83	1975-80
Eagle Lake outlet near Britt, Iowa	05448290	11.3	1975-80
West Branch (West Fork) Iowa River near Klemme, Iowa	05448500	112	1948-58
Iowa River near Iowa Falls, Iowa	05450000	665	1911-14
Upper Pine Lake at Eldora, Iowa	05450500	14.9	1936-70
Lower Pine Lake at Eldora, Iowa	05451000	15.9	1936-70
Iowa River near Belle Plaine, Iowa	05452500	2,455	1939-59
Lake Macbride near Solon, Iowa	05453500	27.0	1936-71
Cedar River at Mitchell, Iowa	05457500	826	1933-42
Shell Rock River near Northwood, Iowa	05459000	300	1945-86
Shell Rock River at Marble Rock (Greene), Iowa	05460500	1,318	1933-53
Shell Rock River at Greene, Iowa	05461000	1,357	1933-42
Shell Rock River near Clarksville, Iowa	05461500	1,626	1915-27; 1932-34
Fourmile Creek near Lincoln, Iowa	05464130	13.78	1962-67; 1969-74
Half Mile Creek near Gladbrook, Iowa	05464133	1.33	1962-67; 1969-74
Fourmile Creek near Traer, Iowa	05464137	19.51	1962-74; 1975-80
Prairie Creek at Fairfax, Iowa	05464640	178	1966-82
South Skunk River below Squaw Creek near Ames, Iowa	05471000	556	1952-79
Lake Keomah near Oskaloosa, Iowa	05472000	3.06	1936-71
Skunk River at Coppock, Iowa	05473000	2,916	1913-44
Big Creek near Mount Pleasant, Iowa	05473500	106	1955-79
East Fork Des Moines River near Burt, Iowa	05478000	462	1971-74
East Fork Des Moines River near Hardy, Iowa	05478500	1,268	1940-54
Des Moines River near Fort Dodge, Iowa	05479500	3,753	1911-13
Lizard Creek near Clare, Iowa	05480000	257	1940-82
Des Moines River near Boone, Iowa	05481500	5,511	1920-68
Des Moines River at Des Moines, Iowa	05482000	6,245	1905-06; 1915-61
Storm Lake at Storm Lake, Iowa	05482140	28.3	1970-75
Springbrook Lake near Guthrie Center, Iowa	05483500	5.18	1936-71
Raccoon River at Des Moines, Iowa	05485000	3,590	1902-03
Lake Ahquabi near Indianola, Iowa	05487000	4.93	1936-71
White Breast Creek near Knoxville, Iowa	05488000	380	1945-62
Muchakinock Creek near Eddyville, Iowa	05489190	70.2	1975-79
Lake Wapello near Drakesville, Iowa	05490000	7.75	1936-71
Sugar Creek near Keokuk, Iowa	05491000	105	1922-31; 1958-73
Fox River at Bloomfield, Iowa	05494300	87.7	1957-73
Fox River at Cantril, Iowa	05494500	161	1940-51
Rock River at Rock Rapids, Iowa	06483270	788	1959-74
Dry Creek at Hawarden, Iowa	06484000	48.4	1948-69
West Fork ditch at Holly Springs, Iowa	06602000	399	1939-69
Loon Creek near Orleans, Iowa	06603920	31	1971-74
Spirit Lake outlet at Orleans, Iowa	06604100	75.6	1971-74
Milford Creek at Milford, Iowa	06604400	146	1971-74
Little Sioux River at Spencer, Iowa	06605100	990	1936-42
Little Sioux River at Gillett Grove, Iowa	06605600	1,334	1958-73
Little Sioux River near Kennebeck, Iowa	06606700	2,738	1939-69
Odebolt Creek near Arthur, Iowa	06607000	39.3	1957-75
Maple River at Turin, Iowa	06607300	725	1939-41
Little Sioux River near Blencoe (Turin), Iowa	06607510	4,470	1939-42
Steer Creek near Magnolia, Iowa	06609200	9.26	1963-69
Thompson Creek near Woodbine, Iowa	06609590	6.97	1963-69
Willow Creek near Logan, Iowa	06609600	129	1972-75
Indian Creek at Council Bluffs, Iowa	06610500	7.99	1954-76
Mosquito Creek near Earling, Iowa	06610520	33.0 (revised)	1965-79
Waubonsie Creek near Bartlett, Iowa	06806000	30.4	1946-69
West Nishnabotna River at Harlan, Iowa	06807320	316	1977-82
West Nishnabotna River at (near) White Cloud, Iowa	06807500	967	1918-24
Mule Creek near Malvern, Iowa	06808000	10.6	1954-69
Spring Valley Creek near Tabor, Iowa	06808200	7.6	1955-64
Dauids Creek near Hamlin, Iowa	06809000	26.0	1952-73
West Nodaway River at Villisca, Iowa	06816500	342	1918-25
Honey Creek near Russell, Iowa	06903500	13.2	1952-62
Chariton River near Centerville, Iowa	06904000	708	1938-59

DISCONTINUED WATER-QUALITY STATIONS

The following water-quality stations have been discontinued in Iowa. Continuous daily records of water temperature or sediment and monthly or periodic samples of chemical quality were collected and published for the period of record shown for each station. An asterisk (*) in the type of record column indicates that periodic data is available for that parameter subsequent to the period of daily record.

Discontinued water-quality stations

Station name	Station number	Drainage area (sq mi)	Type of Record	Period of record
Upper Iowa River at Decorah, Iowa	05387500	511	Sed., Temp.	1963-1983
Upper Iowa River near Dorchester, Iowa	05388250	770	Sed., Temp.	1975-81
Paint Creek at Waterville, Iowa	05388500	42.8	Temp.	1952-56
			Sed.	1952-57
Turkey River at Garber, Iowa	05412500	1,545	Temp., Sed.*	1957-62
Mississippi River at Dubuque, Iowa	05414700	1,600	Chem.	1969-73
Maquoketa River near Maquoketa, Iowa	05418500	1,553	Chem., Temp., Sed.	1978-82
Wapsipinicon River at Independence, Iowa	05421000	1,048	Chem.*	1968-70
			Temp.*, Sed.*	1967-70
Crow Creek at Bettendorf, Iowa	05422470	17.8	Chem., Temp., Sed.	1978-82
Iowa River near Rowan, Iowa	05449500	429	Temp.*, Sed.*	1957-62
Cedar River near Gilbertville, Iowa	05464020	5,234	Chem.	1971; 1975-81
Fourmile Creek near Lincoln, Iowa	05464130	13.78	Chem., Temp., Sed.	1969-74
Half Mile Creek near Gladbrook, Iowa	05464133	1.33	Chem., Temp., Sed.	1969-74
Fourmile Creek near Traer, Iowa	05464137	19.51	Chem., Temp., Sed.	1969-74
Cedar River near Palo, Iowa	05464450	6,380	Chem.	1975-79
Cedar River at Cedar Rapids, Iowa	05464500	6,640	Chem.*	1906-07; 1944-54
			Temp.*	1944-54
			Sed.	1943-54
Cedar River near Bertram, Iowa	05464760	6,955	Chem.	1975-81
Mississippi River at Burlington, Iowa	05469720	4,000	Chem.	1969-73
Des Moines River at Fort Dodge, Iowa	05480500	4,190	Chem.	1972-73
Des Moines River at Des Moines, Iowa	05482000	6,245	Chem.	1954-55
			Temp., Sed.	1954-61
E. Fork Hardin Creek near Churдан, Iowa	05483000	24.0	Temp.*, Sed.*	1952-57
M. Fork Raccoon River near Bayard, Iowa	05483450		Chem., Temp., Sed.	1979-85
M. Fork Raccoon River at Panora, Iowa	05483600		Chem., Temp., Sed.	1979-85
Raccoon River at Des Moines, Iowa	05485000	3,590	Chem., Temp.	1945-47
Des Moines River below Raccoon River at Des Moines, Iowa	05485500	9,770	Chem.*	1944-45
			Temp.*, Sed.	1944-47
Des Moines River below Des Moines, Iowa	05485520	9,901	Chem.	1971; 1975-81
Middle River near Indianola, Iowa	05486490	503	Temp.*, Sed.	1962-67
White Breast Creek near Dallas, Iowa	05487980	342	Chem.	1968-73
			Temp., Sed.	1967-73
Big Sioux River at Sioux City, Iowa	06485950	9,410	Chem.	1969-73
Floyd River at James, Iowa	06600500	882	Temp., Sed.	1968-73
Floyd River at Sioux City, Iowa	06600520	921	Chem.	1969-73
Missouri River at Decatur, Nebr.	06601200	316,160	Chem.	1974-81
Little Sioux River at Correctionville, Iowa	06606600	2,500	Chem.*	1954-55
			Temp.*	1951-62
			Sed.	1950-62
Little Sioux River near Kennebec, Iowa	06606700	2,738	Temp.	1950-55
			Sed.	1950-57
Little Sioux River at River Sioux, Iowa	06607513	3,600	Chem.	1969-73
Soldier River near Mondamin, Iowa	06608505	440	Chem.	1970-73
Steer Creek near Magnolia, Iowa	06609200	9.26	Temp., Sed.	1963-69
Thompson Creek near Woodbine, Iowa	06609590	6.97	Temp., Sed.	1963-69
Willow Creek near Logan, Iowa	06609600	129	Chem., Temp.	1972-75
			Sed.	1971-75
Mule Creek near Malvern, Iowa	06808000	10.6	Temp.	1958-69
			Sed.	1954-69
Davids Creek near Hamlin, Iowa	06809000	26.0	Temp.*	1952-53; 1965-68
East Nishnabotna River at Red Oak, Iowa	06809500	894	Temp., Sed.	1962-73
Platte River near Diagonal, Iowa	06818750	217	Chem.	1969-73
Thompson River at Davis City, Iowa	06898000	701	Chem.	1967-73
			Temp., Sed.	1968-73
Weldon River near Leon, Iowa	06898400	104	Chem.	1968-73
Chariton River near Chariton, Iowa	06903400	182	Temp., Sed.	1969-73
Honey Creek near Russell, Iowa	06903500	13.2	Sed.	1952-62
Chariton River near Rathbun, Iowa	06903900	551	Temp.*, Sed.*	1962-69

Type of record: Chem. (chemical quality); Temp. (water temperature); Sed. (sediment).

UPPER IOWA RIVER BASIN

05388250 UPPER IOWA RIVER NEAR DORCHESTER, IA

LOCATION.--Lat 43°25'16", long 91°30'31", in SW1/4 NW1/4 sec.1, T.99 N., R.6 W., Allamakee County, Hydrologic Unit 07060002, on right bank at upstream side of bridge on State Highway 76, 650 ft upstream from Mineral Creek, 0.5 mi upstream from Bear Creek, 3.5 mi south of Dorchester, and 18.1 mi upstream from mouth.

DRAINAGE AREA.--770 mi².

PERIOD OF RECORD.--September 1936 to June 1975 (gage heights and discharge measurements only), July 1975 to current year.

GAGE.--Water-stage recorder. Datum of gage is 660.00 ft above NGVD. Prior to Jan. 6, 1938, nonrecording gage on old bridge at site 0.2 mi upstream at datum 5.91 ft higher. Jan. 6, 1938, to Apr. 26, 1948, nonrecording gage at datum 60.00 ft lower, Apr. 27, 1948 to August 1963, nonrecording gage on old bridge and August 1963 to June 1975 nonrecording gage on new bridge at same datum.

REMARKS.--Estimated daily discharges: Nov. 14-20, Dec. 7-10, Dec. 12 to Feb 25, and Apr. 30 to May 6. Records good except those for estimated daily discharges, which are poor. U.S. Geological Survey gage-height telemeter at station.

AVERAGE DISCHARGE.--12 years, 603 ft³/s, 10.64 in/yr, 436,900 acre-ft/yr; median of yearly mean discharges, 540 ft³/s, 9.5 in/yr, 391,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14,000 ft³/s Mar. 12, 1976, gage height, 17.67 ft; minimum daily discharge, 79 ft³/s Dec. 31, 1976.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 30, 1941, reached a stage of 21.8 ft, from flood profile, discharge, 30,400 ft³/s on basis of slope-area determination of peak flow.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 14	0700	*7,020	*14.10	No other peak greater than base discharge.			

Minimum daily discharge, 160 ft³/s Jan. 19-23.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2970	884	509	240	330	454	621	690	392	362	277	253
2	2190	894	521	235	350	444	610	660	401	363	266	244
3	2130	851	526	230	340	409	599	630	375	369	254	238
4	2720	821	510	225	330	391	605	600	357	360	265	236
5	3220	790	492	220	320	488	602	580	352	355	287	241
6	2530	762	486	215	310	903	599	560	346	330	276	229
7	2070	741	470	210	320	1120	596	530	335	296	267	219
8	1820	751	450	205	345	1120	602	518	333	301	291	242
9	1630	727	420	200	350	978	575	498	327	357	305	263
10	1540	693	370	195	340	817	547	480	326	301	283	249
11	1460	665	346	190	330	721	529	482	333	274	268	243
12	3880	649	338	185	320	650	520	465	327	316	278	238
13	5700	571	320	180	310	607	503	449	316	334	269	247
14	5110	560	450	200	300	587	524	457	315	300	329	248
15	2690	640	500	190	290	573	563	444	318	320	365	236
16	2230	620	450	180	280	580	555	425	303	309	342	244
17	1960	600	420	170	280	573	533	412	295	271	447	242
18	1770	585	400	165	280	557	510	395	398	258	374	236
19	1620	580	380	160	290	575	502	416	335	348	340	223
20	1520	575	360	160	300	574	492	432	332	342	313	230
21	1440	570	350	160	310	566	529	421	762	298	307	227
22	1360	569	340	160	320	566	713	397	740	269	311	221
23	1300	566	330	160	330	560	896	385	551	257	290	224
24	1240	548	320	165	340	564	895	378	478	497	282	222
25	1180	536	310	170	350	591	870	380	442	569	287	219
26	1140	534	300	180	384	636	858	428	437	380	282	215
27	1100	526	290	200	400	704	815	422	404	360	275	213
28	1050	520	280	220	413	740	763	428	389	318	290	206
29	993	516	270	240	---	685	740	421	402	298	285	206
30	945	510	260	270	---	659	710	402	388	305	270	202
31	892	---	250	300	---	630	---	392	---	288	260	---
TOTAL	63400	19354	12018	6180	9162	20022	18976	14577	11809	10305	9235	6956
MEAN	2045	645	388	199	327	646	633	470	394	332	298	232
MAX	5700	894	526	300	413	1120	896	690	762	569	447	263
MIN	892	510	250	160	280	391	492	378	295	257	254	202
AC-FT	125800	38390	23840	12260	18170	39710	37640	28910	23420	20440	18320	13800
CFSM	2.66	.84	.50	.26	.42	.84	.82	.61	.51	.43	.39	.30
IN.	3.06	.94	.58	.30	.44	.97	.92	.70	.57	.50	.45	.34
CAL YR 1986	TOTAL 306262	MEAN 839	MAX 8130	MIN 250	AC-FT 607500	CFSM 1.09	IN. 14.8					
WTR YR 1987	TOTAL 201994	MEAN 553	MAX 5700	MIN 160	AC-FT 400700	CFSM .72	IN. 9.76					

MISSISSIPPI RIVER MAIN STEM

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05389500 MISSISSIPPI RIVER AT MCGREGOR, IA

LOCATION.--Lat 43°01'29", long 91°10'21", in SE1/4 SE1/4 sec.22, T.9S N., R.3 W., Clayton County, Hydrologic Unit 07060001, on right bank in city park at east end of Main Street in McGregor, 2.6 mi upstream from Wisconsin River, 4.3 mi downstream from Yellow River, and at mile 633.4 upstream from Ohio River.

DRAINAGE AREA.--67,500 mi², approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1936 to current year.

REVISED RECORDS.--WDR IA-75-1: 1974.

GAGE.--Water-stage recorder. Datum of gage is 604.84 ft above NGVD. Prior to June 1, 1937, and since June 2, 1939, auxiliary water-stage recorder; June 1, 1937 to June 1, 1939, auxiliary nonrecording gage 14.1 mi upstream in tailwater of dam 9, at datum 5.30 ft lower.

REMARKS.--Estimated daily discharges: Jan. 17-29. Records good except those for estimated daily discharges, which are fair. Stage-discharge relation affected by backwater from Wisconsin River and Lock and Dam No. 10. Minor flow regulation caused by navigation dams. U.S. Army Corps of Engineers data collection platform at station.

COOPERATION.--Auxiliary gage-height and discharge data for Lock and Dam No. 9 furnished by U.S. Army Corps of Engineers.

AVERAGE DISCHARGE.--51 years, 35,730 ft³/s, 7.19 in/yr, 25,890,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 276,000 ft³/s Apr. 24, 1965; maximum gage height, 25.38 ft Apr. 24, 1965; minimum daily discharge, 6,200 ft³/s Dec. 9, 1936; minimum gage height, -0.86 ft Aug. 18, 1936.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1828, that of Apr. 24, 1965.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 158,000 ft³/s Oct. 1; maximum gage height, 20.22 ft Oct. 4; minimum daily discharge, 10,100 ft³/s Sept. 4; minimum gage height, 5.84 ft Sept. 4.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	158000	64300	40700	38000	34000	32000	47200	28000	36200	21400	51400	26100
2	156000	61600	41200	37700	36000	33300	46700	26200	36700	21200	51200	23800
3	154000	60700	41800	37000	37300	33600	45900	25300	36900	19800	48700	13600
4	152000	57200	42000	36600	37800	31200	45000	24500	36700	19000	41100	10100
5	151000	54600	40500	36400	37800	27900	45300	24700	36200	17700	34100	10800
6	149000	53700	39900	35800	37700	28500	44000	26800	35800	16300	27500	13900
7	146000	52300	39900	34900	37600	27000	41600	29800	35900	15800	23100	18600
8	140000	51000	40100	34000	37100	28100	40500	30200	35500	18200	21900	22300
9	132000	51100	39700	33000	36100	29600	39800	29800	35000	19900	22600	21900
10	126000	51300	36700	31100	35400	34800	37900	27100	32800	24400	24900	19900
11	119000	51800	35800	32100	34600	39500	36700	24600	29000	23900	26100	17100
12	116000	51800	34100	32200	33100	42100	36400	21600	26400	24100	26200	15700
13	112000	50300	33600	32100	32000	43600	35200	18100	25700	25100	26900	15100
14	111000	47400	32600	30600	30600	44600	35000	16200	26700	24800	28000	15600
15	110000	45100	31800	30400	30700	44700	35200	18300	26200	22400	27200	17100
16	109000	49800	33200	31900	31400	42500	36600	21700	24000	19700	27300	18100
17	111000	51100	38300	31000	31200	36600	37000	24200	20500	17400	28000	18400
18	112000	49500	45000	31000	30100	32900	37100	25300	15800	17200	26200	20100
19	112000	45300	48600	31000	29300	32700	37100	24900	15800	17100	24800	20800
20	111000	38000	50600	30000	28100	33400	36900	21100	17400	22600	24200	21500
21	109000	36600	50800	29000	27200	34300	36400	18900	21700	25800	24600	23000
22	105000	32500	50600	29000	26500	34800	37000	20000	23500	28300	23300	23800
23	101000	38300	49200	28000	26300	34800	36800	23200	21700	28500	22700	23900
24	96000	43300	48200	27000	26000	34300	35400	25800	18000	29900	20200	23500
25	91600	43200	47700	26000	25700	34800	33800	27700	18900	31000	16600	23100
26	88400	43600	46600	26000	27600	36400	33600	30700	20200	32300	14300	22200
27	84600	43000	45400	25000	28600	37600	34200	32800	21300	36200	14100	21700
28	80800	42000	44400	25000	29700	39700	34300	33400	21400	41500	17100	20400
29	75700	40900	42900	26000	---	43700	32500	35200	21900	44600	21400	19600
30	69400	40400	41700	28200	---	47100	31100	36200	22100	47400	24200	19000
31	64400	---	39500	31200	---	47500	---	36500	---	50000	26400	---
TOTAL	3552900	1441700	1293100	967200	895500	1121600	1142200	808800	795900	803500	836300	580700
MEAN	114600	48060	41710	31200	31980	36180	38070	26090	26530	25920	26980	19360
MAX	158000	64300	50800	38000	37800	47500	47200	36500	36900	50000	51400	26100
MIN	64400	32500	31800	25000	25700	26500	31100	16200	15800	15800	14100	10100
AC-FT	7047000	2860000	2565000	1918000	1776000	2225000	2266000	1604000	1579000	1594000	1659000	1152000
CFSM	1.70	.71	.62	.46	.47	.54	.56	.39	.39	.38	.40	.29
IN.	1.96	.79	.71	.53	.49	.62	.63	.45	.44	.44	.46	.32
CAL YR 1986	TOTAL 24517300	MEAN 67170	MAX 168000	MIN 21000	AC-FT 48630000	CFSM .99	IN. 13.5					
WTR YR 1987	TOTAL 14239400	MEAN 39010	MAX 158000	MIN 10100	AC-FT 28240000	CFSM .58	IN. 7.85					

WATER-QUALITY RECORDS

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

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: July 1975 to current year.

WATER TEMPERATURES: July 1975 to current year.

SUSPENDED-SEDIMENT DISCHARGE: July 1975 to current year.

REMARKS.--Records of specific conductance are obtained from suspended-sediment samples at time of analysis.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SEDIMENT CONCENTRATIONS: Maximum daily mean, 2350 mg/L Mar. 19, 1986; minimum daily mean, 1 mg/L Dec. 23-25, 1976; Dec. 20, 28, 1977; Feb. 13-17, 23, Mar. 5-9, 1986.

SEDIMENT LOADS: Maximum daily, 363,000 tons Mar. 19, 1986; minimum daily, 31 tons Dec. 25, 1976.

EXTREMES FOR CURRENT YEAR.--

SEDIMENT CONCENTRATIONS: Maximum daily mean, 193 mg/L May 27; minimum daily mean, 2 mg/L Dec. 19-21.

SEDIMENT LOADS: Maximum daily, 21,200 tons Oct 3; minimum daily, 218 tons Sept. 4.

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

[illegible]

MISSISSIPPI RIVER MAIN STEM

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05389500 MISSISSIPPI RIVER AT MCGREGOR, IA--Continued

WATER-QUALITY RECORDS

TEMPERATURE, WATER, DEGREES CENTIGRADE, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	19.0	---	---	---	---	---	---	---	---	---	---	18.0
2	18.0	---	1.0	2.0	.0	4.0	---	---	28.0	---	---	---
3	16.0	---	---	---	---	---	8.0	---	---	28.0	28.0	---
4	16.0	---	---	---	---	---	---	14.0	---	---	---	---
5	16.0	8.0	1.0	1.0	.0	5.0	---	---	28.0	---	---	18.0
6	16.0	8.0	---	---	---	---	11.0	---	---	26.0	28.0	---
7	---	---	---	---	---	---	---	---	---	---	---	---
8	16.0	---	---	---	---	---	---	14.0	25.0	---	---	20.0
9	16.0	---	.0	1.0	.0	6.0	---	---	---	26.0	---	---
10	---	6.0	---	---	---	---	14.0	28.0	---	---	26.0	---
11	---	---	---	---	---	---	---	21.0	---	---	---	16.0
12	---	---	---	1.0	---	---	---	---	---	---	---	---
13	---	.0	.0	---	1.0	6.0	14.0	---	---	---	---	17.0
14	10.0	---	---	---	---	---	---	14.0	27.0	25.0	26.0	---
15	---	---	---	1.0	---	---	13.0	13.0	---	---	---	16.0
16	10.0	---	.0	---	1.0	5.0	11.0	---	---	---	---	---
17	---	.0	---	---	---	---	---	---	28.0	26.0	27.0	---
18	---	---	---	---	---	---	---	18.0	---	---	---	---
19	---	---	.0	.0	---	5.0	15.0	---	---	---	26.0	---
20	10.0	.0	---	---	1.0	---	---	18.0	---	28.0	---	---
21	---	---	---	---	---	---	11.0	---	---	---	---	16.0
22	---	---	.0	.0	---	---	---	---	26.0	28.0	26.0	---
23	14.0	---	---	---	4.0	8.0	---	---	---	---	---	---
24	---	.0	---	---	---	---	11.0	---	---	---	---	---
25	---	---	---	---	---	---	---	18.0	28.0	---	25.0	16.0
26	---	---	.0	.0	---	---	---	---	---	---	---	---
27	---	.0	---	---	---	8.0	12.0	---	---	28.0	---	---
28	10.0	---	---	---	4.0	---	---	---	---	---	---	18.0
29	---	---	2.0	---	---	---	15.0	19.0	---	---	---	---
30	10.0	---	---	.0	---	8.0	---	---	29.0	28.0	---	16.0
31	---	---	---	---	---	---	---	---	---	---	---	---

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

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	33	14100	34	5900	16	1760	30	3080	26	2390	20	1730
2	33	13900	33	5490	17	1890	35	3560	12	1170	24	2160
3	51	21200	32	5240	17	1920	45	4500	11	1110	40	3630
4	15	6160	28	4320	17	1930	56	5530	11	1120	40	3370
5	26	10600	28	4130	17	1860	77	7570	12	1220	28	2110
6	18	7240	28	4060	19	2050	84	8120	13	1320	23	1650
7	18	7100	28	3950	21	2260	67	6310	13	1320	23	1680
8	19	7180	51	7020	23	2490	38	3490	11	1100	33	2500
9	28	9980	77	10600	25	2680	19	1690	8	780	82	6550
10	30	10200	79	10900	20	1980	14	1180	7	669	114	10700
11	28	9000	70	9790	48	4640	9	780	5	467	102	10900
12	27	8460	58	8110	67	6170	13	1130	12	1070	66	7500
13	25	7560	47	6380	28	2540	34	2950	11	950	35	4120
14	24	7190	38	4860	18	1580	27	2230	10	826	26	3130
15	30	8910	29	3530	11	944	21	1720	10	829	23	2780
16	36	10600	21	2820	5	448	17	1460	10	848	21	2410
17	32	9590	13	1790	5	517	14	1170	9	758	19	1880
18	28	8470	10	1340	4	486	10	837	7	569	19	1690
19	24	7260	10	1220	2	262	8	670	10	791	33	2910
20	20	5990	23	2360	2	273	8	648	12	910	42	3790
21	20	5890	46	4550	2	274	8	626	16	1180	42	3890
22	19	5390	50	4390	3	410	8	626	14	1000	45	4230
23	18	4910	33	3410	4	531	30	2270	36	2560	50	4700
24	20	5180	22	2570	4	521	29	2110	37	2600	51	4720
25	24	5940	19	2220	5	644	22	1540	22	1530	44	4130
26	27	6440	16	1880	7	881	12	842	25	1860	33	3240
27	30	6850	13	1510	9	1100	18	1220	38	2930	25	2540
28	33	7200	13	1470	11	1320	13	877	23	1840	47	5040
29	38	7770	14	1550	15	1740	9	632	---	---	98	11600
30	38	7120	15	1640	20	2250	12	914	---	---	148	18800
31	36	6260	---	---	25	2670	27	2270	---	---	146	18700
TOTAL	---	259640	---	129000	---	51021	---	72552	---	35717	---	158780

MISSISSIPPI RIVER MAIN STEM

05389500 MISSISSIPPI RIVER AT MCGREGOR, IA--Continued

WATER-QUALITY RECORDS

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

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)
APRIL			MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	96	12200	22	1660	50	4890	31	1790	23	3190	14	987
2	47	5930	21	1490	41	4060	30	1720	22	3040	12	771
3	23	2850	19	1300	40	3990	35	1870	22	2890	9	330
4	19	2310	17	1120	38	3770	47	2410	22	2440	8	218
5	24	2940	13	867	37	3620	43	2050	22	2030	16	467
6	33	3920	11	796	37	3580	29	1280	21	1560	28	1050
7	42	4720	12	966	39	3780	25	1070	19	1190	15	753
8	46	5030	21	1710	39	3740	22	1080	18	1060	23	1380
9	38	4080	41	3300	38	3590	28	1500	15	915	39	2310
10	25	2560	44	3220	36	3190	43	2830	26	1750	25	1340
11	23	2280	34	2260	35	2740	49	3160	42	2960	14	646
12	25	2460	29	1690	33	2350	69	4490	35	2480	14	593
13	30	2650	33	1610	32	2220	48	3250	21	1530	29	1180
14	38	3590	51	2230	64	4610	42	2610	27	2040	23	969
15	45	4280	39	1930	98	6930	63	3810	26	1910	12	554
16	70	6920	44	2580	69	4470	58	3090	29	2140	11	538
17	78	7790	23	1500	34	1880	34	1600	43	3250	27	1340
18	54	5410	38	2600	24	1020	20	929	36	2550	24	1300
19	40	4010	82	5510	28	1190	24	1110	91	6090	13	730
20	43	4280	64	3650	54	2540	34	2070	88	5750	13	755
21	57	5600	71	3620	87	5100	43	3000	63	5510	24	1490
22	67	6690	71	3830	62	3930	40	3060	57	3590	36	2310
23	74	7350	126	7890	40	2340	35	2690	37	2270	48	3100
24	79	7550	185	12900	37	1800	38	3070	24	1310	55	3490
25	68	6210	142	10600	34	1740	56	4690	18	807	52	3240
26	41	3720	159	13200	62	3380	52	4530	15	579	38	2280
27	25	2310	193	17100	104	5980	28	2740	12	457	23	1350
28	23	2130	178	16100	107	6180	40	4480	13	600	20	1100
29	23	2020	145	13800	79	4670	37	4460	39	2250	18	953
30	23	1930	108	10600	42	2510	28	3580	58	3790	15	769
31	---	---	74	7290	---	---	23	3110	25	1760	---	---
TOTAL	---	135920	---	158919	---	105790	---	83329	---	73708	---	38293

TOTAL LOAD FOR YEAR: 1302669 TONS.

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	TEMPER- ATURE WATER (DEG C) (00010)	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	SEDI- MENT, SUS- PENDED (MG/L) (80154)	SEDI- MENT, DIS- CHARGE, SUS- PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN (70331)
OCT						
29...	1400	--	71300	37	7120	99
APR						
15...	1430	13.0	34800	37	3480	96
AUG						
20...	1324	26.0	26100	33	2330	91

PARTICLE-SIZE DISTRIBUTION OF SURFACE BED MATERIAL, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	NUMBER OF SAM- PLING POINTS (00063)	BED MAT. FALL DIAM. % FINER THAN (80157)	BED MAT. SIEVE DIAM. % FINER THAN (80164)	BED MAT. SIEVE DIAM. % FINER THAN (80165)	BED MAT. SIEVE DIAM. % FINER THAN (80166)	BED MAT. SIEVE DIAM. % FINER THAN (80167)	BED MAT. SIEVE DIAM. % FINER THAN (80168)	BED MAT. SIEVE DIAM. % FINER THAN (80169)	BED MAT. SIEVE DIAM. % FINER THAN (80170)
APR											
15...	1440	34800	6	5	12	18	49	82	96	99	100

TURKEY RIVER BASIN

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05411600 TURKEY RIVER AT SPILLVILLE, IA

LOCATION.--Lat 43°12'28", long 91°56'56", in SW1/4 NE1/4 sec.19, T.97 N., R.9 W., Winneshiek County, Hydrologic Unit 07060004, on right bank 60 ft downstream from bridge on county highway W14 at north edge of Spillville, 150 ft downstream from old mill dam, 0.6 mi upstream from Wonder Creek and at mile 98.5.

DRAINAGE AREA.--177 mi².

PERIOD OF RECORD.--June 1956 to September 1973, October 1977 to current year. Monthly discharge only for some periods, published in WSP 1728.

REVISED RECORDS.--WDR IA-75-1: 1974.

GAGE.--Water-stage recorder. Datum of gage is 1,034.92 ft above NGVD.

REMARKS.--Estimated daily discharges: Dec. 6 to Mar. 2. Records good except those for estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--27 years, 128 ft³/s, 9.82 in/yr, 92,740 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,600 ft³/s July 12, 1972, gage height, 16.73 ft; minimum daily discharge, 4.4 ft³/s Feb. 1-3, 1959.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1947 reached a stage of 18.4 ft, from floodmark, discharge, about 10,000 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,200 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 5	0630	1,700	6.90	Oct. 12	----	*5,200	unknown

Minimum discharge, 21 ft³/s Sept. 27-30.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	755	212	129	66	90	96	162	123	94	44	32	41
2	538	234	135	66	88	98	166	122	89	42	30	40
3	627	219	134	66	84	102	165	117	82	42	33	40
4	1080	204	127	66	80	106	155	110	77	41	39	41
5	1330	191	121	66	78	180	153	103	73	40	37	40
6	628	187	115	65	78	320	154	99	70	40	34	38
7	466	183	110	65	82	320	149	96	66	40	33	38
8	393	196	105	64	86	298	139	93	63	40	40	37
9	334	184	100	63	90	237	130	89	60	44	42	35
10	295	172	95	61	88	183	123	86	59	40	40	35
11	417	167	90	59	84	163	117	87	60	39	37	34
12	3770	161	84	58	82	149	114	83	61	58	35	33
13	2030	148	78	58	78	141	108	79	58	49	44	35
14	850	157	110	56	76	141	113	78	54	44	59	32
15	632	158	120	54	74	139	123	76	51	41	58	32
16	530	156	110	50	72	134	124	72	49	39	56	32
17	462	151	105	46	71	140	119	70	51	37	54	32
18	410	150	98	49	70	136	113	73	55	36	45	32
19	368	149	94	52	70	141	107	82	55	41	42	32
20	340	150	90	46	70	143	103	78	58	40	40	34
21	319	142	88	80	72	138	113	74	63	38	55	31
22	301	137	84	74	74	133	184	71	55	37	52	30
23	290	137	82	70	78	129	218	67	51	35	52	28
24	278	135	78	66	80	132	215	65	49	48	48	25
25	264	135	76	64	84	152	192	73	51	44	46	25
26	253	132	72	62	88	225	175	77	49	39	47	25
27	241	133	68	66	90	222	160	81	47	36	46	24
28	229	133	66	74	92	191	147	87	46	35	46	23
29	216	131	66	82	---	178	141	95	46	35	47	23
30	204	128	66	88	---	153	131	98	45	35	42	22
31	199	---	66	90	---	165	---	98	---	33	42	---
TOTAL	19049	4872	2962	1992	2249	5185	4313	2702	1787	1252	1353	969
MEAN	614	162	95.5	64.3	80.3	167	144	87.2	59.6	40.4	43.6	32.3
MAX	3770	234	135	90	92	320	218	123	94	58	59	41
MIN	199	128	66	46	70	96	103	65	45	33	30	22
AC-FT	37780	9660	5880	3950	4460	10280	8550	5360	3540	2480	2680	1920
CFSM	3.47	.92	.54	.36	.45	.94	.81	.49	.34	.23	.25	.18
IN.	4.00	1.02	.62	.42	.47	1.09	.91	.57	.38	.26	.28	.20

CAL YR 1986	TOTAL 76874	MEAN 211	MAX 3770	MIN 45	AC-FT 152500	CFSM 1.19	IN. 16.2
WTR YR 1987	TOTAL 48685	MEAN 133	MAX 3770	MIN 22	AC-FT 96570	CFSM .75	IN. 10.2

TURKEY RIVER BASIN

05412060 SILVER CREEK NEAR LUANA, IA

LOCATION.--Lat 43°01'19", long 91°29'21", in NE1/4 SEC.25, T.95 N., R.6 W., Clayton County, Hydrologic Unit 07060004, on right upstream bank of bridge on county road W70, 2.3 miles south of Highway 52 and 18, and 3.2 miles south of Luana.

DRAINAGE AREA.--4.39 mi².

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

GAGE.--Water-stage recorder.

REMARKS.--Estimated daily discharges: May 27 to June 25 and July 21-22. Records good except those for estimated daily discharges, which are poor.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 137 ft³/s Sept. 21, 1986, gage height, 6.82 ft; minimum daily discharge, 0.56 ft³/s Aug. 22-25 and Sept. 8-9, 1986.

EXTREMES FOR CURRENT YEAR.--Maximum discharge during period May 13 to Sept. 30, 137 ft³/s, Sept. 21, gage height, 6.82 ft; No other peak greater than base discharge of 50 ft³/s; minimum daily discharge, 0.56 ft³/s, Aug. 22-25 and Sept. 8-9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	---	1.9	1.1	.69	.60
2	---	---	---	---	---	---	---	---	1.7	1.1	.69	.60
3	---	---	---	---	---	---	---	---	1.6	.98	.69	.60
4	---	---	---	---	---	---	---	---	1.6	.98	.69	.60
5	---	---	---	---	---	---	---	---	1.6	.97	.69	.60
6	---	---	---	---	---	---	---	---	1.6	.96	.69	.60
7	---	---	---	---	---	---	---	---	1.5	.91	.69	.60
8	---	---	---	---	---	---	---	---	1.4	.88	.64	.56
9	---	---	---	---	---	---	---	---	1.3	.83	.64	.56
10	---	---	---	---	---	---	---	---	1.3	1.1	.64	.69
11	---	---	---	---	---	---	---	---	1.6	.89	.64	.88
12	---	---	---	---	---	---	---	---	1.7	.88	.64	.74
13	---	---	---	---	---	---	---	---	1.2	1.5	.80	.74
14	---	---	---	---	---	---	---	2.0	1.4	.80	1.7	.74
15	---	---	---	---	---	---	---	2.7	1.3	.80	.72	.74
16	---	---	---	---	---	---	---	5.0	1.4	.80	.64	.74
17	---	---	---	---	---	---	---	4.6	1.6	.80	.64	.74
18	---	---	---	---	---	---	---	4.4	1.4	.80	.64	.74
19	---	---	---	---	---	---	---	3.9	1.3	.76	.60	.78
20	---	---	---	---	---	---	---	3.8	1.3	.75	.60	.95
21	---	---	---	---	---	---	---	3.4	1.3	.74	.60	21
22	---	---	---	---	---	---	---	3.2	1.5	.74	.56	2.4
23	---	---	---	---	---	---	---	3.0	2.0	.74	.56	1.3
24	---	---	---	---	---	---	---	2.6	1.5	.78	.56	3.5
25	---	---	---	---	---	---	---	2.4	1.2	2.0	.56	4.8
26	---	---	---	---	---	---	---	2.0	1.2	.79	.64	2.4
27	---	---	---	---	---	---	---	2.2	1.2	.79	.64	1.5
28	---	---	---	---	---	---	---	2.1	1.2	.87	.60	1.1
29	---	---	---	---	---	---	---	3.0	1.1	.72	.60	1.3
30	---	---	---	---	---	---	---	2.5	1.1	.69	.60	1.2
31	---	---	---	---	---	---	---	2.1	---	.69	.64	---
TOTAL	---	---	---	---	---	---	---	---	43.3	27.44	20.77	54.30
MEAN	---	---	---	---	---	---	---	---	1.44	.89	.67	1.81
MAX	---	---	---	---	---	---	---	---	2.0	2.0	1.7	21
MIN	---	---	---	---	---	---	---	---	1.1	.69	.56	.56
AC-FT	---	---	---	---	---	---	---	---	.86	.54	.41	108
CFSM	---	---	---	---	---	---	---	---	.33	.20	.15	.41
IN.	---	---	---	---	---	---	---	---	.37	.23	.18	.46

TURKEY RIVER BASIN

63

05412060 SILVER CREEK NEAR LUANA, IA

LOCATION.--Lat 43°01'19", long 91°29'21", in NE1/4 SEC.25, T.95 N., R.6 W., Clayton County, Hydrologic Unit 07060004, on right upstream bank of bridge on county road W70, 2.3 miles south of Highway 52 and 18, and 3.2 miles south of Luana.

DRAINAGE AREA.--4.39 mi².

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

GAGE.--Water-stage recorder.

REMARKS.--Estimated daily discharges: Oct. 16-26, 28-30, Nov. 3-6, Nov. 28 to Dec. 2, Dec. 5-9, Jan. 16-27, May 7-13, 16 and Aug. 3 to Sept. 30. Records good except those for estimated daily discharges, which are poor.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 137 ft³/s Sept. 21, 1986, gage height, 6.82 ft; minimum daily discharge, 0.35 ft³/s Aug. 6, 1986.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 50 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Aug. 13	----	unknown	unknown	Sept. 17	----	unknown	unknown

Minimum daily discharge, 0.35 ft³/s Aug. 6.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.80	.97	1.1	.88	.80	3.7	1.3	3.9	1.4	.96	.43	1.1
2	.87	.97	1.1	.81	.86	3.7	1.3	3.9	1.3	.80	.43	1.1
3	.87	1.1	1.2	.80	.92	5.1	1.3	3.1	1.5	.81	.40	1.0
4	1.8	1.2	.78	.80	.88	5.0	1.3	2.1	1.3	.75	.40	.90
5	1.5	1.2	.74	.80	.88	5.0	1.3	2.6	1.3	.79	.40	.90
6	1.3	1.2	.74	.86	.92	4.9	1.3	2.4	1.3	.82	.35	.85
7	1.2	1.2	.74	.88	1.2	5.1	1.3	2.5	1.4	.81	.40	.82
8	1.2	1.3	.74	.88	1.9	5.0	1.3	2.6	1.4	.74	1.3	.87
9	1.1	.82	.74	.88	1.4	3.6	1.3	2.7	1.2	.74	1.0	.82
10	1.1	.74	.74	.87	1.2	2.7	1.3	3.4	1.4	.90	.80	.80
11	1.0	.74	.74	.88	1.5	2.2	1.4	3.2	1.6	.97	.55	.80
12	1.3	.71	.74	.88	2.2	1.8	1.4	3.1	1.3	2.2	.50	.80
13	1.2	.69	.74	.88	2.8	1.6	1.3	2.7	1.2	.88	20	.80
14	1.2	.70	.74	.88	2.5	1.6	1.6	1.7	1.4	1.3	10	.80
15	1.2	.74	.75	.92	1.2	1.5	2.1	1.7	1.4	2.8	7.0	.80
16	1.2	.74	.80	.85	1.0	1.4	1.6	2.5	1.8	1.3	6.0	.90
17	1.3	.74	.80	.80	.97	1.3	1.6	2.5	2.6	1.3	5.0	10
18	1.3	.74	.80	.75	1.1	1.4	1.5	3.2	3.3	1.1	4.0	5.0
19	1.3	.74	.80	.72	1.3	1.6	1.4	3.5	2.3	1.1	3.0	3.5
20	1.4	.84	.80	.80	1.4	1.5	1.4	3.8	1.3	.91	2.3	3.0
21	1.4	.88	.80	.80	2.0	1.4	2.0	3.7	3.5	.92	2.2	2.5
22	1.3	.87	.80	.80	2.7	1.4	5.6	2.0	1.4	.92	3.0	2.3
23	1.2	.79	.80	.80	1.8	1.4	5.7	2.0	1.4	1.0	2.5	2.1
24	1.2	.87	.80	.80	1.7	1.5	5.3	2.3	1.1	4.9	1.7	2.0
25	1.2	.98	.80	.80	1.5	1.6	5.2	3.5	1.4	.74	1.6	1.7
26	1.4	1.1	.84	.80	1.7	1.6	5.0	3.1	1.2	.91	2.0	1.5
27	1.4	1.1	.88	.82	1.9	1.6	5.0	1.8	1.2	.78	1.8	1.5
28	1.4	1.1	.88	.87	2.1	1.5	5.0	1.7	1.1	.97	1.6	1.4
29	1.4	1.1	.88	.80	---	1.5	5.0	1.6	1.3	.97	1.5	1.4
30	1.1	1.1	.88	.80	---	1.3	4.2	1.6	.97	.76	1.3	1.3
31	.97	---	.88	.80	---	1.3	---	1.7	---	.49	1.2	---
TOTAL	38.11	27.97	25.57	25.71	42.33	75.6	76.3	82.1	46.27	35.34	84.66	53.26
MEAN	1.23	.93	.82	.83	1.51	2.44	2.54	2.65	1.54	1.14	2.73	1.78
MAX	1.8	1.3	1.2	.92	2.8	5.1	5.7	3.9	3.5	4.9	20	10
MIN	.80	.69	.74	.72	.80	1.3	1.3	1.6	.97	.49	.35	.80
AC-FT	76	55	51	51	84	150	151	163	92	70	168	106
CFSM	.28	.21	.19	.19	.34	.56	.58	.60	.35	.26	.62	.40
IN.	.32	.24	.22	.22	.36	.64	.65	.70	.39	.30	.72	.45

WTR YR 1987 TOTAL 613.21 MEAN 1.68 MAX 20 MIN .35 AC-FT 1220 CFSM .38 IN. 5.20

TURKEY RIVER BASIN

05412070 UNNAMED CREEK NEAR LUANA, IA

LOCATION.--Lat 43°02'24", long 91°28'07", in SE 1/4 SEC.18, T.95 N., R.5 W., Clayton County, Hydrologic Unit 07060004, on right upstream bank at culvert on the north-south gravel road between county road W70 and county road X16, 0.8 mile south of State Highway 52 and 18 and approximately 1.6 miles south of Luana.

DRAINAGE AREA.--1.15 mi².

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

GAGE.--Water-stage recorder.

REMARKS.--Estimated daily discharges: May 13 to July 22 and Sept. 20-23. Records good except those for estimated daily discharges, which are poor.

EXTREMES FOR CURRENT YEAR.--Maximum discharge during period is unknown. No flow at times during August and September.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	---	.50	.08	.04	.00
2	---	---	---	---	---	---	---	---	.45	.07	.03	.00
3	---	---	---	---	---	---	---	---	.40	.06	.03	.00
4	---	---	---	---	---	---	---	---	.40	.06	.02	.00
5	---	---	---	---	---	---	---	---	.40	.05	.01	.00
6	---	---	---	---	---	---	---	---	.38	.05	.01	.00
7	---	---	---	---	---	---	---	---	.35	.05	.01	.00
8	---	---	---	---	---	---	---	---	.32	.05	.0	.00
9	---	---	---	---	---	---	---	---	.30	.04	.11	.00
10	---	---	---	---	---	---	---	---	.30	.04	.06	.00
11	---	---	---	---	---	---	---	---	.33	.04	.00	.00
12	---	---	---	---	---	---	---	---	.34	.04	.00	.00
13	---	---	---	---	---	---	---	.23	.25	.03	.0	.00
14	---	---	---	---	---	---	---	.25	.22	.03	.10	.00
15	---	---	---	---	---	---	---	.50	.20	.03	.00	.00
16	---	---	---	---	---	---	---	1.8	.22	.03	.00	.00
17	---	---	---	---	---	---	---	1.6	.24	.03	.00	.00
18	---	---	---	---	---	---	---	1.4	.20	.03	.00	.00
19	---	---	---	---	---	---	---	1.1	.16	.02	.00	.00
20	---	---	---	---	---	---	---	1.0	.16	.02	.00	.01
21	---	---	---	---	---	---	---	.90	.16	.02	.00	4.5
22	---	---	---	---	---	---	---	.80	.19	.02	.00	1.0
23	---	---	---	---	---	---	---	.70	.17	.03	.00	.35
24	---	---	---	---	---	---	---	.65	.15	.06	.00	1.9
25	---	---	---	---	---	---	---	.60	.12	.47	.00	.76
26	---	---	---	---	---	---	---	.55	.10	.07	.00	.09
27	---	---	---	---	---	---	---	.65	.10	.16	.00	.08
28	---	---	---	---	---	---	---	.70	.09	.13	.00	.06
29	---	---	---	---	---	---	---	.60	.09	.17	.00	.08
30	---	---	---	---	---	---	---	.55	.08	.10	.00	.07
31	---	---	---	---	---	---	---	.53	---	.06	.00	---
TOTAL	---	---	---	---	---	---	---	---	7.37	2.14	.42	8.90
MEAN	---	---	---	---	---	---	---	---	.25	.07	.01	.30
MAX	---	---	---	---	---	---	---	---	.50	.47	.11	4.5
MIN	---	---	---	---	---	---	---	---	.08	.02	.00	.00
AC-FT	---	---	---	---	---	---	---	---	.15	4.2	.8	.18
CFSM	---	---	---	---	---	---	---	---	.21	.06	.0	.26
IN.	---	---	---	---	---	---	---	---	.24	.07	.0	.29

TURKEY RIVER BASIN

65

05412070 UNNAMED CREEK NEAR LUANA, IA

LOCATION.--Lat 43°02'24", long 91°28'07", in SE 1/4 SEC.18, T.95 N., R.5 W., Clayton County, Hydrologic Unit 07060004, on right upstream bank at culvert on the north-south gravel road between county road W70 and county road X16, 0.8 mile south of State Highway 52 and 18 and approximately 1.6 miles south of Luana.

DRAINAGE AREA.--1.15 mi².

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

GAGE.--Water-stage recorder.

REMARKS.--Estimated daily discharges: Nov. 11-14, Dec. 6-10, 17, 18, Dec. 25 to Jan. 3, Jan. 6, 7, 14-18, 22, Feb. 7, 8, 11, 12, Mar. 1-5 and Aug. 21 to Sept. 30. Records fair except those for estimated daily discharges, which are poor.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 96 ft³/s Aug. 13, 1987, gage height, 11.81 ft; no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 25 ft³/s and maximum (*);

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
July 24	0715	45	10.96	Aug. 13	2000	*96	*11.81
Aug. 13	2000	*96	*11.81	Sept. 17	----	unknown	unknown

No flow for many days.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.06	.01	.00	.00	.00	.55	.11	.45	.05	.04	.12	.07
2	.06	.01	.01	.00	.00	.50	.08	.40	.04	.04	.15	.07
3	.07	.01	.0	.01	.00	.70	.07	.29	.04	.03	.14	.07
4	.93	.01	.00	.00	.00	.65	.06	.22	.03	.03	.12	.06
5	.18	.01	.00	.00	.00	.80	.05	.15	.03	.02	.11	.06
6	.12	.01	.01	.01	.35	.91	.03	.13	.04	.02	.08	.05
7	.10	.01	.01	.00	8.0	.88	.03	.12	.04	.01	.05	.05
8	.09	.01	.01	.00	1.0	.71	.02	.11	.04	.01	1.0	.05
9	.07	.01	.01	.00	.27	.50	.11	.11	.03	.01	.16	.05
10	.06	.01	.00	.00	.20	.39	.20	.10	.04	.0	.10	.04
11	.07	.01	.00	.00	5.0	.38	.19	.09	.06	.01	.07	.04
12	.10	.01	.00	.00	1.0	.33	.15	.08	.05	.15	.04	.04
13	.08	.01	.00	.00	.08	.29	.15	.07	.05	.02	6.6	.04
14	.07	.01	.00	.01	.00	.27	.24	.07	.03	.81	2.1	.04
15	.05	.01	.00	.01	.25	.22	.24	.07	.01	.46	.54	.04
16	.05	.03	.00	.00	.01	.17	.19	.07	.02	.03	1.9	.04
17	.04	.10	.01	.00	.00	.17	.18	.07	.05	.02	.69	2.5
18	.04	.07	.00	.00	.00	.25	.15	.12	.04	.03	.63	1.3
19	.03	.05	.00	.00	.62	.19	.12	.07	.03	.04	.39	.80
20	.03	.03	.00	.00	7.4	.15	.12	.08	.01	.03	.32	.60
21	.03	.01	.00	.00	9.8	.15	.24	.06	.34	.02	.30	.50
22	.03	.03	.00	.00	6.4	.15	1.0	.05	.03	.03	.35	.40
23	.03	.03	.00	.00	3.7	.15	.93	.04	.01	.03	.30	.35
24	.03	.01	.00	.00	1.1	.18	.82	.04	.03	4.2	.20	.32
25	.03	.01	.01	.00	.72	.18	.77	.04	.05	.05	.16	.30
26	.03	.01	.01	.00	.82	.16	.79	.04	.04	.06	.17	.27
27	.02	.0	.01	.00	.60	.13	.69	.06	.03	.06	.19	.25
28	.02	.0	.01	.00	2.1	.13	.64	.06	.03	.05	.15	.22
29	.01	.00	.00	.00	---	.16	.62	.05	.04	.05	.12	.20
30	.01	.0	.00	.00	---	.12	.49	.05	.03	.09	.10	.19
31	.01	---	.00	.00	---	.11	---	.04	---	.10	.08	---
TOTAL	2.55	.53	.10	.04	49.42	10.63	9.48	3.40	1.36	6.55	17.43	9.01
MEAN	.08	.02	.0	.0	1.76	.34	.32	.11	.05	.21	.56	.30
MAX	.93	.10	.01	.01	9.8	.91	1.0	.45	.34	4.2	6.6	2.5
MIN	.01	.00	.00	.00	.00	.11	.02	.04	.01	.00	.04	.04
AC-FT	5.1	1.1	.2	.1	98	21	19	6.7	2.7	13	35	18
CFSM	.07	.0	.0	.0	1.53	.30	.27	.10	.0	.18	.49	.26
IN.	.08	.0	.0	.0	1.60	.34	.31	.11	.0	.21	.56	.29

WTR YR 1987 TOTAL 110.50 MEAN .30 MAX 9.8 MIN .00 AC-FT 219 CFSM .26 IN. 3.57

TURKEY RIVER BASIN

05412100 ROBERTS CREEK ABOVE SAINT OLAF, IA

LOCATION.--Lat 42°55'49", long 91°23'03", in NW1/4 sec.25, T.94 N., R.5 W., Clayton County, Hydrologic Unit 07060004, on left downstream bank at bridge on road X28, 0.1 mi north of county road B65, on north edge of St. Olaf.

DRAINAGE AREA.--70.7 mi².

PERIOD OF RECORD.--September 1957 to July 1977 (operated as a low-flow station only), March 26 to Sept. 30, 1986.

GAGE.--Water-stage recorder. Datum of gage is 826.73 ft above NGVD.

REMARKS.--No estimated daily discharges. Records good.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 340 ft³/s Sept. 21, 1986, gage height, 12.72 ft; minimum discharge, 0.01 ft³/s Aug. 11, 1964 result of discharge measurement.

EXTREMES FOR CURRENT YEAR.--Maximum discharge during period Mar. 26 to Sept. 30, 340 ft³/s Sept. 21, gage height, 12.72 ft; minimum discharge, 1.2 ft³/s Sept. 8, 9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	59	27	17	8.2	3.7	1.5
2	---	---	---	---	---	---	54	25	15	8.3	3.3	1.5
3	---	---	---	---	---	---	55	24	15	7.9	2.8	1.4
4	---	---	---	---	---	---	60	24	15	6.9	2.8	1.9
5	---	---	---	---	---	---	56	24	16	6.2	2.7	2.0
6	---	---	---	---	---	---	52	24	15	5.9	2.9	1.6
7	---	---	---	---	---	---	48	22	14	6.4	2.9	1.3
8	---	---	---	---	---	---	45	21	13	6.7	2.8	1.3
9	---	---	---	---	---	---	43	21	12	6.9	2.5	1.6
10	---	---	---	---	---	---	41	22	14	7.3	2.5	2.7
11	---	---	---	---	---	---	41	23	17	9.9	2.3	4.4
12	---	---	---	---	---	---	39	22	16	9.9	2.1	4.7
13	---	---	---	---	---	---	38	21	13	6.7	2.1	2.3
14	---	---	---	---	---	---	56	38	12	5.4	6.3	2.3
15	---	---	---	---	---	---	58	31	12	4.9	6.8	2.4
16	---	---	---	---	---	---	48	50	16	5.0	3.1	2.3
17	---	---	---	---	---	---	44	41	14	4.5	2.4	2.0
18	---	---	---	---	---	---	42	42	12	4.0	3.1	2.1
19	---	---	---	---	---	---	41	35	13	3.7	1.9	2.5
20	---	---	---	---	---	---	37	32	11	3.4	1.7	3.0
21	---	---	---	---	---	---	37	29	10	3.1	1.8	140
22	---	---	---	---	---	---	35	28	17	2.7	1.8	46
23	---	---	---	---	---	---	33	26	21	3.1	1.7	16
24	---	---	---	---	---	---	32	25	12	3.2	1.7	49
25	---	---	---	---	---	111	31	23	11	14	1.9	139
26	---	---	---	---	---	104	30	25	11	11	4.1	37
27	---	---	---	---	---	84	28	26	9.9	5.7	5.1	25
28	---	---	---	---	---	80	30	25	9.3	18	3.0	19
29	---	---	---	---	---	75	29	23	8.5	6.5	1.9	19
30	---	---	---	---	---	67	29	21	8.5	4.6	1.7	18
31	---	---	---	---	---	62	---	20	---	4.2	1.6	---
TOTAL	---	---	---	---	---	---	1271	840	400.2	204.2	86.0	552.8
MEAN	---	---	---	---	---	---	42.4	27.1	13.3	6.59	2.77	18.4
MAX	---	---	---	---	---	---	60	50	21	18	6.8	140
MIN	---	---	---	---	---	---	28	20	8.5	2.7	1.6	1.3
AC-FT	---	---	---	---	---	---	2520	1670	794	405	171	1100
CFSM	---	---	---	---	---	---	.60	.38	.19	.09	.0	.26
IN.	---	---	---	---	---	---	.67	.44	.21	.11	.0	.29

TURKEY RIVER BASIN

67

05412100 ROBERTS CREEK ABOVE SAINT OLAF, IA

LOCATION.--Lat 42°55'49", long 91°23'03", in NW1/4 sec.25, T.94 N., R.5 W., Clayton County, Hydrologic Unit 07060004, on left downstream bank at bridge on road X28, 0.1 mi north of county road B65, on north edge of St. Olaf.

DRAINAGE AREA.--70.7 mi².

PERIOD OF RECORD.--September 1957 to July 1977 (operated as a low-flow station only), March 1986 to current year.

GAGE.--Water-stage recorder. Datum of gage is 826.73 ft above NGVD.

REMARKS.--Estimated daily discharges: Nov. 12, Dec. 5-13, Jan. 10-13 and 16-19. Records good except those for estimated daily discharges, which are poor.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 513 ft³/s Sept. 17, 1987, gage height, 13.02 ft; minimum discharge, 0.01 ft³/s Aug. 11, 1964.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Sept. 17	1730	*513	*13.02	No other peak greater than base discharge.			

Minimum discharge, 2.6 ft³/s Aug. 6, 7.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17	14	11	7.3	5.0	43	25	22	9.5	7.0	4.1	13
2	15	13	11	7.2	5.0	42	24	22	9.0	6.1	3.6	12
3	18	13	12	6.5	5.2	58	22	21	8.5	5.7	3.3	11
4	53	13	8.2	6.2	5.5	41	21	18	7.9	5.4	3.9	11
5	48	12	8.0	6.2	5.5	50	20	17	7.6	4.5	3.8	10
6	34	12	7.0	7.0	5.3	46	19	17	7.1	4.1	2.9	9.7
7	29	12	6.5	7.6	6.1	43	18	16	6.4	4.1	2.8	9.3
8	25	12	6.0	7.0	8.4	39	17	15	5.9	4.3	14	11
9	22	18	6.0	5.6	7.5	30	17	14	5.4	4.8	20	10
10	19	12	5.5	5.4	11	22	16	13	5.3	4.3	7.3	9.3
11	19	10	6.0	4.8	10	21	16	13	6.6	3.4	5.0	9.2
12	27	9.0	6.5	5.3	11	19	15	12	8.6	23	3.9	8.8
13	26	8.2	7.0	6.0	16	18	14	11	6.7	24	7.3	8.8
14	23	11	7.3	6.7	18	20	17	11	5.6	8.5	252	9.4
15	22	11	7.7	6.2	16	21	24	11	5.0	22	112	9.1
16	19	11	8.2	4.3	8.3	18	21	11	3.9	16	78	10
17	18	11	9.2	4.0	7.2	19	17	11	4.6	9.0	79	143
18	17	11	9.1	4.5	8.8	21	16	12	12	7.2	50	98
19	15	11	8.5	5.0	8.3	31	16	19	9.2	6.1	44	52
20	15	12	7.9	5.2	9.4	27	15	17	7.1	5.3	31	44
21	14	12	7.0	5.2	12	25	17	23	43	4.3	38	39
22	14	11	6.5	5.3	21	23	52	15	46	3.8	49	33
23	14	12	7.0	5.3	19	21	70	13	19	3.5	28	28
24	14	9.9	7.5	4.2	14	21	53	12	14	29	22	25
25	14	12	7.9	3.9	15	26	44	11	12	45	22	21
26	16	11	7.6	4.1	13	27	38	13	11	11	28	20
27	18	10	7.3	4.4	15	24	33	13	8.9	8.0	31	18
28	16	11	7.3	4.7	17	22	29	11	7.9	6.9	22	16
29	15	10	7.3	4.7	---	24	28	11	8.5	6.3	20	15
30	13	11	7.3	4.7	---	23	25	10	8.5	5.5	17	14
31	13	---	7.5	4.8	---	23	---	9.8	---	5.3	14	---
TOTAL	642	346.1	238.8	169.3	303.5	888	759	444.8	320.7	303.4	1018.9	727.6
MEAN	20.7	11.5	7.70	5.46	10.8	28.6	25.3	14.3	10.7	9.79	32.9	24.3
MAX	53	18	12	7.6	21	58	70	23	46	45	252	143
MIN	13	8.2	5.5	3.9	5.0	18	14	9.8	3.9	3.4	2.8	8.8
AC-FT	1270	686	474	336	602	1760	1510	882	636	602	2020	1440
CFSM	.29	.16	.11	.08	.15	.41	.36	.20	.15	.14	.46	.34
IN.	.34	.18	.13	.09	.16	.47	.40	.23	.17	.16	.54	.38

CAL YR 1986 TOTAL 5164.1 MEAN 18.3 MAX 140 MIN 1.3 AC-FT 10240 CFSM .26 IN. 2.72
WTR YR 1987 TOTAL 6162.1 MEAN 16.9 MAX 252 MIN 2.8 AC-FT 12220 CFSM .24 IN. 3.24

TURKEY RIVER BASIN

05412500 TURKEY RIVER AT GARBER, IA

LOCATION.--Lat 42°44'24", long 91°15'42", in SE1/4 NW1/4 sec.36, T.92 N., R.4 W., Clayton County, Hydrologic Unit 07060004, on left bank 10 ft downstream from bridge on county highway C43, 800 ft upstream from Wayman Creek, 1,000 ft southeast of Garber, 2,000 ft downstream from Elk Creek, 1 mi downstream from Volga River, and 19.8 mi upstream from mouth.

DRAINAGE AREA.--1,545 mi².

PERIOD OF RECORD.--August 1913 to November 1916, May 1919 to September 1927, April 1929 to September 1930, October 1932 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1308: 1922-25 (M), 1927 (M). WSP 1438: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 634.46 ft above NGVD. Prior to Feb. 7, 1935, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Nov. 15-18, 22-23, Dec. 6-9, 11-31 and Jan. 18 to Feb. 28. Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers data collection platform at station.

COOPERATION.--Two discharge measurements provided by U.S. Army Corps of Engineers.

AVERAGE DISCHARGE.--67 years (1913-16, 1919-27, 1929-30, 1932-87), 958 ft³/s, 8.42 in/yr, 694,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 32,300 ft³/s Feb. 23, 1922, gage height, 28.06 ft, from flood-mark; minimum daily, 49 ft³/s Jan. 28, 29, 1940.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1890, that of Feb. 23, 1922.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 8,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 14	0115	7,390	15.37				

Minimum discharge, 320 ft³/s Aug. 7-8.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5020	1170	752	604	780	1060	1410	1130	888	493	357	638
2	3500	1130	783	586	780	1110	1430	1080	853	467	359	604
3	2570	1140	815	566	780	1160	1430	1060	814	448	344	577
4	3270	1140	804	541	760	1020	1390	999	764	428	346	546
5	3960	1100	720	534	740	1130	1340	969	732	414	345	524
6	4210	1060	700	546	720	1430	1300	932	704	403	336	504
7	3220	1020	680	558	740	1830	1270	902	675	398	324	474
8	2560	1030	660	537	780	1930	1240	862	646	392	623	493
9	2240	1060	640	504	760	1830	1190	825	618	404	662	508
10	1990	1020	633	510	740	1590	1150	798	594	428	490	451
11	1830	953	600	491	720	1370	1110	788	603	406	412	434
12	1890	893	580	485	700	1260	1090	757	618	473	368	415
13	5510	723	560	491	690	1180	1050	735	598	613	414	406
14	6330	673	800	517	680	1140	1090	714	575	544	1160	410
15	3780	900	1100	513	860	1180	1190	687	555	541	1090	432
16	2710	860	1000	416	640	1180	1190	661	529	555	1110	430
17	2320	840	940	380	630	1140	1160	647	506	491	1190	1300
18	2070	820	860	370	600	1180	1120	1100	575	453	1050	1840
19	1880	800	800	450	590	1270	1070	1900	621	430	909	1280
20	1750	782	780	400	580	1330	1030	1340	556	436	805	1060
21	1650	766	760	700	620	1310	1010	1370	1080	431	820	979
22	1560	780	740	640	660	1270	1200	1130	1530	405	1190	929
23	1500	820	720	600	700	1230	1480	1010	934	387	1180	858
24	1420	792	700	580	740	1200	1630	939	760	573	920	799
25	1410	767	680	560	720	1280	1570	906	697	723	802	750
26	1520	764	660	540	740	1350	1490	947	665	533	841	706
27	1480	756	650	600	760	1450	1410	1090	609	460	1030	664
28	1410	760	640	680	800	1520	1330	1010	564	419	1030	631
29	1330	744	630	740	---	1530	1260	972	547	393	897	606
30	1250	741	620	760	---	1470	1200	939	527	379	795	583
31	1190	---	610	780	---	1390	---	921	---	366	710	---
TOTAL	78330	26804	22617	17179	19810	41320	37830	30120	20937	14286	22909	20831
MEAN	2527	893	730	554	707	1333	1261	972	698	461	739	694
MAX	6330	1170	1100	780	800	1930	1630	1900	1530	723	1190	1840
MIN	1190	673	560	370	580	1020	1010	647	506	366	324	406
AC-FT	155400	53170	44860	34070	39290	81960	75040	59740	41530	28340	45440	41320
CFSM	1.64	.58	.47	.36	.46	.86	.82	.63	.45	.30	.48	.45
IN.	1.89	.65	.54	.41	.48	.99	.91	.73	.50	.34	.55	.50

CAL YR 1986 TOTAL 513119 MEAN 1406 MAX 19100 MIN 408 AC-FT 1018000 CFSM .91 IN. 12.4
WTR YR 1987 TOTAL 352973 MEAN 967 MAX 6330 MIN 324 AC-FT 700100 CFSM .63 IN. 8.50

MAQUOKETA RIVER BASIN

69

05418450 NORTH FORK MAQUOKETA RIVER AT FULTON, IA

LOCATION.--Lat 42°08'48", long 90°40'33" in N1/4 sec.25, T.85 N., R.2 E, Jackson County, Hydrologic Unit 07060006, on right downstream bank at bridge on State Highway 61, 7.8 mi upstream from mouth, and 5.5 mi north of junction of State Highway 64 and 61 and 0.5 mi south of Fulton.

DRAINAGE AREA.--516 mi².

PERIOD OF RECORD.--July 1977 to current year.

GAGE.--Water-stage recorder. Datum of gage is 666.19 ft above NGVD. Nonrecording gage July 7 to September 22, 1977.

REMARKS.--Estimated daily discharges: Nov. 12 to Dec. 8, Dec. 10 to Feb. 9 and Aug. 21-26. Records good except those for estimated daily discharges, which are poor. U.S. Weather Service gage-height telemeter at station.

AVERAGE DISCHARGE.--10 years, 379 ft³/s, 9.97 in/yr, 274,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,700 ft³/s Aug. 31, 1981, gage height, 17.26 ft; minimum daily, 70 ft³/s July 11, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 18, 1974 reached a stage of 16.0 ft., from floodmark, discharge 10,000 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s) *1,700	Gage height (ft) *6.75	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Aug. 27	unknown						

Minimum daily discharge, 150 ft³/s Jan. 25-28.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2000	636	490	250	160	838	375	352	466	232	203	288
2	1420	611	500	250	160	792	379	359	629	228	193	265
3	1180	588	510	240	170	459	374	366	425	227	188	245
4	1250	581	520	250	170	478	365	384	358	225	180	229
5	1660	564	520	250	190	351	351	350	324	230	181	225
6	1190	551	520	260	220	324	347	345	303	243	192	220
7	1020	538	510	260	270	310	344	347	291	255	184	219
8	950	534	500	250	360	303	337	339	277	234	243	271
9	875	527	474	240	470	295	328	333	264	220	329	254
10	803	497	420	230	405	274	326	330	254	218	293	231
11	762	485	320	230	369	266	328	329	260	204	231	191
12	770	400	280	230	372	259	333	306	273	196	223	191
13	778	310	260	250	399	257	328	277	257	193	220	188
14	763	330	280	270	409	272	344	273	244	197	228	189
15	737	380	320	250	374	272	365	274	240	228	236	204
16	699	451	370	230	318	267	388	254	231	236	234	210
17	644	460	350	210	254	261	384	251	226	212	221	612
18	610	420	330	200	245	264	372	258	214	204	272	1220
19	583	430	310	190	242	283	358	860	222	203	551	639
20	566	450	300	180	235	282	351	716	228	205	275	480
21	553	450	290	170	236	270	345	594	265	208	620	403
22	544	440	290	170	242	268	349	514	279	206	900	357
23	537	450	280	160	239	267	377	442	286	201	500	328
24	528	460	280	160	239	271	406	396	273	202	350	306
25	564	460	280	150	234	309	432	379	263	212	310	280
26	814	460	280	150	228	326	414	383	273	221	750	254
27	1020	470	270	150	227	326	400	380	241	217	1060	242
28	907	480	270	150	250	324	379	506	233	207	604	233
29	781	490	270	160	---	354	370	440	235	199	435	239
30	706	500	260	160	---	371	362	373	235	261	358	234
31	656	---	260	160	---	370	---	456	---	248	316	---
TOTAL	26870	14403	11114	6460	7687	10563	10911	12166	8569	6772	11080	9447
MEAN	867	480	359	208	275	341	364	392	286	218	357	315
MAX	2000	636	520	270	470	838	432	860	629	261	1060	1220
MIN	528	310	260	150	160	257	326	251	214	193	180	188
AC-FT	53300	28570	22040	12810	15250	20950	21640	24130	17000	13430	21980	18740
CFSM	1.68	.93	.69	.40	.53	.66	.70	.76	.55	.42	.69	.61
IN.	1.94	1.04	.80	.47	.55	.76	.79	.88	.62	.49	.80	.68

CAL YR 1986 TOTAL 200520 MEAN 549 MAX 4770 MIN 190 AC-FT 397700 CFSM 1.06 IN. 14.5
WTR YR 1987 TOTAL 136042 MEAN 373 MAX 2000 MIN 150 AC-FT 269800 CFSM .72 IN. 9.81

MAQUOKETA RIVER BASIN

05418500 MAQUOKETA RIVER NEAR MAQUOKETA, IA

LOCATION.--Lat 42°05'05", long 90°38'04", in SW1/4 NE1/4 sec.17, T.84 N., R.3 E., Jackson County, Hydrologic Unit 07060006, on right bank 300 ft upstream from bridge on State Highway 62, 1,200 ft upstream from Prairie Creek, 2.0 mi northeast of Maquoketa, 2.2 mi downstream from North Fork, and 26.7 mi upstream from mouth.

DRAINAGE AREA.--1,553 mi².

PERIOD OF RECORD.--September 1913 to current year. Prior to October 1939, published as "below North Fork near Maquoketa". Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 405: 1914. WSP 1438: Drainage area. WSP 1508: 1914-17, 1919-25, 1926 (M), 1929, 1933-34 (M), 1943.

GAGE.--Water-stage recorder. Datum of gage is 625.96 ft above NGVD. Prior to July 14, 1924, nonrecording gage, and July 15, 1924 to Sept. 30, 1972, recording gage at same site at datum 10.00 ft higher.

REMARKS.--Estimated daily discharges: Nov. 12-15 and Dec. 10 to Feb. 9. Records good except those for estimated daily discharges, which are poor. Diurnal fluctuation caused by powerplant 4 mi upstream of station. U.S. Army Corps of Engineers data collection platform at station.

AVERAGE DISCHARGE.--74 years, 1,035 ft³/s, 9.05 in/yr, 749,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 48,000 ft³/s June 27, 1944, gage height, 24.70 ft, at datum then in use; minimum daily, 105 ft³/s Feb. 11-20, 1936.

EXTREMES OUTSIDE PERIOD OF RECORD.--A flood, probably in 1903, reached a stage of 23.5 ft, discharge, 43,000 ft³/s, at datum in use prior to Oct. 1, 1972.

EXTREMES FOR CURRENT YEAR.--Maxium discharge, 7,190 ft³/s, Oct. 1, stage falling, peak occurred Sept. 29, 1986; maximum independent peak discharge, 5,500 ft³/s, Aug. 27, gage height, 18.24 ft; minimum daily discharge 394 ft³/s, Aug. 7.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6230	1950	1280	740	490	1570	1270	965	1360	559	437	1470
2	4520	1850	1410	720	500	1640	1290	966	1710	546	435	1370
3	3580	1690	1560	700	530	1240	1230	961	1340	494	473	1260
4	3330	1680	1660	710	540	1230	1170	981	1110	535	406	1180
5	4020	1620	1630	730	550	1100	1120	1060	1020	478	405	1130
6	3680	1540	1400	740	580	1050	1060	972	982	556	460	1080
7	3110	1410	1390	740	640	1050	1040	935	919	592	394	1030
8	2750	1420	1410	720	720	1020	985	920	871	561	459	1060
9	2450	1410	1400	700	860	1040	986	889	839	552	601	1020
10	2190	1370	1180	680	991	993	998	865	787	532	641	999
11	2090	1290	860	660	878	949	962	850	798	518	595	955
12	1990	900	780	680	847	925	987	869	757	466	536	933
13	1810	710	740	720	844	930	1020	791	763	510	526	870
14	1750	800	700	780	869	924	1010	790	806	437	525	849
15	1790	950	800	740	848	913	1170	832	708	553	526	913
16	1930	1060	940	680	809	913	1230	810	688	557	539	871
17	1860	1070	900	650	726	891	1210	695	649	542	685	1060
18	1690	969	880	620	734	888	1230	818	665	504	673	2290
19	1680	1050	860	590	768	893	1090	1730	616	451	922	1860
20	1510	1100	840	550	702	931	1120	1730	709	516	721	1480
21	1550	1150	820	530	714	921	1040	1410	697	440	1700	1430
22	1520	1110	810	520	687	927	1030	1360	705	498	2430	1260
23	1490	1150	800	500	699	945	1080	1220	795	433	1370	1220
24	1490	1200	810	490	662	919	1110	1150	717	474	1070	1170
25	1810	1180	810	480	690	994	1150	1110	704	420	1030	1110
26	2740	1160	800	480	656	1040	1150	1090	699	482	3200	1070
27	2770	1200	780	490	667	1030	1150	1110	661	547	4570	1020
28	3080	1240	760	500	685	1100	1040	1330	649	520	3000	996
29	2470	1270	760	500	---	1180	1060	1380	570	498	2440	960
30	2150	1230	750	490	---	1300	1000	1180	569	476	2060	929
31	2050	---	750	490	---	1230	---	1170	---	598	1620	---
TOTAL	77080	37729	31270	19320	19886	32676	32988	32939	24863	15845	35449	34845
MEAN	2486	1258	1009	623	710	1054	1100	1063	829	511	1144	1161
MAX	6230	1950	1660	780	991	1640	1290	1730	1710	598	4570	2290
MIN	1490	710	700	480	490	888	962	695	569	420	394	849
AC-FT	152900	74840	62020	38320	39440	64810	65430	65330	49320	31430	70310	69120
CFSM	1.60	.81	.65	.40	.46	.68	.71	.68	.53	.33	.74	.75
IN.	1.85	.90	.75	.46	.48	.78	.79	.79	.60	.38	.85	.83

CAL YR 1986 TOTAL 594003 MEAN 1627 MAX 8010 MIN 540 AC-FT 1178000 CFSM 1.05 IN. 14.2
WTR YR 1987 TOTAL 394890 MEAN 1082 MAX 6230 MIN 394 AC-FT 783300 CFSM .70 IN. 9.46

MISSISSIPPI RIVER MAIN STEM

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05420500 MISSISSIPPI RIVER AT CLINTON, IA
(National stream-quality accounting network station)

LOCATION.--Lat 41°46'53", long 90°15'04", in NW1/4 sec.34, T.81 N., R.6 E., Clinton County, Hydrologic Unit 07080101, on right bank at foot of Seventh Avenue in Camanche, 5.0 mi upstream from Wapsipinicon River, 6.4 mi downstream from Clinton, 10.6 mi downstream from dam 13, and at mile 511.8 upstream from Ohio River. Prior to June 6, 1969, at site 400 ft downstream.

DRAINAGE AREA.--85,600 mi², approximately, at Fulton-Lyons Bridge at Clinton.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June to August 1873 (fragmentary), October 1873 to current year (October 1932 to September 1939, published as "at Le Claire").

REVISED RECORDS.--WDR IA-75-1: 1974.

GAGE.--Water-stage recorder. Datum of gage is 562.68 ft above NGVD. Oct. 1, 1955, to June 5, 1969, water-stage recorder at site 400 ft downstream at same datum. Auxiliary water-stage recorder at dam 13 since Oct. 1, 1958. See WSP 1728 for history of changes prior to Oct. 1, 1955.

REMARKS.--Estimated daily discharges: Oct. 1-6, Nov. 10-18, Jan. 3-5, 24-28, Feb. 11-17, Mar. 10 to Apr. 29, May 2, 15, 19-21, June 16-22, 27-28, July 4-5, 9-10, 17-18, 20, 30, Aug. 11, 27, Sept. 7, 18, and 23-30. Records fair. Minor flow regulation caused by navigation dams. U.S. Army Corps of Engineers data collection platform and gage-height telemeter at station.

COOPERATION.--Discharge data at Lock and Dam No.13 furnished by U.S. Army Corps of Engineers.

AVERAGE DISCHARGE.--114 years, 47,900 ft³/s, 7.60 in/yr, 34,710,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 307,000 ft³/s Apr. 28, 1965; maximum gage height, 24.65 ft Apr. 28, 1965; minimum daily discharge, 6,500 ft³/s Dec. 25-27, 1933.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage known since at least 1828, that of Apr. 28, 1965.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 201,000 ft³/s Oct. 6; maximum gage height, 20.64 ft Oct. 7, minimum daily discharge, 18,900 ft³/s Sept. 5, minimum gage height, 8.39 ft Sept. 5.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	170000	82200	58800	52200	38400	41300	63000	45700	47300	31200	55400	33500
2	175000	78400	58600	50500	40500	46300	65000	44300	47600	28600	55700	33500
3	180000	75700	59800	50000	40800	46900	66000	42000	49200	25600	55800	30900
4	190000	73500	60500	49000	40800	47300	65000	42000	48900	25300	55800	26000
5	195000	74700	57900	48000	40600	37700	64000	40700	47600	25900	52500	18900
6	201000	73500	55300	47500	42000	37400	64000	41000	45300	21800	43500	19900
7	200000	70500	56900	49100	41900	37100	62000	40500	45300	20600	36800	22800
8	197000	70500	58200	49200	41700	36700	60000	38700	45900	20700	31700	24900
9	192000	70100	58400	47500	42500	37300	57000	39400	45100	23300	29600	29500
10	185000	72000	54500	44700	41300	39000	55000	40100	40500	27200	28100	30600
11	171000	70000	44100	45300	40000	45000	53000	41900	39300	29400	29600	30800
12	170000	67000	35100	45600	40200	50000	52000	39900	38300	28300	33400	26600
13	162000	63000	36100	45200	40300	58000	52000	35500	40700	29200	33500	22200
14	153000	60000	38600	45600	40000	60000	51000	31500	41100	30400	34900	22600
15	146000	54000	41000	45500	40000	62000	51000	28500	39400	29800	34500	24300
16	140000	56000	41400	45400	39000	61000	52000	29600	36000	27500	34300	26900
17	135000	61000	42700	44300	39000	60000	52000	31800	33000	24900	36200	27300
18	131000	63000	44400	42200	40000	57000	51000	34600	31000	22300	37200	30000
19	129000	66500	45700	40400	39100	54000	50000	40000	28000	21000	35700	35600
20	129000	65000	47600	40200	37300	51000	50000	47200	26000	20100	32900	36600
21	132000	58100	51900	38900	37900	48000	50000	41800	30000	27700	32500	34400
22	135000	52500	53900	37600	40300	46000	51000	33800	34000	33300	30700	31500
23	136000	54600	54700	36100	31600	46000	54000	31000	35800	33200	30400	30200
24	134000	59800	54700	36000	36300	46000	54000	32600	35100	32300	30800	30000
25	129000	62600	55200	35000	37900	46500	51000	35300	34200	32000	29700	30000
26	122000	64200	55200	35000	37200	47000	50000	40700	34000	33700	34100	29500
27	113000	63700	55100	36000	36800	49000	51000	40200	27100	36200	36500	29500
28	104000	62600	55000	37000	36400	52000	52000	44800	28800	40000	31500	29500
29	97100	61200	54100	37200	---	54000	51000	47300	33300	43500	30000	29000
30	92600	60100	53300	37500	---	56000	49900	47400	33300	48500	29900	28000
31	87000	---	52900	37400	---	59000	---	48200	---	52400	31000	---
TOTAL	4632700	1966000	1591600	1331100	1099800	1514500	1648900	1218000	1141100	925900	1134200	855000
MEAN	149400	65530	51340	42940	39280	48850	54960	39290	38040	29870	36590	28500
MAX	201000	82200	60500	52200	42500	62000	66000	48200	49200	52400	55800	36600
MIN	87000	52500	35100	35000	31600	36700	49900	28500	26000	20100	28100	18900
AC-FT	9189000	3900000	3157000	2640000	2181000	3004000	3271000	2416000	2263000	1837000	2250000	1696000
CFSM	1.75	.77	.60	.50	.46	.57	.64	.46	.44	.35	.43	.33
IN.	2.01	.85	.69	.58	.48	.66	.72	.53	.50	.40	.49	.37

CAL YR 1986 TOTAL 29228200 MEAN 80080 MAX 201000 MIN 28000 AC-FT 57970000 CFSM .94 IN. 12.7
WTR YR 1987 TOTAL 19058800 MEAN 52220 MAX 201000 MIN 18900 AC-FT 37800000 CFSM .61 IN. 8.28

MISSISSIPPI RIVER MAIN STEM

05420500 MISSISSIPPI RIVER AT CLINTON, IA--Continued

WATER-QUALITY RECORDS

LOCATION.--Samples collected near bridge on State Highway 136 in Clinton, 6.4 mi upstream from discharge station.

PERIOD OF RECORD.--October 1973 to September 1987 (discontinued).

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1974 to September 1976; October 1978 to September 1981.

WATER TEMPERATURES: October 1974 to September 1986.

REMARKS.--Temperature data were collected at Dam 13 (Sta. 05420400). Temperature data for 1987 water year of uncertain quality and not published. Data is on file in the District office.

COOPERATION.--Temperature record was collected in cooperation with U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 560 microsiemens Nov. 24 to Dec. 3, 1979; minimum daily, 220 microsiemens Apr. 19, 20, 1976; Nov. 8-18, 1980.

WATER TEMPERATURES: Maximum, 31.5°C July 21-23, 1983; minimum, 0.0°C on many days during winter periods each year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH (STAND- ARD) UNITS (00400)	TEMPER- ATURE WATER (DEG C) (00010)	TEMPER- ATURE AIR (DEG C) (00020)	TUR- BID- ITY (NTU) (00076)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	OXYGEN DEMAND, CHEM- ICAL (LOW LEVEL) (MG/L) (00335)	BARO- METRIC PRES- SURE (MM HG) (00025)
NOV 18...	1200	58000	408	8.30	2.5	1.0	10	13.3	99	27	750
MAR 12...	1100	48300	348	9.20	5.0	11.0	4.0	9.5	77	29	740
MAY 26...	0930	40600	410	8.50	18.0	29.0	11	8.2	88	27	754
AUG 25...	1130	26000	342	8.30	22.5	15.0	18	6.6	77	20	752

DATE	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP- TOCOCCI FECAL KF AGAR (COLS. PER 100 ML) (31673)	HARD- NESS NONCARB WH WAT TOT FLD MG/L AS CACO3 (00902)	HARD- NESS (MG/L AS CACO3) (00900)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM AD- SORP- TION RATIO (00931)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)
NOV 18...	K140	K240	45	220	52	21	8.4	8	0.3	2.1
MAR 12...	120	110	24	180	39	19	9.9	11	0.3	2.5
MAY 26...	250	250	44	200	41	23	9.5	9	0.3	1.8
AUG 25...	1800	K3100	13	160	37	16	6.9	9	0.2	2.2

DATE	ALKA- LINITY WH WAT TOTAL FIELD MG/L AS CACO3 (00410)	BICAR- BONATE WH WAT TOTAL FIELD MG/L AS HCO3 (00440)	CAR- BONATE WH WAT TOTAL FIELD MG/L AS CO3 (00445)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, TOTAL (MG/L AS F) (00951)	SOLIDS, RESIDUE AT 105 DEG. C, SUS- PENDE (MG/L) (00530)	SOLIDS, VOLA- TILE, SUS- PENDE (MG/L) (00535)	OIL AND GREASE, TOTAL RECOV. GRAVI- METRIC (MG/L) (00556)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N) (00605)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)
NOV 18...	171	210	0	32	12	0.1	64	5	1	--	2.00
MAR 12...	152	130	25	25	13	0.1	44	10	<1	--	0.990
MAY 26...	153	180	4	39	12	0.2	40	8	1	--	0.810
AUG 25...	145	170	4	26	13	0.2	35	7	1	0.89	0.500

MISSISSIPPI RIVER MAIN STEM

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05420500 MISSISSIPPI RIVER AT CLINTON, IA--Continued

WATER-QUALITY RECORDS

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	NITRO- GEN, AMMONIA TOTAL (MG/L AS N) (00610)	AMMONIA UN- IONIZED (MG/L AS N) (00619)	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)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CYANIDE TOTAL (MG/L AS CN) (00720)	SEDI- MENT, SUS- PENDED (MG/L) (80154)	SEDI- MENT, DIS- CHARGE, SUS- PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. THAN .062 MM (70331)	ALUM- INUM, DIS- (UG/L AS AL) (01106)
NOV 18...	<0.100	<0.002	1.1	--	--	8.9	<0.005	48	7520	100	<50
MAR 12...	<0.100	<0.017	1.5	0.040	<0.010	10	<0.005	43	5610	99	<50
MAY 26...	<0.100	<0.010	1.3	0.220	0.060	8.0	<0.005	37	4060	100	90
AUG 25...	0.110	<0.001	1.0	0.190	0.090	6.8	<0.005	34	3210	96	<50
DATE	ALUM- INUM, TOTAL RECOV- ERABLE (UG/L AS AL) (01105)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	BARIUM, TOTAL RECOV- ERABLE (UG/L AS BA) (01007)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE) (01010)	BERYL- LIUM, TOTAL RECOV- ERABLE (UG/L AS BE) (01012)	BORON, DIS- SOLVED (UG/L AS B) (01020)	BORON, TOTAL RECOV- ERABLE (UG/L AS B) (01022)	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)	CADMIUM TOTAL RECOV- ERABLE (UG/L AS CD) (01027)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR) (01030)	CHRO- MIUM, TOTAL RECOV- ERABLE (UG/L AS CR) (01034)
NOV 18...	1200	35	60	<0.5	<0.5	<50	<50	<3	<3	<5	<5
MAR 12...	240	27	30	<0.5	<0.5	<50	<50	<3	<3	<5	<5
MAY 26...	760	50	60	<0.5	<0.5	<50	<50	<3	<3	<5	<5
AUG 25...	800	43	60	<0.5	<0.5	<50	<50	<3	<3	<5	<5
DATE	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	COBALT, TOTAL RECOV- ERABLE (UG/L AS CO) (01037)	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	COPPER, TOTAL RECOV- ERABLE (UG/L AS CU) (01042)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE) (01045)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB) (01051)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN) (01055)	MERCURY TOTAL RECOV- ERABLE (UG/L AS HG) (71900)
NOV 18...	<5	<5	<5	37	<50	2300	<50	<50	14	180	<0.05
MAR 12...	<5	<5	<5	5	<50	600	<50	<50	<5	82	0.05
MAY 26...	<5	<5	6	<5	82	1100	<50	<50	21	170	<0.05
AUG 25...	<5	<5	9	20	<50	1100	<50	<50	<5	140	<0.05
DATE	NICKEL, DIS- SOLVED (UG/L AS NI) (01065)	NICKEL, TOTAL RECOV- ERABLE (UG/L AS NI) (01067)	SILVER, DIS- SOLVED (UG/L AS AG) (01075)	SILVER, TOTAL RECOV- ERABLE (UG/L AS AG) (01077)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	STRON- TIUM, TOTAL RECOV- ERABLE (UG/L AS SR) (01082)	VANA- DIUM, DIS- SOLVED (UG/L AS V) (01085)	VANA- DIUM, TOTAL (UG/L AS V) (01087)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	ZINC, TOTAL RECOV- ERABLE (UG/L AS ZN) (01092)	PHENOLS TOTAL (UG/L) (32730)
NOV 18...	<5	18	<3	<3	110	110	<5	5	<50	<50	<5
MAR 12...	<5	5	<3	<3	76	80	<5	<5	<50	<50	5
MAY 26...	<5	7	3	<3	88	80	<5	<5	<50	<50	<5
AUG 25...	<5	<5	<3	<3	75	80	<5	<5	<50	<50	<5

WAPSIPINICON RIVER BASIN

05420560 WAPSIPINICON RIVER NEAR ELMA, IA

LOCATION.--Lat 43°14'34", long 92°31'48", in NW1/4 NW1/4 sec 8, T.97 N., R.14 W., Howard County, Hydrologic Unit 07080102, on right bank 10 ft downstream from bridge on county highway B17, 0.2 mi downstream from small left-bank tributary, 4.8 mi west of Elma, and at mile 217.9.

DRAINAGE AREA.--95.2 mi².

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

GAGE.--Water-stage recorder. Datum of gage is 1,130.05 ft above NGVD.

REMARKS.--Estimated daily discharges: Nov. 12, 13, 19, 20, 21, 24, 27, 28 and Dec. 2 to Feb. 25. Records good except those for estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--29 years, 68.6 ft³/s, 9.79 in/yr, 49,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,100 ft³/s June 4, 1974, gage height, 14.94 ft, from high-water mark in well; maximum gage height, 15.38 ft, from high-water mark in well, probably occurred Aug. 22, 1979 (backwater from vegetation); minimum daily discharge, 1.9 ft³/s Feb. 4-8, 1959.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 600 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 4	0915	912	11.80	Oct. 12	1815	*4,240	*14.33

Minimum discharge, 6.8 ft³/s Sept. 5.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	433	68	31	16	13	30	75	36	24	12	8.0	8.1
2	272	63	29	14	13	38	82	35	23	11	7.8	7.7
3	359	60	26	15	14	38	78	34	21	11	8.5	7.5
4	755	58	24	16	15	41	75	31	19	11	11	7.5
5	574	54	19	15	16	76	77	29	17	10	10	7.3
6	295	53	21	15	18	96	78	27	16	10	9.1	10
7	211	51	23	14	19	107	69	27	14	10	8.6	11
8	169	52	23	14	21	105	59	25	14	11	12	11
9	136	51	23	14	25	77	52	24	12	13	13	9.2
10	114	45	21	14	50	52	47	24	12	12	12	11
11	582	37	22	13	47	47	45	24	13	11	9.6	9.4
12	3020	35	22	14	50	41	42	22	15	15	8.7	8.6
13	2280	33	21	16	55	39	40	21	13	14	9.9	10
14	457	38	20	17	48	40	41	22	12	12	11	12
15	268	37	20	15	40	44	45	21	11	12	11	11
16	205	36	20	13	36	41	45	20	11	10	12	11
17	169	35	19	12	33	38	42	19	10	9.6	12	24
18	143	35	18	11	30	39	39	20	11	9.2	9.6	17
19	126	38	18	11	29	47	37	22	12	12	8.7	13
20	114	35	18	11	28	48	34	22	13	11	8.4	16
21	104	38	18	11	25	48	33	21	12	9.9	14	16
22	95	34	17	12	23	48	45	19	11	9.1	30	14
23	94	34	16	11	22	48	75	18	12	8.6	16	12
24	87	33	16	10	22	50	85	17	11	9.3	12	11
25	82	32	16	10	23	69	67	17	11	10	10	11
26	78	30	16	11	26	95	58	21	11	9.4	10	11
27	74	30	16	12	27	100	51	21	9.4	8.9	10	10
28	69	30	16	12	28	85	45	21	9.4	8.5	10	9.9
29	64	30	17	12	---	73	42	23	10	8.4	10	9.2
30	60	31	17	12	---	66	39	30	13	8.3	9.3	9.8
31	59	---	17	13	---	71	---	28	---	8.0	8.4	---
TOTAL	11548	1234	620	406	796	1837	1642	741	402.8	325.2	340.6	336.2
MEAN	373	41.1	20.0	13.1	28.4	59.3	54.7	23.9	13.4	10.5	11.0	11.2
MAX	3020	68	31	17	55	107	85	36	24	15	30	24
MIN	59	30	16	10	13	30	33	17	9.4	8.0	7.8	7.3
AC-FT	22910	2450	1230	805	1580	3640	3260	1470	799	645	676	667
CFSM	3.91	.43	.21	.14	.30	.62	.57	.25	.14	.11	.12	.12
IN.	4.51	.48	.24	.16	.31	.72	.64	.29	.16	.13	.13	.13

CAL YR 1986	TOTAL 42307.0	MEAN 116	MAX 3130	MIN 14	AC-FT 83920	CFSM 1.22	IN. 16.5
WTR YR 1987	TOTAL 20228.7	MEAN 55.4	MAX 3020	MIN 7.3	AC-FT 40120	CFSM .58	IN. 7.90

WAPSIPINICON RIVER BASIN

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05421000 WAPSIPINICON RIVER AT INDEPENDENCE, IA

LOCATION.--Lat 42°27'49", long 91°53'42", in SE1/4 sec.4, T.88 N., R.9 W., Buchanan County, Hydrologic Unit 07080102, on right bank at Sixth Street in Independence, 1,800 ft downstream from dam at abandoned hydroelectric plant, 4.9 mi downstream from Otter Creek, 9.7 mi upstream from Pine Creek, and at mile 142.5.

DRAINAGE AREA.--1,048 mi².

PERIOD OF RECORD.--July 1933 to current year.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1508: 1938-39, 1940 (M), 1947.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 882.85 ft above NGVD. Prior to May 24, 1941 nonrecording gage in tailrace of powerplant 1,800 ft upstream at datum 80.00 ft lower.

REMARKS.--Estimated daily discharges: Jan. 17-25 and Aug. 21-23. Records good except those for estimated daily discharges, which are fair. U.S. Army Corps of Engineers data collection platform at station.

AVERAGE DISCHARGE.--54 years, 625 ft³/s, 8.10 in/yr, 452,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 26,800 ft³/s July 18, 1968, gage height, 21.11 ft; minimum daily, 7.0 ft³/s for several days in 1934 and 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1901, that of July 18, 1968.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 18	1000	*3,300	*7.73				

Minimum discharge, 32 ft³/s Aug. 3.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	935	922	533	328	177	787	1220	667	613	116	42	546
2	1020	868	642	316	190	930	1210	735	548	108	40	442
3	1130	851	735	288	206	1000	1200	790	475	99	52	368
4	1380	847	763	292	219	1050	1150	788	402	85	58	321
5	1830	836	552	292	222	1140	1070	682	357	79	44	284
6	2130	792	711	322	221	1340	1010	606	314	85	40	254
7	2170	750	745	326	251	1530	956	547	273	80	40	238
8	2010	776	698	308	351	1660	903	496	243	75	167	226
9	1830	762	652	234	356	1660	872	446	208	87	180	170
10	1760	708	329	232	386	1560	819	409	187	85	139	164
11	1680	650	314	285	395	1410	764	379	202	79	102	181
12	1520	606	380	289	480	1230	726	340	189	121	90	173
13	1600	380	363	297	540	1090	696	316	172	134	91	165
14	1860	392	401	304	646	994	707	303	157	178	124	171
15	2100	452	450	267	609	965	766	264	136	219	200	186
16	2310	522	443	173	562	908	849	249	121	214	201	229
17	2830	551	428	180	567	900	928	233	122	222	186	315
18	3270	500	419	170	545	930	915	233	126	181	192	506
19	3090	505	394	165	490	1000	845	247	122	163	194	609
20	2540	460	379	160	453	1010	785	299	156	135	178	548
21	1870	452	354	155	478	1010	732	357	276	114	700	518
22	1380	543	347	150	563	982	763	473	599	97	1300	509
23	1160	591	336	145	643	932	894	506	513	85	1200	477
24	1060	476	336	150	636	906	996	435	386	93	1100	434
25	1050	521	341	155	638	950	1030	414	330	83	867	396
26	1160	535	334	157	638	1050	1010	452	273	73	963	361
27	1300	510	326	156	660	1150	975	635	224	60	1440	336
28	1300	499	326	156	684	1200	892	751	185	56	1360	318
29	1180	490	328	165	---	1270	824	742	163	55	1110	297
30	1060	493	326	171	---	1270	736	734	136	50	886	275
31	986	---	319	172	---	1220	---	702	---	46	686	---
TOTAL	52501	18240	14004	6960	12806	35034	27243	15230	8208	3357	13972	10017
MEAN	1694	608	452	225	457	1130	908	491	274	108	451	334
MAX	3270	922	763	328	684	1660	1220	790	613	222	1440	609
MIN	935	380	314	145	177	787	696	233	121	46	40	164
AC-FT	104100	36180	27780	13810	25400	69490	54040	30210	16280	6660	27710	19870
CFSM	1.62	.58	.43	.21	.44	1.08	.87	.47	.26	.10	.43	.32
IN.	1.86	.65	.50	.25	.45	1.24	.97	.54	.29	.12	.50	.36

CAL YR 1986	TOTAL 330423	MEAN 905	MAX 10800	MIN 114	AC-FT 655400	CFSM .86	IN. 11.7
WTR YR 1987	TOTAL 217572	MEAN 596	MAX 3270	MIN 40	AC-FT 431600	CFSM .57	IN. 7.72

WAPSIPINICON RIVER BASIN

05422000 WAPSIPINICON RIVER NEAR DE WITT, IA

LOCATION.--Lat 41°46'01", long 90°32'05", in SW1/4 NE1/4 sec.6, T.80 N., R.4 E., Clinton County, Hydrologic Unit 07080103, on left bank 5 ft upstream from bridge on U.S. Highway 61, 0.9 mi downstream from Silver Creek, 4.0 mi south of water tower in De Witt, 6.2 mi upstream from Brophy Creek, and 18.2 mi upstream from mouth.

DRAINAGE AREA.--2,330 mi².

PERIOD OF RECORD.--June 1934 to current year.

REVISED RECORDS.--WSP 1308: 1937 (M). WSP 1438: Drainage area. WSP 1708: 1951.

GAGE.--Water-stage recorder. Datum of gage is 598.81 ft above NGVD.

REMARKS.--Estimated daily discharges: Dec. 13-18 and Jan. 23 to Feb. 3. Records good except those for estimated daily discharges, which are poor. U. S. Army Corps of Engineers gage-height telemeter and data collection platform at station.

AVERAGE DISCHARGE.--53 years, 1,559 ft³/s, 9.09 in/yr, 1,129,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 29,900 ft³/s May 17, 1974, gage height, 13.07 ft; minimum daily, 46 ft³/s Jan. 22, 23, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 6,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 2	0630	6,330	10.87	Aug. 28	0847	*7,700	*11.32

Minimum discharge, 288 ft³/s Aug. 7-8.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5830	2790	1640	1180	880	1330	2700	1640	1550	661	343	2670
2	5880	2560	1890	1150	860	1590	2580	1570	2360	630	328	2280
3	4130	2410	2130	1120	840	1500	2450	1490	1930	598	322	1980
4	3450	2270	2180	1080	809	1420	2350	1460	1590	568	320	1760
5	3320	2150	2170	1060	803	1530	2290	1710	1450	532	307	1600
6	3340	2080	2120	1040	824	1580	2230	1650	1320	517	322	1450
7	3290	2020	2060	1040	877	1630	2160	1570	1210	516	301	1330
8	3340	1960	2150	1020	924	1690	2070	1500	1160	512	337	1270
9	3390	1910	2170	993	864	1810	1990	1380	1070	509	373	1240
10	3360	1820	2110	1000	818	1930	1910	1290	1000	479	369	1110
11	3300	1770	2000	968	850	2060	1850	1230	947	454	374	1020
12	3170	1720	1770	962	878	2120	1810	1160	897	443	386	961
13	3070	1630	2000	946	931	2110	1770	1110	847	450	401	895
14	3090	1610	2100	939	947	2030	1810	1070	813	460	420	845
15	3050	1470	2200	970	943	1910	2040	1010	786	492	398	849
16	2930	1400	2100	931	937	1830	2120	965	744	479	362	856
17	3000	1450	2000	893	977	1770	2060	901	717	464	393	931
18	3080	1530	1900	789	933	1720	1970	892	679	457	394	1690
19	3160	1540	1730	796	937	1700	1970	1110	663	472	408	1880
20	3300	1530	1620	824	994	1710	1950	1380	673	468	473	1530
21	3570	1500	1530	839	1010	1750	1900	2310	779	477	1390	1410
22	3800	1460	1460	845	971	1790	1820	2220	768	463	2030	1410
23	3800	1520	1400	800	922	1800	1790	1610	756	444	1810	1380
24	3340	1630	1400	560	893	1790	1730	1460	727	435	1710	1310
25	2870	1640	1370	620	896	1840	1710	1430	787	430	1970	1240
26	3830	1660	1340	660	937	1900	1710	1450	888	397	4030	1210
27	4490	1640	1290	720	971	1910	1780	1460	894	397	6290	1170
28	3980	1640	1250	760	996	1940	1780	1420	809	386	7400	1160
29	3540	1640	1240	820	---	2390	1740	1550	748	399	5700	1110
30	3230	1630	1220	860	---	2950	1720	1580	709	369	3880	1070
31	2990	---	1190	900	---	2850	---	1550	---	370	3190	---
TOTAL	108920	53580	54730	27885	25422	57880	59760	44128	30271	14728	46731	40617
MEAN	3546	1786	1765	900	908	1867	1992	1423	1009	475	1507	1354
MAX	5880	2790	2200	1180	1010	2950	2700	2310	2360	661	7400	2670
MIN	2870	1400	1190	560	803	1330	1710	892	663	369	301	845
AC-FT	218000	106300	108600	55310	50420	114800	118500	87530	60040	29210	92690	80560
CFSM	1.52	.77	.76	.39	.39	.80	.85	.61	.43	.20	.65	.58
IN.	1.75	.86	.87	.45	.41	.92	.95	.70	.48	.24	.75	.65

CAL YR 1986 TOTAL 955424 MEAN 2618 MAX 17700 MIN 601 AC-FT 1895000 CFSM 1.12 IN. 15.3
WTR YR 1987 TOTAL 565652 MEAN 1550 MAX 7400 MIN 301 AC-FT 1122000 CFSM .67 IN. 9.03

CROW CREEK BASIN

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05422470 CROW CREEK AT BETTENDORF, IA

LOCATION.--Lat 41°33'03", long 90°27'15", in NW1/4 NW1/4 sec.24, T.78 N., R.4 E., Scott County, Hydrologic Unit 07080101, on left bank 200 ft upstream from bridge on Valley Road (old U.S. Highway 67), 3.5 mi east of U.S. Highway 6, and 0.7 mi upstream from mouth.

DRAINAGE AREA.--17.8 mi².

PERIOD OF RECORD.--October 1977 to current year.

GAGE.--Water-stage recorder. Datum of gage is 576.23 ft above NGVD.

REMARKS.--Estimated daily discharges: Nov. 12-14, Dec. 5, 10-13, Jan. 16, 18-24, 29, Feb. 9-10 and 16-20. Records good except those for estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--10 years, 16.0 ft³/s, 12.21 in/yr, 11,590 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,490 ft³/s June 15, 1982, gage height, 10.24 ft; minimum daily, 0.23 ft³/s (corrected) Sept. 10, 11, 26-28, 1978.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 250 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 20	1915	893	6.61	Aug. 26	0445	*1,350	*7.51
Aug. 21	0815	1,120	7.09				

Minimum discharge, 1.10 ft³/s Aug. 1, 2, 3.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	27	24	22	13	9.3	20	18	7.8	18	2.3	1.7	5.2
2	23	21	30	13	8.8	9.7	15	8.0	14	1.9	1.1	4.6
3	22	20	22	13	7.8	7.9	14	7.3	12	1.9	5.0	4.1
4	17	19	19	13	7.6	7.5	13	6.5	11	1.8	4.5	3.7
5	15	17	18	13	6.9	7.6	13	8.1	10	2.0	2.4	3.4
6	12	17	17	13	6.9	7.5	12	6.4	10	2.2	2.5	3.1
7	11	17	29	12	7.0	7.7	13	6.1	10	2.8	2.0	3.1
8	10	17	32	12	6.9	8.0	12	5.7	9.3	1.9	25	3.1
9	7.9	14	31	15	6.6	7.6	12	5.4	8.3	1.6	3.7	2.8
10	7.2	13	27	13	7.6	6.9	12	4.7	7.8	1.6	2.0	2.8
11	7.4	14	30	12	6.0	7.0	13	3.5	8.4	1.7	1.5	2.8
12	13	13	25	12	5.7	6.7	12	3.2	7.4	1.6	1.4	3.0
13	9.8	12	28	12	5.4	7.7	13	3.2	6.2	1.6	1.4	2.7
14	9.4	15	22	14	5.7	7.2	23	3.2	5.3	1.7	10	2.8
15	7.7	13	20	13	5.0	8.7	18	2.9	4.8	8.8	3.4	3.1
16	7.2	13	18	12	4.7	7.5	14	3.0	4.5	3.0	4.2	4.9
17	6.6	13	18	14	7.4	6.9	13	3.1	4.3	2.4	7.7	5.5
18	7.2	16	17	13	7.0	8.3	12	3.2	3.8	2.1	5.9	3.8
19	6.7	14	17	12	6.0	7.7	12	4.2	4.0	2.2	8.4	3.4
20	6.5	17	16	11	6.6	6.9	11	156	6.9	1.8	12	3.3
21	6.0	14	15	13	5.1	6.6	10	101	5.4	8.2	349	3.3
22	5.3	14	15	12	5.3	6.4	11	41	3.5	11	34	3.3
23	5.7	15	15	12	5.0	6.9	11	34	3.1	3.7	14	3.3
24	5.9	14	14	15	5.0	10	10	30	3.1	2.4	5.6	3.4
25	22	14	15	14	4.8	15	9.6	28	5.6	2.2	28	3.6
26	56	14	16	14	4.8	9.8	9.5	26	3.5	1.9	569	3.6
27	36	13	16	12	4.8	8.9	11	23	2.7	1.9	34	3.4
28	32	13	15	11	7.3	11	8.7	20	2.5	2.0	15	4.2
29	28	13	14	10	---	45	8.8	18	2.4	1.4	11	6.2
30	27	12	14	11	---	24	7.8	16	5.2	1.5	8.0	4.1
31	25	---	13	8.4	---	20	---	16	---	3.0	6.3	---
TOTAL	482.5	455	620	387.4	177.0	328.6	372.4	602.5	203.0	86.1	1179.7	109.6
MEAN	15.6	15.2	20.0	12.5	6.32	10.6	12.4	19.4	6.77	2.78	38.1	3.65
MAX	56	24	32	15	9.3	45	23	156	18	11	569	6.2
MIN	5.3	12	13	8.4	4.7	6.4	7.8	2.8	2.4	1.4	1.1	2.7
AC-FT	957	902	1230	768	351	652	739	1200	403	171	2340	217
CFSM	.87	.85	1.12	.70	.36	.60	.70	1.09	.38	.16	2.14	.21
IN.	1.01	.95	1.30	.81	.37	.69	.78	1.26	.42	.18	2.47	.23

CAL YR 1986 TOTAL 6313.2 MEAN 17.3 MAX 250 MIN .98 AC-FT 12520 CFSM .97 IN. 13.2
WTR YR 1987 TOTAL 5003.8 MEAN 13.7 MAX 569 MIN 1.1 AC-FT 9920 CFSM .77 IN. 10.5

IOWA RIVER BASIN

05449000 EAST BRANCH IOWA RIVER NEAR KLEMME, IA

LOCATION.--Lat 43°00'31", long 93°37'42", in NE1/4 NW1/4 sec.36, T.95 N., R.24 W., Hancock County, Hydrologic Unit 07080207, on left bank 15 ft upstream from bridge on county highway B55, 1.2 mi west of Chicago, Rock Island and Pacific Railroad crossing in Klemme, 1.5 mi upstream from Drainage ditch 9, 18.2 mi upstream from confluence with West Branch Iowa River, and at mile 341.0.

DRAINAGE AREA.--133 mi².

PERIOD OF RECORD.--April 1948 to September 1976, June 1977 to current year. Prior to October 1958, published as East Fork Iowa River near Klemme.

REVISED RECORDS.--WSP 1438: Drainage area. WDR IA-80-1: 1978.

GAGE.--Water-stage recorder. Datum of gage is 1,179.33 ft above NGVD. Apr. 1, 1948, to Sept. 30, 1955, nonrecording gage at site 0.6 mi upstream at datum 0.80 ft higher. Oct. 1, 1955, to Sept. 30, 1969, at present site at datum 0.31 ft lower.

REMARKS.--Estimated daily discharges: Nov. 11-17 and Dec. 4 to Feb. 15. Records good except those for estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--38 years (water years 1948-76, 1978-87), 67.3 ft³/s, 6.87 in/yr, 48,760 acre-ft/yr; median of yearly mean discharges, 54 ft³/s, 5.5 in/yr, 39,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,960 ft³/s June 19, 1954, gage height, 11.2 ft, from flood-mark, site and datum then in use; maximum gage height, 10.67 ft Apr. 6, 1965 (corrected), backwater from ice; minimum daily discharge, 0.2 ft³/s Feb. 22-26, 1959.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1944 reached a stage of about 10 ft, from information by local residents, former site and datum.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 700 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 12	2345	*730	*8.19	No other peak greater than base discharge.			

Minimum discharge, 7.8 ft³/s Aug. 31, Sept. 5.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	127	86	79	35	34	21	126	59	25	9.7	8.7	8.1
2	107	85	81	34	35	26	136	59	25	9.9	8.7	8.2
3	173	87	78	33	36	24	136	55	19	9.7	9.6	8.2
4	296	81	76	32	34	26	129	49	18	9.6	9.8	8.3
5	295	80	72	31	35	30	122	47	17	9.8	8.5	8.3
6	208	79	66	30	35	32	114	47	17	9.7	8.4	10
7	165	77	60	30	33	37	101	45	16	9.2	8.6	8.9
8	137	81	50	31	32	38	91	43	16	9.7	11	11
9	116	73	45	34	28	32	83	42	15	15	9.4	8.7
10	107	70	39	38	26	33	78	41	15	11	8.6	8.4
11	217	64	34	43	24	34	76	39	16	10	8.4	9.1
12	664	58	38	40	22	33	72	34	15	25	9.3	8.7
13	708	55	42	35	19	38	70	35	14	20	11	9.4
14	595	60	45	31	22	41	78	39	13	15	10	11
15	458	64	49	28	30	40	138	29	13	63	9.2	20
16	334	70	49	26	55	39	166	29	12	44	10	14
17	250	64	47	25	51	41	144	29	13	22	9.5	13
18	202	58	46	24	48	46	125	29	13	16	9.1	11
19	176	89	44	24	48	47	116	28	12	15	8.9	11
20	160	154	43	25	38	53	103	26	12	13	8.9	11
21	146	107	42	25	39	59	89	25	12	12	9.0	10
22	136	71	40	26	20	62	87	20	12	11	8.9	10
23	128	56	38	23	19	65	86	19	11	10	8.7	9.7
24	120	65	36	23	19	69	79	19	11	10	8.6	9.8
25	116	60	34	24	19	105	79	22	11	9.8	9.1	9.5
26	111	59	36	24	20	142	74	37	10	9.7	9.6	9.7
27	106	62	36	25	21	129	68	32	9.9	9.7	9.0	9.6
28	101	66	35	27	21	111	64	30	10	9.4	8.7	9.7
29	94	69	34	28	---	105	65	31	10	9.4	8.4	9.2
30	92	75	33	30	---	143	59	29	9.8	8.9	8.3	9.1
31	94	---	35	33	---	134	---	27	---	8.7	8.0	---
TOTAL	6739	2225	1482	917	863	1835	2954	1095	422.7	454.9	281.9	302.6
MEAN	217	74.2	47.8	29.6	30.8	59.2	98.5	35.3	14.1	14.7	9.09	10.1
MAX	708	154	81	43	55	143	166	59	25	63	11	20
MIN	92	55	33	23	19	21	59	19	9.8	8.7	8.0	8.1
AC-FT	13370	4410	2940	1820	1710	3640	5860	2170	838	902	559	600
CFSM	1.63	.56	.36	.22	.23	.45	.74	.27	.11	.11	.07	.08
IN.	1.88	.62	.41	.26	.24	.51	.83	.31	.12	.13	.08	.08

CAL YR 1986	TOTAL 39555.0	MEAN 108	MAX 768	MIN 13	AC-FT 78460	CFSM .81	IN. 11.1
WTR YR 1987	TOTAL 19572.0	MEAN 53.6	MAX 708	MIN 8.0	AC-FT 38820	CFSM .40	IN. 5.47

IOWA RIVER BASIN

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05449500 IOWA RIVER NEAR ROWAN, IA

LOCATION.--Lat 42°45'36", long 93°37'23", in NW1/4 NE1/4 sec.25, T.92 N., R.24 W., Wright County, Hydrologic Unit 07080207, on left bank 10 ft downstream from bridge on county highway C38, 0.9 mi downstream from drainage ditch 123, 3.8 mi northwest of Rowan, 10.7 mi downstream from confluence of East and West Branches, and at mile 316.4.

DRAINAGE AREA.--429 mi².

PERIOD OF RECORD.--October 1940 to September 1976, June 1977 to current year.

REVISED RECORDS.--WSP 1308: 1942-43 (M). WSP 1438: Drainage area. WDR IA-80-1: 1978.

GAGE.--Water-stage recorder. Datum of gage is 1,143.35 ft above NGVD. Prior to Oct. 14, 1948, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Nov. 12-16 and Dec. 9 to Feb. 15. Records good except those for estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--46 years (water years 1941-76, 1978-87), 218 ft³/s, 6.90 in/yr, 157,900 acre-ft/yr; median of yearly mean discharges, 200 ft³/s, 6.3 in/yr, 145,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,460 ft³/s June 21, 1954, gage height, 14.88 ft; minimum daily 2.9 ft³/s Jan. 21-23, 1959.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,200 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 15	0130	*1,680	*10.69	No other peak greater than base discharge.			

Minimum discharge, 27 ft³/s Sept. 4.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	532	329	238	108	81	80	333	179	104	43	34	30
2	440	309	253	103	84	75	351	174	109	41	33	29
3	395	309	254	100	86	76	370	172	107	40	34	29
4	621	305	234	98	82	78	366	158	96	39	35	28
5	852	291	220	96	80	86	353	146	90	39	38	28
6	839	285	258	94	74	93	338	142	86	39	33	30
7	690	277	238	92	72	100	310	140	81	40	31	32
8	536	276	210	89	70	106	276	135	78	41	42	35
9	439	276	180	85	70	106	245	129	74	46	41	37
10	387	258	150	87	70	96	232	126	71	51	39	35
11	534	219	120	92	70	93	221	122	74	47	34	38
12	1250	200	125	96	70	98	215	118	75	73	34	35
13	1540	185	140	92	70	94	205	111	70	80	58	35
14	1640	170	145	88	72	98	220	112	65	76	50	35
15	1650	220	150	86	74	102	388	113	62	78	45	59
16	1480	230	148	82	75	102	572	105	59	117	44	91
17	1250	222	145	78	93	102	585	103	59	96	42	73
18	1010	213	142	74	118	111	496	102	62	73	42	63
19	802	201	140	72	99	135	418	102	62	69	37	55
20	671	179	135	70	85	155	361	99	58	61	35	51
21	594	186	128	70	80	166	331	96	58	53	34	48
22	541	220	123	70	81	177	300	94	57	48	32	46
23	505	214	118	70	79	180	291	93	54	45	32	44
24	472	184	112	70	75	182	276	91	52	42	31	43
25	444	197	109	72	74	201	253	91	53	45	34	40
26	421	205	114	74	74	292	246	108	50	39	36	39
27	400	201	117	76	74	357	230	120	47	38	37	38
28	379	205	111	78	75	330	214	119	46	37	36	36
29	356	214	111	80	---	249	201	121	43	37	34	35
30	336	226	109	80	---	162	192	116	45	36	32	34
31	326	---	110	80	---	267	---	109	---	35	30	---
TOTAL	22332	7006	4887	2602	2207	4549	9389	3746	2047	1644	1149	1251
MEAN	720	234	158	83.9	78.8	147	313	121	68.2	53.0	37.1	41.7
MAX	1650	329	258	108	118	357	585	179	109	117	58	91
MIN	326	170	109	70	70	75	192	91	43	35	30	28
AC-FT	44300	13900	9690	5160	4380	9020	18620	7430	4060	3260	2280	2480
CFSM	1.68	.54	.37	.20	.18	.34	.73	.28	.16	.12	.09	.10
IN.	1.94	.61	.42	.23	.19	.39	.81	.32	.18	.14	.10	.11

CAL YR 1986	TOTAL 136969	MEAN 375	MAX 2000	MIN 63	AC-FT 271700	CFSM .87	IN. 11.9
WTR YR 1987	TOTAL 62809	MEAN 172	MAX 1650	MIN 28	AC-FT 124600	CFSM .40	IN. 5.45

IOWA RIVER BASIN

05451500 IOWA RIVER AT MARSHALLTOWN, IA

LOCATION.--Lat 42°03'57", long 92°54'27", in SE1/4 SE1/4 sec.23, T.84 N., R.18 W., Marshall County, Hydrologic Unit 07080208, on right bank 10 ft downstream from bridge on State Highway 14, 1,500 ft upstream from Burnett Creek, 2.2 mi upstream from Linn Creek and at mile 222.8.

DRAINAGE AREA.--1,564 mi², including that of Burnett Creek.

PERIOD OF RECORD.--October 1902 to September 1903, October 1914 to September 1927, October 1932 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1558: 1915-18, 1919 (M), 1920, 1921-23 (M), 1924-27, 1933, 1934 (M), 1936, 1938, 1947 (M).

GAGE.--Water-stage recorder. Datum of gage is 853.10 ft above NGVD. See WSP 1728 for history of changes prior to Sept. 21, 1934.

REMARKS.--Estimated daily discharges: Oct. 4-6, Jan. 16 to Feb. 17, May 20, 21, 23-25, July 11, 12, Aug. 13-17 and 19. Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers data data collection platform at station.

AVERAGE DISCHARGE.--69 years (water years 1903, 1915-27, 1933-87), 825 ft³/s, 7.16 in/yr, 597,700 acre-ft/yr; median of yearly mean discharges, 730 ft³/s, 6.3 in/yr, 529,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 42,000 ft³/s June 4, 1918, gage height, 17.74 ft, from flood-mark, from rating curve extended above 19,000 ft³/s on basis of velocity-area study; maximum gage height, 19.77 ft March 19, 1979; minimum daily discharge, 4.7 ft³/s Jan. 25, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 5,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 13	0600	5,620	*15.99	Aug. 27	0200	*5,680	15.44

Minimum discharge, 165 ft³/s Aug. 7.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2090	1460	1020	662	460	403	1200	1030	918	275	211	949
2	1880	1430	1160	632	580	469	1360	1000	852	256	197	844
3	1790	1400	1230	612	750	800	1440	1040	814	245	187	743
4	1780	1360	1210	631	720	776	1400	997	744	233	186	662
5	1840	1340	1110	628	680	804	1380	957	703	218	179	603
6	2060	1270	1100	632	640	748	1360	919	657	210	171	563
7	2410	1250	1080	614	610	754	1310	901	607	206	165	647
8	2760	1280	1080	568	580	768	1240	856	523	205	393	621
9	2120	1250	1050	522	530	756	1170	827	465	203	448	544
10	2020	1190	919	562	500	702	1090	835	475	235	340	539
11	2500	1150	847	477	470	676	1010	808	486	556	286	528
12	5220	1110	700	533	450	643	942	770	544	1420	259	492
13	5590	981	750	546	420	619	917	742	946	2040	287	470
14	5250	895	803	662	390	621	1050	724	896	2040	300	454
15	4720	976	933	656	370	848	2190	696	686	1730	316	496
16	4380	1000	949	640	350	1220	2780	667	555	1250	376	600
17	4110	1010	873	620	340	1140	2790	654	497	937	469	658
18	3840	968	785	600	325	1110	2650	654	492	713	553	667
19	3530	906	784	570	341	1490	2490	691	451	771	624	664
20	3180	903	771	550	350	1560	2280	728	434	838	669	635
21	2750	853	790	520	353	1460	1990	565	451	674	649	593
22	2360	851	840	490	332	1340	1750	516	421	576	531	558
23	2110	890	833	460	308	1240	1670	500	382	490	439	535
24	1940	884	844	450	296	1190	1570	504	361	431	354	512
25	1800	946	831	445	289	1170	1450	508	376	393	559	492
26	1990	932	812	445	287	1110	1400	520	425	351	3940	477
27	1910	919	780	445	286	1070	1340	789	368	319	4560	456
28	1770	931	823	445	299	1090	1270	976	333	291	2420	441
29	1640	949	785	445	---	1190	1220	951	315	269	1720	407
30	1530	971	691	450	---	1150	1140	981	298	248	1370	372
31	1470	---	658	450	---	1190	---	1060	---	228	1170	---
TOTAL	84340	32255	27841	16962	12306	30107	46849	24366	16475	18851	24328	17222
MEAN	2721	1075	898	547	439	971	1562	786	549	608	785	574
MAX	5590	1460	1230	662	750	1560	2790	1060	946	2040	4560	949
MIN	1470	851	658	445	286	403	917	500	298	203	165	372
AC-FT	167300	63980	55220	33640	24410	59720	92920	48330	32680	37390	48250	34160
CFSM	1.74	.69	.57	.35	.28	.62	.99	.50	.35	.39	.50	.37
IN.	2.01	.77	.66	.40	.29	.72	1.11	.58	.39	.45	.58	.41

CAL YR 1986 TOTAL 579436 MEAN 1587 MAX 8540 MIN 290 AC-FT 1149000 CFSM 1.02 IN. 13.8
WTR YR 1987 TOTAL 351902 MEAN 964 MAX 5590 MIN 165 AC-FT 698000 CFSM .62 IN. 8.37

IOWA RIVER BASIN

81

05451700 TIMBER CREEK NEAR MARSHALLTOWN, IA

LOCATION.--Lat 42°00'25", long 92°51'15", in SE1/4 SW1/4 sec.8, T.83 N., R.17 W., Marshall County, Hydrologic Unit 07080208, on left bank 20 ft downstream from bridge on U.S. Highway 30, 3.5 mi upstream from mouth, and 4.1 mi southeast of court house in Marshalltown.

DRAINAGE AREA.--118 mi².

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

REVISED RECORDS.--WSP 1708: 1950-55, 1957-59.

GAGE.--Water-stage recorder. Datum of gage is 849.44 ft above NGVD.

REMARKS.--Estimated daily discharges: Oct. 12-15 and Jan. 10 to Feb. 7. Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers data collection platform at station.

AVERAGE DISCHARGE.--38 years, 75.3 ft³/s, 8.66 in/yr, 54,550 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,000 ft³/s Aug. 16, 1977, gage height, 17.69 ft; no flow for a few days in 1956 and 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1947 reached a stage of 16.8 ft, discharge, 5,700 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 5	0100	*943	*9.38				

Minimum discharge, 20 ft³/s Aug. 7, 8.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	583	166	87	59	54	59	151	95	106	37	24	205
2	436	150	114	58	52	55	170	91	96	33	23	185
3	374	146	117	60	44	100	156	98	87	30	22	165
4	367	135	107	55	40	264	142	104	79	30	22	150
5	377	132	103	55	37	338	132	95	74	30	22	137
6	329	126	100	57	33	123	123	90	68	29	21	131
7	294	120	104	54	34	96	112	88	65	29	21	127
8	267	121	103	52	38	86	103	84	61	32	22	117
9	239	112	94	54	41	76	99	82	59	35	29	108
10	217	111	93	64	40	67	94	78	58	35	28	103
11	212	102	128	58	38	66	89	76	60	33	25	101
12	680	104	121	45	36	63	85	72	61	160	23	96
13	540	119	111	33	36	61	84	69	57	88	39	93
14	450	132	115	38	41	60	133	68	53	62	59	88
15	350	104	102	41	33	65	222	64	49	58	72	85
16	249	90	102	44	38	62	228	62	47	62	75	86
17	225	87	94	49	58	60	216	60	45	56	77	91
18	212	92	84	44	53	74	187	58	45	50	83	88
19	205	86	78	42	45	83	166	62	45	46	99	84
20	192	88	74	42	34	80	150	62	47	42	98	81
21	186	78	70	45	33	76	144	60	49	39	92	79
22	184	84	70	42	32	72	145	58	47	36	85	76
23	178	91	70	43	29	69	145	56	45	34	77	73
24	179	82	68	50	30	71	133	55	43	32	69	70
25	200	84	67	54	29	78	125	54	95	31	68	67
26	240	92	64	56	29	70	118	66	54	29	139	65
27	209	87	62	59	29	69	110	91	46	28	488	63
28	192	86	62	58	34	70	104	95	42	27	453	61
29	176	84	63	58	---	127	99	95	40	26	330	60
30	168	84	63	54	---	142	98	90	39	25	281	59
31	159	---	60	52	---	139	---	109	---	24	236	---
TOTAL	8869	3175	2750	1575	1070	2921	4063	2387	1762	1308	3202	2994
MEAN	286	106	88.7	50.8	38.2	94.2	135	77.0	58.7	42.2	103	99.8
MAX	680	166	128	64	58	338	228	109	106	160	488	205
MIN	159	78	60	33	29	55	84	54	39	24	21	59
AC-FT	17590	6300	5450	3120	2120	5790	8060	4730	3490	2590	6350	5940
CFSM	2.42	.90	.75	.43	.32	.80	1.15	.65	.50	.36	.88	.85
IN.	2.80	1.00	.87	.50	.34	.92	1.28	.75	.56	.41	1.01	.94

CAL YR 1986	TOTAL 61210	MEAN 168	MAX 2420	MIN 20	AC-FT 121400	CFSM 1.42	IN. 19.3
WTR YR 1987	TOTAL 36076	MEAN 98.8	MAX 680	MIN 21	AC-FT 71560	CFSM .84	IN. 11.4

IOWA RIVER BASIN

05451900 RICHLAND CREEK NEAR HAVEN, IA

LOCATION.--Lat 41°53'58", long 92°28'27", in SE1/4 NE1/4 sec.21, T.82 N., R.14 W., Tama County, Hydrologic Unit 07080208, on right bank 5 ft upstream from bridge on county highway, 0.6 mi northeast of Haven, and 2.8 mi upstream from mouth.

DRAINAGE AREA.--56.1 mi².

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

REVISED RECORDS.--WSP 1708: 1950-55, 1956 (M), 1957, 1958 (M), 1959.

GAGE.--Water-stage recorder. Datum of gage is 788.69 ft above NGVD. Prior to Oct. 1, 1971, at datum 10.00 ft higher.

REMARKS.--Estimated daily discharges: Nov. 13, 14, Dec. 10-15, Jan. 15-31 and Feb. 15-18. Records good except those for estimated daily discharges, which are poor. U.S. Army Corp of Engineers data collection platform at station.

AVERAGE DISCHARGE.--38 years, 36.8 ft³/s, 8.91 in/yr, 26,660 acre-ft/yr; median of yearly mean discharges, 32 ft³/s, 7.8 in/yr, 23,330 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,000 ft³/s May 28, 1974, gage height, 24.00 ft; no flow Jan. 22 to Feb. 2, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1918 reached a stage of 24.3 ft, discharge not determined.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Aug. 26	0945	*825	*15.88				

Minimum discharge, 3.8 ft³/s, Aug. 2.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	221	70	58	30	28	30	115	51	45	16	5.8	22
2	167	65	84	29	26	30	108	50	38	16	5.0	20
3	143	65	78	29	21	45	94	48	35	15	5.4	18
4	171	60	67	28	19	175	82	45	33	14	5.8	16
5	136	58	62	28	19	184	75	44	33	14	5.1	15
6	114	56	59	28	19	70	70	43	31	15	5.2	14
7	105	54	61	26	20	54	66	41	30	14	5.3	14
8	94	67	59	26	19	46	62	40	28	15	22	14
9	84	51	54	27	19	41	59	39	27	18	10	13
10	80	49	41	27	20	37	56	38	27	14	7.2	13
11	92	49	36	26	19	36	56	36	30	13	6.1	13
12	207	46	43	26	18	35	52	34	28	93	6.1	12
13	125	36	45	26	18	35	51	33	25	29	8.1	13
14	106	45	49	29	19	35	176	33	23	20	10	13
15	93	44	44	24	17	43	208	31	22	22	7.9	14
16	86	42	41	18	16	41	144	31	21	18	8.7	17
17	79	40	41	21	14	40	116	30	20	15	8.6	30
18	73	40	41	26	16	50	99	30	20	14	13	18
19	70	39	39	24	18	56	88	30	20	14	7.9	17
20	68	41	37	23	17	52	80	32	22	13	6.5	16
21	65	37	36	22	17	49	77	31	23	12	5.9	15
22	63	39	35	21	17	46	82	27	20	11	5.1	14
23	61	49	36	20	16	45	78	26	19	11	5.0	14
24	59	44	35	20	16	46	72	26	22	11	4.9	14
25	81	43	34	19	16	52	69	28	26	9.8	29	14
26	165	46	33	19	16	49	66	145	20	9.0	457	15
27	118	47	32	19	16	49	62	69	18	8.3	109	15
28	97	48	32	18	19	50	59	54	17	7.9	52	15
29	83	50	31	19	---	224	57	47	17	7.2	38	15
30	75	49	31	22	---	148	52	42	16	6.8	30	14
31	72	---	30	27	---	118	---	43	---	6.4	25	---
TOTAL	3253	1469	1404	747	515	2011	2531	1297	756	502.4	920.6	467
MEAN	105	49.0	45.3	24.1	18.4	64.9	84.4	41.8	25.2	16.2	29.7	15.6
MAX	221	70	84	30	28	224	208	145	45	93	457	30
MIN	59	36	30	18	14	30	51	26	16	6.4	4.9	12
AC-FT	6450	2910	2780	1480	1020	3990	5020	2570	1500	997	1830	926
CFSM	1.87	.87	.81	.43	.33	1.16	1.50	.75	.45	.29	.53	.28
IN.	2.16	.97	.93	.50	.34	1.33	1.68	.86	.50	.33	.61	.31

CAL YR 1986	TOTAL 25884.0	MEAN 70.9	MAX 1340	MIN 7.5	AC-FT 51340	CFSM 1.26	IN. 17.2
WTR YR 1987	TOTAL 15873.0	MEAN 43.5	MAX 457	MIN 4.9	AC-FT 31480	CFSM .78	IN. 10.5

IOWA RIVER BASIN

83

05452000 SALT CREEK NEAR ELBERON, IA

LOCATION.--Lat 41°57'51", long 92°18'47", in NW1/4 NW1/4 sec.36, T.83 N., R.13 W., Tama County, Hydrologic Unit 07080208, at left downstream end of bridge on U.S. Highway 30, 2.0 mi upstream from Hog Run, 3.0 mi south of Elberon, and 9.0 mi upstream from mouth.

DRAINAGE AREA.--201 mi².

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

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1558: 1946.

GAGE.--Water-stage recorder. Datum of gage is 781.58 ft above NGVD (Iowa Highway Commission bench mark). Prior to Oct. 15, 1945 and June 14, 1947 to Feb. 10, 1949, nonrecording gage on upstream side of bridge at present datum.

REMARKS.--Estimated daily discharges: Nov. 13, 14, 28, 29, Dec. 11-18, Jan. 9-13, Jan. 16 to Feb. 3 and Feb. 16-19. Records good except those for Oct. 1-8, Nov. 10-12, 15-27, Nov. 30 to Dec. 10, Dec. 19 to Jan. 8, Jan. 14, 15, Mar. 5, 6, 15-22, Mar. 27 to Apr. 8, Apr. 15, 16 and Apr. 21-25, which are fair, and Nov. 13, 14, 28, 29, Dec. 11-18, Jan. 9-13, Jan. 16 to Feb. 3 and Feb. 16-19, which are poor. U.S. Army Corps of Engineers rain-gage and data collection platform at station.

AVERAGE DISCHARGE.--42 years, 134 ft³/s, 9.05 in/yr, 97,080 acre-ft/yr; median of yearly mean discharges, 120 ft³/s, 8.1 in/yr, 86,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge observed, 35,000 ft³/s June 13, 1947, gage height, 17.6 ft from rating curve extended above 17,000 ft³/s; maximum gage height, 20.00 ft June 15, 1982; minimum daily discharge, 0.85 ft³/s Jan. 31, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 16, 1944, reached a stage of 19.9 ft, from floodmark at downstream side of bridge, discharge, about 30,000 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Aug. 18	1415	1,650	13.56	Aug. 27	1215	*3,580	*15.54

Minimum discharge, 22 ft³/s Aug. 7, 8.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	429	214	210	115	88	97	310	168	125	65	28	215
2	320	203	444	112	110	91	275	170	116	64	27	184
3	290	190	413	115	150	155	246	162	109	61	25	163
4	340	176	326	109	109	230	225	148	101	56	27	149
5	270	157	266	110	93	522	213	142	98	53	25	134
6	232	157	260	112	83	237	201	142	95	53	24	124
7	208	161	254	104	88	179	187	138	90	54	23	121
8	185	273	239	102	91	160	177	131	85	55	55	112
9	167	200	223	90	76	141	168	129	81	59	47	104
10	159	172	129	75	85	119	162	123	80	54	29	99
11	159	158	160	72	82	121	158	119	92	51	26	99
12	360	148	170	80	78	114	152	112	86	251	24	93
13	294	135	155	90	72	114	147	110	78	161	25	88
14	279	130	180	103	78	113	221	110	73	91	46	84
15	237	172	200	82	67	160	545	102	69	247	34	83
16	210	145	165	69	58	281	424	101	66	116	30	88
17	187	140	155	58	52	232	348	100	65	84	57	109
18	172	135	150	65	56	209	272	99	65	71	929	96
19	163	140	144	70	60	289	270	109	64	65	405	87
20	158	144	139	64	64	260	246	106	138	61	143	84
21	155	128	133	62	66	230	222	187	212	56	103	80
22	149	144	137	59	66	203	240	111	117	52	75	76
23	147	157	132	58	62	189	250	102	92	49	63	75
24	161	140	130	56	61	179	236	99	116	50	57	73
25	219	141	128	55	61	182	222	101	102	45	215	70
26	596	144	126	54	60	161	209	380	88	41	2190	69
27	400	146	123	54	61	154	203	255	79	38	2910	68
28	290	145	121	53	64	150	184	188	74	36	721	66
29	260	140	132	58	---	153	185	162	71	34	437	66
30	236	179	118	65	---	348	171	142	67	32	331	64
31	222	---	117	74	---	318	---	133	---	30	262	---
TOTAL	7654	4814	5779	2445	2141	6091	7069	4381	2794	2235	9393	3023
MEAN	247	160	186	78.9	76.5	196	236	141	93.1	72.1	303	101
MAX	596	273	444	115	150	522	545	380	212	251	2910	215
MIN	147	128	117	53	52	91	147	99	64	30	23	64
AC-FT	15180	9550	11460	4850	4250	12080	14020	8690	5540	4430	18630	6000
CFSM	1.23	.80	.93	.39	.38	.98	1.17	.70	.46	.36	1.51	.50
IN.	1.42	.89	1.07	.45	.40	1.13	1.31	.81	.52	.41	1.74	.56

CAL YR 1986 TOTAL 77746 MEAN 213 MAX 4270 MIN 27 AC-FT 154200 CFSM 1.06 IN. 14.4
WTR YR 1987 TOTAL 57819 MEAN 158 MAX 2910 MIN 23 AC-FT 114700 CFSM .79 IN. 10.7

IOWA RIVER BASIN

05452200 WALNUT CREEK NEAR HARTWICK, IA

LOCATION.--Lat 41°50'06", long 92°23'10", in SE1/4 SW1/4 sec.8, T.81 N, R.13 W., Poweshiek County, Hydrologic Unit 07080208, on right bank 5 ft downstream from bridge on county highway V21, 1.2 mi downstream from North Walnut Creek, 4.0 mi northwest of Hartwick, and 6.5 mi upstream from mouth.

DRAINAGE AREA.--70.9 mi².

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

REVISED RECORDS.--WSP 1558: 1950 (P), 1951-57.

GAGE.--Water-stage recorder. Datum of gage is 786.59 ft above NGVD.

REMARKS.--Estimated daily discharges: Nov. 13-15, Dec. 10-14, Jan. 9, 10, Jan. 16 to Feb. 1, Feb. 15-18, Apr. 14-19 and Aug. 27. Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers data collection platform at station.

AVERAGE DISCHARGE.--38 years, 45.7 ft³/s, 8.75 in/yr, 33,110 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,100 ft³/s July 2, 1983, gage height, 16.65 ft, from rating curve extended above 2,600 ft³/s on basis of contracted-opening and flow-over-embankment measurement of peak flow; no flow at times most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1947 reached a stage of 17.7 ft, from information by local residents, discharge not determined.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Aug. 26	unknown	(a)	unknown				

(a) Peak discharge was at least 970 ft³/s before gage stopped working.

Minimum daily discharge, 5.5 ft³/s Aug. 7.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	215	105	79	44	40	47	111	58	82	17	7.2	32
2	174	98	113	44	45	57	97	57	46	17	6.5	28
3	157	95	104	43	40	70	89	56	41	15	6.0	24
4	244	89	91	42	37	90	82	52	37	14	6.1	22
5	176	86	84	42	35	120	86	48	36	15	5.7	20
6	148	81	84	42	35	85	79	48	34	15	5.6	19
7	134	78	89	40	36	74	72	47	33	15	5.5	19
8	120	149	86	40	35	66	67	45	31	27	16	18
9	109	89	78	40	34	57	64	42	29	26	8.4	17
10	103	82	60	40	35	51	61	39	27	17	6.9	16
11	114	75	54	39	34	48	60	37	30	15	6.5	16
12	262	68	60	40	33	46	59	36	28	99	6.2	15
13	157	50	54	40	34	47	56	36	26	31	6.7	15
14	135	55	66	44	33	46	110	36	25	22	9.1	14
15	119	60	61	39	30	57	200	33	23	27	8.7	14
16	112	60	61	26	24	53	150	33	21	21	7.7	16
17	103	58	63	31	21	51	125	32	22	19	8.8	28
18	97	58	61	35	26	65	110	32	23	16	8.7	19
19	92	56	58	33	32	73	100	34	25	16	7.6	17
20	88	57	55	33	31	68	93	48	55	15	6.8	17
21	84	52	53	32	31	65	85	56	33	14	6.7	16
22	81	57	53	31	31	60	88	36	26	13	6.3	14
23	78	75	52	31	30	59	85	35	24	12	6.0	14
24	79	66	51	30	30	60	79	34	31	12	5.8	13
25	135	66	49	29	29	64	77	34	33	11	28	13
26	256	72	48	29	28	60	76	155	23	10	160	13
27	181	71	47	28	29	60	73	74	20	9.7	400	12
28	150	70	47	28	33	62	65	60	19	9.0	69	12
29	130	69	47	28	---	173	65	52	19	8.7	64	12
30	117	68	45	30	---	150	61	47	18	8.2	49	12
31	111	---	45	35	---	125	---	45	---	7.9	38	---
TOTAL	4261	2215	1998	1108	911	2209	2625	1477	920	574.5	983.5	517
MEAN	137	73.8	64.5	35.7	32.5	71.3	87.5	47.6	30.7	18.5	31.7	17.2
MAX	262	149	113	44	45	173	200	155	82	99	400	32
MIN	78	50	45	26	21	46	56	32	18	7.9	5.5	12
AC-FT	8450	4390	3960	2200	1810	4380	5210	2930	1820	1140	1950	1030
CFSM	1.94	1.04	.91	.50	.46	1.01	1.23	.67	.43	.26	.45	.24
IN.	2.24	1.16	1.05	.58	.48	1.16	1.38	.77	.48	.30	.52	.27

CAL YR 1986 TOTAL 30351.0 MEAN 83.2 MAX 1170 MIN 11 AC-FT 60200 CFSM 1.17 IN. 15.9
WTR YR 1987 TOTAL 19799.0 MEAN 54.2 MAX 400 MIN 5.5 AC-FT 39270 CFSM .77 IN. 10.4

IOWA RIVER BASIN

85

05453000 BIG BEAR CREEK AT LADORA, IA

LOCATION.--Lat 41°44'58", long 92°10'55", in SW1/4 SW1/4 sec.7, T.80 N., R.11 W., Iowa County, Hydrologic Unit 07080208, on left bank 10 ft downstream from bridge on county highway V52, 0.4 mi south of Ladora, 1.2 mi downstream from Coats Creek, 2.8 mi upstream from Little Bear Creek, and 8.1 mi upstream from mouth.

DRAINAGE AREA.--189 mi².

PERIOD OF RECORD.--October 1945 to current year. Prior to October 1966, published as Bear Creek at Ladora.

REVISED RECORDS.--WSP 1308: 1947 (M). WSP 1438: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 744.94 ft above NGVD; Oct. 1945 to June 26, 1946, non-recording gage and June 27, 1946 to Sept. 30, 1980, water stage recorder at datum 10.00 ft higher.

REMARKS.--Estimated daily discharges: Nov. 13-15, Dec. 10-16, Jan. 8-13, Jan. 17 to Feb. 1 and Feb. 16-19. Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers data collection platform at station.

AVERAGE DISCHARGE.--42 years, 126 ft³/s, 9.05 in/yr, 91,290 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,500 ft³/s Mar. 30, 1960, gage height, 14.60 ft, datum then in use; maximum gage height, 15.32 ft, datum then in use, Sept. 18, 1977; no flow for several day in 1956 and 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Aug. 26	unknown	*3,150	*20.52	No other peak greater than base discharge.			

Minimum daily discharge, 15 ft³/s Aug. 3.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	719	273	157	109	100	108	308	139	96	42	17	81
2	522	249	234	106	125	107	278	135	93	41	16	73
3	462	239	225	106	114	147	253	130	85	39	15	65
4	481	224	202	104	97	165	230	121	79	36	16	60
5	470	213	189	103	90	395	212	114	74	44	16	57
6	386	204	186	105	90	205	197	113	69	36	17	53
7	351	196	193	100	90	172	187	109	68	36	17	52
8	321	266	202	84	86	164	177	104	64	38	25	50
9	289	210	188	64	72	154	169	101	63	62	29	47
10	268	190	140	68	84	139	163	101	60	52	19	46
11	265	183	120	74	83	131	159	95	60	39	17	46
12	727	176	130	84	78	125	152	88	59	118	17	42
13	460	140	150	98	75	121	146	87	55	100	18	40
14	396	150	140	110	79	115	373	86	53	53	21	39
15	337	165	180	101	72	113	604	81	50	60	23	46
16	305	159	165	66	55	113	392	79	49	53	24	44
17	285	153	149	54	45	110	326	77	48	39	32	208
18	265	153	146	60	49	130	295	76	48	34	22	99
19	254	148	137	68	58	166	257	80	51	32	20	75
20	231	155	133	64	74	153	232	170	50	30	20	66
21	219	141	127	61	74	148	215	206	97	28	20	58
22	210	147	125	59	72	142	219	114	55	27	19	54
23	208	194	124	57	69	139	214	101	49	26	20	53
24	206	177	123	56	69	137	199	96	66	26	20	52
25	245	168	121	55	68	152	184	94	163	24	41	49
26	744	170	117	54	67	146	177	121	66	23	1590	47
27	634	164	114	53	68	144	166	128	54	22	641	46
28	421	161	114	52	72	144	154	108	50	20	225	43
29	354	156	114	56	---	457	152	97	47	20	150	43
30	314	152	112	64	---	415	141	92	45	19	116	41
31	269	---	110	78	---	334	---	95	---	18	95	---
TOTAL	11638	5476	4667	2373	2175	5391	6931	3338	1964	1237	3338	1775
MEAN	375	183	151	76.5	77.7	174	231	108	65.5	39.9	108	59.2
MAX	744	273	234	110	125	457	604	206	163	118	1590	208
MIN	206	140	110	52	45	107	141	76	45	18	15	39
AC-FT	23080	10860	9260	4710	4310	10690	13750	6620	3900	2450	6620	3520
CFSM	1.99	.97	.80	.41	.41	.92	1.22	.57	.35	.21	.57	.31
IN.	2.29	1.08	.92	.47	.43	1.06	1.36	.66	.39	.24	.66	.35

CAL YR 1986 TOTAL 100964 MEAN 277 MAX 4070 MIN 33 AC-FT 200300 CFSM 1.46 IN. 19.9
WTR YR 1987 TOTAL 50303 MEAN 138 MAX 1590 MIN 15 AC-FT 99780 CFSM .73 IN. 9.90

IOWA RIVER BASIN

05453100 IOWA RIVER AT MARENGO, IA

LOCATION.-- Lat 41°48'48" long 92°03'51", in SE1/4 NE1/4 sec.24, T.81 N., R.11 W., Iowa County, Hydrologic Unit 07080208, on left bank 5 ft upstream from bridge on State Highway 411, 1.0 mi downstream from Big Bear Creek, 0.8 mi north of Marengo, 4.6 mi upstream from Hilton Creek, and at mile 139.1.

DRAINAGE AREA.--2,794 mi².

PERIOD OF RECORD.--October 1956 to current year. Monthly discharge only for some periods, published in WSP 1728.

REVISED RECORDS.--WSP 1558: 1957.

GAGE.--Water-stage recorder. Datum of gage is 720.52 ft above NGVD.

REMARKS.--Estimated daily discharges: Nov. 14-16, Dec. 13-17, Jan. 1-8 and Jan. 18 to Feb. 9. Records fair except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers data collection platform at station.

AVERAGE DISCHARGE.--31 years, 1,858 ft³/s, 9.03 in/yr, 1,346,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 30,800 ft³/s Mar. 31, 1960, gage height, 19.21 ft; maximum gage height, 19.79 ft July 12, 1969; minimum daily discharge, 24 ft³/s Jan. 29 to Feb. 1, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 6,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 1	0900	6,720	14.70	Aug. 26	2200	*7,500	*15.15
Oct. 19	1800	6,410	14.44				

Minimum discharge, 344 ft³/s Aug. 7, 8.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6610	3330	2080	1300	970	1010	3230	2140	2000	875	473	3830
2	6530	3180	2550	1250	1120	1100	3090	2120	1840	852	438	3000
3	5950	3090	2860	1250	1380	1360	3070	2080	1640	824	406	2510
4	5170	2990	2860	1250	1570	1620	3060	2020	1530	790	380	2160
5	5060	2880	2760	1200	1740	2800	2970	1980	1440	794	366	1930
6	4950	2760	2670	1200	1780	2860	2850	1920	1380	764	357	1770
7	4980	2650	2620	1150	1700	2420	2750	1850	1320	755	349	1640
8	4730	2760	2610	1200	1440	2100	2650	1790	1270	744	393	1570
9	4290	2680	2530	1250	1320	1870	2520	1740	1210	825	454	1590
10	3950	2470	2280	1260	1350	1760	2400	1680	1150	810	560	1490
11	3660	2350	2070	1200	1240	1700	2290	1620	1140	765	554	1430
12	4480	2260	1880	1240	1200	1630	2180	1530	1140	970	488	1360
13	4900	2040	1200	1230	1140	1600	2070	1460	1130	1430	449	1300
14	5340	1800	1050	1290	1120	1570	2330	1410	1160	1750	471	1250
15	5610	1700	1300	1270	1080	1760	3900	1360	1390	2280	691	1210
16	5770	1900	1250	1190	1020	2020	4310	1340	1330	2370	798	1190
17	5950	2040	1450	1120	976	2180	4560	1320	1200	1920	789	1450
18	6150	2070	1590	960	924	2370	4550	1290	1120	1540	875	1490
19	6340	2030	1690	880	937	2630	4310	1310	1070	1310	1780	1420
20	6260	2010	1560	940	945	2700	3960	1570	1160	1160	2250	1370
21	5840	1940	1480	1000	963	2880	3670	1820	1370	1150	1740	1320
22	5230	1890	1610	970	957	2820	3550	1490	1200	1110	1400	1270
23	4490	2020	1510	900	948	2660	3390	1320	1080	990	1190	1210
24	4030	2060	1550	850	927	2510	3230	1310	1050	898	1050	1160
25	3930	2030	1500	805	908	2450	3090	1240	1320	824	1060	1110
26	5390	2010	1440	790	892	2400	2880	1320	1090	761	4850	1070
27	5480	2050	1370	780	887	2290	2690	2040	1020	695	6770	1070
28	4790	2020	1370	770	897	2180	2530	1880	991	635	6420	1090
29	4250	2010	1410	760	---	3070	2430	1880	946	588	6620	1070
30	3790	2030	1330	800	---	3820	2280	1850	906	548	6530	1030
31	3510	---	1290	870	---	3420	---	1810	---	510	5680	---
TOTAL	157410	69050	56720	32925	32331	69560	92790	51490	37593	32237	56631	46360
MEAN	5078	2302	1830	1062	1155	2244	3093	1661	1253	1040	1827	1545
MAX	6610	3330	2860	1300	1780	3820	4560	2140	2000	2370	6770	3830
MIN	3510	1700	1050	760	887	1010	2070	1240	906	510	349	1030
AC-FT	312200	137000	112500	65310	64130	138000	184000	102100	74570	63940	112300	91960
CFSM	1.82	.82	.65	.38	.41	.80	1.11	.59	.45	.37	.65	.55
IN.	2.10	.92	.76	.44	.43	.93	1.24	.69	.50	.43	.75	.62

CAL YR 1986 TOTAL 1144700 MEAN 3136 MAX 12300 MIN 460 AC-FT 2271000 CFSM 1.12 IN. 15.2
WTR YR 1987 TOTAL 735097 MEAN 2014 MAX 6770 MIN 349 AC-FT 1458000 CFSM .72 IN. 9.79

05453510 CORALVILLE LAKE NEAR CORALVILLE, IA

LOCATION.--Lat 41°43'29", long 91°31'40", in SW1/4 NE1/4 sec.22, T.80 N., R.6 W., Johnson County, Hydrologic Unit 07080208, at outlet works at left end of Coralville Dam on Iowa River, 2.3 mi upstream from Rapid Creek, 4.3 mi northeast of Coralville Post Office and at mile 83.3.

DRAINAGE AREA.--3,115 mi².

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

GAGE.--Water-stage recorder. Datum of gage is at NGVD (levels by U.S. Army Corps of Engineers).

REMARKS.--Reservoir is formed by earthfill dam completed in 1957. Storage began in September 1958. Releases controlled by three gates, 8.33 ft wide and 20 ft high, into forechamber of 23-ft diameter concrete conduit through dam. Inlet invert elevation at 646.0 ft. No dead storage. Maximum design discharge through gates is 20,000 ft³/s. Ungated spillway is concrete overflow section 500 ft in length at elevation 712 ft above NGVD, contents, 469,000 acre-ft, surface area, 24,800 acres. Reservoir is used for flood control, low-flow augmentation, conservation and recreation. Normal operation will maintain an elevation of 670 ft Feb. 15 to June 15, surface area, 1,820 acres, 680 ft June 15 to Sept. 25, surface area, 4,900 acres, 683 ft Sept. 25 to Dec. 15, and 680 ft December 15 to Feb. 1 with a minimum release of 150 ft³/s and maximum release of 10,000 ft³/s Dec. 15 to May 1 and 6,000 ft³/s May 1 to Dec. 15. Storage tables for water years 1985-1986 published as day second-feet instead of acre-feet storage.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 472,000 acre-ft July 21, 1969, elevation, 711.85 ft; minimum daily contents, 456 acre-ft Jan. 15, 1975; minimum elevation, 658.77 ft Mar. 10, 1959.

EXTREMES FOR CURRENT YEAR.--Maximum daily contents, 251,000 acre-ft Oct. 29; maximum elevation, 701.5 ft Oct. 29; minimum daily contents, 17,900 acre-ft Mar. 14; minimum elevation, 674.9 ft Mar. 15.

Capacity table (elevation, in feet, and contents, in acre-ft)

655	5,000	683	55,000	700	232,000
670	10,600	685	69,000	705	327,000
675	21,000	690	108,000	710	427,000
680	40,300	695	162,000	712	469,000

RESERVOIR STORAGE (AC-FT), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	111000	248000	55500	36000	36700	20500	22000	19900	37000	35600	39600	73700
2	122000	245000	51000	35800	36700	20700	19900	20200	36600	36500	39400	72600
3	136000	242000	46400	35500	36500	21000	19000	20000	35500	37100	39400	68400
4	148000	239000	42400	35500	36500	21500	19100	19400	34400	37200	39300	63200
5	160000	236000	40200	35600	36700	21400	19500	18900	34900	37100	39300	58700
6	170000	233000	38800	35900	37200	22100	19600	19300	35900	37200	39200	54200
7	180000	229000	37600	35900	37700	21300	19300	21300	36200	37100	39300	51100
8	189000	226000	36500	36000	37400	18800	18500	23700	36200	36700	40400	50200
9	197000	223000	35600	36100	36800	18200	19100	25600	35600	36700	40700	49700
10	201000	219000	35100	36100	36800	18600	19400	27300	35600	36800	41200	49700
11	203000	213000	34300	35700	37000	18800	19600	28800	35900	36700	42100	49600
12	202000	207000	34200	35300	36500	18800	19200	30300	35900	37000	43100	49300
13	203000	198000	35200	35300	35800	18500	19200	31800	35900	36700	44000	49200
14	205000	190000	36100	35300	34800	17900	21000	33200	35900	37000	44700	49500
15	208000	181000	36400	35300	33300	18900	21000	34400	35900	36800	45500	49600
16	210000	172000	36700	35000	31700	19500	21600	35900	36600	36600	46900	51200
17	213000	163000	36900	35000	29800	19800	21700	36200	36900	36300	47900	52000
18	217000	156000	37600	35100	27800	20300	20900	36100	37300	35900	49500	51500
19	220000	148000	37800	34900	25500	19600	20100	36100	38200	35400	50200	50800
20	224000	140000	37100	35000	23600	18900	20200	36900	39100	35200	50800	49900
21	229000	132000	36100	35700	22400	19100	20200	38700	40000	35400	50600	49700
22	233000	124000	35800	36300	21300	19400	19900	39200	39700	36500	49900	49500
23	235000	115000	35400	36800	20200	19500	19400	38200	37900	37600	49800	49500
24	235000	107000	35600	36300	19800	20000	19100	37800	36100	38400	49800	49600
25	238000	98200	36200	36100	19800	20200	19100	38000	34800	38900	52400	49700
26	243000	91400	36600	36200	19600	19900	19500	37700	35000	39300	56000	49600
27	247000	84400	36600	36700	19500	19200	19600	37000	34800	39200	59600	49600
28	250000	77200	36200	36900	20000	18100	19700	36800	34600	39000	63200	49600
29	251000	69200	36000	37000	---	20300	19800	36700	34800	38800	65400	49500
30	249000	61200	35800	36900	---	21300	19400	37300	35100	39300	68200	49100
31	250000	---	36000	36700	---	22600	---	37300	---	39600	71100	---
MEAN	205800	168900	37990	35870	30260	19830	19850	31290	36280	37210	48340	52980
MAX	251000	248000	55500	37000	37700	22600	22000	39200	40000	39600	71100	73700
MIN	111000	61200	34200	34900	19500	17900	18500	18900	34400	35200	39200	49100

CAL YR 1986 MEAN 80790 MAX 251000 MIN 9040
WTR YR 1987 MEAN 60530 MAX 251000 MIN 17900

IOWA RIVER BASIN

05454000 RAPID CREEK NEAR IOWA CITY, IA

LOCATION.--Lat 41°41'19", long 91°29'15", in NE1/4 NE1/4 sec.36, T.80 N., R.6 W., Johnson County, Hydrologic Unit 07080209, on left bank 80 ft upstream from bridge on State Highway 1, 3.5 mi northeast of Iowa City, and 4.7 mi upstream from mouth.

DRAINAGE AREA.--25.3 mi².

PERIOD OF RECORD.--October 1937 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1558: 1941 (M), 1943 (P), 1944 (M), 1946. WSP 1708: 1951 (P), 1952. WDR IOWA 1967: Drainage area.

GAGE.--Water-stage recorder and concrete control with sharp-crested weir. Datum of gage is 673.72 ft above NGVD.

REMARKS.--Estimated daily discharges: Nov. 13-16, Dec. 5, Dec. 10-12, 17, 19-20, 23-25, Dec. 28 to Jan. 28, Feb. 6-8, 14-15 and 21-22. Records good except those for estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--50 years, 16.4 ft³/s, 8.80 in/yr, 11,880 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,100 ft³/s May 23, 1965, gage height, 14.10 ft, from contracted-opening measurement of peak flow; maximum gage height, 14.93 ft July 17, 1972; no flow at times most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 600 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
June 21	0755	*2,610	*12.52	No other peak greater than base discharge.			

Minimum discharge, 0.29 ft³/s, Aug. 6, 7, 8.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	67	31	28	9.7	8.9	37	42	16	36	10	.70	4.7
2	52	28	46	9.6	9.8	19	35	16	13	9.0	.51	4.0
3	43	27	33	9.5	8.6	14	31	16	10	8.1	.45	3.2
4	41	24	27	9.4	7.4	12	28	15	8.3	7.2	.37	2.8
5	35	23	25	9.4	7.2	12	26	13	7.6	7.0	.35	2.5
6	30	22	23	9.3	7.2	12	25	13	6.9	6.6	.32	2.4
7	27	21	35	9.3	7.1	12	23	12	6.3	8.5	.30	2.6
8	24	21	58	9.2	6.9	12	22	12	5.7	6.3	9.5	3.3
9	21	18	58	9.1	6.6	11	21	11	5.1	5.6	2.7	2.0
10	19	18	47	9.0	7.2	9.6	20	11	5.1	5.0	.80	1.8
11	19	17	39	8.9	7.3	9.9	20	10	5.7	4.5	.55	1.9
12	21	16	38	8.8	7.0	9.8	18	9.2	5.3	4.8	.45	1.7
13	30	16	29	8.6	6.9	10	21	9.2	4.5	4.2	.48	1.7
14	32	15	26	8.4	6.8	11	95	9.1	4.0	3.8	.53	1.8
15	26	15	23	8.2	6.6	24	84	8.2	3.4	5.1	.53	3.7
16	23	14	21	8.0	6.2	22	56	8.1	3.1	3.7	.49	9.0
17	21	14	19	7.8	6.2	19	46	8.1	3.0	3.1	.38	33
18	19	15	18	7.5	5.8	28	39	8.0	4.5	2.8	.39	15
19	17	14	17	6.9	5.8	30	34	8.5	88	2.5	.45	10
20	17	15	16	6.2	6.1	26	30	12	39	2.2	.35	8.3
21	16	13	15	5.7	6.3	24	27	11	591	1.9	.96	7.0
22	16	15	14	4.7	6.4	21	26	8.0	43	1.7	1.6	6.1
23	15	20	13	3.9	6.3	20	29	7.7	29	1.5	.64	5.3
24	14	16	12	4.7	6.0	49	25	7.7	24	1.3	.47	4.8
25	32	16	12	5.5	6.5	111	23	8.9	21	1.2	13	4.0
26	136	16	11	6.4	5.9	86	22	8.6	17	1.0	141	3.7
27	65	14	11	7.3	6.2	73	22	17	15	.91	27	3.3
28	50	14	10	8.0	9.9	73	19	25	13	.84	15	3.7
29	42	14	10	8.3	---	108	19	11	12	.84	10	4.0
30	37	13	9.7	8.1	---	61	19	9.5	12	.76	7.5	3.1
31	34	---	9.7	7.4	---	48	---	9.2	---	1.3	5.8	---
TOTAL	1041	535	753.4	242.8	195.1	1014.3	947	349.0	1041.5	123.25	243.57	160.4
MEAN	33.6	17.8	24.3	7.83	6.97	32.7	31.6	11.3	34.7	3.98	7.86	5.35
MAX	136	31	58	9.7	9.9	111	95	25	591	10	141	33
MIN	14	13	9.7	3.9	5.8	9.6	18	7.7	3.0	.76	.30	1.7
AC-FT	2060	1060	1490	482	387	2010	1880	692	2070	244	483	318
CFSM	1.33	.70	.96	.31	.28	1.29	1.25	.44	1.37	.16	.31	.21
IN.	1.53	.79	1.11	.36	.29	1.49	1.39	.51	1.53	.18	.36	.24
CAL YR 1986	TOTAL 14240.07	MEAN 39.0	MAX 1720	MIN 2.9	AC-FT 28250	CFSM 1.54	IN. 20.9					
WTR YR 1987	TOTAL 6646.26	MEAN 18.2	MAX 591	MIN .30	AC-FT 13180	CFSM .72	IN. 9.77					

IOWA RIVER BASIN

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05454300 CLEAR CREEK NEAR CORALVILLE, IA

LOCATION.--Lat 41°40'36", long 91°35'55", in NE1/4 SE1/4 sec.1, T.79 N., R.7 W., Johnson County, Hydrologic Unit 07080209, on left bank about 150 ft upstream from bridge on county highway, 1.1 mi west of post office in Coralville, 1.5 mi downstream from Deer Creek and 2.7 mi upstream from mouth.

DRAINAGE AREA.--98.1 mi².

PERIOD OF RECORD.--October 1952 to current year. Monthly discharge only for some periods, published in WSP 1728.

GAGE.--Water-stage recorder. Datum of gage is 647.48 ft above NGVD (levels by U.S. Army Corps of Engineers). Prior to Jan. 7, 1957, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Nov. 13-15, Dec. 10-16 and Jan. 9 to Feb. 5. Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers data collection platform at station.

AVERAGE DISCHARGE.--35 years, 67.9 ft³/s, 9.40 in/yr, 49,190 acre-ft/yr; median of yearly mean discharges, 60 ft³/s, 8.3 in/yr, 43,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,900 ft³/s (corrected) June 15, 1982, gage height, 14.61 ft; no flow Jan. 18 to Feb. 4, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s) *809	Gage height (ft) *7.73	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Aug. 26	0255						

Minimum discharge, 1.7 ft³/s Aug. 25.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	297	126	74	49	30	81	136	54	49	23	5.3	27
2	207	114	151	47	33	67	117	53	43	22	4.7	24
3	175	110	113	47	37	67	107	52	37	22	4.4	21
4	169	102	97	46	45	57	100	49	34	21	4.0	19
5	156	96	86	46	52	56	95	47	32	20	3.7	18
6	130	91	84	47	58	57	90	47	29	20	3.9	20
7	118	87	107	44	38	56	86	45	28	22	4.0	21
8	108	89	132	43	38	54	82	43	26	19	16	18
9	96	78	128	37	40	53	79	42	24	19	15	15
10	89	74	64	30	39	47	78	40	23	22	10	15
11	87	73	94	27	38	51	77	39	24	19	6.0	15
12	92	71	58	35	35	49	75	37	24	20	6.5	13
13	101	50	98	40	32	49	76	37	21	21	5.6	13
14	120	89	100	36	35	52	131	37	20	19	6.1	13
15	96	78	104	33	31	129	154	34	19	23	6.2	18
16	88	67	96	20	30	97	117	33	17	22	6.6	34
17	81	63	86	19	34	81	106	33	17	18	4.3	184
18	75	65	70	23	32	115	96	32	23	17	5.0	45
19	72	61	66	29	32	146	89	33	28	15	4.5	28
20	70	65	63	36	32	118	85	69	44	14	3.4	23
21	67	58	60	27	33	105	81	117	179	12	3.1	20
22	65	62	59	21	33	94	81	52	51	11	2.6	18
23	64	92	59	18	31	88	91	46	40	10	2.8	17
24	79	77	58	17	33	98	84	43	35	9.8	2.6	17
25	132	71	56	16	32	141	78	44	35	9.1	30	16
26	603	68	54	15	31	116	74	43	36	8.9	643	16
27	315	63	53	16	32	106	74	68	29	8.4	267	16
28	220	62	52	18	37	103	66	91	27	7.7	82	16
29	177	60	52	20	---	214	63	46	25	7.0	53	17
30	151	58	50	23	---	190	56	41	25	6.5	39	17
31	137	---	49	26	---	152	---	53	---	5.9	30	---
TOTAL	4437	2320	2473	951	1003	2889	2724	1500	1044	494.3	1280.3	754
MEAN	143	77.3	79.8	30.7	35.8	93.2	90.8	48.4	34.8	15.9	41.3	25.1
MAX	603	126	151	49	58	214	154	117	179	23	643	184
MIN	64	50	49	15	30	47	56	32	17	5.9	2.6	13
AC-FT	8800	4600	4910	1890	1990	5730	5400	2980	2070	980	2540	1500
CFSM	1.46	.79	.81	.31	.37	.95	.93	.49	.35	.16	.42	.26
IN.	1.68	.88	.94	.36	.38	1.10	1.03	.57	.40	.19	.49	.29

CAL YR 1986	TOTAL 49417.0	MEAN 135	MAX 2700	MIN 19	AC-FT 98020	CFSM 1.38	IN. 18.7
WTR YR 1987	TOTAL 21869.6	MEAN 59.9	MAX 643	MIN 2.6	AC-FT 43380	CFSM .61	IN. 8.29

IOWA RIVER BASIN

05454500 IOWA RIVER AT IOWA CITY, IA

LOCATION.--Lat 41°39'24", long 91°32'27", in SE1/4 SE1/4 sec.9, T.79 N., R.6 W., Johnson County, Hydrologic Unit 07080209, on right bank 25 ft downstream from Hydraulics Laboratory of University of Iowa in Iowa City, 175 ft downstream from University Dam, 0.8 mi upstream from Ralston Creek, 3.6 mi downstream from Clear Creek, and at mile 74.2.

DRAINAGE AREA.--3,271 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1903 to current year. Monthly discharge only for some periods, published in WSP 1308.

GAGE.--Water-stage recorder. Datum of gage is 29.00 ft above Iowa City datum, and 617.27 ft above NGVD. Oct. 1, 1934 to Sept. 30, 1972, at datum 10.00 ft higher. See WSP 1708 for history of changes prior to Oct. 1, 1984.

REMARKS.--No estimated daily discharges. Records excellent. Slight fluctuation at low stages caused by powerplant above station. Flow regulated by Coralville Lake (station 05453510) 9.1 mi upstream, since Sept. 17, 1958. U.S. Army Corps of Engineers data collection platform at station.

AVERAGE DISCHARGE.--84 years, 1,738 ft³/s, 7.22 in/yr, 1,259,000 acre-ft/yr; median of yearly mean discharges, 1,470 ft³/s, 6.1 in/yr, 1,060,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 42,500 ft³/s June 8, 1918, gage height, 19.6 ft from graph based on gage readings, site and datum then in use; minimum daily discharge, 29 ft³/s Oct. 21, 22, 1916, regulated.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of July 17, 1881, reached a stage of 21.1 ft, from floodmarks at site and datum in use 1913-21, from information by local resident, discharge, 51,000 ft³/s. Maximum stage known since at least 1850, about 3 ft higher than that of July 17, 1881, occurred in June 1851, discharge, 70,000 ft³/s, estimated.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 6,100 ft³/s Nov. 19, gage-height, 17.17 ft; minimum daily discharge, 205 ft³/s Aug. 17.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3690	4700	5360	1710	1240	1300	4090	2550	2390	748	536	4510
2	3060	4670	5430	1710	1250	1340	4250	2360	2420	550	589	4520
3	1430	4660	5270	1700	1250	1390	3880	2450	2390	547	545	4510
4	1310	4620	5060	1590	1240	1560	3440	2540	2180	677	453	4470
5	1290	4590	4300	1490	1240	1970	3290	2450	1560	790	429	4270
6	1260	4570	3610	1490	1240	2760	3300	2130	1210	784	429	4070
7	1240	4560	3640	1490	1440	3210	3290	1650	1330	788	400	3580
8	1230	4580	3640	1480	1690	3180	3270	1270	1410	775	427	2390
9	1220	4520	3470	1480	1680	2530	3010	1280	1400	769	377	1910
10	2060	4660	2980	1490	1690	1920	2790	1280	1280	771	313	1780
11	3990	5240	2430	1480	1700	1920	2790	1290	1190	770	256	1640
12	4480	5680	1790	1480	1690	1930	2770	1130	1190	789	212	1630
13	4530	5980	1290	1490	1690	1930	2730	1030	1180	987	211	1560
14	4570	5960	1260	1490	1680	1940	2840	1020	1180	1430	208	1370
15	4510	5920	1430	1480	1820	2010	3440	1020	1170	1800	208	1240
16	4490	5880	1840	1280	1990	2030	4030	1030	1170	2380	208	1260
17	4490	5880	2120	1150	1980	2260	4410	1310	1180	2350	205	1770
18	4490	5920	2210	1150	1960	2750	4890	1550	1200	2060	210	1910
19	4500	5980	2450	1130	1950	3270	4870	1550	1370	1860	555	1970
20	4510	6070	2740	963	1810	3380	4680	1660	1300	1470	1620	1950
21	4530	5990	2730	803	1590	3110	4130	1790	1740	1130	2080	1710
22	4550	5940	2480	787	1500	3110	4040	1940	1720	870	2080	1510
23	4560	5940	2240	828	1480	3120	4070	2030	2100	753	1690	1420
24	4600	5850	2070	872	1290	3180	3870	1750	1890	750	1160	1340
25	4720	5780	1910	865	1090	3290	3570	1580	1730	754	1380	1270
26	5550	5710	1910	793	1090	3220	3280	1700	1460	735	2400	1210
27	5080	5620	1980	797	1080	3180	3150	2200	1230	885	2220	1210
28	4880	5550	2050	912	1110	3170	2950	2470	1170	896	3610	1220
29	4800	5460	1960	1130	---	3200	2790	2230	1010	808	4340	1210
30	4750	5380	1720	1240	---	3430	2780	2010	882	480	4510	1200
31	4730	---	1720	1240	---	3890	---	2110	---	396	4480	---
TOTAL	115100	161860	85090	38990	42460	80480	106690	54360	44632	31552	38341	65610
MEAN	3713	5395	2745	1258	1516	2596	3556	1754	1488	1018	1237	2187
MAX	5550	6070	5430	1710	1990	3890	4890	2550	2420	2380	4510	4520
MIN	1220	4520	1260	787	1080	1300	2730	1020	882	396	205	1200
AC-FT	228300	321000	168800	77340	84220	159600	211600	107800	88530	62580	76050	130100

CAL YR 1986 TOTAL 1375480 MEAN 3768 MAX 9180 MIN 481 AC-FT 2728000
WTR YR 1987 TOTAL 865165 MEAN 2370 MAX 6070 MIN 205 AC-FT 1716000

IOWA RIVER BASIN

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05454500 IOWA RIVER AT IOWA CITY, IA--Continued

WATER-QUALITY RECORDS

LOCATION.--Samples collected at Benton Street bridge at Iowa City, 0.5 mi downstream from gaging station.

PERIOD OF RECORD.--September 1906 to September 1907, water years 1944 to current year.

PERIOD OF DAILY RECORD.--

CHEMICAL ANALYSIS: September 1906 to September 1907, October 1943 to September 1954.

SPECIFIC CONDUCTANCE: October 1968 to September 1987 (discontinued).

WATER TEMPERATURES: January 1944 to September 1987 (discontinued).

SUSPENDED-SEDIMENT DISCHARGE: October 1943 to September 1987 (discontinued).

REMARKS.--Records of specific conductance are obtained from suspended-sediment samples at times of analysis. During periods of partial ice cover, sediment samples are collected in open water channel.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 760 microsiemens Jan. 4, 1984; minimum daily, 150 microsiemens May 17, 1974.

WATER TEMPERATURES: Maximum daily, 32.0°C July 19, 1957, Aug. 24, 25, 1959, June 27, 1971; minimum daily, 0.0°C on many days during winter period.

SEDIMENT CONCENTRATIONS: Maximum daily mean, 7,800 mg/L June 13, 1953; minimum daily mean, 1 mg/L Feb. 4, 1979, Jan. 14, 15, 29, 1984.

SEDIMENT LOADS: Maximum daily, 177,000 tons May 23, 1944; minimum daily, 0.82 ton Jan. 21, 22, 1977.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 610 microsiemens Feb. 5, July 14; minimum daily, 345 microsiemens Aug. 27.

WATER TEMPERATURES: Maximum daily, 27.0°C July 30 to Aug. 1, Aug. 3, 4; minimum daily, 0.0°C on many days during winter period.

SEDIMENT CONCENTRATIONS: Maximum daily mean, 743 mg/L Aug. 26; minimum daily mean, 5 mg/L Jan. 31.

SEDIMENT LOADS: Maximum daily, 5,070 tons Aug. 26; minimum daily, 15 tons Aug 15.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	370	540	600	---	---	---	500	580	520	540	535	365
2	---	---	580	405	550	550	480	---	520	520	---	380
3	---	540	560	555	580	520	480	---	520	540	520	375
4	---	540	580	---	530	540	485	560	505	500	500	---
5	---	540	580	550	610	475	---	545	520	---	440	---
6	400	550	580	570	575	540	500	460	500	520	475	---
7	400	---	---	420	---	540	510	460	---	510	480	---
8	400	560	560	440	---	---	590	500	500	535	---	500
9	400	---	560	540	590	440	475	560	520	520	---	520
10	410	560	580	---	580	435	560	460	535	540	500	520
11	410	560	580	---	520	440	---	---	505	---	480	540
12	---	545	600	480	530	465	---	510	500	---	485	560
13	440	560	580	540	540	500	440	490	---	600	460	---
14	440	560	---	500	520	---	480	460	---	610	460	540
15	440	---	580	590	---	---	510	445	---	555	490	540
16	440	---	470	520	510	505	470	480	---	560	---	500
17	---	560	580	590	525	460	465	---	---	520	480	540
18	---	570	520	---	475	490	---	510	540	500	---	545
19	---	580	540	500	515	485	---	520	570	---	460	545
20	500	580	540	540	500	490	500	530	---	485	440	---
21	520	580	---	480	495	515	500	520	---	480	440	560
22	520	---	450	460	---	---	490	505	535	475	440	460
23	540	---	505	420	---	---	460	---	560	480	---	535
24	560	580	440	490	---	480	440	---	580	475	440	540
25	---	580	---	---	560	510	---	---	595	---	---	540
26	---	600	430	535	540	500	---	495	560	---	375	520
27	535	---	---	500	500	510	500	490	550	485	345	---
28	540	---	---	460	560	---	530	460	---	500	435	565
29	540	---	520	440	---	---	580	500	520	520	---	520
30	---	---	480	560	---	510	500	---	520	540	---	555
31	540	---	420	---	---	500	---	---	---	540	440	---

IOWA RIVER BASIN

05454500 IOWA RIVER AT IOWA CITY, IA--Continued

WATER-QUALITY RECORDS

TEMPERATURE, WATER, DEGREES CENTIGRADE, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18.0	10.0	3.0	---	---	---	5.0	11.0	20.0	24.5	27.0	18.5
2	---	---	2.0	1.0	1.0	1.0	4.0	---	21.0	26.0	---	18.0
3	---	9.0	2.0	1.0	.0	1.0	6.0	---	20.0	22.0	27.0	17.0
4	---	10.0	1.0	---	1.0	---	5.0	13.0	19.0	22.0	27.0	---
5	---	9.0	1.0	6.0	.0	---	---	12.0	20.0	---	23.0	---
6	14.0	10.0	1.0	1.0	.0	---	---	20.0	21.0	23.0	23.0	---
7	15.0	---	---	1.0	---	---	8.0	14.0	---	24.0	26.0	---
8	17.0	8.0	1.0	1.0	---	---	10.0	15.0	22.0	23.0	---	20.0
9	16.0	---	1.0	1.0	.0	---	10.0	16.0	22.0	25.0	---	19.0
10	13.0	7.0	.0	---	.0	1.0	12.0	---	20.0	25.0	24.0	19.0
11	16.0	10.0	.0	---	.0	1.0	---	18.0	21.0	---	25.0	19.0
12	---	1.0	.0	.0	1.0	4.0	---	16.0	23.0	---	23.0	19.0
13	15.0	1.0	.0	1.0	1.0	4.0	12.0	16.0	---	17.0	25.0	---
14	12.0	5.0	---	2.0	1.0	---	12.0	20.0	---	22.0	25.0	18.0
15	12.0	---	1.0	.0	---	---	11.0	16.0	---	22.0	23.0	20.0
16	11.0	---	2.0	.0	1.0	1.0	12.0	17.0	---	23.0	---	20.0
17	---	3.0	2.0	.0	.0	6.0	13.0	---	---	23.0	24.0	20.0
18	---	4.0	1.0	---	.0	5.0	---	19.0	25.0	23.0	---	19.0
19	---	3.0	.0	.0	.0	2.0	---	20.0	25.0	---	23.0	17.0
20	12.0	3.0	1.0	.0	.0	5.0	13.0	20.0	---	26.0	23.0	---
21	13.0	2.0	---	.0	2.0	5.0	16.0	20.0	---	25.0	23.0	16.0
22	13.0	---	1.0	.0	---	---	15.0	18.0	24.0	26.0	23.0	16.0
23	12.0	---	1.0	.0	---	---	---	---	25.0	25.0	---	15.0
24	12.0	2.0	1.0	.0	---	9.0	11.0	---	25.0	26.0	21.0	16.0
25	---	10.0	---	---	3.0	9.0	12.0	---	25.0	---	---	15.0
26	---	3.0	2.0	.0	.0	9.0	---	18.0	23.0	---	18.0	16.0
27	11.0	---	---	.0	.0	9.0	14.0	19.0	21.0	26.0	18.0	---
28	11.0	---	---	1.0	2.0	---	13.5	19.0	---	26.0	20.0	18.0
29	11.0	---	4.0	.0	---	---	16.0	20.0	24.0	26.0	---	11.0
30	---	---	1.0	.0	---	5.0	15.0	---	25.0	27.0	---	16.0
31	11.0	---	1.0	---	---	6.0	---	---	---	27.0	18.0	---

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MEAN CONCENTRATION (MG/L)	LOADS (T/DAY)	MEAN CONCENTRATION (MG/L)	LOADS (T/DAY)	MEAN CONCENTRATION (MG/L)	LOADS (T/DAY)	MEAN CONCENTRATION (MG/L)	LOADS (T/DAY)	MEAN CONCENTRATION (MG/L)	LOADS (T/DAY)	MEAN CONCENTRATION (MG/L)	LOADS (T/DAY)
OCTOBER			NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	144	1430	18	228	47	680	37	171	8	27	35	123
2	82	677	16	202	42	616	36	166	15	51	30	109
3	69	266	15	189	20	285	34	156	15	51	45	169
4	59	209	12	150	21	287	32	137	24	80	51	215
5	54	188	15	186	21	244	15	60	10	33	51	271
6	50	170	15	185	21	205	19	76	10	33	44	328
7	41	137	15	185	20	197	21	84	35	136	45	390
8	43	143	18	223	18	177	19	76	17	78	72	618
9	53	175	18	220	31	290	15	60	12	54	108	738
10	114	857	30	377	27	217	14	56	13	59	117	607
11	66	711	47	665	16	118	13	52	16	73	93	482
12	49	593	69	1060	17	82	20	80	10	46	47	245
13	42	514	60	969	17	59	30	121	8	37	29	151
14	42	518	53	853	18	61	39	157	8	36	39	204
15	40	487	45	719	48	185	16	64	27	133	142	771
16	33	400	38	603	47	233	22	76	12	64	123	674
17	30	364	32	508	33	189	8	25	12	64	110	671
18	27	327	24	384	30	179	9	28	13	69	90	668
19	24	292	36	581	34	225	10	31	14	74	97	856
20	22	268	34	557	21	155	57	148	37	181	52	475
21	22	269	40	647	19	140	77	167	35	150	42	353
22	21	258	37	593	49	328	69	147	34	138	35	294
23	20	246	32	513	47	284	98	219	27	108	33	278
24	18	224	27	426	79	442	60	141	27	94	72	618
25	34	433	22	343	76	392	33	77	12	35	75	666
26	246	3730	19	293	68	351	20	43	17	50	64	556
27	100	1370	18	273	69	369	17	37	15	44	72	618
28	38	501	18	270	32	177	31	76	17	51	68	582
29	24	311	17	251	31	164	42	128	---	---	147	1270
30	23	295	17	247	49	228	10	33	---	---	98	908
31	21	268	---	---	38	176	5	17	---	---	48	504
TOTAL	---	16631	---	12900	---	7735	---	2909	---	2049	---	15412

IOWA RIVER BASIN

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05454500 IOWA RIVER AT IOWA CITY, IA--Continued

WATER-QUALITY RECORDS

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

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)
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	47	519	80	551	74	478	67	135	27	39	87	1060
2	48	551	77	491	72	470	62	92	31	49	72	878
3	44	461	73	483	48	310	52	77	35	52	63	767
4	38	353	74	507	52	306	44	80	37	45	78	941
5	40	355	82	542	48	202	65	139	38	44	103	1190
6	70	624	103	592	42	137	64	135	37	43	88	967
7	68	604	99	441	75	269	64	136	37	40	77	744
8	70	618	57	195	90	343	60	126	37	43	40	258
9	77	626	40	138	57	215	63	131	38	39	28	144
10	83	625	55	190	53	183	58	121	38	32	31	149
11	102	768	58	202	52	167	62	129	38	26	30	133
12	113	845	38	116	50	161	62	132	33	19	23	101
13	108	796	33	92	50	159	64	171	31	18	22	93
14	197	1510	33	91	48	153	68	263	31	17	24	89
15	255	2370	40	110	48	152	116	564	27	15	36	121
16	140	1520	39	108	50	158	163	1050	28	16	53	180
17	144	1710	49	173	60	191	100	634	30	17	121	578
18	123	1620	51	213	92	298	76	423	29	16	71	366
19	115	1510	53	222	154	570	64	321	30	45	45	239
20	122	1540	158	708	164	576	53	210	41	179	41	216
21	108	1200	368	1780	225	1110	47	143	69	388	61	282
22	109	1190	150	786	166	771	43	101	101	567	72	294
23	96	1050	97	532	145	822	34	69	74	338	59	226
24	90	940	100	472	126	643	40	81	48	150	42	152
25	78	752	70	299	108	504	48	98	88	328	45	154
26	76	673	64	294	88	347	55	109	743	5070	40	131
27	70	595	293	1930	74	246	58	139	252	1580	42	137
28	62	494	513	3520	69	218	42	102	197	1920	55	181
29	62	467	77	464	78	213	46	100	132	1550	50	163
30	62	465	62	336	77	183	40	52	99	1210	25	81
31	---	---	67	382	---	---	38	41	83	1000	---	---
TOTAL	---	27351	---	16960	---	10555	---	6104	---	14895	---	11016
TOTAL LOAD FOR YEAR:		144517	TONS.									

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	TEMPER- ATURE WATER (DEG C) (00010)	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	SEDI- MENT, SUS- PENDED (MG/L) (80154)	SEDI- MENT, DIS- CHARGE, SUS- PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
APR						
07...	1100	10.0	3280	68	602	90
JUL						
01...	1100	27.0	879	80	190	90
AUG						
04...	1045	29.5	486	36	47	100
SEP						
01...	1055	19.5	4560	90	1110	98

IOWA RIVER BASIN
05454500 IOWA RIVER AT IOWA CITY, IA--Continued
WATER-QUALITY RECORDS

PARTICLE-SIZE DISTRIBUTION OF SURFACE BED MATERIAL, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	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)
APR 28...	1430	879	6	--	0	2	30
JUN 11...	1235	1190	6	--	0	4	56
JUL 01...	1100	879	7	--	0	5	48
AUG 04...	1055	486	6	0	2	12	44
NOV 06...	1430	4630	6	--	0	1	4
SEP 01...	1255	4560	4	1	2	7	45

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 28...	67	82	90	93	100	--
JUN 11...	92	99	100	--	--	--
JUL 01...	75	84	90	95	100	--
AUG 04...	78	91	94	97	99	100
NOV 06...	43	79	93	96	99	100
SEP 01...	68	77	83	88	97	100

IOWA RIVER BASIN

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05455000 RALSTON CREEK AT IOWA CITY, IA

LOCATION.--Lat 41°39'50", long 91°30'48", in SE1/4 NW1/4 sec. 11, T.79 N., R.6 W., Johnson County, Hydrologic Unit 07080209, on left bank 10 ft upstream from bridge on Rochester Avenue, 1.0 mi northeast of post office in Iowa City and 2.2 mi upstream from mouth.

DRAINAGE AREA.--3.01 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1924 to September 30, 1987 (discontinued).

REVISED RECORDS.--WSP 1508: 1933, 1935-37, 1940-41 (M), 1942, 1943 (M), 1948-51, 1952 (P), 1953, 1954 (M), 1955, WDR IOWA 1967: 1965-66; WDR IA-80-1: 1965(M).

GAGE.--Water-stage recorder and V-notch sharp-crested weir. Datum of gage is 663.27 ft above NGVD (University of Iowa bench mark).

REMARKS.--Estimated daily discharges: Nov. 9-14, Dec. 8-23, Jan. 16-30, Feb. 5-8, 14, July 18, 22-25, July 27 to Aug. 3, Aug. 10, 12, 15-17 and 20-23. Records good except those for estimated daily discharges, which are poor. Retention dam upstream 1,500 feet since 1984.

AVERAGE DISCHARGE.--63 years, 1.77 ft³/s, 7.99 in/yr, 1,280 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,760 ft³/s July 17, 1972, gage height, 9.01 ft; maximum gage height, 9.06 ft July 18, 1956; no flow at times most years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 151 ft³/s, June 19, gage height, 3.87 ft., no flow Aug. 2-7, 17, 21-24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1966 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.2	2.6	4.9	1.1	.95	5.1	3.5	1.3	4.8	.42	.01	.29
2	5.0	2.4	4.4	1.0	1.1	2.1	2.9	1.5	1.5	.38	.00	.23
3	4.3	2.8	2.6	.92	.76	1.7	2.7	1.2	.90	.35	.00	.20
4	4.3	1.9	2.0	.89	.67	1.5	2.4	.99	.65	.25	.00	.16
5	3.2	1.8	1.7	.91	.66	1.4	2.2	.89	.58	.32	.00	.15
6	2.7	1.7	1.9	1.1	.63	1.5	2.1	.85	.51	.26	.00	.26
7	2.3	1.6	3.9	.88	.61	1.4	2.0	.76	.45	.32	.00	.47
8	2.2	1.6	3.5	.88	.60	1.4	1.9	.69	.41	.23	2.3	.22
9	1.8	1.3	3.0	.85	.58	1.2	1.8	.66	.40	.20	.09	.12
10	1.8	1.2	2.1	.99	.70	.89	1.7	.60	.40	.17	.03	.12
11	1.8	1.3	1.8	.88	.76	.98	1.9	.54	.41	.15	.04	.13
12	2.6	1.2	1.5	.97	.70	1.1	1.7	.44	.43	.40	.02	.11
13	5.0	1.1	1.1	1.1	.68	1.2	2.9	.47	.41	.15	.06	.12
14	3.1	1.2	.90	1.3	.62	2.0	19	.49	.41	.16	.04	.93
15	2.2	1.3	1.1	.91	.56	4.3	8.0	.40	.34	.40	.02	1.6
16	2.0	1.4	1.0	.55	.51	2.4	5.0	.37	.29	.12	.01	4.5
17	1.8	1.5	.98	.66	.58	1.9	3.7	.36	.27	.11	.00	3.0
18	1.7	1.7	.94	.56	.56	5.8	3.1	.51	.58	.10	.05	.85
19	1.6	1.4	.92	.48	.54	5.0	2.6	1.4	24	.09	.04	.45
20	1.6	1.7	.90	.43	.53	3.6	2.3	5.9	3.9	.08	.02	.37
21	1.4	1.4	.96	.39	.64	3.3	2.1	2.4	3.7	.07	.00	.32
22	1.4	1.8	1.1	.35	.61	2.7	2.2	.98	1.4	.06	.00	.28
23	1.4	1.9	1.2	.33	.57	2.2	3.5	.77	.87	.06	.00	.24
24	1.5	1.5	1.4	.31	.57	5.1	2.1	.72	.65	.05	.00	.23
25	6.0	1.5	1.3	.30	.57	5.0	1.9	1.5	1.2	.04	7.0	.20
26	21	1.4	1.2	.32	.56	3.6	1.9	1.1	.59	.04	24	.18
27	5.8	1.3	1.2	.37	.61	3.2	2.3	6.6	.47	.03	1.7	.14
28	4.3	1.4	1.2	.43	2.7	4.9	1.6	5.2	.40	.02	.64	.69
29	3.4	1.2	1.2	.53	---	8.2	1.5	1.5	.41	.02	.40	.24
30	2.9	1.2	1.4	.62	---	4.9	1.2	1.4	.42	.02	.36	.18
31	2.7	---	1.2	.66	---	3.9	---	1.1	---	.01	.32	---
TOTAL	111.0	47.3	54.52	21.97	20.13	93.47	93.7	43.59	51.75	5.08	37.15	16.98
MEAN	3.58	1.58	1.76	.71	.72	3.02	3.12	1.41	1.72	.16	1.20	.57
MAX	21	2.8	4.9	1.3	2.7	8.2	19	6.6	24	.42	24	4.5
MIN	1.4	1.1	.90	.30	.51	.89	1.2	.36	.27	.01	.00	.11
AC-FT	220	94	108	44	40	185	186	86	103	10	74	34

CAL YR 1986 TOTAL 1573.73 MEAN 4.31 MAX 119 MIN .23 AC-FT 3120
WTR YR 1987 TOTAL 596.63 MEAN 1.63 MAX 24 MIN .00 AC-FT 1180

IOWA RIVER BASIN

05455000 RALSTON CREEK AT IOWA CITY, IA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--April 1952 to September 1987 (discontinued).

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: April 1968 to September 1987 (discontinued).

WATER TEMPERATURES: October 1960 to September 1987 (discontinued).

SUSPENDED-SEDIMENT DISCHARGE: April 1952 to September 1987 (discontinued).

REMARKS.--Records of specific conductance are obtained from suspended-sediment samples at time of analysis.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 8,000 microsiemens Dec. 24, 1973; minimum daily, 120 microsiemens May 19, 20, 1977.

WATER TEMPERATURES: Maximum daily, 31.0°C July 21, 1968; minimum daily, 0.0°C on many days during winter periods.

SEDIMENT CONCENTRATIONS: Maximum daily mean, 9,300 mg/L Aug. 20, 1975; minimum daily mean, 0 mg/L on many days in 1953-59, 1963-68, 1971, 1975-77, 1980-81, 1983, 1984, 1985, 1987.

SEDIMENT LOADS: Maximum daily, 4,300 tons May 23, 1966; minimum daily, 0 ton on many days most years.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 1,700 microsiemens Jan. 27; minimum daily, 220 microsiemens Aug. 8.

WATER TEMPERATURES: Maximum daily, 27.0°C July 28, 31 and Aug. 1; minimum daily, 0.0°C on many days during winter period.

SEDIMENT CONCENTRATIONS: Maximum daily mean, 3,390 mg/L Apr. 14; minimum daily mean, 0 mg/L Aug. 2-7, 17, 20-24.

SEDIMENT LOADS: Maximum daily, 394 tons June 19; minimum daily, 0 ton July 25 to Aug 7, Aug. 10-12, 14-24.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	460	580	420	420	490	620	380	430	280	480	500	500
2	560	605	500	450	490	500	400	400	480	520	---	---
3	400	560	460	440	450	600	400	440	505	460	---	---
4	480	530	460	440	480	510	460	400	500	470	---	---
5	440	530	410	430	430	540	500	500	460	470	---	---
6	510	640	420	440	420	485	390	440	510	470	---	---
7	470	530	440	600	440	385	385	440	480	460	---	550
8	440	440	420	620	420	390	410	435	460	520	220	555
9	500	420	470	680	435	380	410	440	535	470	560	---
10	520	480	430	780	440	395	400	440	460	460	---	---
11	440	440	420	580	440	400	395	540	450	460	---	---
12	560	440	460	520	435	460	380	440	445	550	---	---
13	540	440	400	500	500	400	390	440	510	515	380	---
14	540	480	400	460	430	380	310	660	470	480	525	---
15	560	440	435	440	420	400	480	460	480	460	540	440
16	460	500	405	450	440	430	---	460	465	440	540	640
17	---	440	410	440	430	390	390	450	480	455	---	700
18	500	450	410	480	420	370	400	560	460	440	---	565
19	420	440	420	625	420	370	460	480	550	480	---	545
20	520	800	410	490	500	400	410	510	560	485	---	560
21	460	460	420	440	510	380	415	560	340	550	---	540
22	540	440	420	440	460	395	520	520	510	460	---	575
23	480	490	420	450	475	380	485	480	480	575	---	---
24	470	420	420	460	460	430	400	500	480	440	---	520
25	480	440	420	530	500	430	520	460	500	580	360	---
26	310	420	420	1600	560	400	390	460	480	505	410	615
27	460	440	440	1700	450	445	420	600	480	460	600	---
28	520	450	420	570	490	375	400	520	470	445	545	555
29	620	430	435	540	---	380	400	480	605	440	560	---
30	490	480	440	620	---	380	410	490	480	465	485	---
31	560	---	430	490	---	380	---	485	---	460	480	---

IOWA RIVER BASIN

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05455000 RALSTON CREEK AT IOWA CITY, IA--Continued

WATER-QUALITY RECORDS

TEMPERATURE, WATER, DEGREES CENTIGRADE, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15.5	10.0	---	2.5	3.0	4.0	7.0	14.0	19.0	20.0	27.0	20.0
2	16.0	6.0	3.0	2.5	2.7	5.0	7.5	15.0	20.0	21.0	---	---
3	18.0	8.5	---	3.0	3.0	6.0	8.0	14.0	16.0	22.0	---	---
4	16.0	8.5	2.2	2.5	3.0	5.7	12.0	10.0	18.0	20.0	---	---
5	15.0	8.5	.0	2.5	3.0	8.0	13.0	12.0	17.0	24.0	---	---
6	10.0	11.0	3.5	3.0	4.0	8.5	14.0	12.0	20.0	21.0	---	---
7	11.0	10.5	4.0	3.0	3.0	11.5	12.0	14.0	21.0	23.0	---	20.0
8	15.0	10.0	---	2.5	2.5	11.0	10.0	12.0	23.0	22.0	22.0	21.0
9	15.0	5.0	4.0	2.5	2.5	6.5	14.0	22.0	16.0	24.0	22.0	---
10	10.0	4.0	1.5	2.0	3.5	7.0	12.0	22.0	18.0	22.0	---	---
11	13.0	2.0	1.5	2.5	4.0	5.0	7.0	21.5	20.0	25.0	---	---
12	12.0	1.0	1.0	3.0	4.0	5.0	11.0	15.0	22.0	24.0	---	---
13	11.0	.0	.0	3.0	3.5	9.0	10.0	15.0	18.0	21.0	24.0	---
14	10.0	2.0	2.0	3.5	3.0	9.0	12.0	20.0	21.0	19.0	24.0	---
15	12.0	1.0	2.5	2.0	2.5	6.0	10.0	16.0	22.0	19.0	24.0	---
16	7.0	3.0	2.0	1.7	2.0	6.0	15.0	16.0	20.0	20.0	24.0	---
17	10.0	5.0	2.0	2.5	2.5	6.5	12.0	22.0	22.0	24.0	---	---
18	9.0	4.0	3.5	1.5	3.5	5.0	11.0	18.0	26.0	25.0	---	---
19	12.0	3.0	3.0	1.5	4.0	5.0	20.0	19.0	22.0	24.0	---	---
20	13.0	4.0	2.5	1.2	2.5	9.0	---	20.0	22.0	26.0	---	---
21	13.0	2.0	2.5	2.0	5.0	10.0	14.0	21.0	20.0	25.0	---	---
22	14.0	3.0	3.0	.0	4.5	10.0	12.0	15.0	20.0	25.0	---	---
23	14.0	3.0	3.0	.0	---	12.0	14.0	12.0	21.0	25.0	---	---
24	14.0	.0	3.0	2.0	5.0	11.0	12.0	12.0	21.0	24.0	---	---
25	12.0	3.0	3.0	1.5	4.7	8.5	11.0	13.0	20.0	25.0	15.0	---
26	10.0	4.0	3.0	.0	5.0	8.0	14.0	15.0	20.0	25.0	17.0	---
27	11.0	4.0	3.0	.0	5.0	8.0	14.0	20.0	21.0	25.0	18.0	---
28	12.0	3.0	3.0	2.0	---	8.0	12.0	17.0	21.0	27.0	20.0	---
29	11.0	3.0	3.5	2.0	---	2.0	13.0	20.0	21.0	25.0	21.0	---
30	13.0	---	3.2	2.0	---	4.0	12.0	20.0	20.0	26.0	19.0	---
31	12.0	---	3.5	2.5	---	5.2	---	20.0	---	27.0	20.0	---

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

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)	LOAD (T/DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	102	2.3	61	.43	109	1.4	40	.12	34	.09	51	.70
2	30	.41	65	.42	74	.88	19	.05	38	.11	49	.28
3	36	.42	54	.41	58	.41	14	.03	33	.07	32	.15
4	47	.55	21	.11	55	.30	8	.02	19	.03	31	.13
5	24	.21	26	.13	44	.20	22	.05	25	.04	42	.16
6	48	.35	73	.34	30	.15	38	.11	30	.05	40	.16
7	34	.21	64	.28	95	1.0	24	.06	24	.04	46	.17
8	36	.21	59	.25	107	1.0	35	.08	32	.05	30	.11
9	51	.25	75	.26	69	.56	45	.10	18	.03	31	.10
10	41	.20	86	.28	52	.29	50	.13	13	.02	33	.08
11	50	.24	82	.29	52	.25	29	.07	12	.02	51	.13
12	52	.37	83	.27	34	.14	29	.08	33	.06	56	.17
13	255	3.4	84	.25	32	.10	33	.10	30	.06	31	.10
14	88	.74	80	.26	38	.09	42	.15	22	.04	66	.36
15	38	.23	77	.27	52	.15	45	.11	35	.05	61	.71
16	29	.16	74	.28	30	.08	32	.05	26	.04	34	.22
17	18	.09	76	.31	21	.06	41	.07	32	.05	27	.14
18	28	.13	114	.52	30	.08	70	.11	24	.04	433	6.8
19	19	.08	67	.25	25	.06	48	.06	46	.07	37	.50
20	30	.13	102	.47	20	.05	50	.06	45	.06	51	.50
21	31	.12	83	.31	32	.08	73	.08	34	.06	26	.23
22	39	.15	88	.43	39	.12	76	.07	15	.02	14	.10
23	93	.35	87	.45	50	.16	56	.05	25	.04	22	.13
24	91	.37	57	.23	45	.17	31	.03	28	.04	77	1.1
25	195	3.2	68	.28	49	.17	34	.03	30	.05	48	.65
26	365	27	80	.30	38	.12	28	.02	29	.04	33	.32
27	47	.74	76	.27	52	.17	38	.04	34	.06	32	.28
28	76	.88	70	.26	70	.23	52	.06	48	.35	94	1.2
29	65	.60	64	.21	63	.20	52	.07	---	---	103	2.3
30	47	.37	57	.18	102	.39	38	.06	---	---	62	.82
31	42	.31	---	---	85	.28	26	.05	---	---	45	.47
TOTAL	---	44.77	---	9.00	---	9.34	---	2.17	---	1.68	---	19.27

IOWA RIVER BASIN
05455000 RALSTON CREEK AT IOWA CITY, IA--Continued
WATER-QUALITY RECORDS
SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

[illegible]

IOWA RIVER BASIN

99

05455010 SOUTH BRANCH RALSTON CREEK AT IOWA CITY, IA

LOCATION.--Lat 41°39'05", long 91°30'27", in SW1/4 NE1/4 sec.14, T.79 N., R.6 W., Johnson County, Hydrologic Unit 07080209, on right bank 60 ft downstream from bridge on Muscatine Avenue in Iowa City, and 1.2 mi upstream from mouth.

DRAINAGE AREA.--2.94 mi².

PERIOD OF RECORD.--October 1963 to current year.

REVISED RECORDS.--WDR IOWA 1966: Drainage area.

GAGE.--Water-stage recorder and V-notch sharp-crested weir. Datum of gage is 678.03 ft above NGVD.

REMARKS.--Estimated daily discharges: Dec. 13, 14, Jan. 2-4, Jan. 16 to Feb. 1 and Feb. 6, 7. Records good except those for estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--24 years, 2.49 ft³/s, 11.50 in/yr, 1,804 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,070 ft³/s July 17, 1972, gage height, 9.47 ft; no flow at times most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of July 14, 1962, reached a stage of 10.5 ft, from flood profile, discharge not determined.

EXTREMES FOR CURRENT YEAR.-- Peak discharges greater than base discharge of 200 ft³/s, and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
June 19	1505	230	5.05	Aug. 26	0115	*237	*5.09

No flow Aug. 2-7, 17, 20-24.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.4	2.3	5.0	.85	.78	3.5	1.9	1.1	1.8	.48	.01	.18
2	5.1	2.0	3.3	.80	1.0	1.7	1.6	1.6	1.1	.46	.0	.19
3	4.4	1.9	2.3	.78	.83	1.3	1.5	.97	.58	.38	.0	.20
4	4.6	1.8	1.9	.76	.75	1.2	1.9	.91	.44	.38	.0	.19
5	3.3	1.7	1.7	.81	.73	1.2	1.8	.77	.33	.43	.00	.15
6	2.8	1.6	1.7	.85	.68	1.2	1.9	.74	.31	.32	.00	.38
7	2.5	1.9	4.1	.77	.62	1.1	1.8	.69	.27	.53	.00	.18
8	2.2	1.9	3.2	.76	.59	1.1	1.6	.69	.21	.29	6.4	.09
9	2.0	1.5	2.5	.79	.60	1.0	1.9	.60	.20	.29	.10	.07
10	1.9	1.3	2.0	.82	.65	.89	1.8	.51	.20	.27	.03	.07
11	1.9	1.3	1.8	.74	.65	1.2	2.1	.44	.21	.21	.04	.14
12	2.7	1.1	1.5	1.1	.62	1.4	1.8	.38	.20	1.4	.01	.25
13	5.7	1.0	1.4	1.2	.62	1.1	4.3	.36	.20	.26	.28	.17
14	3.0	1.1	1.3	1.0	.64	2.8	15	.31	.19	.69	.04	2.6
15	2.3	1.1	1.2	.83	.56	4.0	5.1	.27	.17	1.9	.01	.59
16	2.0	1.2	1.1	.60	.56	2.2	3.5	.30	.16	.25	.01	4.6
17	1.8	1.4	1.0	.74	.57	1.9	2.9	.24	.17	.20	.0	1.1
18	1.7	1.9	.94	.69	.55	6.8	2.5	.77	.33	.25	.17	.42
19	1.5	1.4	.96	.64	.54	4.1	2.3	2.2	26	.20	.01	.38
20	1.5	1.9	.83	.58	.53	3.3	1.9	12	3.1	.18	.00	.36
21	1.3	1.1	.90	.54	.56	2.8	1.8	1.4	1.7	.09	.00	.23
22	1.5	1.5	1.1	.52	.56	2.4	2.0	.72	1.1	.06	.00	.18
23	1.2	1.7	1.1	.50	.59	2.5	3.4	.63	.92	.05	.00	.18
24	1.5	1.3	1.1	.50	.57	6.2	1.8	.68	.77	.04	.00	.23
25	6.8	1.2	1.2	.49	.51	3.8	1.8	2.3	1.4	.04	18	.21
26	14	1.2	1.3	.48	.50	2.3	1.9	1.7	.71	.03	27	.17
27	4.3	1.1	1.4	.50	.48	1.9	2.2	7.2	.56	.03	1.1	.24
28	3.2	1.1	1.1	.50	3.9	4.0	1.6	2.3	.56	.02	.48	.94
29	2.8	.93	.91	.52	---	5.1	1.5	.67	.72	.02	.36	.26
30	2.5	.85	.85	.58	---	2.8	1.3	.61	.60	.01	.25	.16
31	2.3	---	.85	.66	---	2.2	---	.61	---	.01	.19	---
TOTAL	102.7	43.28	51.54	21.90	20.74	78.99	78.4	44.67	45.21	9.77	54.49	15.11
MEAN	3.31	1.44	1.66	.71	.74	2.55	2.61	1.44	1.51	.32	1.76	.50
MAX	14	2.3	5.0	1.2	3.9	6.8	15	12	26	1.9	27	4.6
MIN	1.2	.85	.83	.48	.48	.89	1.3	.24	.16	.01	.00	.07
AC-FT	204	.86	102	43	41	157	156	89	90	19	108	30
CFSM	1.13	.49	.57	.24	.25	.87	.89	.49	.51	.11	.60	.17
IN.	1.30	.55	.65	.28	.26	.99	.99	.57	.57	.12	.69	.19

CAL YR 1986 TOTAL 1447.89 MEAN 3.97 MAX 115 MIN .37 AC-FT 2870 CFSM 1.35 IN. 18.3
WTR YR 1987 TOTAL 566.79 MEAN 1.55 MAX 27 MIN .00 AC-FT 1120 CFSM .53 IN. 7.17

IOWA RIVER BASIN

05455100 OLD MANS CREEK NEAR IOWA CITY, IA

LOCATION.--Lat. 41°36'23", Long. 91°36'56", in SE1/4 SW1/4 NW1/4 sec. 36, T.79 N., R.7 W., Johnson County, Hydrologic Unit 07080209, on left bank 10 ft downstream from bridge on county highway W62, 5 miles southwest of Iowa City, 5.9 miles upstream of Dirty Face Creek, and 8.6 miles upstream from mouth.

DRAINAGE AREA.--201 mi².

PERIOD OF RECORD.--October 1950 to September 1984, published in WSP 1914. Annual maximum, water years 1965-84. Occasional low-flow measurements, water years 1964-77, October 1984 to current year.

GAGE.--Water-stage recorder. Datum of gage is 639.49 ft. above NGVD. Prior to Nov. 16, 1984, nonrecording gage at same datum.

REMARKS.--Estimated daily discharges: Nov. 13-16, Dec. 11-15, Dec. 23 to Jan. 2, Jan. 17 to Feb. 4, Feb. 9, May 31 and June 1. Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers data collection platform at station.

AVERAGE DISCHARGE.--17 years (1951-1964, 1985-1987), 105 ft³/s, 7.09 in/yr, 76,070 acre-ft/yr; median of yearly mean discharges, 98 ft³/s, 6.6 in/yr, 70,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,980 ft³/s May 18, 1986, gage height, 14.03 ft.; minimum discharge 2.6 ft³/s Sept. 20, Oct. 8, 1985.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge, 13,500 ft³, June 15, 1982, gage height, 15.25 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
June 20	2215	*1,660	*9.69	No other peaks greater than base discharge.			

Minimum daily discharge, 3.9 ft³/s Aug. 24.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	722	276	132	88	51	146	258	105	543	65	13	73
2	442	250	267	87	51	140	219	103	216	61	11	63
3	364	235	227	89	51	132	198	102	150	60	11	55
4	356	219	184	88	61	116	184	101	122	53	9.3	48
5	352	203	165	88	72	109	173	92	105	51	9.3	37
6	280	192	165	95	71	107	164	92	95	52	9.1	34
7	245	178	185	87	73	103	155	87	87	52	7.6	29
8	227	181	225	81	73	100	147	83	82	48	18	26
9	197	162	225	77	62	96	141	81	73	46	26	21
10	180	151	176	87	65	85	135	79	68	49	13	18
11	172	150	140	85	62	88	132	75	68	43	8.8	21
12	169	144	170	92	63	87	129	73	67	46	8.3	19
13	185	110	150	86	62	87	127	71	60	55	7.8	15
14	242	120	160	94	66	88	233	70	54	42	8.8	14
15	204	135	155	87	65	130	371	67	50	170	9.5	28
16	186	130	153	50	70	127	262	84	46	100	11	31
17	167	130	150	48	61	113	223	63	44	52	7.9	313
18	156	136	142	57	55	164	198	63	71	43	9.2	125
19	152	133	135	63	56	284	182	194	201	39	8.3	86
20	147	135	132	68	54	221	169	512	409	35	7.5	71
21	144	128	124	64	57	191	157	737	981	31	7.2	61
22	138	132	119	60	55	170	153	227	223	28	6.6	53
23	135	185	110	56	55	157	162	152	147	27	5.1	48
24	132	179	105	54	57	159	157	131	125	26	3.9	45
25	191	158	100	51	56	236	143	123	139	27	10	42
26	1200	151	99	49	56	197	135	116	131	24	1450	38
27	879	138	96	48	55	177	130	204	90	21	1260	37
28	509	134	94	47	54	170	119	235	80	19	372	35
29	402	136	90	48	---	399	117	123	76	17	211	36
30	331	131	89	49	---	387	112	105	97	15	140	34
31	307	---	89	50	---	293	---	325	---	13	98	---
TOTAL	9513	4842	4553	2173	1689	5059	5185	4655	4700	1410	3778.2	1556
MEAN	307	161	147	70.1	60.3	163	173	150	157	45.5	122	51.9
MAX	1200	276	267	95	73	399	371	737	981	170	1450	313
MIN	132	110	89	47	51	85	112	63	44	13	3.9	14
AC-FT	18870	9600	9030	4310	3350	10030	10280	9230	9320	2800	7490	3090
CFSM	1.53	.80	.73	.35	.30	.81	.86	.75	.78	.23	.61	.26
IN.	1.76	.90	.84	.40	.31	.84	.96	.86	.87	.26	.70	.29

CAL YR 1986 TOTAL 98152.0 MEAN 272 MAX 5010 MIN 24 AC-FT 196700 CFSM 1.35 IN. 18.4
WTR YR 1987 TOTAL 49113.1 MEAN 135 MAX 1450 MIN 3.9 AC-FT 97420 CFSM .67 IN. 9.09

IOWA RIVER BASIN

101

05455500 ENGLISH RIVER AT KALONA, IA

LOCATION.--Lat 41°27'59", long 91°42'56", in SE1/4 SE1/4 sec.13, T.77 N., R.8 W., Washington County, Hydrologic Unit 07080209, on right bank 30 ft upstream from bridge on State Highway 1, 0.8 mi south of Kalona, 1.1 mi upstream from Camp Creek, 4.5 mi downstream from Smith Creek, and 14.5 mi upstream from mouth.

DRAINAGE AREA.--573 mi².

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

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1558: 1940 (M), 1941. WSP 1708: 1956, 1957 (P), 1958 (P).

GAGE.--Water-stage recorder. Datum of gage is 633.45 ft above NGVD (levels by U.S. Army Corps of Engineers). Prior to Dec. 27, 1939, nonrecording gage 30 ft downstream at same datum.

REMARKS.--Estimated daily discharges: Nov. 11-14, Dec. 8-21, Jan. 9-12 and Jan. 15 to Feb. 4. Records good except those for estimated daily discharges, which are poor. U. S. Army Corps of Engineers gage-height telemeter and data collection platform at station.

AVERAGE DISCHARGE.--48 years, 377 ft³/s, 8.94 in/yr, 273,100 acre-ft/yr; median of yearly mean discharges, 340 ft³/s, 8.1 in/yr, 246,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 20,000 ft³/s Sept. 21, 1965, gage height, 21.45 ft; minimum daily, 0.66 ft³/s Feb. 5-7, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1930 reached a stage of 19.9 ft, from floodmark, from information by local residents, discharge, 18,500 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 26	1900	*4,860	*13.89	No other peaks greater than base discharge.			

Minimum discharge, 0.8 ft³/s Aug. 24, 25.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2800	767	335	246	130	260	754	285	1670	120	18	221
2	1510	709	525	234	160	410	634	275	640	109	15	175
3	1110	653	633	209	190	385	528	279	407	101	12	143
4	1020	615	519	207	180	460	475	251	321	94	11	119
5	1200	565	420	231	222	435	438	231	273	88	9.3	103
6	903	532	440	244	207	518	413	215	246	123	8.3	93
7	715	499	463	237	190	418	389	211	224	135	7.4	82
8	614	492	540	207	194	376	366	200	202	111	18	79
9	525	507	560	165	165	338	346	187	183	95	33	86
10	457	442	410	130	152	286	332	178	167	107	44	67
11	422	400	320	170	160	256	320	167	165	157	24	67
12	510	320	290	200	178	262	311	149	171	125	9.5	67
13	1130	250	260	227	152	257	303	134	159	265	7.0	56
14	932	245	350	249	145	265	453	132	139	249	11	48
15	735	402	450	125	145	263	2220	125	121	209	11	58
16	584	413	430	90	120	250	1670	116	107	519	14	96
17	503	389	395	110	103	239	1030	111	99	264	14	700
18	435	369	380	135	108	271	797	278	94	165	16	1220
19	388	348	355	170	119	518	655	492	172	131	28	459
20	358	344	340	145	133	510	566	1370	383	105	13	298
21	332	343	330	115	136	434	497	2150	997	89	7.3	232
22	310	323	317	90	133	396	471	1070	359	75	4.3	194
23	294	432	316	74	127	364	501	548	222	71	3.0	170
24	337	556	315	62	116	352	496	417	182	72	1.4	153
25	600	458	309	76	114	401	443	364	190	63	21	138
26	3870	422	291	72	115	419	407	345	407	55	2180	124
27	3660	388	271	94	114	382	383	742	220	44	3810	113
28	1830	363	265	110	122	363	350	726	163	33	1570	107
29	1220	355	264	96	---	700	326	449	142	28	641	103
30	975	342	261	90	---	1330	311	356	134	25	410	98
31	853	---	251	110	---	922	---	398	---	22	291	---
TOTAL	31132	13243	11605	4720	4130	13040	17185	12951	8959	3849	9262.5	5669
MEAN	1004	441	374	152	147	421	573	418	299	124	299	189
MAX	3870	767	633	249	222	1330	2220	2150	1670	519	3810	1220
MIN	294	245	251	62	103	239	303	111	94	22	1.4	48
AC-FT	61750	26270	23020	9360	8190	25860	34090	25690	17770	7630	18370	11240
CFSM	1.75	.77	.65	.27	.26	.73	1.00	.73	.52	.22	.52	.33
IN.	2.02	.86	.75	.31	.27	.85	1.12	.84	.58	.25	.60	.37

CAL YR 1986 TOTAL 249767.0 MEAN 684 MAX 10100 MIN 74 AC-FT 495400 CFSM 1.19 IN. 16.2
WTR YR 1987 TOTAL 135745.5 MEAN 372 MAX 3870 MIN 1.4 AC-FT 269300 CFSM .65 IN. 8.81

05455700 IOWA RIVER NEAR LONE TREE, IA

LOCATION.--Lat 41°25'15", long 91°28'25", in NW1/4 NE1/4 s⁶.6, T.76 N., R.5 W., Louisa County, Hydrologic Unit 07080209, on left bank 2,000 ft downstream from new tri-county bridge on county highway W66, 5 mi southwest of Lone Tree, 6.2 mi downstream from English River, and at mile 47.2.

DRAINAGE AREA.--4,293 mi².

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

GAGE.--Water-stage recorder. Datum of gage is 588.16 ft above NGVD. Prior to Dec. 28, 1956, nonrecording gage same site and datum.

REMARKS.--Estimated daily discharges: Dec. 12-15, Jan. 20 to Feb. 2, Feb. 12 to Mar. 19, Mar. 20 to Apr. 6 and Apr. 15-25. Records good except those for estimated daily discharges, which are poor. Flow regulated by Coralville Lake (station 05453510) 36.1 mi upstream since Sept. 17, 1958. U.S. Army Corps of Engineers gage-height telemeter and data collection platform at station.

AVERAGE DISCHARGE.--31 years. 2.915 ft³/s. 9.22 in/yr. 2,112,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 35,700 ft³/s May 19, 1974, gage height, 18.97 ft; maximum gage height, 20.27 ft Sept. 22, 1965; minimum daily discharge, 69 ft³/s; Aug. 4, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 25, 1944, reached a stage of 19.94 ft, discharge not determined, from information by U.S. Army Corps of Engineers.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 10,600 ft³/s Oct. 27, gage height, 13.07 ft; minimum daily discharge, 311 ft³/s Aug. 17.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9490	6320	6200	2450	1950	1600	5600	3410	4890	1190	532	5000
2	7660	6160	6330	2410	2200	1700	5800	3030	4360	957	635	4980
3	5220	6030	6560	2380	2130	1800	5300	2980	3370	847	650	4960
4	3830	5930	6450	2350	1980	2100	4600	3070	3130	822	601	4930
5	3630	5830	6060	2270	1900	2500	4200	3070	2740	966	530	4850
6	3560	5730	5240	2200	1840	3000	4150	2900	1970	1000	512	4560
7	3170	5650	4810	2180	1810	3600	4040	2500	1750	1020	503	4410
8	2960	5580	4910	2160	1910	3900	4020	1940	1860	1030	522	3480
9	2810	5530	5070	2120	2060	3200	3990	1780	1870	966	572	2360
10	2690	5460	4860	2100	2110	2500	3900	1760	1820	944	470	2260
11	3440	5560	4210	2090	2140	2450	3680	1750	1590	942	422	2000
12	4870	5990	2500	2080	2170	2500	3540	1720	1530	953	352	1940
13	5640	6320	1900	2100	2200	2500	3430	1470	1500	975	313	1920
14	6270	6480	1800	2110	2200	2550	3360	1440	1480	1480	315	1770
15	6260	6530	2200	2130	2200	2600	4500	1430	1450	1780	313	1580
16	6020	6620	2490	2100	2300	2700	5600	1400	1420	2680	314	1540
17	5850	6600	2710	2010	2400	2900	6500	1410	1400	3070	311	1980
18	5720	6600	2960	1880	2400	3500	7000	1860	1400	2540	313	3270
19	5630	6600	3040	1810	2350	4130	7200	2540	1620	2340	327	2830
20	5570	6700	3290	1550	2200	4200	6700	3510	2590	1890	850	2490
21	5540	6760	3480	1350	2100	4100	5900	5330	3820	1480	1870	2350
22	5510	6730	3520	1100	1950	4000	5400	4020	3020	1180	2120	1930
23	5490	6740	3280	1150	1900	3900	5100	3120	2510	932	2110	1840
24	5480	6870	3070	1200	1700	3900	5000	2870	2510	847	1430	1680
25	5600	6880	2920	1200	1450	4000	4600	2390	2410	835	1370	1630
26	7530	6740	2770	1200	1400	4000	4300	2310	2160	849	4840	1500
27	10300	6620	2700	1150	1400	3950	4120	2690	1790	758	6550	1470
28	9640	6500	2710	1150	1450	3900	3930	4000	1590	1010	6230	1450
29	7710	6400	2750	1250	---	3900	3710	3340	1450	1150	5250	1460
30	6920	6290	2680	1500	---	4300	3500	2670	1370	815	5240	1420
31	6540	---	2520	1700	---	4900	---	2660	---	584	5060	---
TOTAL	176550	188750	115990	56430	55800	100780	142670	80570	66370	38832	51427	79840
MEAN	5695	6292	3742	1820	1993	3251	4756	2599	2212	1253	1659	2661
MAX	10300	6880	6560	2450	2400	4900	7200	5330	4890	3070	6550	5000
MIN	2690	5460	1800	1100	1400	1600	3360	1400	1370	584	311	1420
AC-FT	350200	374400	230100	111900	110700	199900	283000	159800	131600	77020	102000	158400
CAL YR 1986	TOTAL 1871470		MEAN 5127	MAX 20000	MIN 660	AC-FT 3712000						
WTR YR 1987	TOTAL 11154010		MEAN 3162	MAX 10300	MIN 311	AC-FT 2289000						

IOWA RIVER BASIN

103

05457700 CEDAR RIVER AT CHARLES CITY, IA

LOCATION.--Lat 43°03'45", long 92°40'23", in SE1/4 NE1/4, sec.12, T.9S N., R.16 W., Floyd County, Hydrologic Unit 07080201, on right bank 800 ft downstream from bridge on U.S. Highway 18 (Brantingham Street) in Charles City, 10.6 mi upstream from Gizzard Creek, and at mile 252.9 upstream from mouth of Iowa River.

DRAINAGE AREA.--1,054 mi².

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

GAGE.--Water-stage recorder. Datum of gage is 973.02 ft above NGVD.

REMARKS.--Estimated daily discharges: Oct. 17-27, Nov. 8-21, Nov. 27 to Jan. 11, Jan. 18-29, Feb. 9-14 and Mar. 6-11. Records good except those for estimated daily discharges, which are poor. Occasional minor regulation by dam 0.2 mi upstream from gage. Daily wire-weight gage readings available in district office for period Sept. 13, 1945 to June 30, 1954, at same site and datum. Discharge not published for this period because of extreme regulation of streamflow by power dam 0.2 mi upstream. U.S. National Weather Service gage-height telemeter at station.

AVERAGE DISCHARGE.--23 years, 731 ft³/s, 9.42 in/yr, 529,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 21,000 ft³/s Apr. 7, 1965, gage height, 19.14 ft; maximum gage height, 21.64 ft Mar. 2, 1965, backwater from ice; minimum daily discharge, 60 ft³/s Nov. 23, 1977, Jan. 7, 1978.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Mar. 27, 1961, reached a stage of 21.6 ft, from floodmarks, discharge, 29,200 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,600 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 5	0800	3,770	6.92	Oct. 13	0630	*9,160	*11.87

Minimum discharge, 145 ft³/s July 8.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1710	817	450	330	279	308	680	407	316	199	215	250
2	1430	797	480	325	277	295	681	402	300	189	196	239
3	1450	778	490	325	281	284	664	396	282	182	190	225
4	2880	761	490	330	292	289	626	388	264	164	194	216
5	3690	734	470	330	299	325	596	374	255	158	222	212
6	3010	700	480	340	295	350	575	365	241	156	213	217
7	2220	687	490	340	311	390	548	353	230	154	210	226
8	1780	685	450	320	354	430	518	346	225	158	233	223
9	1500	666	380	300	382	470	492	332	213	177	220	240
10	1310	659	350	300	405	430	471	324	208	239	210	250
11	1490	628	360	320	410	400	462	327	210	307	216	238
12	6030	537	380	359	406	387	458	606	234	372	221	224
13	9030	583	400	383	390	375	430	257	221	314	226	226
14	7260	634	380	358	370	370	437	221	215	477	226	231
15	4320	634	400	325	333	370	458	218	198	507	225	240
16	3050	596	430	264	306	362	469	213	183	383	234	237
17	2500	576	440	234	278	348	472	208	185	324	221	244
18	2100	517	450	260	298	359	467	242	192	297	238	233
19	1900	443	450	290	316	370	441	255	193	291	242	236
20	1700	511	440	330	310	387	420	260	198	268	246	241
21	1550	543	410	270	291	397	407	287	213	248	305	248
22	1400	589	380	300	281	404	405	382	249	226	335	254
23	1300	610	360	310	276	413	431	403	267	211	401	268
24	1200	498	355	320	272	489	476	360	243	206	353	272
25	1140	486	355	300	271	653	480	330	252	212	309	268
26	1090	486	340	290	269	833	480	347	300	270	281	253
27	1000	410	340	280	272	930	474	344	275	308	264	240
28	927	410	340	275	280	874	444	361	242	290	259	231
29	884	430	340	270	---	821	432	371	228	255	252	222
30	836	450	340	278	---	705	420	375	213	238	263	212
31	808	---	340	287	---	686	---	344	---	239	259	---
TOTAL	72495	17855	12560	9543	8804	14504	14814	10398	7045	8019	7679	7116
MEAN	2339	595	405	308	314	468	494	335	235	259	248	237
MAX	9030	817	490	383	410	930	681	606	316	507	401	272
MIN	808	410	340	234	269	284	405	208	183	154	190	212
AC-FT	143800	35420	24910	18930	17460	28770	29380	20620	13970	15910	15230	14110
CFSM	2.22	.56	.38	.29	.30	.44	.47	.32	.22	.25	.24	.23
IN.	2.56	.63	.44	.34	.31	.51	.52	.37	.25	.28	.27	.25

CAL YR 1986	TOTAL 385301	MEAN 1056	MAX 10500	MIN 210	AC-FT 764200	CFSM 1.00	IN. 13.6
WTR YR 1987	TOTAL 190832	MEAN 523	MAX 9030	MIN 154	AC-FT 378500	CFSM .50	IN. 6.74

IOWA RIVER BASIN

05458000 LITTLE CEDAR RIVER NEAR IONIA, IA

LOCATION.--Lat 43°02'05", long 92°30'05", in SW1/4 NE1/4 sec.21, T.95 N., R.14 W., Chickasaw County, Hydrologic Unit 07080201, on left bank 12 ft downstream from bridge on county highway B57, 2.4 mi west of Ionia, 6.4 mi upstream from mouth, and 7.6 mi downstream from Beaver Creek.

DRAINAGE AREA.--306 mi².

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

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1708: 1959.

GAGE.--Water-stage recorder. Datum of gage is 973.35 ft above NGVD.

REMARKS.--No estimated daily discharges. Records good. U.S. National Weather Service gage-height telemeter at station.

AVERAGE DISCHARGE.--33 years, 180 ft³/s, 7.99 in/yr, 130,400 acre-ft/yr; median of yearly mean discharges, 150 ft³/s, 6.7 in/yr, 109,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,800 ft³/s Mar. 27, 1961, gage height, 15.58 ft; minimum daily discharge, 3.0 ft³/s Feb. 4-9, 1959.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 22, 1954, reached a stage of 11.37 ft, discharge, 4,600 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,200 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 5	1245	1,620	7.95	Oct. 19	0015	2,450	9.14
Oct. 13	1430	*5,150	*11.91				

Minimum discharge, 21 ft³/s Aug. 2, 3.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1250	237	136	90	63	111	207	122	89	35	22	32
2	666	233	147	89	66	103	209	117	84	34	22	31
3	726	225	154	81	69	108	206	114	78	33	23	29
4	1300	218	141	91	72	120	199	108	72	31	24	28
5	1580	209	100	88	72	144	193	102	67	30	24	27
6	987	202	144	89	73	168	191	98	62	30	24	27
7	638	196	156	90	80	198	182	95	59	29	25	31
8	518	195	135	86	103	214	170	93	56	30	32	32
9	433	193	123	61	123	202	159	88	53	30	32	31
10	375	184	63	78	138	171	150	85	51	30	31	37
11	607	165	90	81	135	151	144	84	51	32	28	39
12	2280	149	116	90	148	141	141	81	54	51	28	34
13	4480	104	105	93	155	134	133	77	52	41	29	33
14	3270	134	100	90	150	132	133	75	48	38	32	33
15	905	180	100	67	130	133	147	73	45	38	32	36
16	661	171	102	50	109	128	147	69	42	36	35	35
17	549	167	103	71	102	126	142	67	40	33	33	36
18	474	147	104	86	103	127	134	67	41	31	31	39
19	2240	130	103	78	103	137	127	71	40	31	28	43
20	421	133	98	75	101	140	122	78	45	33	28	40
21	349	147	93	73	103	141	118	74	44	33	48	38
22	324	168	91	69	103	142	125	72	42	29	43	39
23	308	162	93	61	101	142	141	72	43	28	43	39
24	297	130	95	57	99	146	172	71	46	28	50	38
25	285	148	97	57	99	206	176	69	44	27	52	36
26	273	149	96	57	98	235	169	76	43	26	48	35
27	261	137	92	58	99	247	157	77	40	25	44	34
28	835	135	93	60	100	237	147	76	39	26	43	33
29	239	137	96	61	---	220	138	76	39	25	39	31
30	227	134	97	62	---	189	130	94	37	24	36	29
31	218	---	92	63	---	198	---	99	---	23	34	---
TOTAL	27976	5019	3355	2302	2897	4991	4709	2620	1546	970	1043	1025
MEAN	902	167	108	74.3	103	161	157	84.5	51.5	31.3	33.6	34.2
MAX	4480	237	156	93	155	247	209	122	89	51	52	43
MIN	218	104	63	50	63	103	118	67	37	23	22	27
AC-FT	55490	9960	6650	4570	5750	9900	9340	5200	3070	1920	2070	2030
CFSM	2.95	.55	.35	.24	.34	.53	.51	.28	.17	.10	.11	.11
IN.	3.40	.61	.41	.28	.35	.61	.57	.32	.19	.12	.13	.12

CAL YR 1986	TOTAL 110093	MEAN 302	MAX 4480	MIN 55	AC-FT 218400	CFSM .99	IN. 13.4
WTR YR 1987	TOTAL 58453	MEAN 160	MAX 4480	MIN 22	AC-FT 115900	CFSM .52	IN. 7.11

IOWA RIVER BASIN

105

05458500 CEDAR RIVER AT JANESVILLE, IA

LOCATION.--Lat 42°38'54", long 92°27'54", in NE1/4SW1/4 sec.35, T.91 N., R.14 W., Bremer County, Hydrologic Unit 07080201, on left bank 300 ft downstream from bridge on county highway at Janesville, 3.6 mi upstream from West Fork Cedar River, and at mile 207.7 upstream from mouth of Iowa River.

DRAINAGE AREA.--1,661 mi².

PERIOD OF RECORD.--October 1904 to Sept. 1906, October 1914 to September 1927, October 1932 to September 1942, October 1945 to current year. Monthly discharge only for some periods, published in WSP 1308. Published as Red Cedar River at Janesville, 1905-6.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1558: 1906 (M), 1915-16 (M), 1917, 1918-19 (M), 1920-27, 1933-37 (M), 1940-42 (M).

GAGE.--Water-stage recorder. Datum of gage is 868.26 ft above NGVD. Prior to July 26, 1919, nonrecording gage at site 1,000 ft downstream at datum 4.0 ft lower. July 26, 1919, to Sept. 30, 1927, Nov. 14, 1932, to Sept 30, 1942, and Apr. 26, 1946, to Nov. 10, 1949, nonrecording gage at county bridge 300 ft upstream at same datum.

REMARKS.--Estimated daily discharges: Dec. 11-22, Jan. 1-4, 8-12, 17-18, 23-25 and 31. Records good except those for estimated daily discharges, which are poor. Diurnal fluctuation during low water caused by powerplant at Waverly, 10 mi upstream. U.S. National Weather Service gage-height telemeter at station.

AVERAGE DISCHARGE.--67 years (water years 1905-06, 1915-27, 1933-42, 1946-87), 870 ft³/s, 7.11 in/yr, 630,300 acre-ft/yr; median of yearly mean discharges, 760 ft³/s, 6.2 in/yr, 551,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 37,000 ft³/s Mar. 28, 1961, gage height, 16.33 ft; minimum daily, 28 ft³/s Oct. 21, 1922.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Mar. 17, 1945, reached a stage of 16.2 ft, from floodmark at site 300 ft upstream, discharge, 34,300 ft³/s. Flood of Mar. 16, 1929, reached a stage of about 16 ft, from information by City of Waterloo, discharge not determined.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 1	1145	5,300	5.66	Oct. 15	0345	*12,600	*10.18
Oct. 6	2030	5,370	5.72				

Minimum discharge, 261 ft³/s July 8.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5190	1580	919	630	479	736	1150	703	647	367	330	395
2	4380	1560	967	600	478	746	1160	693	617	353	347	387
3	2960	1550	1030	580	489	733	1140	668	579	341	352	358
4	2840	1510	1040	590	521	729	1100	650	523	327	339	347
5	3710	1460	963	605	500	846	1050	608	510	316	315	332
6	5100	1420	939	641	537	921	997	539	473	301	320	331
7	4940	1370	945	619	528	997	946	589	468	410	335	321
8	3830	1340	1060	610	551	1080	910	570	436	265	419	331
9	3050	1290	1000	600	587	1140	862	548	419	293	408	331
10	2590	1280	662	560	724	1070	820	541	398	307	357	330
11	2390	1240	600	530	745	989	786	536	407	329	341	358
12	3040	1140	750	560	774	867	756	526	414	521	338	358
13	5770	773	720	592	775	805	760	648	405	580	365	349
14	10400	930	840	638	826	775	766	615	402	499	502	336
15	11900	982	780	599	742	756	785	454	383	565	405	375
16	7680	1230	1100	459	689	742	815	432	365	650	388	379
17	4970	1270	950	430	652	711	824	432	356	577	379	421
18	3860	1130	800	490	615	713	808	430	357	492	379	440
19	3280	1160	900	555	600	749	772	477	357	468	367	408
20	2920	763	800	652	625	758	752	510	374	471	360	410
21	2650	1060	780	721	665	752	771	537	432	416	483	408
22	2490	1150	760	643	665	751	745	528	392	402	622	390
23	2340	1100	792	520	625	742	773	582	406	384	509	388
24	2210	1070	703	470	613	754	785	627	452	355	549	405
25	2140	1020	693	610	610	832	834	627	441	350	550	401
26	2080	899	692	729	585	1070	881	661	419	341	562	388
27	1970	728	693	515	583	1270	869	659	428	354	545	375
28	1850	854	668	479	598	1380	817	651	440	418	491	358
29	1760	931	660	477	---	1400	778	658	413	422	445	356
30	1690	919	655	482	---	1280	737	658	390	391	430	322
31	1600	---	640	480	---	1180	---	671	---	361	422	---
TOTAL	117580	34709	25501	17666	17381	28274	25949	18028	13103	12626	12954	11088
MEAN	3793	1157	823	570	621	912	865	582	437	407	418	370
MAX	11900	1580	1100	729	826	1400	1160	703	647	650	622	440
MIN	1600	728	600	430	478	711	737	430	356	265	315	321
AC-FT	233200	68850	50580	35040	34480	56080	51470	35760	25990	25040	25690	21990
CFSM	2.28	.70	.50	.34	.37	.55	.52	.35	.26	.25	.25	.22
IN.	2.63	.78	.57	.40	.39	.63	.58	.40	.29	.28	.29	.25

CAL YR 1986	TOTAL 626587	MEAN 1717	MAX 14500	MIN 390	AC-FT 1243000	CFSM 1.03	IN. 14.0
WTR YR 1987	TOTAL 334859	MEAN 917	MAX 11900	MIN 265	AC-FT 664200	CFSM .55	IN. 7.50

IOWA RIVER BASIN

05458900 WEST FORK CEDAR RIVER AT FINCHFORD, IA

LOCATION.--Lat 42°37'50", long 92°32'24", in SW1/4 SE1/4 sec 16, T.90 N., R.14 W., Black Hawk County, Hydrologic Unit 07080204, on left bank 100 ft downstream from bridge on county highway C55 at Finchford, 3.2 mi upstream upstream from Shell Rock River, and 5.0 mi upstream from mouth.

DRAINAGE AREA.--846 mi².

PERIOD OF RECORD.--October 1945 to current year. Prior to October 1955, published as West Fork Shell Rock River at Finchford.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1558: 1946 (M), 1947.

GAGE.--Water-stage recorder. Datum of gage is 867.54 ft above NGVD. Prior to June 10, 1955, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Nov. 11-18, Dec. 6 to Jan. 10 and Jan. 19 to Feb. 14. Records good except those for estimated daily discharges, which are poor. An authorized diversion of 2,100 acre-ft is made into Big Marsh, 16 mi upstream from gage, each year between September 1 and November 15. Net effect on daily flows at gage is unknown. U.S. National Weather Service gage-height telemeter at station.

AVERAGE DISCHARGE.--42 years, 516 ft³/s, 8.28 in/yr, 373,800 acre-ft/yr; median of yearly mean discharges, 450 ft³/s, 7.2 in/yr, 326,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 31,900 ft³/s June 27, 1951, gage height, 17.28 ft, from floodmarks; minimum daily, 5.9 ft³/s Feb. 26, 27, 1959.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in March 1929 reached a stage of about 14 ft, from information by local resident, discharge, about 12,800 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 15	1745	*2,620	*10.81	No other peak greater than base discharge.			

Minimum daily discharge, 113 ft³/s Sept. 7.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	540	640	464	280	230	324	547	408	366	163	170	153
2	533	638	497	270	220	340	595	397	336	155	161	139
3	516	623	530	270	220	350	608	432	336	149	156	133
4	604	610	529	280	220	366	618	476	328	143	155	127
5	758	594	475	280	230	437	602	420	306	138	153	121
6	905	573	440	290	240	511	586	395	289	135	149	116
7	885	558	430	280	250	542	576	382	274	133	143	115
8	765	560	400	270	270	544	547	368	260	133	146	120
9	675	544	380	260	300	525	507	356	248	132	155	121
10	604	521	350	250	340	474	472	343	238	138	164	135
11	591	450	310	250	390	426	446	332	237	144	163	133
12	1220	400	330	262	430	398	427	318	233	175	150	128
13	1730	380	350	288	400	379	412	306	228	264	152	129
14	2180	350	360	314	380	366	418	300	218	358	196	132
15	2570	400	360	311	355	363	474	292	206	400	241	141
16	2570	440	360	281	294	359	727	287	195	806	246	177
17	2290	440	350	239	266	360	960	278	187	788	230	293
18	1690	440	340	243	260	370	943	278	185	573	231	326
19	1370	448	330	240	273	406	823	284	185	449	233	307
20	1190	400	320	260	297	451	722	295	187	395	241	280
21	1060	455	320	270	280	481	658	303	190	364	228	260
22	962	498	320	250	278	482	604	289	190	313	207	244
23	887	528	315	220	268	468	574	276	180	275	193	231
24	832	503	310	200	259	459	560	265	178	253	181	223
25	821	613	310	230	251	512	534	262	249	243	178	218
26	810	551	310	260	248	593	510	307	252	234	185	208
27	773	490	310	250	249	667	485	385	234	226	194	201
28	739	479	300	230	256	662	455	390	204	211	203	196
29	704	456	295	210	---	622	438	372	185	198	202	190
30	666	453	290	210	---	521	421	379	172	189	198	183
31	637	---	285	220	---	463	---	404	---	180	188	---
TOTAL	33077	15035	11270	7968	7954	14221	17249	10579	7076	8457	5792	5480
MEAN	1067	501	364	257	284	459	575	341	236	273	187	183
MAX	2570	640	530	314	430	667	960	476	366	806	246	326
MIN	516	350	285	200	220	324	412	262	172	132	143	115
AC-FT	65610	29820	22350	15800	15780	28210	34210	20980	14040	16770	11490	10870
CFSM	1.26	.59	.43	.30	.34	.54	.68	.40	.28	.32	.22	.22
IN.	1.45	.66	.50	.35	.35	.63	.76	.47	.31	.37	.25	.24

CAL YR 1986	TOTAL 292904	MEAN 802	MAX 6810	MIN 150	AC-FT 581000	CFSM .95	IN. 12.9
WTR YR 1987	TOTAL 144158	MEAN 395	MAX 2570	MIN 115	AC-FT 285900	CFSM .47	IN. 6.34

IOWA RIVER BASIN

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05459500 WINNEBAGO RIVER AT MASON CITY, IA

LOCATION.--Lat 43°09'54", long 93°11'33", in NE1/4NW1/4 sec.3, T.96 N., R.20 W., Cerro Gordo County, Hydrologic Unit 07080203, on right bank 650 ft upstream from Thirteenth Street Bridge in Mason City, 0.1 mi downstream from Calmus Creek, and 1.0 mi upstream from Willow Creek, and at mile 275.8 upstream from mouth of Iowa River.

DRAINAGE AREA.--526 mi².

PERIOD OF RECORD.--October 1932 to current year. Prior to December 1932, monthly discharge only, published in WSP 1308. Prior to October 1959, published as Lime Creek at Mason City.

REVISED RECORDS.--WSP 825: 1935-36. WSP 1438: Drainage area. WSP 1558: 1933-37, 1943 (M), 1945, 1948.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,069.59 ft above NGVD. Prior to Oct. 15, 1934, nonrecording gage at datum 6.47 ft lower. Oct. 15 to Nov. 6, 1934, nonrecording gage at different datum, and Nov. 7, 1934, to Mar. 22, 1935, nonrecording gage at present datum.

REMARKS.--Estimated daily discharges: Oct. 1-5, 7, 8, 11-15, 25, 26, Nov. 11-18, Dec. 11 to Jan. 11, Jan. 17 to Feb. 2 and Mar. 20-25. Records good except those for estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--55 years, 265 ft³/s, 6.84 in/yr, 192,000 acre-ft/yr; median of yearly mean discharges, 220 ft³/s, 5.7 in/yr, 159,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,800 ft³/s Mar. 30, 1933, gage height, 15.7 ft, present datum; minimum daily, 2.5 ft³/s Dec. 29-31, 1933, Aug. 5, 1934.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 12	unknown	*3,000	unknown	No other peak greater than base discharge.			

Minimum discharge, 19 ft³/s Sept. 4.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	502	373	282	120	96	115	345	190	108	32	35	23
2	483	360	298	125	105	108	371	185	105	29	29	22
3	550	355	303	125	128	108	366	176	102	28	28	21
4	991	346	283	125	129	112	346	163	96	26	33	20
5	1070	337	239	120	123	126	325	156	87	25	45	22
6	845	326	276	120	120	141	307	151	80	25	33	29
7	584	312	289	115	135	150	291	146	74	26	28	26
8	439	320	266	110	146	152	287	138	68	31	35	27
9	432	305	223	105	125	152	260	134	63	40	35	33
10	380	290	106	100	138	147	243	132	60	48	34	32
11	734	220	140	100	142	144	236	124	60	40	29	36
12	2580	200	170	147	149	139	235	119	60	66	34	35
13	2820	200	165	154	138	137	226	116	55	66	45	40
14	1860	235	160	149	134	136	235	117	51	68	44	46
15	1320	260	160	122	93	136	304	107	45	70	39	52
16	1030	255	155	75	85	133	374	103	41	64	39	48
17	900	250	155	115	106	128	375	100	40	58	38	46
18	817	240	155	115	119	136	343	95	44	50	36	50
19	754	226	150	110	119	150	306	93	43	48	31	47
20	701	241	145	100	118	155	282	100	45	48	29	53
21	645	224	145	90	111	155	260	113	59	42	32	47
22	588	264	140	86	110	167	250	106	62	41	35	44
23	546	263	140	82	107	180	264	101	68	37	33	39
24	516	219	140	82	106	243	262	94	64	34	25	36
25	511	256	135	84	108	355	256	94	57	35	25	34
26	478	259	135	84	108	418	247	124	50	31	29	33
27	437	252	130	85	108	412	232	140	42	29	29	31
28	421	259	130	86	108	389	217	129	38	28	32	30
29	395	262	130	88	---	329	211	128	36	67	28	28
30	375	270	125	90	---	313	203	125	33	56	26	26
31	368	---	125	90	---	316	---	113	---	44	24	---
TOTAL	25072	8179	5595	3299	3314	5982	8459	3912	1836	1332	1017	1056
MEAN	809	273	180	106	118	193	282	126	61.2	43.0	32.8	35.2
MAX	2820	373	303	154	149	418	375	190	108	70	45	53
MIN	368	200	106	75	85	108	203	93	33	25	24	20
AC-FT	49730	16220	11100	6540	6570	11870	16780	7760	3640	2640	2020	2090
CFSM	1.54	.52	.34	.20	.23	.37	.54	.24	.12	.08	.06	.07
IN.	1.77	.58	.40	.23	.23	.42	.60	.28	.13	.09	.07	.07

CAL YR 1986 TOTAL 161193 MEAN 442 MAX 3640 MIN 76 AC-FT 319700 CFSM .84 IN. 11.4
WTR YR 1987 TOTAL 69053 MEAN 189 MAX 2820 MIN 20 AC-FT 137000 CFSM .36 IN. 4.88

IOWA RIVER BASIN

05460000 CLEAR LAKE AT CLEAR LAKE, IA

LOCATION.--Lat 43°08'01", long 93°22'57", in SE1/4 NE1/4 sec.13, T.96 N., R.22 W., Cerro Gordo County, Hydrologic Unit 07080203, at the public bathing beach in the town of Clear Lake near dam across Clear Creek.

DRAINAGE AREA.--22.6 mi².

PERIOD OF RECORD.--May 1933 to current year. No winter records 1933-52. Record fragmentary November 1952 to June 1959.

GAGE.--Water-stage recorder. Datum of gage is 1,222.24 ft above NGVD, and 4.60 ft below crest of spillway of dam at outlet. See WSP 1708 for history of changes prior to June 25, 1959.

REMARKS.--Lake is formed by concrete dam on Clear Creek with ungated overflow spillway 50 ft long at elevation 1,226.84 ft above NGVD. Dam constructed in 1903. A previous outlet works had been constructed in 1887. Lake is used for conservation and recreation. Area of lake is approximately 3,600 acres.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height observed, 5.94 ft July 3, 1951; minimum observed, 1.16 ft Dec. 20, 22-24, 1958.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 5.10 ft Nov. 8; minimum, 3.38 ft Sept. 5.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.69	4.88	4.81	4.76	4.70	4.67	4.80	4.63	4.36	3.93	3.72	3.57
2	4.70	4.87	4.83	4.75	4.71	4.66	4.78	4.61	4.35	3.85	3.70	3.53
3	4.74	4.87	4.83	4.75	4.69	4.66	4.77	4.58	4.33	3.79	3.71	3.51
4	4.79	4.84	4.83	4.75	4.68	4.66	4.77	4.57	4.29	3.76	3.70	3.49
5	4.79	4.84	4.83	4.75	4.69	4.65	4.75	4.57	4.28	3.76	3.67	3.49
6	4.77	4.84	4.82	4.75	4.69	4.66	4.76	4.57	4.26	3.75	3.66	3.48
7	4.77	4.82	4.82	4.75	4.68	4.68	4.76	4.55	4.25	3.74	3.64	3.47
8	4.75	4.96	4.83	4.75	4.68	4.65	4.76	4.55	4.19	3.76	3.69	3.47
9	4.73	4.83	4.83	4.74	4.68	4.63	4.76	4.55	4.15	3.83	3.68	3.47
10	4.73	4.79	4.83	4.74	4.67	4.64	4.75	4.52	4.12	3.81	3.66	3.46
11	4.83	4.79	4.83	4.74	4.67	4.64	4.75	4.49	4.14	3.81	3.64	3.46
12	4.97	4.79	4.81	4.73	4.67	4.64	4.76	4.44	4.13	3.96	3.70	3.46
13	4.97	4.79	4.81	4.73	4.67	4.63	4.74	4.44	4.13	3.95	3.75	3.44
14	4.98	4.77	4.80	4.73	4.66	4.59	4.75	4.46	4.11	3.94	3.76	3.44
15	4.98	4.77	4.80	4.73	4.65	4.60	4.83	4.43	4.07	3.96	3.75	3.45
16	4.99	4.77	4.80	4.73	4.65	4.60	4.84	4.42	4.05	3.96	3.77	3.50
17	4.98	4.77	4.80	4.73	4.65	4.56	4.83	4.40	4.04	3.96	3.76	3.53
18	4.96	4.80	4.79	4.73	4.65	4.58	4.83	4.38	4.05	3.96	3.75	3.52
19	4.96	4.82	4.79	4.73	4.65	4.63	4.79	4.36	4.04	3.96	3.73	3.51
20	4.96	4.84	4.78	4.73	4.64	4.64	4.81	4.38	4.04	3.96	3.70	3.51
21	4.95	4.84	4.78	4.73	4.64	4.65	4.77	4.41	4.03	3.96	3.68	3.49
22	4.94	4.84	4.78	4.73	4.65	4.60	4.77	4.36	4.01	3.95	3.66	3.49
23	4.94	4.84	4.78	4.72	4.64	4.64	4.78	4.31	4.00	3.95	3.64	3.49
24	4.93	4.83	4.78	4.72	4.63	4.67	4.76	4.29	3.99	3.83	3.62	3.49
25	4.93	4.83	4.78	4.70	4.63	4.75	4.75	4.26	4.00	3.81	3.61	3.49
26	4.92	4.82	4.77	4.70	4.63	4.77	4.74	4.33	3.98	3.80	3.63	3.49
27	4.92	4.82	4.77	4.71	4.63	4.76	4.73	4.34	3.96	3.79	3.62	3.49
28	4.92	4.81	4.77	4.70	4.62	4.74	4.72	4.34	3.96	3.82	3.62	3.49
29	4.89	4.81	4.77	4.71	---	4.79	4.69	4.35	3.95	3.81	3.62	3.49
30	4.87	4.80	4.76	4.71	---	4.81	4.66	4.35	3.94	3.79	3.61	3.47
31	4.88	---	4.76	4.70	---	4.81	---	4.35	---	3.77	3.58	---
MEAN	4.88	4.82	4.80	4.73	4.66	4.67	4.77	4.44	4.11	3.86	3.68	3.49
MAX	4.99	4.96	4.83	4.76	4.71	4.81	4.84	4.63	4.36	3.96	3.77	3.57
MIN	4.69	4.77	4.76	4.70	4.62	4.56	4.66	4.26	3.94	3.74	3.58	3.44

CAL YR 1986 MEAN 4.77 MAX 5.11 MIN 4.43
WTR YR 1987 MEAN 4.41 MAX 4.99 MIN 3.44

IOWA RIVER BASIN

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05462000 SHELL ROCK RIVER AT SHELL ROCK, IA

LOCATION.--Lat 42°39'10", long 92°35'45", in NE1/4 NW1/4 sec.11, T.91 N., R.15 W., Butler County, Hydrologic Unit 07080202 on right bank 400 ft upstream from bridge on county highway C45 in Shell Rock, 2.2 mi downstream from Curry Creek, and 10.4 mi upstream from mouth.

DRAINAGE AREA.--1,746 mi².

PERIOD OF RECORD.--June 1953 to current year. Prior to July 1953, monthly discharge only, published in WSP 1728.

REVISED RECORDS.--WSP 1438: Drainage area.

GAGE.--Water-stage recorder. Rockfill dam since Oct. 19, 1957. Datum of gage is 885.34 ft above NGVD.

REMARKS.--Estimated daily discharges: Nov. 13-15, Dec. 12 to Jan. 12 and Jan. 17-30. Records good except those for estimated daily discharges, which are poor. Diurnal fluctuation at low stages caused by power plant upstream at Greene. U.S. National Weather Service gage-height telemeter at station.

AVERAGE DISCHARGE.--34 years, 999 ft³/s, 7.77 in/yr, 723,800 acre-ft/yr; median of yearly mean discharges, 830 ft³/s, 6.5 in/yr, 601,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 33,500 ft³/s Mar. 28, 1961, gage height, 16.26 ft; minimum daily, 38 ft³/s Feb. 9, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in 1856 reached a stage of 17.7 ft at bridge 400 ft downstream, from information provided by U.S. Army Corps of Engineers, discharge, about 45,000 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 13	1215	*7,410	*11.08	No other peak greater than base discharge.			
Minimum discharge, 151 ft ³ /s Sept. 5.							

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1910	1360	893	500	383	496	1010	660	541	351	338	178
2	1660	1330	947	510	382	462	1030	633	517	329	321	171
3	1520	1320	993	510	386	468	1080	611	485	317	305	165
4	2530	1290	988	510	414	475	1060	579	449	298	308	157
5	3200	1250	835	510	434	502	1000	551	428	283	313	154
6	2800	1210	758	500	432	535	965	528	410	274	299	157
7	2330	1180	920	450	440	598	927	511	392	268	313	168
8	2040	1160	937	400	508	657	873	494	379	263	363	168
9	1800	1150	863	370	538	674	842	483	361	268	356	165
10	1620	1110	538	340	534	634	827	468	344	296	342	176
11	1660	1050	450	330	507	591	800	450	341	311	297	178
12	4140	883	600	400	517	567	791	428	355	478	263	196
13	7140	600	600	492	522	546	782	411	369	491	253	202
14	5980	880	580	540	516	538	789	407	342	485	285	202
15	4480	820	560	517	491	542	825	397	316	549	255	227
16	3680	1020	590	363	407	534	991	393	297	860	247	234
17	3210	1050	580	380	403	518	1130	381	294	637	229	240
18	2880	995	560	400	413	533	1100	401	318	519	242	227
19	2600	871	550	420	444	576	1010	399	325	478	222	217
20	2420	838	550	410	452	589	945	412	333	434	211	221
21	2260	801	550	380	443	606	883	484	347	407	226	225
22	2110	820	550	330	439	634	837	591	320	384	229	221
23	1980	965	540	300	431	649	838	556	388	361	229	211
24	1880	893	540	310	427	699	855	498	601	349	206	207
25	1820	833	540	350	424	801	855	467	714	335	206	199
26	1720	895	540	350	419	993	830	553	556	322	215	189
27	1640	877	540	350	427	1210	795	562	495	308	210	184
28	1570	859	530	350	446	1200	748	591	439	303	203	179
29	1500	874	520	355	---	1130	725	567	400	296	197	175
30	1420	873	510	360	---	954	695	595	373	290	211	169
31	1360	---	500	370	---	970	---	566	---	341	193	---
TOTAL	78860	30057	20152	12657	12579	20881	26839	15627	12229	11885	8087	5782
MEAN	2544	1002	650	408	449	674	895	504	408	383	261	193
MAX	7140	1360	993	540	538	1210	1130	660	714	860	363	240
MIN	1360	600	450	300	382	462	695	381	294	263	193	154
AC-FT	156400	59620	39970	25110	24950	41420	53240	31000	24260	23570	16040	11470
CFSM	1.46	.57	.37	.23	.26	.39	.51	.29	.23	.22	.15	.11
IN.	1.68	.64	.43	.27	.27	.44	.57	.33	.26	.25	.17	.12

CAL YR 1986 TOTAL 559313 MEAN 1532 MAX 10400 MIN 343 AC-FT 1109000 CFSM .88 IN. 11.9
WTR YR 1987 TOTAL 255635 MEAN 700 MAX 7140 MIN 154 AC-FT 507100 CFSM .40 IN. 5.45

IOWA RIVER BASIN

05463000 BEAVER CREEK AT NEW HARTFORD, IA

LOCATION.--Lat 42°30'50", long 92°37'55", in SE1/4 SE1/4 sec.28, T.90 N., R.15 W., Butler County, Hydrologic Unit 07080205, on right bank 5 ft from right end of bridge on county highway T55, 0.2 mi north of New Hartford, and 8 mi upstream from mouth.

DRAINAGE AREA.--347 mi².

PERIOD OF RECORD.--October 1945 to current year. Prior to April 1948, monthly discharge only, published in WSP 1308.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1558: 1948-49. WSP 1708: 1947 (M).

GAGE.--Water-stage recorder. Datum of gage is 882.44 ft above NGVD. Prior to July 14, 1959, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Nov. 11 to Feb. 10, May 5-15, 23-24, May 29 to June 3, June 14-20, 26-30, July 4-9, 17, 19, 20 and July 22 to Sept. 30. Records good except those for estimated daily discharges, which are poor. U.S. National Weather Service gage-height telemeter at station.

AVERAGE DISCHARGE.--42 years, 203 ft³/s, 7.94 in/yr, 147,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 18,000 ft³/s June 13, 1947, gage height, 13.5 ft, from graph based on gage readings, from rating curve extended above 14,000 ft³/s; minimum daily, 2.3 ft³/s Jan. 20-24, 1956, Jan. 24, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,400 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 13	1330	*2,240	*8.93	No other peak greater than base discharge.			

Minimum daily discharge, 32 ft³/s Aug. 7.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	294	280	170	130	152	234	336	162	200	65	50	98
2	280	292	180	128	158	253	356	161	158	71	45	90
3	265	287	180	125	170	283	339	211	144	69	42	86
4	455	272	165	125	188	323	312	212	124	68	39	82
5	703	260	160	124	240	445	299	200	122	64	37	80
6	502	253	160	124	220	469	290	196	112	62	34	79
7	405	248	165	124	270	446	277	190	103	61	32	77
8	346	247	155	124	560	417	260	180	104	70	81	75
9	300	236	150	124	500	368	252	170	87	92	70	74
10	269	227	140	121	370	315	244	175	81	96	52	73
11	299	210	135	118	309	288	233	190	86	95	45	72
12	1120	190	130	133	318	268	211	200	93	104	42	71
13	2060	165	130	145	286	253	199	200	92	123	40	70
14	1350	200	130	150	278	249	218	205	87	178	72	70
15	768	220	140	140	244	246	525	200	86	183	130	130
16	608	215	140	130	205	249	652	190	84	206	100	108
17	507	200	140	120	201	263	487	180	81	160	80	115
18	445	195	140	125	197	285	399	170	80	125	60	100
19	403	190	140	130	197	368	347	160	83	110	58	86
20	384	200	140	135	185	384	314	146	86	105	62	76
21	366	210	142	140	180	353	289	170	90	113	58	67
22	344	200	145	142	170	325	275	146	86	100	54	62
23	334	190	145	135	165	300	273	138	79	92	51	58
24	319	180	145	130	160	289	266	138	77	86	50	54
25	332	175	144	132	155	317	250	160	78	80	54	52
26	371	170	142	135	155	305	236	207	76	74	90	50
27	352	170	140	140	160	288	230	259	73	70	170	48
28	325	170	139	144	171	272	214	229	70	64	150	47
29	299	165	135	146	---	290	191	210	67	60	120	46
30	277	165	133	150	---	310	166	195	64	56	120	45
31	272	---	130	150	---	330	---	180	---	52	100	---
TOTAL	15354	6382	4530	4119	6564	9785	8940	5730	2853	2954	2188	2241
MEAN	495	213	146	133	234	316	298	185	95.1	95.3	70.6	74.7
MAX	2060	292	180	150	560	469	652	259	200	206	170	130
MIN	265	165	130	118	152	234	166	138	64	52	32	45
AC-FT	30450	12660	8990	8170	13020	19410	17730	11370	5660	5860	4340	4450
CFSM	1.43	.61	.42	.38	.68	.91	.86	.53	.27	.27	.20	.22
IN.	1.65	.68	.49	.44	.70	1.05	.96	.61	.31	.32	.23	.24

CAL YR 1986	TOTAL 129079	MEAN 354	MAX 5070	MIN 63	AC-FT 256000	CFSM 1.02	IN. 13.8
WTR YR 1987	TOTAL 71640	MEAN 196	MAX 2060	MIN 32	AC-FT 142100	CFSM .57	IN. 7.68

IOWA RIVER BASIN
05463050 CEDAR RIVER AT CEDAR FALLS, IA

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WATER-QUALITY RECORDS

LOCATION.--Lat 42°32'20", Long 92°26'58", in NW1/4 NE1/4 sec.12, T.89 N, R.14W., Black Hawk County, Hydrologic Unit 07080205, at bridge on U.S. Highway 20 at Cedar Falls, 1.1 mile upstream from Dry Run, and at mile 196.0 upstream from mouth of Iowa River.

DRAINAGE AREA.--4,734 mi².

PERIOD OF RECORD: October 1975 to September 1979, May 1984 to September 1985, October 1986 to current year.

REMARKS.--Water discharge estimated on basis of records at gaging station 8.1 mile downstream at Waterloo. No significant inflow between gaging station and sampling site.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	TEMPER- ATURE AIR (DEG C) (00020)	TUR- BID- ITY (NTU) (00076)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED SATUR- ATION (00301)	BARO- METRIC PRES- SURE (MM HG) (00025)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
DEC 17...	1030	2690	630	8.30	0.0	2.0	1.3	14.2	100	744	120	150
FEB 24...	1215	1950	550	8.40	2.0	5.0	0.40	13.6	100	750	K59	K40
MAY 08...	0930	2490	483	8.50	17.0	18.0	5.5	10.6	111	751	K40	K50
JUL 09...	1130	1370	372	8.50	25.0	29.0	6.0	8.3	103	744	370	3800
AUG 31...	1130	1190	500	8.80	20.0	20.0	12	10.4	116	752	K550	K180
DATE	HARD- NESS NONCARB WH WAT TOT FLD MG/L AS CACO3 (00902)	HARD- NESS (MG/L AS CACO3) (00900)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM AD- SORP- TION RATIO (00931)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	ALKA- LINITY WH WAT TOTAL FIELD MG/L AS CACO3 (00410)	BICAR- BONATE WH WAT TOTAL FIELD MG/L AS HCO3 (00440)	CAR- BONATE WH WAT TOTAL FIELD MG/L AS CO3 (00445)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)
DEC 17...	70	320	86	26	9.7	6	0.2	2.0	252	300	2	44
FEB 24...	64	290	80	23	10	7	0.3	2.5	231	250	17	40
MAY 08...	60	220	50	24	11	10	0.3	1.3	164	190	5	36
JUL 09...	45	170	36	20	11	12	0.4	2.5	127	150	2	34
AUG 31...	53	240	56	24	13	10	0.4	5.2	186	220	5	38
DATE	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N) (00605)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N) (00610)
DEC 17...	24	0.20	12	385	360	0.52	2800	0.67	7.00	0.010	0.030	0.030
FEB 24...	21	0.20	10	343	340	0.47	1810	2.3	5.40	0.030	0.060	0.050
MAY 08...	22	0.20	2.5	265	250	0.36	1780	1.9	4.40	0.030	0.020	0.040
JUL 09...	16	0.20	4.1	237	200	0.32	877	2.3	0.870	0.020	0.030	0.030
AUG 31...	22	0.20	6.7	288	280	0.39	925	4.7	2.10	0.020	<0.010	0.030

IOWA RIVER BASIN

05463050 CEDAR RIVER AT CEDAR FALLS, IA--Continued

WATER-QUALITY RECORDS

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	NITRO- GEN, AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P) (00671)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS, TOTAL (MG/L AS P) (00665)	SEDI- MENT, SUS- PENDED (MG/L) (80154)	SEDI- MENT, DIS- CHARGE, SUS- PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. THAN .062 MM (70331)	ARSENIC DIS- (UG/L AS AS) (01000)	ALUM- INUM, DIS- (UG/L AS AL) (01106)	BARIUM, DIS- (UG/L AS BA) (01005)	BERYL- LIUM, DIS- (UG/L AS BE) (01010)
DEC 17...	0.70	0.080	0.070	0.070	51	370	28	--	--	--	--
FEB 24...	2.3	0.090	0.100	0.140	11	58	91	3	<10	90	<0.5
MAY 08...	1.9	<0.010	0.010	0.120	42	282	91	2	20	76	<0.5
JUL 09...	2.3	0.020	0.060	0.200	37	137	97	--	--	--	--
AUG 31...	4.7	<0.010	0.020	0.150	37	119	93	4	<10	92	<0.5
DATE	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR) (01030)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MERCURY DIS- SOLVED (UG/L AS HG) (71890)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	NICKEL, DIS- SOLVED (UG/L AS NI) (01065)
DEC 17...	--	--	--	--	--	--	--	--	--	--	--
FEB 24...	1	<1	<3	3	7	<5	11	16	2.1	<10	<1
MAY 08...	<1	<1	<3	2	<3	<5	9	6	<0.1	<10	<1
JUL 09...	--	--	--	--	--	--	--	--	--	--	--
AUG 31...	<1	<1	<3	4	7	<5	6	7	0.2	<10	2
DATE	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)	ATRA- ZINE, TOTAL (UG/L) (39630)	CYAN- AZINE TOTAL (UG/L) (81757)	METRI- BUZIN IN WHOLE WATER (UG/L) (81408)	ALA- CHLOR TOTAL RECOVER (UG/L) (77825)	METOLA- CHLOR IN WHOLE WATER (UG/L) (39356)	TRI- FLURA- LIN TOTAL RECOVER (UG/L) (39030)
DEC 17...	--	--	--	--	--	--	--	--	--	--	--
FEB 24...	1	<1	160	<6	7	--	--	--	--	--	--
MAY 08...	1	<1	140	<6	5	0.17	0.10	<0.10	<0.10	<0.10	<0.10
JUL 09...	--	--	--	--	--	0.18	<0.10	<0.10	<0.10	0.10	<0.10
AUG 31...	1	<1	170	<6	5	0.19	<0.10	<0.10	<0.10	<0.10	<0.10

IOWA RIVER BASIN

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05463500 BLACK HAWK CREEK AT HUDSON, IA

LOCATION.--Lat 42°24'28", long 92°27'47", in SW1/4 NE1/4 sec.27, T.88 N., R.14 W., Black Hawk County, Hydrologic Unit 07080205, on left bank 35 ft downstream from bridge on State Highway 58, 0.2 mi northwest of Chicago and Great Western Railway tracks at the west edge of Hudson, 4.5 mi upstream from Prescotts Creek, and 9.6 mi upstream from mouth.

DRAINAGE AREA.--303 mi².

PERIOD OF RECORD.--April 1952 to current year.

REVISED RECORDS.--WSP 1438: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 865.03 ft above NGVD.

REMARKS.--Estimated daily discharges: Oct. 21-28, Nov. 11 to Jan. 10 and Jan. 17 to Feb. 9. Records good except those for estimated daily discharges, which are poor. U.S. National Weather Service gage-height telemeter at station.

AVERAGE DISCHARGE.--35 years, 174 ft³/s, 7.80 in/yr, 126,100 acre-ft/yr; median of yearly mean discharges, 170 ft³/s, 7.6 in/yr, 123,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 19,300 ft³/s July 9, 1969, gage height, 18.23 ft; minimum daily, 0.12 ft³/s Jan. 26, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,200 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Feb. 8	0800	*852	(a) *11.23				

(a) Ice jam.

Minimum discharge, 42 ft³/s Aug. 7, 8.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	138	180	102	115	127	118	355	222	173	60	52	192
2	138	187	102	113	128	128	435	217	162	58	50	185
3	138	188	100	112	135	143	415	232	154	56	48	179
4	155	186	102	112	155	266	374	219	146	53	47	170
5	357	178	103	112	235	574	355	204	137	52	46	160
6	289	174	103	112	200	483	342	196	129	51	44	150
7	217	169	102	110	230	421	318	187	123	50	43	144
8	198	165	100	105	560	374	293	177	117	53	104	147
9	176	161	97	100	310	314	272	172	111	72	216	147
10	157	155	88	96	233	261	254	177	107	55	105	142
11	149	140	92	97	212	235	242	176	107	51	75	138
12	437	125	100	105	265	214	228	173	109	202	65	134
13	715	112	106	119	245	203	215	168	105	224	66	129
14	483	100	109	120	227	198	275	163	99	121	176	123
15	365	145	110	116	204	203	693	156	92	151	420	345
16	299	145	115	109	189	271	647	151	87	146	237	289
17	256	140	116	110	183	311	528	147	82	109	167	315
18	226	138	117	117	180	334	454	145	77	96	142	301
19	208	138	118	120	180	430	402	143	93	89	151	245
20	194	137	117	120	170	417	366	141	91	93	155	215
21	187	132	115	119	157	369	347	187	105	89	148	194
22	180	128	114	118	147	329	358	177	90	84	135	187
23	186	126	115	115	139	298	358	152	82	79	122	186
24	190	124	116	115	130	281	348	143	97	74	111	181
25	200	115	118	115	123	281	327	140	88	71	104	171
26	205	119	119	116	120	271	304	149	79	68	311	164
27	205	116	119	118	117	257	284	304	72	65	701	158
28	194	113	120	120	115	243	261	245	69	62	474	151
29	190	115	119	120	---	261	253	219	66	59	344	146
30	181	105	119	122	---	283	232	194	63	57	271	141
31	177	---	118	125	---	359	---	183	---	54	223	---
TOTAL	7390	4256	3391	3523	5416	9130	10535	5659	3112	2604	5353	5529
MEAN	238	142	109	114	193	295	351	183	104	84.0	173	184
MAX	715	188	120	125	560	574	693	304	173	224	701	345
MIN	138	100	88	96	115	118	215	140	63	50	43	123
AC-FT	14660	8440	6730	6990	10740	18110	20900	11220	6170	5170	10620	10970
CFSM	.79	.47	.36	.38	.64	.97	1.16	.60	.34	.28	.57	.61
IN.	.91	.52	.42	.43	.66	1.12	1.29	.69	.38	.32	.66	.68

CAL YR 1986	TOTAL 99392	MEAN 272	MAX 3410	MIN 41	AC-FT 197100	CFSM .90	IN. 12.2
WTR YR 1987	TOTAL 65898	MEAN 181	MAX 715	MIN 43	AC-FT 130700	CFSM .60	IN. 8.09

IOWA RIVER BASIN

05464000 CEDAR RIVER AT WATERLOO, IA

LOCATION.--Lat 42°29'44", long 92°20'03", in NW1/4 NW1/4 sec.25, T.89 N., R.13 W., Black Hawk County, Hydrologic Unit 07080205, on left bank at foot of East Seventh Street, 0.3 mi upstream from Eleventh Avenue bridge in Waterloo, 1.1 mi downstream from Black Hawk Creek, and at mile 187.9 upstream from mouth of Iowa River.

DRAINAGE AREA.--5,146 mi².

PERIOD OF RECORD.--October 1940 to current year. Prior to April 1941, monthly discharge only, published in WSP 1308.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1558: 1950.

GAGE.--Water-stage recorder. Datum of gage is 824.14 ft above NGVD.

REMARKS.--Estimated daily discharges: Jan. 17-26. Records good except those for estimated daily discharges, which are poor. Slight diurnal fluctuation during low flow caused by powerplant upstream from station. U.S. National Weather Service gage-height telemeter and U.S. Army Corps of Engineers data collection platform at station.

AVERAGE DISCHARGE--47 years, 3,066 ft³/s, 8.10 in/yr, 2,221,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 76,700 ft³/s Mar. 29, 1961, gage height, 21.86 ft; minimum daily, 152 ft³/s Jan. 28, 1959.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Mar. 16, 1929, reached a stage of about 20 ft, determined by U. S. Army Corps of Engineers, from information by City of Waterloo, discharge, 65,000 ft³/s. Flood of Apr. 2, 1933, reached a stage of about 19.5 ft from information by City of Waterloo, discharge, 61,000 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 13,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 15	1715	*19,700	*11.15	No other peaks greater than base discharge.			

Minimum discharge, 818 ft³/s Sept. 6, 7.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8510	4420	2840	2010	1410	2320	4470	3010	2510	1200	1190	1070
2	8780	4360	3080	1960	1480	2540	4690	3000	2360	1150	1110	967
3	6990	4340	3320	1840	1550	2570	4760	2950	2220	1070	1270	905
4	6730	4250	3400	1890	1660	2720	4700	2940	2100	1010	1100	879
5	8410	4110	3010	1940	1790	3340	4570	2840	1950	967	1010	854
6	9990	3980	2950	1940	1830	3740	4400	2600	1880	955	974	829
7	10200	3840	3070	1950	1970	3830	4250	2620	1760	953	951	837
8	8950	3810	3220	1890	2540	3890	4090	2540	1690	1250	1780	864
9	7490	3690	3150	1830	2830	3860	3870	2470	1590	1390	1520	870
10	6340	3440	2050	1750	2750	3680	3680	2420	1500	1300	1340	844
11	5850	3450	1540	1610	2710	3390	3500	2380	1560	1330	1120	870
12	7090	3120	1820	1660	2780	3130	3360	2300	1530	2130	1020	867
13	11700	2100	1930	1780	2780	2920	3290	2270	1490	2390	1070	876
14	16600	2010	2140	1970	2700	2830	3410	2450	1450	2510	1400	895
15	19400	2500	2540	1940	2570	2820	4020	2170	1370	2570	1800	1080
16	18100	3320	2630	1270	2210	2840	4790	2030	1280	3100	1610	1360
17	13300	3630	2690	1000	2010	2870	5060	2000	1310	3500	1370	1520
18	10300	3420	2650	1150	1930	2980	4980	1920	1250	2920	1360	1630
19	8620	3100	2490	1300	2020	3190	4650	2040	1300	2550	1310	1550
20	7770	2480	2360	1200	2060	3410	4330	2080	1320	2290	1230	1450
21	7270	2550	2280	1150	2060	3420	4190	2150	1370	2090	1390	1400
22	6720	3160	2230	1150	2080	3380	4000	2240	1370	1920	1330	1330
23	6300	3180	2220	1100	2010	3280	3900	2200	1360	1770	1250	1280
24	5960	3060	2230	1100	1940	3300	3830	2160	1490	1700	1130	1250
25	5790	3020	2220	1050	1920	3580	3770	2150	1770	1560	1210	1210
26	5660	3030	2200	1550	1880	3920	3730	2390	1740	1470	1560	1190
27	5460	2780	2100	1330	1870	4430	3660	2750	1580	1380	1990	1140
28	5060	2680	2090	1330	1960	4780	3470	2810	1480	1360	1790	1110
29	4910	2780	2090	1350	---	4930	3320	2720	1400	1380	1490	1070
30	4730	2770	2080	1360	---	4610	3150	2600	1290	1310	1330	1010
31	4500	---	2050	1380	---	4350	---	2610	---	1220	1190	---
TOTAL	263480	98380	76670	47730	59300	106850	121890	75810	48270	53695	41195	33007
MEAN	8499	3279	2473	1540	2118	3447	4063	2445	1609	1732	1329	1100
MAX	19400	4420	3400	2010	2830	4930	5060	3010	2510	3500	1990	1630
MIN	4500	2010	1540	1000	1410	2320	3150	1920	1250	953	951	829
AC-FT	522600	195100	152100	94670	117600	211900	241800	150400	95740	106500	81710	65470
CFSM	1.65	.64	.48	.30	.41	.67	.79	.48	.31	.34	.26	.21
IN.	1.90	.71	.55	.35	.43	.77	.88	.55	.35	.39	.30	.24

CAL YR 1986	TOTAL 1889490	MEAN 5177	MAX 32200	MIN 1470	AC-FT 3748000	CFSM 1.01	IN. 13.7
WTR YR 1987	TOTAL 1026280	MEAN 2812	MAX 19400	MIN 829	AC-FT 2036000	CFSM .55	IN. 7.42

IOWA RIVER BASIN

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05464500 CEDAR RIVER AT CEDAR RAPIDS, IA

LOCATION.--Lat 41°58'14", long 91°40'01", in SE1/4 NW1/4 sec.28, T.83 N., R.7 W., Linn County, Hydrologic Unit 07080205, on right bank 400 ft upstream from bridge on Eighth Avenue in Cedar Rapids, 2.7 mi upstream from Prairie Creek, and at mile 112.7 upstream from mouth of Iowa River.

DRAINAGE AREA.--6,510 mi².

PERIOD OF RECORD.--October 1902 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 955: 1924. WSP 1308: 1904, 1906-13, 1915, 1917, 1919-24, 1928, 1930,. WSP 1438: Drainage area. WSP 1558: 1915-18 (M), 1920 (M), 1922 (M), 1929, 1933, 1943.

GAGE.--Water-stage recorder. Datum of gage is 700.47 ft above NGVD. Prior to Aug. 20, 1920, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Jan. 18-24. Records excellent except those for estimated daily discharges, which are fair. U.S. Geological Survey gage-height telemeter and U.S. Army Corps of Engineers data collection platform at station.

AVERAGE DISCHARGE.--85 years, 3,496 ft³/s, 7.29 in/yr, 2,533,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 73,000 ft³/s Mar. 31, 1961, gage height, 19.66 ft; maximum gage height, 20.0 ft Mar. 18, 1929; minimum discharge 53 ft³/s Jan. 6, 1950, caused by construction operations upstream; minimum daily, 212 ft³/s Dec. 10, 1949.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1851 reached a stage of about 20 ft, discharge, 65,000 ft³/s, estimated.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 12,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 18	0730	*22,700	*8.99	May 21	1430	12,700	6.63

Minimum daily discharge, 1,020 ft³/s Aug. 4.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8560	6170	4100	3020	2050	2580	5960	3940	3060	1680	1510	3130
2	8870	5890	4820	3120	2250	2840	5830	3800	2940	1610	1350	2810
3	9730	5720	5260	2900	2310	3180	5870	3750	3000	1520	1290	2540
4	9420	5590	5220	2750	2320	3360	5760	3760	2790	1400	1020	2260
5	8410	5470	5090	2640	2380	3600	5680	3630	2620	1450	1580	2110
6	8610	5290	4600	2820	2460	4270	5560	3520	2490	1410	1350	2050
7	10200	5130	4500	2760	2510	4650	5330	3350	2360	1440	1210	1920
8	11200	5030	4510	2690	2660	4610	5020	3220	2250	1440	1600	1810
9	11100	4960	4450	2550	3110	4520	4990	3060	2130	1540	1820	1800
10	9580	4820	3960	2050	3230	4410	4390	3090	2040	1590	1960	1790
11	7890	4630	2910	2430	3330	4310	4700	2930	2050	1440	1960	1740
12	7090	4470	2770	2420	3670	4080	4300	2690	2030	1520	1480	1690
13	7940	3650	2310	2660	3830	3790	4140	2730	1970	1920	1590	1670
14	10200	2930	1840	2460	3450	3590	4430	2730	1910	2490	1450	1620
15	13100	2510	2180	2480	3230	3790	4780	2660	1810	2610	1620	1800
16	16300	3210	2900	2030	3120	3920	5560	2640	1740	2590	1910	2250
17	19900	4260	3620	1720	2960	4100	5930	2430	1740	2710	2130	2590
18	22000	5040	3940	1400	2680	4240	6120	2460	1660	3040	2420	3080
19	19300	4870	4150	1650	2550	4550	5950	2530	1650	3060	2650	2960
20	14400	4400	3930	1500	2510	4680	5770	2740	1760	2550	2450	2810
21	11200	3940	3590	1350	2570	4610	5300	3630	2110	2460	3080	2590
22	9600	3640	3460	1300	2580	4570	5130	2720	2100	2300	2830	2440
23	8550	3970	3510	1400	2570	4390	5050	2880	1990	1990	2470	2330
24	8070	4250	3460	1250	2520	4360	4890	2830	1890	1880	2180	2210
25	7900	4150	3300	1160	2460	4650	4730	2830	2270	2070	2280	2030
26	9110	4040	3270	1390	2310	4940	4690	3090	2030	1800	6400	2050
27	9900	4110	2960	1670	2440	4950	4590	3720	2120	1680	9010	1950
28	8690	4000	3120	1820	2380	5130	4410	3690	2000	1580	6920	1930
29	7530	3890	3030	1860	---	6030	4270	3720	1890	1440	5910	1850
30	6960	3890	3030	2190	---	6620	4130	3580	1760	1490	4550	1750
31	6360	---	3080	2040	---	6670	---	3330	---	1420	3750	---
TOTAL	327670	133920	112870	65480	76440	135990	153260	97680	64160	59120	83730	65560
MEAN	10570	4464	3641	2112	2730	4387	5109	3151	2139	1907	2701	2185
MAX	22000	6170	5260	3120	3830	6670	6120	3940	3060	3060	9010	3130
MIN	6360	2510	1840	1160	2050	2580	4130	2430	1650	1400	1020	1620
AC-FT	649900	265600	223900	129900	151600	269700	304000	193700	127300	117300	166100	130000
CFSM	1.62	.69	.56	.32	.42	.67	.78	.48	.33	.29	.41	.34
IN.	1.87	.77	.64	.37	.44	.78	.88	.56	.37	.34	.48	.37

CAL YR 1986	TOTAL 2367360	MEAN 6486	MAX 38900	MIN 1600	AC-FT 4696000	CFSM .99	IN. 13.5
WTR YR 1987	TOTAL 1375880	MEAN 3770	MAX 22000	MIN 1020	AC-FT 2729000	CFSM .58	IN. 7.86

IOWA RIVER BASIN

05465000 CEDAR RIVER NEAR CONESVILLE, IA

LOCATION.--Lat 41°24'36", long 91°17'06", in SW1/4 SW1/4 sec.2, T.76 N., R.4 W., Muscatine County, Hydrologic Unit 07080206, on right bank 10 ft downstream from bridge on county highway G28, 3.4 mi northeast of Conesville, 5.2 mi downstream from Wapsinonoc Creek, 10.7 mi upstream from mouth, and at mile 39.8 upstream from mouth of Iowa River.

DRAINAGE AREA.--7,785 mi².

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

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1708: 1956.

GAGE.--Water-stage recorder. Datum of gage is 581.95 ft above NGVD. Prior to Feb. 2, 1940, and Apr. 11, 1952, to July 1, 1954, nonrecording gage, Feb. 2, 1940, to Apr. 10, 1952, and July 2, 1954, to Sept. 16, 1963, water-stage recorder, at site 150 ft downstream on left bank at same datum.

REMARKS.-- Estimated daily discharges: Jan. 22 to Feb. 8, Mar. 3-7, Mar. 29 to Apr. 1, Apr. 5-12, June 13-19 and June 27 to July 23. Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers data collection platform at station.

AVERAGE DISCHARGE.--48 years, 4,796 ft³/s, 8.37 in/yr, 3,475,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 70,800 ft³/s Apr. 2, 1961, gage height, 16.62 ft; maximum gage height, 16.85 ft Apr. 12, 1965; minimum daily discharge, 250 ft³/s Nov. 28, 1955, result of freezeup.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in March 1929 reached a stage of 15.8 ft, from information by local residents to U.S. Army Corps of Engineers.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 12,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 1	2300	13,600	11.27	Oct. 28	0015	14,100	11.43
Oct. 20	1115	*21,200	*13.01	Aug. 28	0815	16,300	12.03

Minimum daily discharge, 1,600 ft³/s Jan. 24.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13200	8490	4950	4130	3500	3390	7600	5100	4150	2500	1980	5580
2	12900	7980	5500	4110	3300	3390	7000	4930	3910	2400	1970	4780
3	11700	7610	6370	4080	3300	3600	7010	4790	3840	2300	1950	4210
4	11900	7360	6930	4060	3400	3800	7010	4610	3630	2200	1930	3890
5	11700	7080	6820	4030	3500	4100	7000	4570	3490	2100	1880	3560
6	10600	6870	6530	3970	3600	4500	6900	4510	3340	2050	1800	3360
7	10100	6590	6330	3900	3700	5000	6800	4410	3210	2000	1760	3210
8	11100	6430	6280	3860	3800	5300	6700	4280	3100	2000	1790	3030
9	11900	6180	6310	3820	3910	5330	6600	4110	3000	1950	1790	2880
10	12100	6020	6210	3790	3870	5280	6500	3970	2880	1950	1780	2750
11	10900	5900	5690	3730	3850	5200	6400	3860	2790	1900	1790	2730
12	9460	5610	4660	3490	3840	5150	6300	3750	2730	1900	1810	2650
13	8570	5400	4220	3410	3850	4970	6300	3670	2650	1900	1820	2600
14	9020	4930	3070	3380	3900	4740	5770	3510	2550	2100	1830	2590
15	10600	4160	3130	3400	3940	4620	6560	3440	2450	2500	1850	2590
16	12900	4000	3300	3390	3950	4730	6690	3420	2400	3000	1840	2570
17	15100	4000	4070	3370	3940	4890	7090	3400	2350	3200	1860	2690
18	17200	4730	4880	3320	3900	5200	7450	3300	2300	3500	2120	3430
19	19400	5540	5030	3150	3850	5530	7460	3220	2250	3200	2240	3870
20	20900	5780	5150	2900	3790	5680	7340	3640	2530	2800	2630	4040
21	18400	5390	5100	2740	3740	5930	7110	5280	2810	2600	3540	3910
22	13500	4980	4830	2300	3680	5830	6740	5670	4040	2400	5000	3680
23	11200	4660	4600	1800	3610	5780	6530	4580	3650	2350	3770	3420
24	9980	4820	4520	1600	3560	5700	6440	4010	3390	2230	3060	3250
25	9500	5190	4560	1800	3520	6050	6190	3730	3230	2230	2900	3100
26	11800	5110	4440	2000	3480	5990	5960	3650	3120	2220	5870	2970
27	13700	5020	4370	2200	3440	5600	5880	3640	3000	2220	12200	2840
28	13600	4970	4330	2400	3400	6760	5760	4350	2900	2170	15600	2760
29	11700	5060	4260	2700	---	7500	5510	4640	2800	2080	11600	2730
30	10200	4880	4220	3000	---	8000	5310	4410	2650	2030	8600	2650
31	9090	---	4160	3200	---	8400	---	4270	---	1990	7050	---
TOTAL	383920	170740	154820	99030	103120	165940	197910	128720	91140	71970	117610	98320
MEAN	12380	5691	4994	3195	3683	5353	6597	4152	3038	2322	3794	3277
MAX	20900	8490	6930	4130	3950	8400	7600	5670	4150	3500	15600	5580
MIN	8570	4000	3070	1600	3300	3390	5310	3220	2250	1900	1760	2570
AC-FT	761500	338700	307100	196400	204500	329100	392600	255300	180800	142800	233300	195000
CFSM	1.59	.73	.64	.41	.47	.69	.85	.53	.39	.30	.49	.42
IN.	1.63	.82	.74	.47	.49	.79	.95	.62	.44	.34	.56	.47
CAL YR 1986	TOTAL 3030660	MEAN 8303	MAX 35500	MIN 2200	AC-FT 6011000	CFSM 1.07	IN. 14.5					
WTR YR 1987	TOTAL 1783240	MEAN 4886	MAX 20900	MIN 1600	AC-FT 3537000	CFSM .63	IN. 8.52					

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DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21100	14600	11300	6090	5100	4520	13300	8540	7430	4110	2500	10700
2	21600	13800	11300	6130	5600	5100	12800	8280	8900	3850	2460	9770
3	19000	13300	12000	6030	5400	5480	12300	7880	8350	3560	2530	9080
4	15800	12900	13000	5930	5100	5380	11700	7720	7470	3370	2470	8600
5	14600	12700	13300	5790	4880	5680	11100	7620	6930	3310	2400	8210
6	13900	12400	12800	5810	4860	6190	10700	7530	6400	3330	2270	7750
7	12600	12200	12000	5720	4680	7110	10500	7260	5670	3310	2280	7400
8	12300	11900	11500	5740	4710	8140	10300	6770	5300	3300	2530	6870
9	12800	11700	11400	5700	5020	8440	10100	6160	5200	3290	2550	5650
10	13000	11500	11200	5680	5030	8010	9680	5880	5090	3120	2700	4860
11	13100	11300	10500	5740	5280	7130	9270	5720	4970	3110	2610	4660
12	13800	11300	9330	5580	5490	6980	8820	5640	4750	3210	2680	4440
13	13600	11300	7000	5480	5600	6920	8840	5460	4640	3190	2660	4340
14	13700	11300	6000	5520	5780	6730	8900	5150	4570	3150	2510	4250
15	14500	11100	5500	5640	5930	6650	9960	5040	4460	3810	2420	4080
16	15700	10600	5700	5670	5680	6640	12000	4950	4370	4570	2330	4020
17	17400	10400	6100	5530	5630	6790	12500	4910	4210	5520	2320	4060
18	19000	10300	7270	5410	5530	7160	12500	5040	4100	5390	2460	5550
19	20900	10800	7690	5160	5370	8070	12800	5290	4040	5100	2700	6950
20	22800	11500	7880	4980	5230	8110	12700	5820	4370	5070	2900	6560
21	24000	11900	8220	4500	5050	9420	12300	8380	6180	4750	3950	6160
22	21200	11900	8230	3500	4790	9180	11700	10100	8380	4160	6600	5730
23	17600	11600	7960	2900	4690	9000	11200	9370	6590	3770	6300	5180
24	15300	11400	7180	2700	4640	8920	11100	7590	5800	3530	5230	4920
25	14300	11500	7010	2800	4540	9250	10800	6840	5540	3250	4390	4670
26	19100	11600	6830	2950	4310	9750	10300	6340	5250	3190	6240	4460
27	23900	11600	6680	3300	4240	9810	9850	6290	5240	3160	14600	4230
28	23500	11600	6560	3600	4260	9790	9530	6860	4770	3140	19000	4130
29	20000	11500	6430	3900	---	10300	9210	8360	4430	3030	17400	4140
30	17400	11400	6470	4150	---	11600	8760	8130	4330	2950	13900	4010
31	15600	---	6150	4500	---	12900	---	7620	---	2700	12200	---
TOTAL	533100	352900	270490	152130	142430	246150	325520	212540	167730	114300	160100	175430
MEAN	17200	11760	8725	4907	5087	7940	10850	6856	5591	3687	5165	5

IOWA RIVER BASIN

05465500 IOWA RIVER AT WAPELLO, IA--Continued
(National stream-accounting network station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1978 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: January 1978 to current year.

WATER TEMPERATURES: January 1978 to current year.

SUSPENDED-SEDIMENT DISCHARGE: April 1978 to current year.

REMARKS.--During periods of ice effect samples are collected in open water channel or through ice cover. Records of specific conductance are obtained from suspended-sediment samples at time of analysis.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 810 microsiemens Jan. 23, 1978-Jan. 20, 1981; minimum daily, 250 microsiemens Sept. 18, 1978, July 20, 1982.

WATER TEMPERATURES: Maximum daily, 33.0°C July 25, 1987; minimum daily, 0.0°C on many days during winter period.

SEDIMENT CONCENTRATIONS: Maximum daily mean, 4,970 mg/L June 25, 1981; minimum daily mean, 1 mg/L Jan. 21, 22, 1981.

SEDIMENT LOADS: Maximum daily, 413,000 tons July 19, 1982; minimum daily, 5.4 tons Jan. 21, 1981.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 640 microsiemens Feb. 5; minimum daily, 330 microsiemens Aug. 27.

WATER TEMPERATURES: Maximum daily, 33.0°C July 25.

SEDIMENT CONCENTRATIONS: Maximum daily mean, 3,700 mg/L May 22; minimum daily mean, 17 mg/L Jan. 19.

SEDIMENT LOADS: Maximum daily, 101,000 tons May 22; minimum daily, 168 tons Jan. 24.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	380	---	570	500	---	580	---	---	500	440	---	440
2	380	550	580	440	540	580	575	---	---	440	420	430
3	420	555	565	---	---	560	---	---	495	460	405	370
4	---	---	560	450	500	---	540	530	---	---	425	360
5	440	570	---	460	640	540	520	490	---	425	---	---
6	460	555	---	520	---	540	500	520	460	460	---	400
7	485	555	555	420	560	530	580	---	440	410	420	---
8	505	555	545	---	520	560	495	---	440	---	420	---
9	---	565	550	---	540	---	---	460	480	---	440	460
10	---	565	550	540	520	520	560	515	420	420	440	460
11	505	---	560	450	520	540	520	440	480	420	---	460
12	495	570	---	---	---	520	---	460	475	420	420	485
13	500	575	580	---	585	---	480	---	480	420	420	450
14	495	575	605	440	565	540	540	475	---	440	---	460
15	505	---	560	---	---	500	540	460	480	460	400	500
16	505	565	440	435	540	510	540	460	---	---	400	500
17	455	565	---	500	540	455	545	470	460	450	---	---
18	---	560	---	---	540	520	510	460	---	425	430	440
19	450	565	440	460	585	500	---	480	485	430	445	440
20	480	560	520	460	580	490	545	480	---	---	420	---
21	510	---	---	560	---	---	570	375	385	415	440	---
22	540	585	460	580	580	480	535	---	360	420	390	---
23	550	575	475	---	610	480	500	425	400	400	440	---
24	---	575	545	---	585	---	---	460	460	440	435	535
25	550	565	440	480	620	535	510	---	---	420	400	540
26	445	570	430	480	580	---	---	500	---	400	395	500
27	445	---	---	460	---	535	---	500	---	420	330	485
28	465	565	---	470	---	480	495	440	---	415	360	485
29	510	575	440	---	---	510	510	460	500	---	---	---
30	540	585	460	460	---	540	---	480	500	380	410	---
31	555	---	440	480	---	540	---	---	---	405	---	---

IOWA RIVER BASIN

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05465500 IOWA RIVER AT WAPELLO, IA--Continued

WATER-QUALITY RECORDS

TEMPERATURE, WATER, DEGREES CENTIGRADE, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20.0	---	3.0	2.0	---	5.0	---	---	24.0	25.0	---	21.0
2	19.0	11.0	3.0	2.0	1.0	5.0	10.0	---	---	25.5	30.0	20.0
3	20.0	10.0	3.0	---	---	5.0	---	---	23.0	25.5	30.0	20.0
4	---	---	2.0	2.0	2.0	---	10.0	10.0	---	---	30.0	19.0
5	17.0	10.0	---	3.0	2.0	6.0	11.0	16.5	---	25.5	---	---
6	17.0	10.0	---	3.0	---	6.0	11.0	18.0	23.0	25.5	---	23.0
7	16.0	11.0	3.0	3.0	2.0	7.0	12.0	---	24.0	25.5	30.0	---
8	17.0	10.0	3.0	---	2.0	8.0	13.0	---	24.0	---	30.0	---
9	---	9.0	2.5	---	3.0	---	---	22.0	24.0	---	29.0	20.0
10	---	8.0	1.0	2.0	3.0	---	14.0	24.0	24.0	28.0	29.0	20.0
11	16.0	---	1.0	2.0	3.0	6.0	13.0	22.0	24.0	28.0	---	19.0
12	15.0	3.0	---	---	---	6.0	---	22.0	24.0	28.0	30.0	20.0
13	14.0	3.0	3.0	---	5.0	---	13.0	---	24.0	26.5	30.0	20.0
14	13.0	3.0	2.0	4.0	4.0	6.0	13.0	23.0	---	30.0	---	20.0
15	13.0	---	1.0	---	---	5.0	13.0	24.0	24.5	26.5	30.0	19.5
16	14.0	5.0	2.0	3.0	2.0	5.0	15.0	24.0	---	---	30.0	19.5
17	13.0	5.0	---	2.0	3.0	5.0	15.0	24.0	25.5	28.0	---	---
18	---	4.0	---	---	2.0	5.0	14.0	25.0	---	30.0	28.0	19.0
19	13.0	3.0	3.0	2.0	3.0	5.0	---	24.0	25.0	28.0	27.5	19.0
20	14.0	3.0	3.0	2.0	3.0	7.0	16.0	19.0	---	---	27.0	---
21	14.0	---	---	1.5	---	---	15.0	24.0	25.0	27.0	26.5	---
22	14.0	4.0	3.0	1.0	4.0	7.0	15.0	---	25.5	27.0	26.0	---
23	13.0	4.0	3.0	---	4.0	8.0	15.0	24.0	25.5	32.0	24.5	---
24	---	3.0	3.0	---	5.0	---	---	21.0	24.5	32.0	22.0	19.0
25	16.0	3.0	3.0	1.0	5.0	11.0	---	22.0	---	33.0	26.0	20.0
26	12.0	4.0	2.5	1.0	6.0	---	15.0	24.0	---	32.0	27.0	19.0
27	13.0	---	2.5	1.0	---	10.0	---	---	---	31.0	22.0	19.0
28	13.0	3.0	---	1.0	---	10.0	15.0	24.0	---	---	22.0	19.0
29	13.0	4.0	3.0	---	---	10.0	15.0	24.0	24.5	---	22.0	---
30	13.0	3.5	3.0	1.0	---	10.0	---	24.0	25.0	30.0	---	---
31	13.0	---	3.0	1.5	---	10.0	---	---	---	31.0	21.0	---

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

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	437	24900	94	3710	37	1130	60	987	28	386	49	598
2	500	29200	88	3280	38	1160	65	1080	35	529	73	1010
3	407	20900	77	2770	65	2110	59	961	34	496	68	1010
4	343	14600	68	2370	79	2770	52	833	33	454	68	988
5	275	10800	63	2160	89	3200	47	735	33	435	97	1490
6	232	8710	58	1940	65	2250	38	596	39	512	182	3040
7	195	6630	63	2080	51	1650	49	757	71	899	187	3590
8	181	6010	60	1930	58	1800	50	775	75	954	144	3160
9	165	5700	58	1830	57	1750	40	616	102	1380	175	3990
10	152	5340	50	1550	44	1330	30	460	47	638	145	3140
11	167	5910	51	1560	35	992	26	403	47	670	110	2120
12	187	6970	50	1530	37	932	26	392	59	875	104	1960
13	147	5400	38	1160	42	794	30	444	66	998	94	1760
14	175	6470	48	1460	38	616	78	1160	57	890	83	1510
15	167	6540	51	1530	45	668	109	1660	45	720	83	1490
16	155	6570	40	1140	100	1540	70	1070	39	598	88	1580
17	198	9300	38	1070	128	2110	39	582	33	502	109	2000
18	190	9750	38	1060	110	2160	23	336	32	478	111	2150
19	167	9420	45	1310	75	1560	17	237	25	362	104	2270
20	146	8990	47	1460	55	1170	41	551	18	254	121	2980
21	123	7970	41	1320	82	1820	43	522	18	245	147	3740
22	107	6120	35	1120	95	2110	28	265	22	285	153	3790
23	93	4420	31	971	58	1250	23	180	19	241	120	2920
24	87	3590	41	1260	41	795	23	168	19	238	108	2600
25	90	3470	42	1300	34	644	52	393	19	233	138	3450
26	413	23100	63	1970	72	1330	94	749	18	209	182	4790
27	515	33200	57	1790	88	1590	70	624	18	206	139	3680
28	302	19200	38	1190	85	1510	78	758	19	219	137	3620
29	188	10200	34	1060	79	1370	90	948	---	---	267	7430
30	127	5970	36	1110	66	1150	73	818	---	---	252	7890
31	103	4340	---	---	59	980	45	547	---	---	407	14200
TOTAL	---	329690	---	49991	---	46241	---	20607	---	14906	---	99946

IOWA RIVER BASIN

05465500 IOWA RIVER AT WAPELLO, IA--Continued

WATER-QUALITY RECORDS

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

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)
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	278	9980	118	2720	310	6220	237	2630	98	661	218	6300
2	186	6430	113	2530	419	10100	182	1890	94	624	201	5300
3	138	4580	107	2280	378	8520	148	1420	94	642	177	4340
4	108	3410	100	2080	324	6530	143	1300	76	507	155	3600
5	115	3450	112	2300	289	5410	138	1230	55	356	155	3440
6	114	3290	102	2070	257	4440	129	1160	45	276	155	3240
7	120	3400	86	1690	208	3180	145	1300	63	388	154	3080
8	138	3840	87	1590	173	2480	199	1770	81	553	139	2580
9	124	3380	109	1810	149	2090	212	1880	108	744	112	1710
10	105	2740	129	2050	154	2120	178	1500	125	911	100	1310
11	103	2580	120	1850	163	2190	131	1100	69	486	89	1120
12	114	2710	105	1600	138	1770	150	1300	69	501	83	995
13	110	2630	103	1520	144	1800	158	1360	68	488	80	937
14	374	8990	104	1450	138	1700	102	868	58	393	78	895
15	490	13200	112	1520	113	1360	226	2320	101	660	86	947
16	265	8590	120	1600	114	1350	375	4630	98	617	125	1360
17	264	8910	122	1620	140	1590	446	6650	69	432	143	1570
18	247	8340	124	1690	163	1800	235	3420	176	1170	406	6420
19	228	7880	123	1760	184	2010	150	2070	187	1360	520	9760
20	208	7130	230	3610	542	6400	152	2080	144	1130	318	5630
21	190	6310	2610	63900	1280	22200	108	1390	160	1710	246	4090
22	175	5530	3700	101000	1660	37600	87	977	398	7090	210	3250
23	131	3960	1680	42500	820	14600	98	998	196	3330	162	2270
24	123	3690	698	14300	325	5090	98	934	261	3690	99	1320
25	120	3500	375	6930	155	2320	97	851	309	3660	88	1110
26	118	3280	260	4450	120	1700	107	922	678	13500	89	1070
27	140	3720	223	3790	297	4200	87	742	959	35700	90	1030
28	157	4040	640	11900	259	3340	73	619	407	20900	93	1040
29	133	3310	1080	24400	223	2670	82	671	366	17200	99	1110
30	125	2960	520	11400	248	2900	91	725	323	12100	79	855
31	---	---	330	6790	---	---	99	722	283	9320	---	---
TOTAL	---	155760	---	330700	---	169680	---	51429	---	141099	---	81679
TOTAL LOAD FOR YEAR:		1491728	TONS.									

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	TEMPER- ATURE WATER (DEG C) (00010)	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	SEDI- MENT, SUS- PENDE (MG/L) (80154)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (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)
OCT								
29...	1030	13.0	19300	218	11400	--	--	--
MAR								
10...	1030	6.0	8530	140	3220	--	--	--
MAY								
05...	1100	16.0	7660	95	1960	--	--	--
21...	1800	24.0	9620	3810	99000	46	52	69
JUN								
22...	2000	25.5	8360	1430	32300	46	60	63
JUL								
10...	1015	28.0	3070	166	1380	--	--	--
AUG								
24...	1130	22.0	5600	264	3990	29	39	--

05465500 IOWA RIVER AT WAPELLO, IA--Continued

WATER-QUALITY RECORDS

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	SED.	SED.	SED.	SED.	SED.	SED.	SED.
	SUSP.	SUSP.	SUSP.	SUSP.	SUSP.	SUSP.	SUSP.
	FALL	FALL	FALL	FALL	FALL	FALL	SIEVE
	DIAM.	DIAM.	DIAM.	DIAM.	DIAM.	DIAM.	DIAM.
	% FINER	% FINER	% FINER	% FINER	% FINER	% FINER	% FINER
	THAN	THAN	THAN	THAN	THAN	THAN	THAN
	.016 MM	.062 MM	.125 MM	.250 MM	.500 MM	1.00 MM	.062 MM
	(70340)	(70342)	(70343)	(70344)	(70345)	(70346)	(70331)
OCT 29...	--	--	--	--	--	--	83
MAR 10...	--	75	76	82	99	100	--
MAY 05...	--	--	--	--	--	--	93
MAY 21...	88	--	--	--	--	--	100
JUN 22...	81	--	--	--	--	--	100
JUL 10...	--	--	--	--	--	--	100
AUG 24...	63	94	96	100	--	--	--

PARTICLE-SIZE DISTRIBUTION OF SURFACE BED MATERIAL, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	NUMBER OF SAM- PLING POINTS	BED	BED	BED	BED	BED	BED	BED	BED
				MAT.	MAT.	MAT.	MAT.	MAT.	MAT.	MAT.	MAT.
				SIEVE	SIEVE	SIEVE	SIEVE	SIEVE	SIEVE	SIEVE	SIEVE
				DIAM.	DIAM.	DIAM.	DIAM.	DIAM.	DIAM.	DIAM.	DIAM.
				% FINER	% FINER	% FINER	% FINER	% FINER	% FINER	% FINER	% FINER
				THAN	THAN	THAN	THAN	THAN	THAN	THAN	THAN
				.062 MM	.125 MM	.250 MM	.500 MM	1.00 MM	2.00 MM	4.00 MM	8.00 MM
				(80164)	(80165)	(80166)	(80167)	(80168)	(80169)	(80170)	(80171)
											(80172)
OCT 29...	1030	19300	7	--	0	6	41	76	91	98	--
MAR 10...	1030	19500	7	0	1	14	48	81	94	98	100
MAY 05...	1100	7660	7	--	0	2	25	72	92	98	100
JUL 10...	1015	3070	1	1	2	8	46	75	88	97	99
AUG 24...	1130	5400	5	--	0	4	28	58	76	87	95

IOWA RIVER BASIN

05465500 IOWA RIVER AT WAPELLO, IOWA--Continued

WATER-QUALITY RECORDS

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	INSTANT- TIME	STREAM- FLOW, DUCT- TANEOUS (CFS) (00061)	SPE- CIFIC CON- (STAND- ANCE (US/CM) (00095)	PH ARD UNITS (00400)	TEMPER- ATURE WATER (DEG C) (00010)	TEMPER- ATURE AIR (DEG C) (00020)	TUR- DIS- ITY (NTU) (00076)	OXYGEN, CENT SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- SATUR- ATION) (MM (00301)	BARO- METRIC PRES- SURE OF (00025)	COLI- FORM, FECAL, 0.7 (COLS./ 100 ML) (31625)	STREP- TOCOCCEI FECAL, KF AGA PER (31673)
OCT												
29...	1030	19500	512	8.20	13.0	12.0	48	10.5	101	750	1300	5400
DEC												
15...	1315	5400	592	8.30	1.0	8.0	8.7	--	--	756	K56	390
MAR												
10...	1030	8530	501	8.10	6.0	3.0	27	12.3	102	740	K110	160
MAY												
05...	1100	7660	498	8.70	16.0	19.0	10	10.0	102	760	K80	K130
JUL												
10...	1015	3070	430	9.10	28.0	28.0	16	12.4	161	752	K140	K50
AUG												
24...	1130	5600	410	8.60	22.0	18.5	25	7.4	85	759	1400	410

DATE	HARD- NESS NONCARB WH WAT TOT FLD MG/L AS CACO3 (00902)	HARD- NESS WH WAT AS (MG/L AS CACO3) (00900)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM AD- SORP- TION RATIO (00931)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	ALKA- LITY WH WAT TOTAL FIELD MG/L AS CACO3 (00410)	BICAR- BONATE WH WAT TOTAL FIELD MG/L AS HCO3 (00440)	CAR- BONATE WH WAT TOTAL FIELD MG/L AS CO3 (00445)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)
OCT												
29...	70	270	71	22	8.6	6	0.2	3.2	198	240	0	31
DEC												
15...	72	310	82	26	13	8	0.3	1.9	240	290	0	38
MAR												
10...	71	260	70	20	11	8	0.3	2.7	186	230	0	35
MAY												
05...	62	230	52	24	13	11	0.4	1.4	167	190	6	37
JUL												
10...	41	180	40	20	18	17	0.6	2.3	141	130	21	38
AUG												
24...	47	190	44	19	13	13	0.4	3.9	141	160	5	34

DATE	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N) (00605)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N) (00610)
OCT												
29...	16	0.20	15	336	290	0.46	17700	0.89	7.40	0.020	0.020	0.010
DEC												
15...	26	0.20	14	370	350	0.50	5390	0.67	7.80	0.020	0.160	0.130
MAR												
10...	38	0.30	9.7	304	300	0.41	7000	2.2	7.20	0.040	0.110	0.110
MAY												
05...	25	0.20	3.3	281	260	0.38	5810	2.3	6.10	0.020	0.020	0.030
JUL												
10...	28	0.30	0.5	236	250	0.32	1960	2.9	1.30	0.040	0.060	0.040
AUG												
24...	20	0.30	1.3	226	230	0.31	3420	5.3	2.20	0.050	0.010	0.030

IOWA RIVER BASIN

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05465500 IOWA RIVER AT WAPELLO, IOWA--Continued

WATER-QUALITY RECORDS

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	NITRO- GEN, AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P) (00671)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS, TOTAL (MG/L AS P) (00665)	SEDI- MENT, SUS- PENDED (MG/L) (80154)	SEDI- MENT, CHARGE, SUS- PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)	SED. SUSP. FALL DIAM. % FINER THAN .062 MM (70342)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	ALUM- INUM, DIS- SOLVED (UG/L AS AL) (01106)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE) (01010)
OCT 29...	0.90	0.120	0.170	0.480	218	11500	83	--	3	<10	130	<0.5
DEC 15...	0.80	0.090	0.120	0.100	--	--	--	--	--	--	--	--
MAR 10...	2.3	0.120	0.160	0.330	140	3220	--	75	1	<10	99	<0.
MAY 05...	2.3	0.010	0.210	0.190	95	1960	93	--	1	<10	86	<0.5
JUL 10...	2.9	0.030	0.050	0.320	166	1380	100	--	--	--	--	-
AUG 24...	5.3	0.110	0.140	0.470	264	3990	--	94	2	<10	96	<0.5

DATE	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR) (01030)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MERCURY DIS- SOLVED (UG/L AS HG) (71890)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	NICKEL, DIS- SOLVED (UG/L AS NI) (01065)
OCT 29...	1	<1	<3	4	14	<5	12	2	0.1	<10	<1
DEC 15...	--	--	--	--	--	--	--	--	--	--	--
MAR 10...	1	<1	<3	2	14	<5	13	6	0.3	<10	1
MAY 05...	<1	<1	<3	3	<3	<5	7	1	0.3	<10	<1
JUL 10...	--	--	--	--	--	--	--	--	--	--	--
AUG 24...	<1	<1	<3	3	<3	<5	5	<1	0.3	<10	2

DATE	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)	ATRA- ZINE, TOTAL (UG/L) (39630)	CYAN- AZINE TOTAL (UG/L) (81757)	METRI- BUZIN IN WHOLE WATER (UG/L) (81408)	ALA- CHLOR TOTAL RECOVER (UG/L) (77825)	METOLA- CHLOR IN WHOLE WATER (UG/L) (39356)	TRI- FLURA- LIN TOTAL RECOVER (UG/L) (39030)
OCT 29...	1	<1	150	<6	20	--	--	--	--	--	--
DEC 15...	--	--	--	--	--	--	--	--	--	--	--
MAR 10...	1	<1	150	<6	16	--	--	--	--	--	--
MAY 05...	1	<1	140	<6	9	0.19	0.11	<0.10	<0.10	<0.10	<0.10
JUL 10...	--	--	--	--	--	0.46	<0.10	<0.10	<0.10	<0.10	<0.10
AUG 24...	1	<1	130	<6	3	0.51	0.10	<0.10	<0.10	0.28	<0.10

SKUNK RIVER BASIN

05470000 SOUTH SKUNK RIVER NEAR AMES, IA

LOCATION.--Lat 42°04'05", long 93°37'02", in NW1/4 SW1/4 sec.23, T.84 N., R.24 W., Story County, Hydrologic Unit 07080105, on left bank 2.5 mi north of Ames, 3.5 mi downstream from Keigley Branch, 5.2 mi upstream from Squaw Creek, and at mile 228.1 upstream from mouth of Skunk River.

DRAINAGE AREA.--315 mi².

PERIOD OF RECORD.--July 1920 to September 1927, October 1932 to current year. Monthly discharge only for some periods, published in WSP 1308. Prior to October 1966, published as Skunk River near Ames.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1308: 1921, 1925-26, 1934-35 (M), 1937 (M), 1939 (M), 1947-50 (M). WDR Iowa 1967: 1965. WDR IA-74-1: 1973 (P).

GAGE.--Water-stage recorder. Concrete control since July 21, 1934. Datum of gage is 893.61 ft above NGVD (Iowa Highway Commission benchmark). Prior to Aug. 25, 1921, nonrecording gage at same site and datum.

REMARKS.--No estimated daily discharges. Records good. U.S. National Weather Service gage-height telemeter at station.

AVERAGE DISCHARGE--62 years (water years 1921-27, 1933-87), 164 ft³/s, 7.07 in/yr, 118,800 acre-ft/yr; median of yearly mean discharges, 130 ft³/s, 5.6 in/yr, 94,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,630 ft³/s June 10, 1954, gage height, 13.66 ft; maximum gage height, 13.90 ft May 20, 1944; no flow at times in 1934, 1937, 1953-57, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 5	0230	1,610	5.35	July 12	1900	*3,040	*6.84
Oct. 13	0530	2,940	6.82	Aug. 26	1745	2,290	6.01

Minimum discharge, 30 ft³/s Feb. 18, result of freezeup.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	583	309	262	109	74	119	336	201	326	68	73	402
2	481	302	315	105	89	133	365	203	303	62	67	343
3	464	304	324	103	108	195	337	201	252	57	62	294
4	1060	286	306	100	116	207	312	182	216	54	58	256
5	1370	256	272	98	111	226	298	169	198	50	54	225
6	866	257	270	97	91	256	290	166	182	46	48	231
7	638	245	259	95	100	275	268	159	167	43	45	318
8	508	247	253	93	116	272	239	144	153	66	162	254
9	412	225	235	92	95	245	220	134	139	347	257	216
10	383	211	181	91	99	210	206	126	129	193	158	196
11	631	205	212	88	113	195	199	119	121	122	113	181
12	2380	202	237	87	96	180	190	115	116	2390	97	166
13	2640	173	166	92	86	173	179	110	111	2810	155	157
14	1660	199	212	125	87	173	252	108	108	1610	184	151
15	1150	217	199	163	81	231	849	103	101	1510	168	145
16	918	196	185	116	69	536	900	99	96	983	140	249
17	735	178	178	136	64	457	669	95	92	688	112	266
18	604	175	169	156	60	420	538	93	89	529	487	243
19	515	168	164	120	86	554	451	120	86	617	586	210
20	466	179	157	104	93	557	399	118	78	761	388	194
21	396	160	149	103	75	480	352	113	162	516	305	177
22	372	173	156	103	73	411	332	105	110	417	227	166
23	363	171	150	68	67	364	319	97	87	383	181	156
24	350	162	145	82	65	340	291	94	85	336	154	150
25	367	173	141	97	64	322	273	93	251	280	436	141
26	397	177	136	92	64	301	261	278	201	239	2020	135
27	394	181	129	69	65	283	246	567	135	216	1630	128
28	360	188	125	88	72	269	227	449	101	202	1020	122
29	330	198	120	86	---	225	225	538	92	189	725	115
30	311	215	116	81	---	211	210	548	80	178	625	109
31	303	---	113	70	---	302	---	396	---	136	489	---
TOTAL	22407	6332	6036	3129	2379	9122	10233	6043	4367	16098	11226	6098
MEAN	723	211	195	101	85.0	294	341	195	146	519	362	203
MAX	2640	309	324	163	116	557	900	567	326	2810	2020	402
MIN	303	160	113	68	60	119	179	93	78	43	45	109
AC-FT	44440	12560	11970	6210	4720	18090	20300	11990	8660	31930	22270	12100
CFSM	2.29	.67	.62	.32	.27	.93	1.08	.62	.46	1.65	1.15	.65
IN.	2.65	.75	.71	.37	.28	1.08	1.21	.71	.52	1.90	1.33	.72

CAL YR 1986	TOTAL 129814	MEAN 356	MAX 3440	MIN 19	AC-FT 257500	CFSM 1.13	IN. 15.3
WTR YR 1987	TOTAL 103470	MEAN 283	MAX 2810	MIN 43	AC-FT 205200	CFSM .90	IN. 12.2

SKUNK RIVER BASIN

125

05470500 SQUAW CREEK AT AMES, IA

LOCATION.--Lat 42°01'21", long 93°37'45", in NE1/4 NW1/4 sec.10, T.83 N., R.24 W., Story County, Hydrological Unit 07080105, on left bank 65 ft downstream from Lincoln Way Bridge in Ames, 0.2 mi, downstream from College Creek, and 2.4 mi, upstream from mouth.

DRAINAGE AREA.--204 mi².

PERIOD OF RECORD.--May 1919 to September 1927, May 1965 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1308: Drainage area, 1920-22 (M), 1923, 1924-25 (M), 1926, 1927 (M), WDR Iowa. 1966: 1965, WDR IA-71-1: 1970 (M).

GAGE.--Water-stage recorder and concrete control. Datum of gage is 881.00 ft above NGVD (levels by Iowa State University). Prior to Mar. 11, 1925, nonrecording gage at site 0.6 mi upstream at different datum. Mar. 11, 1925 to Apr. 30, 1927, nonrecording gage at site 65 ft upstream at datum about 4 ft higher.

REMARKS.--No estimated daily discharges. Records good. U.S. National Weather Service gage-height telemeter at station.

AVERAGE DISCHARGE.--30 years (water years 1920-27, 1966-87), 133 ft³/s, 8.85 in/yr, 96,360 acre-ft/yr; median of yearly mean discharges, 100 ft³/s, 6.7 in/yr, 72,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,300 ft³/s June 27, 1975, gage height, 14.00 ft, on basis of contracted-opening measurement; no flow at times most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 4, 1918, reached a stage of 14.5 ft, from floodmarks, site and datum used 1919-25, discharge, 6,900 ft³/s. Flood of Mar. 1, 1965, reached a stage of 10.7 ft, from graph based on gage readings, at present site and datum, discharge, 4,200 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,600 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 12	1130	2,120	7.27	Aug. 26	1045	*2,490	*8.03
July 12	1200	1,670	5.71				

Minimum discharge, 15.0 ft³/s July 6, 7.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	311	261	202	78	44	93	208	140	222	31	24	304
2	265	250	216	77	48	91	273	150	298	28	20	270
3	273	242	210	76	44	145	230	147	245	23	22	236
4	618	221	197	74	43	149	207	130	194	20	21	207
5	622	215	194	75	47	157	198	122	168	18	18	182
6	436	205	181	80	45	166	194	120	150	17	16	208
7	366	192	180	75	52	166	172	118	133	34	36	223
8	313	195	182	70	49	152	152	112	121	127	155	177
9	274	175	169	72	38	133	135	110	108	60	173	155
10	253	170	155	71	49	115	123	105	106	35	97	138
11	595	168	164	70	44	111	121	98	108	33	68	126
12	2000	167	156	84	42	106	111	92	97	1220	117	112
13	1290	155	126	78	36	101	108	91	86	752	142	105
14	784	171	179	101	38	103	274	89	78	398	128	97
15	582	156	143	97	33	124	959	81	69	331	107	104
16	495	146	136	56	27	161	713	79	63	303	94	120
17	413	139	130	83	36	162	551	78	61	189	89	132
18	349	138	117	86	40	190	440	97	60	147	372	123
19	322	131	115	71	43	282	354	82	58	135	371	114
20	305	140	111	63	42	264	305	80	58	221	245	110
21	286	122	102	66	39	225	263	78	56	142	203	103
22	268	131	110	58	40	189	246	70	48	100	159	97
23	272	130	103	59	35	167	234	66	42	76	138	95
24	327	133	101	61	37	159	202	64	42	97	116	92
25	405	139	99	54	35	147	193	66	78	103	454	88
26	476	159	88	51	36	135	183	230	59	78	2300	86
27	398	169	90	48	40	133	169	395	45	55	1710	83
28	336	174	91	44	60	132	156	303	39	49	944	81
29	292	185	89	43	---	102	161	338	49	41	652	77
30	268	191	81	45	---	115	146	317	38	34	512	72
31	258	---	79	40	---	155	---	263	---	29	374	---
TOTAL	14452	5170	4296	2106	1162	4630	7781	4311	2979	4926	9877	4117
MEAN	466	172	139	67.9	41.5	149	259	139	99.3	159	319	137
MAX	2000	261	216	101	60	282	959	395	298	1220	2300	304
MIN	253	122	79	40	27	91	108	64	38	17	16	72
AC-FT	28670	10250	8520	4180	2300	9180	15430	8550	5910	9770	19590	8170
CFSM	2.29	.84	.68	.33	.20	.73	1.27	.68	.49	.78	1.56	.67
IN.	2.64	.94	.78	.38	.21	.84	1.42	.79	.54	.90	1.80	.75

CAL YR 1986 TOTAL 85142 MEAN 233 MAX 2850 MIN 8.2 AC-FT 168900 CFSM 1.14 IN. 15.5
WTR YR 1987 TOTAL 65807 MEAN 180 MAX 2300 MIN 16 AC-FT 130500 CFSM .88 IN. 12.0

SKUNK RIVER BASIN

05471050 SOUTH SKUNK RIVER AT COLFAX, IA

LOCATION.--Lat 41°40'55", long 93°14'47", in NE1/4 NE1/4 SW1/4 sec.1, T.79 N., R.21 W., Jasper County, Hydrologic Unit 07080105, on left bank 15 ft downstream of bridge on State Highway 117 at north edge of Colfax, 1 mile downstream from Sugar Creek, 2.8 miles upstream from Indian Creek, and at mile 191 upstream from mouth of Skunk River.

DRAINAGE AREA.--803 mi².

PERIOD OF RECORD.--October 1, 1985 to current year.

GAGE.--Water-stage recorder. Datum of gage is 770.00 ft above NGVD.

REMARKS.--Estimated daily discharges: Nov. 11-13, Jan. 15 to Feb. 1 and July 12-15. Records fair except those for estimated daily discharges, which are poor. U.S. National Weather Service gage-height telemeter at station.

EXTREMES FOR PERIOD OF RECORD.-- Maximum discharge, 6,850 ft³/s Aug. 27, 1987, gage height, 17.35 ft; minimum discharge, 105 ft³/s Sept. 13, 1986.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood occurred in late June, 1975. Discharge and gage height not determined.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 13	2130	4,800	15.80	Aug. 27	1715	*6,850	*17.35
July 13	unknown	4,000	15.00				

Minimum daily discharge, 141 ft³/s July 6.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1840	1080	625	364	278	410	781	594	793	215	243	1520
2	1580	1050	679	353	283	476	847	868	717	193	223	1300
3	1410	1020	706	352	282	505	855	1890	710	177	205	1140
4	1460	993	686	336	283	568	798	946	601	163	193	1010
5	2480	941	652	327	286	583	770	841	551	152	176	910
6	2130	899	642	327	281	585	755	749	524	141	161	882
7	1650	867	644	325	272	588	736	700	495	176	148	1020
8	1450	841	653	305	287	588	694	655	482	268	309	1000
9	1270	790	636	337	274	597	653	611	452	784	525	876
10	1150	700	590	345	257	564	623	580	429	652	489	826
11	1190	680	563	321	271	531	601	546	420	472	369	778
12	3440	640	616	318	279	521	583	506	406	1700	459	734
13	4610	620	558	365	260	511	569	477	378	3000	1510	699
14	4140	663	529	375	258	518	778	455	357	2700	1310	671
15	2850	640	597	325	254	535	1570	424	332	1960	885	692
16	2290	667	563	283	242	607	1880	403	310	1790	703	699
17	1930	644	538	300	245	796	1500	387	293	1250	597	817
18	1600	643	519	312	248	792	1260	375	283	720	616	799
19	1400	587	504	302	239	846	1110	393	275	807	1260	749
20	1290	565	491	291	246	967	1010	388	266	883	1050	724
21	1200	558	471	280	248	945	924	357	285	883	835	659
22	1140	563	461	269	246	869	882	323	317	688	701	635
23	1110	607	472	258	243	799	865	309	280	595	597	607
24	1550	600	453	267	236	770	833	350	254	535	534	588
25	1600	593	440	275	236	741	795	358	273	605	736	572
26	1760	599	427	283	231	711	770	413	380	487	2860	545
27	1600	596	397	292	234	680	708	751	365	425	6560	514
28	1410	599	397	300	261	669	663	905	288	375	4990	499
29	1260	597	396	294	---	727	647	825	258	338	3080	473
30	1150	604	386	289	---	640	615	1160	245	303	2300	462
31	1090	---	368	283	---	677	---	906	---	274	1850	---
TOTAL	56030	21446	16659	9653	7260	20316	26075	19445	12019	23711	36474	23400
MEAN	1807	715	537	311	259	655	869	627	401	765	1177	780
MAX	4610	1080	706	375	287	967	1880	1890	793	3000	6560	1520
MIN	1090	558	368	258	231	410	569	309	245	141	148	462
AC-FT	111100	42540	33040	19150	14400	40300	51720	38570	23840	47030	72350	46410
CFSM	2.25	.89	.67	.39	.32	.82	1.08	.78	.50	.95	1.47	.97
IN.	2.60	.99	.77	.45	.34	.94	1.21	.90	.56	1.10	1.69	1.08

CAL YR 1986	TOTAL 350043	MEAN 959	MAX 5710	MIN 114	AC-FT 694300	CFSM 1.19	IN. 16.2
WTR YR 1987	TOTAL 272488	MEAN 747	MAX 6560	MIN 141	AC-FT 540500	CFSM .93	IN. 12.6

SKUNK RIVER BASIN

127

05471200 INDIAN CREEK NEAR MINGO, IA

LOCATION.--Lat 41°48'17", long 93°18'36", near corner common to secs. 20, 21, 28, and 29, T.81 N., R.21, W., Hydrologic Unit 07080105, Jasper County, on right bank 30 ft downstream from bridge on State Highway 117, 0.7 mile downstream from Wolf Creek, 2.2 miles upstream from Byers Branch, 2.9 miles northwest of Mingo, and 11.3 upstream from S. Skunk River.

DRAINAGE AREA.--276 mi².

PERIOD OF RECORD.--May 1958 to September 30, 1975; October 1, 1985 to September 30, 1986.

REVISED RECORDS.--WSP 1728: 1958 (M), 1959 (M).

GAGE.--Water-stage recorder. Datum of gage is 810.47 ft above NGVD.

REMARKS.--Estimated daily discharges: Dec. 14-15, Jan. 3-10, Jan. 17 to Feb. 3 and Feb. 23-26. Records good except those for estimated daily discharges, which are poor. U.S. National Weather Service gage-height telemeter at station.

AVERAGE DISCHARGE.--19 years (1958-75, 1985-87) 195 ft³/s, 9.60 in/yr, 141,300 acre-ft/yr; median of yearly mean discharges, 180 ft³/s, 8.9 in/yr, 130,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,380 ft³/s June 12, 1966, gage height, 16.41 ft; minimum daily discharge, 0.14 ft³/s Jan. 11-12, 1968.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 20, 1944, reached a stage of 21.4 ft, from information by local resident, discharge not determined.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 12	0600	2,740	11.47	Aug. 26	1315	*5,540	*14.64
July 13	0900	2,110	10.40				

Minimum discharge, 28 ft³/s Aug. 6, 7.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	942	381	234	114	90	118	263	158	260	54	49	796
2	774	371	272	110	88	131	302	160	232	48	43	649
3	667	367	289	110	86	195	297	228	217	44	40	550
4	749	342	277	105	81	206	276	189	186	40	38	473
5	793	325	250	105	76	224	262	171	169	37	34	412
6	646	313	245	100	68	228	258	162	154	35	31	417
7	560	291	240	100	74	226	246	157	139	44	29	464
8	500	288	237	98	77	222	229	147	125	94	178	541
9	447	255	220	96	63	198	216	142	114	524	260	444
10	410	239	185	94	69	173	208	136	105	238	157	402
11	720	229	186	91	72	164	197	128	110	154	115	370
12	2500	221	192	113	69	157	187	120	107	1160	165	335
13	1570	193	185	113	63	152	179	115	95	1770	342	314
14	1130	204	210	116	62	148	219	115	87	869	510	291
15	881	223	220	120	61	150	580	110	80	900	357	285
16	740	201	211	96	53	159	555	107	73	801	270	304
17	642	188	195	98	54	173	447	106	67	536	231	357
18	563	180	185	100	56	190	375	110	64	392	346	333
19	513	176	172	98	61	220	324	112	61	310	879	304
20	494	183	171	96	69	239	287	144	85	319	564	284
21	463	165	158	92	72	241	262	124	100	256	424	260
22	433	173	160	88	74	222	245	109	76	209	323	244
23	414	196	148	85	63	212	240	100	66	180	261	233
24	492	198	150	87	62	206	225	99	77	139	221	226
25	534	202	136	90	61	200	209	100	140	126	670	210
26	581	217	134	94	59	184	201	131	135	112	4600	202
27	531	222	130	96	60	179	193	304	100	95	4280	195
28	475	232	148	98	70	181	179	322	79	81	2450	185
29	417	228	139	96	---	196	175	283	71	70	1450	178
30	385	229	126	94	---	182	165	399	64	61	1170	169
31	382	---	117	92	---	230	---	325	---	55	1010	---
TOTAL	21348	7232	5922	3085	1913	5906	8001	5113	3438	9753	21497	10427
MEAN	689	241	191	99.5	68.3	191	267	165	115	315	693	348
MAX	2500	381	289	120	90	241	580	399	260	1770	4600	796
MIN	382	165	117	85	53	118	165	99	61	35	29	169
AC-FT	42340	14340	11750	6120	3790	11710	15870	10140	6820	19350	42640	20680
CFSM	2.50	.87	.69	.36	.25	.69	.97	.60	.42	1.14	2.51	1.26
IN.	2.88	.97	.80	.42	.26	.80	1.08	.69	.46	1.31	2.90	1.41

CAL YR 1986	TOTAL 145292	MEAN 398	MAX 3810	MIN 52	AC-FT 288200	CFSM 1.44	IN. 19.6
WTR YR 1987	TOTAL 103635	MEAN 284	MAX 4600	MIN 29	AC-FT 205600	CFSM 1.03	IN. 14.0

SKUNK RIVER BASIN

05471500 SOUTH SKUNK RIVER NEAR OSKALOOSA, IA

LOCATION.--Lat 41°21'19", long 92°39'31", in NW1/4 SW1/4 sec.25, T.76 N., R.16 W., Mahaska County, Hydrologic Unit 07080105, on right bank 400 ft upstream from bridge on U.S. Highway 63, 0.3 mi downstream from Painter Creek, 4.0 mi north of Oskaloosa, 52.0 mi. upstream from confluence with North Skunk River, and at mile 147.3 upstream from mouth of Skunk River.

DRAINAGE AREA.--1,635 mi².

PERIOD OF RECORD.--October 1945 to current year. Prior to October 1966, published as Skunk River near Oskaloosa. Prior to October 1948, monthly discharge only, published in WSP 1308.

REVISED RECORDS.--WSP 1438: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 685.50 ft above NGVD. Prior to Nov. 21, 1947, nonrecording gage at site 400 ft downstream at same datum.

REMARKS.--Estimated daily discharges: Nov. 9-19, Dec. 8-25, Jan. 11, Jan. 15 to Feb. 8, May 18-20, 25-31, June 25 to July 7, July 11 and Aug. 8 to Sept. 8. Records fair except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers data collection platform at station.

AVERAGE DISCHARGE.--42 years, 977 ft³/s, 8.12 in/yr, 707,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 20,000 ft³/s June 15, 1947, gage height, 21.26 ft, from floodmarks; maximum gage height, 22.52 ft Feb. 3, 1973, backwater from ice; minimum daily discharge, 1.8 ft³/s Oct. 11-13, 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in May 1944 reached a stage of 25.8 ft, from floodmarks, discharge, 37,000 ft³/s, from rating curve extended above 18,000 ft³/s on basis of velocity-area study.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 5,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 14	1845	7,350	18.62	Aug. 28	----	*14,000	unknown
July 14	0600	5,240	16.53				

Minimum daily discharge, 282 ft³/s Aug. 7.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5740	2210	1200	788	630	698	1400	1140	1790	470	510	3500
2	4500	2180	1230	757	620	956	1380	1090	1700	440	452	3000
3	3900	2080	1290	726	610	1200	1370	3730	1580	420	402	2600
4	3580	2000	1350	726	601	1230	1440	3070	1460	400	370	2400
5	3710	1920	1380	732	591	1290	1490	2080	1340	390	337	2100
6	4460	1820	1380	732	581	1290	1460	1790	1230	370	307	2000
7	3670	1770	1380	727	571	1290	1400	1680	1150	850	282	2100
8	3120	1750	1400	705	550	1260	1340	1540	1060	1050	550	2050
9	2770	1700	1350	675	530	1230	1270	1390	993	1510	1000	1860
10	2470	1650	1250	678	510	1190	1190	1250	934	2060	990	1750
11	2350	1450	1200	660	509	1140	1100	1130	881	1550	820	1670
12	4660	1400	1300	678	515	1090	1020	1030	838	2930	1000	1570
13	6420	1350	1220	670	506	1040	960	936	802	4410	2000	1440
14	7150	1450	1200	729	491	993	1530	855	770	5150	3000	1310
15	6430	1500	1300	680	474	953	2370	785	738	4490	2300	1330
16	4800	1450	1250	640	446	913	2900	717	705	3490	1800	1320
17	3890	1400	1220	620	422	963	3310	658	672	3000	1400	1550
18	3330	1320	1200	620	439	1250	2720	650	644	2280	1350	1660
19	2930	1250	1150	630	419	1440	2340	1100	623	1870	2000	1660
20	2650	1140	1100	640	431	1370	2070	2300	607	1770	3000	1600
21	2460	1150	1070	640	444	1600	1930	1400	608	1690	2400	1490
22	2310	1180	1050	640	439	1590	1840	1030	596	1610	1700	1370
23	2200	1230	1100	600	423	1490	1730	843	573	1510	1300	1270
24	2200	1260	1050	580	414	1410	1660	725	556	1370	1200	1200
25	2930	1270	1000	580	403	1340	1580	720	600	1220	1100	1140
26	3980	1250	948	600	398	1270	1500	710	800	1080	3000	1090
27	3670	1220	883	620	396	1200	1430	1600	790	958	12000	1040
28	3170	1210	859	640	425	1130	1350	1800	600	826	11000	1010
29	2780	1200	857	660	---	2050	1270	1700	550	715	8300	1010
30	2500	1200	837	650	---	1790	1200	2200	500	634	5800	1010
31	2310	---	812	640	---	1470	---	2000	---	569	4000	---
TOTAL	113040	44960	35816	20663	13788	39126	49550	43649	26690	51082	75670	50100
MEAN	3646	1499	1155	667	492	1262	1652	1408	890	1648	2441	1670
MAX	7150	2210	1400	788	630	2050	3310	3730	1790	5150	12000	3500
MIN	2200	1140	812	580	396	698	960	650	500	370	282	1010
AC-FT	224200	89180	71040	40990	27350	77610	98280	86580	52940	101300	150100	99370
CFSM	2.23	.92	.71	.41	.30	.77	1.01	.86	.54	1.01	1.49	1.02
IN.	2.57	1.02	.81	.47	.31	.89	1.13	.99	.61	1.16	1.72	1.14

CAL YR 1986 TOTAL 714769 MEAN 1958 MAX 9220 MIN 320 AC-FT 1418000 CFSM 1.20 IN. 16.3
WTR YR 1987 TOTAL 564134 MEAN 1546 MAX 12000 MIN 282 AC-FT 1119000 CFSM .95 IN. 12.8

SKUNK RIVER BASIN

129

05472500 NORTH SKUNK RIVER NEAR SIGOURNEY, IA

LOCATION.--Lat 41°18'03", Long 92°12'16", in NE1/4 SE1/4 sec.14, T.75 N., R.12 W., Keokuk County, Hydrologic Unit 07080106, on right bank 20 ft downstream from bridge on State Highway 149, 1.2 mi downstream from Cedar Creek, 2.2 mi south of Sigourney, 4.0 mi upstream from Bridge Creek, and 16.2 mi upstream from confluence with South Skunk River.

DRAINAGE AREA.--730 mi².

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

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1558: 1946-47 (M).

GAGE.--Water-stage recorder. Datum of gage is 651.53 ft above NGVD. Prior to June 10, 1953, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Oct. 10-13, 24, 25, Nov. 1-3, 7-9, 14-17, 19-26, Nov. 28 to Dec. 1, Dec. 4-7, Dec. 11 to Jan. 3, Jan. 15 to Feb. 5, Feb. 11, Feb. 28 to Mar. 1, Mar. 8-15, 17-19, 21, 22, and Mar. 29 to Apr. 1. Records good except those for Oct. 1 to Apr. 2, which are poor. U.S. Army Corps of Engineers data collection platform at station.

AVERAGE DISCHARGE.--42 years, 454 ft³/s, 8.45 in/yr, 328,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 27,500 ft³/s Mar. 31, 1960, gage height, 25.33 ft; minimum daily, 0.1 ft³/s Oct. 7 to Nov. 15, 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in May 1944 reached a stage of 22.8 ft, from floodmark, discharge, 14,500 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,800 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Aug. 30	2330	*5,590	*18.81	No other peak greater than base discharge.			

Minimum daily discharge, 120 ft³/s Jan. 25, 26.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1966 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2760	860	850	270	150	300	1050	516	632	157	157	2800
2	2780	810	732	255	160	503	960	496	480	149	151	1140
3	2990	770	603	245	165	571	881	483	420	141	144	898
4	2850	735	540	225	170	730	802	636	375	136	137	764
5	1840	685	500	221	155	753	737	579	341	137	131	683
6	1770	635	470	247	143	942	690	512	316	134	129	634
7	1650	600	940	229	177	732	650	480	295	171	126	593
8	1530	590	730	215	159	650	615	455	277	1290	130	562
9	1120	570	692	179	184	580	580	438	258	573	145	518
10	1000	550	642	175	140	530	553	420	243	669	251	485
11	900	506	580	194	130	490	526	400	235	551	194	469
12	1800	475	540	215	154	460	503	378	240	425	145	458
13	3500	444	490	225	161	430	493	357	243	1290	134	428
14	2260	490	560	264	156	410	947	347	228	888	1480	404
15	2250	560	680	200	163	400	2080	336	206	942	1160	423
16	1590	540	640	160	151	380	1820	330	187	2080	768	460
17	1010	520	600	190	147	450	1350	318	175	1350	573	1280
18	946	484	560	170	144	580	1190	306	166	670	519	1150
19	847	460	530	160	143	700	1000	302	166	513	426	770
20	750	430	490	155	141	621	866	491	248	425	388	612
21	722	410	460	160	196	760	786	1730	579	360	351	538
22	706	410	430	150	197	580	792	1020	363	315	307	483
23	680	420	400	140	186	496	832	557	323	274	274	441
24	660	420	375	130	175	462	794	461	238	245	239	416
25	1300	430	350	120	163	505	738	429	367	232	285	392
26	2590	410	340	120	161	549	694	427	300	249	2010	368
27	2260	391	370	130	159	507	654	601	274	201	2620	349
28	1540	385	365	130	200	469	610	702	210	175	2640	333
29	1170	380	340	130	---	780	576	534	177	160	3360	320
30	1010	375	320	135	---	1400	548	474	166	172	5050	310
31	908	---	290	145	---	1200	---	526	---	167	5310	---
TOTAL	49689	15745	16409	5684	4530	18920	25317	16041	8728	15241	29734	19481
MEAN	1603	525	529	183	162	610	844	517	291	492	959	649
MAX	3500	860	940	270	200	1400	2080	1730	632	2080	5310	2800
MIN	660	375	290	120	130	300	493	302	166	134	126	310
AC-FT	98560	31230	32550	11270	8990	37530	50220	31820	17310	30230	58980	38640
CFSM	2.20	.72	.73	.25	.22	.84	1.16	.71	.40	.67	1.31	.89
IN.	2.53	.80	.84	.29	.23	.96	1.29	.82	.44	.78	1.52	.99

CAL YR 1986	TOTAL 309981	MEAN 849	MAX 8160	MIN 110	AC-FT 614800	CFSM 1.16	IN. 15.8
WTR YR 1987	TOTAL 225519	MEAN 618	MAX 5310	MIN 120	AC-FT 447300	CFSM .85	IN. 11.5

SKUNK RIVER BASIN

05473400 CEDAR CREEK NEAR OAKLAND MILLS, IA

LOCATION.--Lat. 40°55'20", long 91°40'10", in SE1/4 NW1/4 sec.28, T.71 N., R.7 W., Henry County, Hydrologic Unit 07080107, on left bank 30 ft upstream from bridge on county highway H46, 3.0 mi west of Oakland Mills, 2.9 mi upstream from Wolf Creek, and 4.3 mi upstream from mouth.

DRAINAGE AREA.--530 mi².

PERIOD OF RECORD.--Occasional low-flow measurements, water years 1957 to 1977. July 1977 to current year.

GAGE.--Water-stage recorder. Datum of gage is 565.07 ft above NGVD.

REMARKS.--Estimated daily discharges: Nov. 11-19, Dec. 11-24, 27-29, Jan. 3-26, Mar. 28 to Apr. 28, Sept. 1-5 and 23-27. Records good except those for estimated daily discharges, which are poor. Occasional high-water measurements were made by U.S. Army Corps of Engineers in 1965, 1966, 1970 and 1974 and by U.S. Geological Survey in 1966 and 1967.

AVERAGE DISCHARGE.--10 years, 402 ft³/s, 10.3 in/yr, 291,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,560 ft³/s Apr. 3, 1983, gage height, 19.68 ft; minimum daily, 1.0 ft³/s July 9, 1977 and Sept. 14, 1983.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of April 22, 1973 reached a stage of 24.09 ft, discharge not determined. Flood of June 1905 reached a stage approximately 2 feet higher from information by local resident.

EXTREMES FOR CURRENT PERIOD.--Peak discharges greater than base discharge of 3,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 3	1245	*7,160	*18.40	Oct. 27	0945	5,560	16.53
Apr. 16	----	unknown	unknown				

Minimum discharge, 2.5 ft³/s Sept. 9.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5570	418	88	78	70	399	800	118	304	18	19	22
2	5960	348	92	75	73	871	650	106	1780	40	11	19
3	6880	298	133	46	79	562	530	106	553	24	11	11
4	6630	275	130	50	83	382	420	116	428	18	14	6.0
5	3710	243	93	54	69	298	370	114	231	17	38	5.1
6	1140	205	80	50	61	265	330	97	163	21	19	3.3
7	729	191	217	53	95	227	305	86	128	19	11	3.8
8	574	173	892	47	78	201	280	83	110	16	13	2.9
9	459	163	938	35	96	177	260	78	103	17	139	2.7
10	365	148	549	27	128	144	240	72	91	15	76	17
11	308	118	220	35	71	122	220	69	87	15	22	21
12	306	98	260	49	79	120	205	65	74	14	12	12
13	524	86	230	52	82	120	400	60	74	14	8.7	9.5
14	957	95	198	46	79	126	800	55	70	17	28	8.5
15	771	89	200	38	69	129	1500	50	60	22	54	9.6
16	479	96	205	33	74	129	3000	50	53	19	32	11
17	362	90	185	28	68	126	1600	47	47	15	42	12
18	295	83	170	30	52	167	950	46	40	13	24	146
19	239	78	152	27	55	542	610	47	43	14	15	133
20	206	104	150	25	60	464	460	48	203	12	8.2	60
21	185	141	150	28	63	292	385	49	111	11	7.1	41
22	168	143	132	24	60	230	340	72	190	9.9	4.7	33
23	154	123	120	28	59	199	275	99	95	9.1	3.5	25
24	147	125	105	26	58	183	225	57	56	10	3.0	20
25	679	112	102	23	60	329	190	44	42	16	7.7	15
26	4540	102	95	27	58	426	165	41	33	17	97	14
27	5430	103	94	32	58	301	150	45	36	14	697	14
28	3130	100	91	36	69	210	140	872	29	12	295	15
29	990	90	88	41	---	350	128	485	23	12	89	16
30	652	89	84	49	---	600	123	240	20	36	42	26
31	499	---	83	55	---	1000	---	170	---	48	26	---
TOTAL	53038	4527	6326	1247	2006	9691	16051	3687	5277	555.0	1868.9	734.4
MEAN	1711	151	204	40.2	71.6	313	535	119	176	17.9	60.3	24.5
MAX	6880	418	938	78	128	1000	3000	872	1780	48	697	146
MIN	147	78	80	23	52	120	123	41	20	9.1	3.0	2.7
AC-FT	105200	8980	12550	2470	3980	19220	31840	7310	10470	1100	3710	1460
CFSM	3.23	.28	.39	.08	.14	.59	1.01	.22	.33	.0	.11	.0
IN.	3.72	.32	.44	.09	.14	.68	1.13	.26	.37	.0	.13	.05

CAL YR 1986	TOTAL 208681.6	MEAN 572	MAX 7430	MIN 5.8	AC-FT 413900	CFSM 1.08	IN. 14.6
WTR YR 1987	TOTAL 105008.2	MEAN 288	MAX 6880	MIN 2.7	AC-FT 208300	CFSM .54	IN. 7.37

SKUNK RIVER BASIN

131

05474000 SKUNK RIVER AT AUGUSTA, IA
(National stream-quality accounting network station)

LOCATION.--Lat 40°45'13", long 91°16'40", in NE1/4 NE1/4 sec.26, T.69 N., R.4 W., Des Moines County, Hydrologic Unit 07080107, on left bank 300 ft upstream from bridge on State Highway 394 at Augusta, 2.0 mi upstream from Long Creek, and at mile 12.5.

DRAINAGE AREA.--4,303 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September to November 1913, October 1914 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1308: 1915 (M), 1919-27 (M), 1932-34 (M), 1936, 1937-38 (M), 1942 (M). WSP 1438: Drainage area. WDR IA-71-1: 1966 (M).

GAGE.--Water-stage recorder. Datum of gage is 521.24 ft above NGVD. Prior to Nov. 15, 1913, nonrecording gage at site 400 ft upstream at datum about 0.7 ft higher. May 27, 1915, to Jan. 14, 1935, nonrecording gage at site 400 ft upstream at present datum.

REMARKS.--Estimated daily discharges: Dec. 11-17, 19, 21, 22 and Jan. 16 to Feb. 4. Records good except those for estimated daily discharges, which are poor. U. S. Army Corps of Engineers data collection platform at station.

AVERAGE DISCHARGE.--73 years (water years 1915-87), 2,473 ft³/s, 7.80 in/yr, 1,792,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 66,800 ft³/s Apr. 23, 1973, gage height, 27.05 ft; minimum daily, 7 ft³/s Aug. 27 to Sept. 1, 1934.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 1, 1903, reached a stage of about 21 ft, discharge, about 45,000 ft³/s. Stage and discharge for flood of April 1973 are believed to be the greatest since 1851.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 15,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 4	0845	*29,000	*18.50	Oct. 27	1300	19,000	15.28

Minimum discharge, 556 ft³/s Aug. 8.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21300	5950	2640	1930	1150	1490	5160	2660	2550	887	903	7530
2	23700	5370	2690	1860	1300	2340	4210	2530	3880	806	810	8240
3	27700	5010	2770	1790	1500	2590	3760	2440	3900	768	753	9020
4	28700	4790	2900	1680	1650	2540	3570	2370	2870	705	742	9660
5	24900	4570	2930	1690	1540	2620	3440	2370	2470	664	665	9220
6	15400	4340	2890	1650	1490	2780	3330	4040	2160	647	634	6890
7	11000	4140	3230	1720	1500	2800	3170	3420	1920	712	587	5010
8	9130	3970	4000	1710	1440	2880	3020	2930	1740	668	565	3860
9	8260	3790	4830	1620	1370	2710	2910	2660	1740	657	598	3280
10	7740	3690	4430	1530	1250	2540	2810	2460	1450	2210	707	3090
11	7240	3590	3450	1550	1200	2410	2710	2320	1340	1710	631	3030
12	6720	3380	2600	1620	1150	2270	2590	2200	1250	2430	717	2810
13	6450	3160	2400	1460	1110	2130	2690	2040	1180	2290	972	2610
14	7760	2960	3100	1530	1120	2030	3730	1920	1140	2360	916	2440
15	8480	2780	3800	1640	1130	2010	7430	1820	1100	4210	956	2300
16	7840	2520	3250	1300	1080	1980	10100	1720	1040	4210	2910	2210
17	7440	2650	3050	1150	1010	1910	8100	1640	974	4660	3280	2270
18	7700	2970	2940	1350	978	1990	6380	1590	913	5260	2680	3280
19	7830	3040	2800	1250	937	2680	5780	1560	859	4340	2160	4070
20	7420	2890	2760	1200	900	3060	5140	1510	981	3310	1860	3450
21	6770	2780	2600	1150	886	3080	4560	1660	1370	2700	1740	2890
22	6080	2780	2500	1100	921	3020	4120	3160	1150	2310	2010	2570
23	5410	2740	2530	1100	944	2930	3860	3970	1790	2070	2350	2350
24	5000	2680	2390	1050	950	2940	3840	2790	1300	2030	2000	2180
25	5500	2750	2340	1000	943	3080	3720	2060	1080	1810	1810	2020
26	14800	2880	2300	1000	920	3180	3490	1790	973	1540	1890	1890
27	18700	2820	2240	1000	896	3120	3300	1660	924	1340	3460	1800
28	16800	2740	2140	1000	918	3020	3100	2340	981	1220	6460	1730
29	11500	2670	2040	1050	---	4570	2930	3400	972	1180	6300	1660
30	8290	2630	1960	1000	---	5060	2790	2790	935	1060	6430	1550
31	6850	---	1940	1000	---	5220	---	2670	---	975	6850	---
TOTAL	358410	103030	88440	42680	32183	86980	125740	75390	46932	61739	65346	114910
MEAN	11560	3434	2853	1377	1149	2806	4191	2432	1564	1992	2108	3830
MAX	28700	5950	4830	1930	1650	5220	10100	4040	3900	5260	6850	9660
MIN	5000	2520	1940	1000	886	1490	2590	1510	859	647	565	1550
AC-FT	710900	204400	175400	84660	63830	172500	249400	149500	93090	122500	129600	227900
CFSM	2.69	.80	.66	.32	.27	.65	.97	.57	.36	.46	.49	.89
IN.	3.10	.89	.76	.37	.28	.75	1.09	.65	.41	.53	.56	.99

CAL YR 1986	TOTAL 1728600	MEAN 4736	MAX 28700	MIN 630	AC-FT 3429000	CFSM 1.10	IN. 14.9
WTR YR 1987	TOTAL 1201780	MEAN 3293	MAX 28700	MIN 565	AC-FT 2384000	CFSM .77	IN. 10.4

SKUNK RIVER BASIN

05474000 SKUNK RIVER AT AUGUSTA, IA--Continued
(National stream-quality accounting network station)

WATER-QUALITY RECORDS

LOCATION.--Samples collected at bridge on State Highway 394, 300 ft downstream from gage.

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

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1975 to current year.

WATER TEMPERATURES: October 1975 to current year.

SUSPENDED-SEDIMENT DISCHARGE: October 1975 to current year.

REMARKS.--During periods of ice effect, sediment samples are collected in open water channel. Records of specific conductance are obtained from suspended sediment samples at time of analysis.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 950 microsiemens Dec. 20, 1979, Feb. 12, 1980; minimum daily, 180 microsiemens Aug. 17, 1986.

WATER TEMPERATURES: Maximum daily, 34.0°C July 20, 1980; minimum daily, 0.0°C on many days during winter periods.

SEDIMENT CONCENTRATIONS: Maximum daily mean, 8,550 mg/L June 25, 1981; minimum daily mean, 1 mg/L Mar. 8, 9, 12, 1978, Jan. 5, 6, 1984.

SEDIMENT LOADS: Maximum daily, 499,000 tons Mar. 21, 1978; minimum daily, 1.5 tons Feb. 8, 1977.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 620 microsiemens June 11, 12; minimum daily, 270 microsiemens Oct. 4.

TEMPERATURES: Maximum daily, 32.0°C July 26-28 and July 31 to Aug. 3; minimum daily, 0.0°C on many days during winter periods.

SEDIMENT CONCENTRATIONS: Maximum daily mean, 4,100 mg/L May 6; minimum daily mean, 7 mg/L Feb. 21.

SEDIMENT LOADS: Maximum daily, 82,600 tons Apr. 16; minimum daily, 17 tons Feb. 21.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	320	540	575	480	600	500	410	580	515	520	520	320
2	300	550	560	520	490	500	440	580	515	540	480	360
3	280	555	585	490	470	470	460	570	420	540	405	410
4	270	560	520	520	480	480	480	570	495	520	390	445
5	360	565	460	470	460	480	500	570	560	560	400	500
6	460	560	520	460	490	480	500	420	570	520	430	510
7	490	580	515	460	500	460	520	425	580	500	440	530
8	535	565	520	410	460	490	475	510	610	410	420	545
9	540	580	460	560	460	480	500	560	600	380	400	525
10	560	580	460	460	500	480	490	565	560	480	425	545
11	570	570	480	440	490	520	480	580	620	280	360	560
12	560	565	480	450	475	540	490	580	620	290	400	545
13	560	560	535	520	460	460	500	565	560	310	420	570
14	540	575	535	500	480	510	470	585	600	300	390	580
15	440	580	480	480	520	450	380	540	530	300	380	585
16	440	580	530	480	500	440	340	490	540	310	515	580
17	490	560	540	505	490	410	370	520	540	380	295	590
18	515	590	520	495	420	530	420	510	520	360	360	540
19	540	560	585	500	480	510	470	510	540	435	400	520
20	550	580	510	530	520	500	500	500	510	460	460	420
21	560	570	505	560	500	500	500	560	540	500	485	500
22	580	580	450	500	490	510	510	500	505	520	505	560
23	580	570	460	520	510	510	570	330	510	540	540	540
24	580	560	470	470	420	515	580	350	475	540	520	580
25	560	570	455	460	450	515	590	415	460	560	545	535
26	340	555	500	540	410	510	575	485	500	545	560	600
27	350	560	490	515	510	520	590	530	500	540	510	620
28	310	560	500	520	500	510	600	545	520	540	360	560
29	475	560	420	460	---	460	600	410	520	550	300	560
30	500	580	460	450	---	420	600	480	540	560	300	540
31	540	---	450	480	---	460	---	440	---	550	300	---

SKUNK RIVER BASIN

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05474000 SKUNK RIVER AT AUGUSTA, IA--Continued

WATER-QUALITY RECORDS

TEMPERATURE, WATER, DEGREES CENTIGRADE, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20.0	11.0	3.0	2.0	2.0	4.0	6.0	21.0	26.0	25.0	32.0	20.0
2	20.0	11.0	3.0	2.0	2.0	7.0	6.0	21.0	25.0	28.0	32.0	20.0
3	---	11.0	3.0	2.0	3.0	7.0	6.0	18.0	23.0	28.0	32.0	20.0
4	18.0	10.0	1.0	2.0	3.0	7.0	6.0	17.0	23.0	29.0	29.0	21.0
5	18.0	10.0	1.0	2.0	3.0	7.0	9.0	18.0	25.0	29.0	29.0	21.0
6	18.0	10.0	1.0	3.0	3.0	8.0	11.0	18.0	25.0	29.0	30.0	21.0
7	16.2	10.0	4.0	3.0	3.0	11.0	11.0	18.0	25.0	29.0	30.0	22.0
8	16.0	10.0	4.0	3.0	3.0	11.0	12.0	20.0	27.0	28.0	29.0	22.0
9	16.0	9.0	4.0	1.0	3.0	7.0	15.0	21.0	26.0	29.0	29.0	22.0
10	16.0	9.0	2.0	1.0	3.0	7.0	13.0	23.0	24.0	28.0	29.0	22.0
11	16.0	6.0	1.0	1.0	3.0	7.0	13.0	23.0	25.0	29.0	29.0	22.0
12	13.0	3.0	.0	2.0	5.0	7.0	15.0	23.0	25.0	27.0	28.0	21.0
13	11.0	1.0	.0	3.0	5.0	9.0	13.0	23.0	28.0	27.0	26.0	21.0
14	11.0	1.0	.0	4.0	5.0	9.0	14.0	23.0	30.0	27.0	26.0	21.0
15	12.0	1.0	1.0	2.0	3.0	7.0	14.0	22.0	31.0	25.0	28.0	21.0
16	12.0	5.0	1.0	2.0	3.0	7.0	14.0	22.0	31.0	25.0	30.0	21.0
17	12.0	3.0	2.0	2.0	3.0	7.0	16.0	23.0	30.0	25.0	28.0	20.0
18	12.0	2.0	1.0	2.0	3.0	7.0	16.0	25.0	30.0	25.0	28.0	20.0
19	12.0	2.0	1.0	2.0	5.0	7.0	18.0	25.0	30.0	27.0	28.0	20.0
20	14.0	2.0	1.0	1.0	5.0	9.0	19.0	26.0	30.0	27.0	28.0	19.0
21	14.0	5.0	1.0	.0	5.0	10.0	17.0	27.0	28.0	29.0	28.0	19.0
22	14.0	6.0	2.0	.0	5.0	10.0	16.0	22.0	29.0	29.0	25.0	19.0
23	14.0	5.0	2.0	.0	6.0	13.0	15.0	22.0	29.0	29.0	25.0	19.0
24	14.0	7.0	1.0	.0	6.0	12.0	17.0	22.0	28.0	30.0	25.0	20.0
25	13.0	6.0	1.0	.0	5.0	10.0	17.0	20.0	28.0	30.0	25.0	20.0
26	13.0	6.0	1.0	.0	6.0	10.0	17.0	20.0	28.0	32.0	26.0	20.0
27	13.0	5.0	2.0	.0	5.0	9.0	18.0	25.0	28.0	32.0	19.0	20.0
28	12.5	5.0	2.0	.0	5.0	9.0	19.0	23.0	26.0	32.0	18.0	20.0
29	13.0	5.0	2.0	.0	---	7.0	19.0	23.0	26.0	31.0	19.0	19.0
30	13.0	3.0	2.0	.0	---	6.0	19.0	23.0	25.0	31.0	19.0	19.0
31	11.0	---	2.0	.0	---	6.0	---	24.0	---	32.0	19.0	---

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

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	571	32800	213	3420	42	299	41	214	23	71	375	1510
2	780	49900	184	2670	48	349	28	141	36	126	246	1550
3	629	47000	167	2260	40	299	23	111	47	190	145	1010
4	490	38000	154	1990	57	446	22	100	39	174	128	878
5	317	21300	141	1740	81	641	34	155	37	154	126	891
6	373	15500	134	1570	61	476	51	227	43	173	162	1220
7	362	10800	132	1480	196	1710	36	167	30	121	300	2270
8	323	7960	127	1360	185	2000	27	125	15	58	1370	10700
9	303	6760	123	1260	316	4120	18	79	12	44	790	5780
10	285	5960	125	1250	282	3370	15	62	12	40	365	2500
11	257	5020	122	1180	176	1640	29	121	9	29	180	1170
12	273	4950	121	1100	121	849	52	227	21	65	119	729
13	257	4480	118	1010	120	778	38	150	26	78	94	541
14	353	7400	128	1020	92	770	16	66	8	24	88	482
15	624	14300	88	661	44	451	23	102	8	24	84	456
16	462	9780	62	422	50	439	45	158	9	26	52	278
17	335	6730	53	379	42	346	42	130	9	25	30	155
18	297	6170	61	489	45	357	31	113	10	26	44	236
19	295	6240	95	780	62	469	20	67	12	30	186	1350
20	269	5390	97	757	73	544	23	75	10	24	200	1650
21	217	3970	93	698	70	491	25	78	7	17	204	1700
22	201	3300	59	443	85	574	14	42	11	27	230	1880
23	194	2830	50	370	67	458	10	30	19	48	236	1870
24	187	2520	52	376	60	387	13	37	22	56	255	2020
25	273	4290	48	356	68	430	28	76	24	61	247	2050
26	969	40700	62	482	49	304	51	138	26	65	187	1610
27	800	40400	84	640	43	260	47	127	22	53	154	1300
28	408	18500	63	466	48	277	37	100	72	178	162	1320
29	340	10600	47	339	86	474	35	99	---	---	722	8910
30	292	6540	45	320	62	328	41	111	---	---	760	10400
31	253	4680	---	---	57	299	34	92	---	---	700	9870
TOTAL	---	444770	---	31286	---	24635	---	3520	---	2007	---	78286

SKUNK RIVER BASIN

05474000 SKUNK RIVER AT AUGUSTA, IA--Continued

WATER-QUALITY RECORDS

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

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)
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	1100	15300	190	1360	690	4750	150	359	72	176	950	19300
2	690	7840	184	1260	1720	21100	138	300	73	160	817	18200
3	405	4110	155	1020	2820	30700	108	224	60	122	760	18500
4	302	2910	118	755	1450	11200	102	194	133	266	672	17500
5	269	2500	318	2810	650	4330	111	199	110	198	531	13200
6	270	2430	4100	44700	503	2930	92	161	80	137	462	8590
7	243	2080	2620	24200	484	2510	87	167	68	108	461	6240
8	188	1530	1020	8070	385	1810	79	142	67	102	411	4280
9	180	1410	530	3810	490	2300	61	108	52	84	325	2880
10	169	1280	310	2060	273	1070	473	2820	57	109	292	2440
11	160	1170	230	1440	180	651	350	1620	50	85	280	2290
12	162	1130	222	1320	148	499	910	5970	52	101	278	2110
13	437	3170	217	1200	122	389	898	5550	70	184	262	1850
14	412	4660	170	881	118	363	680	4330	42	104	248	1630
15	1950	40700	163	801	114	339	2870	33100	58	150	218	1350
16	3030	82600	157	729	111	312	2030	23100	585	4600	186	1110
17	2000	43700	156	691	109	287	1840	23200	1050	9300	179	1100
18	1220	21000	140	601	107	264	1960	27800	730	5280	410	3630
19	1000	15600	130	548	109	253	1600	18700	445	2600	753	8270
20	920	12800	123	501	186	493	970	8670	325	1630	680	6330
21	680	8370	210	941	272	1010	652	4750	288	1350	457	3570
22	528	5870	1140	9730	230	714	452	2820	329	1790	259	1800
23	433	4510	2600	27900	1070	5170	364	2030	422	2680	195	1240
24	346	3590	2100	15800	510	1790	325	1780	347	1870	180	1060
25	273	2740	950	5280	277	808	290	1420	342	1670	162	884
26	224	2110	380	1840	220	578	257	1070	392	2000	141	720
27	199	1770	280	1250	177	442	236	854	800	7470	122	593
28	202	1690	480	3030	162	429	200	659	2540	44300	125	584
29	195	1540	1960	18000	187	491	178	567	1770	30100	117	524
30	190	1430	1230	9270	159	401	135	386	1260	21900	98	410
31	---	---	990	7140	---	---	75	197	1050	19400	---	---
TOTAL	---	301540	---	198938	---	98383	---	173247	---	160026	---	152185
TOTAL LOAD FOR YEAR:			1668825 TONS.									

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	TEMPER- ATURE WATER (DEG C) (00010)	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	SEDI- MENT, SUS- PENDED (MG/L) (80154)	SEDI- MENT, DIS- CHARGE, SUS- PENDED (T/DAY) (80155)	% FINER THAN .002 MM (70337)	% FINER THAN .004 MM (70338)	% FINER THAN .008 MM (70339)
OCT								
28...	1030	12.0	16300	356	15700	33	39	46
FEB								
25...	1115	4.0	893	21	51	--	--	--
APR								
15...	1420	--	7720	2090	43600	--	--	--
15...	1520	--	7920	2200	47000	--	--	--
15...	1525	--	7940	2280	48900	--	--	--
MAY								
04...	1130	16.0	2310	95	593	--	--	--
18...	1440	26.5	1580	133	567	--	--	--
18...	1445	26.5	1580	135	576	--	--	--
JUL								
08...	1030	27.0	666	88	158	--	--	--
14...	1330	--	2190	580	3430	--	--	--
14...	1335	--	2190	586	3470	--	--	--
16...	1320	--	4190	2010	22700	--	--	--
16...	1325	--	4190	1970	22300	--	--	--
AUG								
28...	1130	18.0	6760	2920	53300	14	25	39

05474000 SKUNK RIVER AT AUGUSTA, IA--Continued

WATER-QUALITY RECORDS

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

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. FALL DIAM. % FINER THAN .062 MM (70331)
OCT 28...	54	78	82	93	100	--	--
FEB 25...	--	--	--	--	--	--	39
APR 15...	--	--	--	--	--	--	95
15...	--	--	--	--	--	--	95
15...	--	--	--	--	--	--	93
MAY 04...	--	--	--	--	--	--	76
18...	--	--	--	--	--	--	95
18...	--	--	--	--	--	--	96
JUL 08...	--	--	--	--	--	--	100
14...	--	--	--	--	--	--	99
14...	--	--	--	--	--	--	99
16...	--	--	--	--	--	--	99
16...	--	--	--	--	--	--	99
AUG 28...	59	97	98	98	99	100	--

PARTICLE-SIZE DISTRIBUTION OF SURFACE BED MATERIAL, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	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)
MAY 04...	1130	2310	4	--	0	3	43
AUG 28...	1130	6760	5	0	1	11	58

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)
MAY 04...	78	90	94	98	100	--
AUG 28...	84	93	95	96	97	100

SKUNK RIVER BASIN
05474000 SKUNK RIVER AT AUGUSTA, IA-Continued
WATER-QUALITY RECORDS

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	TEMPER- ATURE AIR (DEG C) (00020)	TUR- BID- ITY (NTU) (00076)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	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												
28...	1030	16300	316	8.20	12.0	20.0	77	10.9	103	750	4600	K5300
DEC												
15...	1000	4500	605	8.60	0.0	0.0	3.4	14.6	101	757	K48	330
FEB												
25...	1115	983	580	8.50	4.0	5.0	1.5	13.0	101	750	K33	K13
MAY												
04...	1130	2310	597	8.60	16.0	19.0	2.2	--	--	760	K100	110
JUL												
08...	1030	666	440	9.20	27.0	26.0	25	15.0	190	756	3200	2200
AUG												
28...	1130	6760	515	8.90	18.0	21.0	330	5.8	62	758	K19000	K23000

DATE	HARD- NESS NONCARB WH WAT TOT FLD MG/L AS CACO3 (00902)	HARD- NESS (MG/L AS CACO3) (00900)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM AD- SORP- TION RATIO (00931)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	ALKA- LINITY WH WAT TOTAL FIELD MG/L AS CACO3 (00410)	BICAR- BONATE WH WAT TOTAL FIELD MG/L AS HCO3 (00440)	CAR- BONATE WH WAT TOTAL FIELD MG/L AS CO3 (00445)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)
OCT												
28...	39	150	40	13	5.0	6	0.2	5.9	115	140	0	24
DEC												
15...	70	300	79	26	12	8	0.3	2.3	234	270	7	47
FEB												
25...	76	310	81	27	14	9	0.4	1.7	238	270	10	60
MAY												
04...	64	300	77	26	11	7	0.3	1.7	236	270	8	46
JUL												
08...	49	210	46	23	12	11	0.4	2.4	161	160	19	43
AUG												
28...	37	150	40	12	8.3	10	0.3	4.4	113	140	0	28

DATE	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N) (00605)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N) (00610)
OCT												
28...	11	0.20	14	214	180	0.29	9420	0.55	4.20	0.030	0.040	0.050
DEC												
15...	18	0.30	16	364	350	0.50	4420	1.1	6.90	0.020	0.080	0.070
FEB												
25...	16	0.20	10	368	360	0.50	977	0.79	4.50	0.020	0.020	0.010
MAY												
04...	21	0.30	13	360	350	0.49	2250	0.37	7.00	0.020	0.020	0.030
JUL												
08...	15	0.30	9.4	256	270	0.35	460	2.0	1.90	0.030	0.070	0.060
AUG												
28...	11	0.30	12	190	190	0.26	3470	5.2	2.70	0.110	0.110	0.130

SKUNK RIVER BASIN

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05474000 SKUNK RIVER AT AUGUSTA, IA--Continued

WATER-QUALITY RECORDS

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	NITRO- GEN, AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P) (00671)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS, TOTAL (MG/L AS P) (00665)	SEDI- MENT, SUS- PENDED (MG/L) (80154)	SEDI- MENT, DIS- CHARGE, SUS- PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)	SED. SUSP. FALL DIAM. % FINER THAN .062 MM (70342)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	ALUM- INUM, DIS- SOLVED (UG/L AS AL) (01106)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE) (01010)
OCT 28...	0.60	0.190	0.240	0.290	356	15700	--	78	2	120	87	<0.5
DEC 15...	1.2	0.080	0.090	0.090	--	--	--	--	--	--	--	--
FEB 25...	0.80	0.040	0.060	0.100	21	56	39	--	<1	<10	100	<0.5
MAY 04...	0.40	0.130	0.130	0.120	95	593	76	--	1	<10	110	<0.5
JUL 08...	2.1	0.010	0.040	0.180	88	158	100	--	--	--	--	--
AUG 28...	5.3	0.120	0.170	0.820	--	--	--	--	2	290	320	<0.5

DATE	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR) (01030)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MERCURY DIS- SOLVED (UG/L AS HG) (71890)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	NICKEL, DIS- SOLVED (UG/L AS NI) (01065)
OCT 28...	2	<1	<3	4	110	<5	10	4	<0.1	<10	5
DEC 15...	--	--	--	--	--	--	--	--	--	--	--
FEB 25...	1	<1	<3	4	17	<5	15	15	0.2	<10	4
MAY 04...	<1	<1	<3	3	<3	<5	10	3	0.1	<10	<1
JUL 08...	--	--	--	--	--	--	--	--	--	--	--
AUG 28...	<1	1	<3	7	480	<5	<4	25	0.2	<10	3

DATE	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)	ATRA- ZINE, TOTAL (UG/L) (39630)	CYAN- AZINE TOTAL (UG/L) (81757)	METRI- BUZIN IN WHOLE WATER (UG/L) (81408)	ALA- CHLOR TOTAL RECOVER (UG/L) (77825)	METOLA- CHLOR IN WHOLE WATER (UG/L) (39356)	TRI- FLURA- LIN TOTAL RECOVER (UG/L) (39030)
OCT 28...	<1	<1	110	<6	9	--	--	--	--	--	--
DEC 15...	--	--	--	--	--	--	--	--	--	--	--
FEB 25...	1	<1	200	<6	5	--	--	--	--	--	--
MAY 04...	1	<1	200	<6	15	0.36	0.36	<0.10	<0.10	<0.10	<0.10
JUL 08...	--	--	--	--	--	0.52	0.21	<0.10	<0.10	0.26	<0.10
AUG 28...	<1	<1	110	<6	38	1.2	0.40	<0.10	0.27	0.32	<0.10

MISSISSIPPI RIVER MAIN STEM

05474500 MISSISSIPPI RIVER AT KEOKUK, IA
(National stream-quality accounting network station)

LOCATION.--Lat 40°23'37", long 91°22'27", in SE1/4 SW1/4 sec.30, T.65 N., R.4 W., Lee County, Hydrologic Unit 07080104, near right bank in tailwater of dam and powerplant of Union Electric Co. at Keokuk, 0.2 mi upstream from bridge on U.S. Highway 136, 2.7 mi upstream from Des Moines River, and at mile 364.2 upstream from Ohio River.

DRAINAGE AREA.--119,000 mi², approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--January 1878 to current year.

GAGE.--Water-stage recorder. Datum of gage is 477.41 ft above NGVD (levels by U.S. Army Corps of Engineers); Jan. 1, 1978, to May 1913, nonrecording gage at Galland (formerly Nashville), 8 mi upstream; zero of gage was set to low-water mark of 1864, or 496.52 ft above NGVD.

REMARKS.--Discharge computed from records of operation of turbines in powerplant and spillway gates in dam. Minor flow regulation caused by powerplant since 1913 and navigation dams. Records for May 1913 to September 1937 adjusted for change in contents in Keokuk Reservoir, those after September 1937 unadjusted.

COOPERATION.--Records provided by Union Electric Co.

AVERAGE DISCHARGE.--109 years, 64,310 ft³/s, 7.34 in/yr, 46,590,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 344,000 ft³/s Apr. 24, 1973; maximum gage height, 23.35 ft Apr. 24, 1973; minimum daily discharge, 5,000 ft³/s Dec. 27, 1933.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 6, 1851, reached a stage of 21.0 ft, present site and datum, estimated as 13.5 ft at Galland, discharge, 360,000 ft³/s.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 268,000 ft³/s Oct. 6; minimum daily discharge, 25,300 ft³/s July 10.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	199000	149000	84600	67000	44900	48600	89300	71200	69600	43100	59300	79800
2	214000	136000	82700	66700	46600	55400	92300	71500	68500	45400	63200	82200
3	262000	128000	81800	64900	54200	62200	92700	64200	71200	39500	66100	78000
4	262000	119000	80700	63400	45700	63100	92700	59500	69200	32600	66900	61600
5	264000	108000	83200	63200	57200	64800	92200	58700	66000	31300	68000	57300
6	268000	106000	85200	61000	53300	61200	88800	59000	66000	33300	63200	37600
7	260000	103000	82200	61700	52400	57800	86600	58500	59700	28900	55300	33500
8	258000	97500	83100	60500	55400	57200	83300	57900	56600	27800	43700	44900
9	258000	94600	87000	61900	53000	56600	81700	55000	56700	26100	42000	38200
10	252000	94300	85200	60300	52600	59800	77700	52200	57200	25300	39300	43100
11	248000	95000	69800	55800	55000	62000	72400	51000	55900	35100	34400	46200
12	240000	93300	52800	55500	56900	61400	70800	53700	51800	42800	31900	45500
13	236000	90600	31100	53100	55900	65000	68400	53500	45000	41600	40600	38100
14	229000	88300	37900	54900	54200	71300	72100	48000	44700	37700	49600	30600
15	218000	84500	43800	53600	58200	81200	81600	42900	45700	41100	51500	29800
16	211000	76900	53400	53900	54200	76500	84500	37500	47300	42100	52200	34500
17	204000	75500	60800	57600	50800	77000	86600	39900	45400	42900	59900	41500
18	197000	81100	63500	58400	49400	77800	82900	39900	40300	39100	63400	42600
19	193000	85800	66300	49800	51100	77000	81800	42700	31800	30900	63700	47200
20	188000	90200	70000	44300	52900	73800	80800	50700	32300	28800	61200	56000
21	185000	86600	71900	41200	52500	71800	78100	75600	36000	27300	57300	52000
22	184000	86300	73000	43800	51600	70400	76100	77500	42800	34000	66000	53600
23	182000	73900	74000	40600	51000	66300	75200	62000	43100	45700	62700	48500
24	182000	69300	73900	30200	50900	65400	79100	56800	41300	45700	56700	45100
25	182000	81000	72600	34600	52100	64900	77500	53800	41800	45500	49800	42400
26	194000	82900	71600	38200	50500	72300	79700	50100	42000	43100	55700	39900
27	197000	85600	70900	37600	48900	71100	75500	54000	41900	42400	86300	42300
28	196000	87400	70500	37600	46200	78700	72900	58000	34200	43500	95600	43100
29	185000	88700	70300	40300	---	86300	74300	66700	26600	50100	95000	44400
30	173000	85700	70300	40500	---	84300	74800	68400	31800	55700	84400	43600
31	159000	---	68600	44000	---	87500	---	67600	---	55700	80000	---
TOTAL	6680000	2824000	2172700	1596100	1457600	2128700	2422400	1758000	1462400	1204100	1864900	1423100
MEAN	215500	94130	70090	51490	52060	68670	80750	56710	48750	38840	60160	47440
MAX	268000	149000	87000	67000	58200	87500	92700	77500	71200	55700	95600	82200
MIN	159000	69300	31100	30200	44900	48600	68400	37500	26600	25300	31900	29800
AC-FT13250000	5601000	4310000	3166000	2891000	4222000	4805000	3487000	2901000	2388000	3699000	2823000	
CAL YR 1986	TOTAL 43042900	MEAN 117900	MAX 268000	MIN 31100	AC-FT 85380000							
WTR YR 1987	TOTAL 26994000	MEAN 73960	MAX 268000	MIN 25300	AC-FT 53540000							

MISSISSIPPI RIVER MAIN STEM

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05474500 MISSISSIPPI RIVER AT KEOKUK, IA--Continued

WATER-QUALITY RECORDS

LOCATION.--Samples collected at public access 0.5 mi downstream from discharge station.

PERIOD OF RECORD.--October 1974 to September 1987 (discontinued).

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: December 1977 to September 1981.

WATER TEMPERATURES: December 1977 to September 1981.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 612 microsiemens Jan. 21, 1980; minimum daily, 310 microsiemens Apr. 7, 1981.

WATER TEMPERATURES: Maximum daily, 28.0°C July 13-23, 1980; minimum daily, 0.0°C on many days during winter periods.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	TEMPER- ATURE AIR (DEG C) (00020)	TUR- BID- ITY (NTU) (00076)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	OXYGEN DEMAND, CHEM- ICAL (LOW LEVEL) (MG/L) (00335)	BARO- METRIC PRES- SURE (MM OF HG) (00025)
NOV 19...	1100	85800	466	8.40	2.0	4.0	10	13.6	100	23	752
FEB 19...	1330	60000	447	8.40	2.0	5.0	1.4	15.4	112	14	760
MAY 20...	0900	56900	455	7.50	24.0	20.0	9.0	4.2	51	21	754
SEP 01...	1300	82500	400	8.00	21.0	23.0	5.3	5.8	65	24	759

DATE	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP- TOCOCCHI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	HARD- NESS NONCARB WH WAT TOT FLD MG/L AS CACO3 (00902)	HARD- NESS (MG/L AS CACO3) (00900)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM AD- SORP- TION RATIO (00931)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)
NOV 19...	K320	K93	50	250	61	23	9.6	8	0.3	2.0
FEB 19...	K0	K27	50	240	58	23	11	9	0.3	2.1
MAY 20...	K4	K23	37	180	36	23	11	11	0.4	1.4
SEP 01...	310	120	35	180	42	17	7.5	8	0.3	3.5

DATE	ALKA- LINITY WH WAT TOTAL FIELD MG/L AS CACO3 (00410)	BICAR- BONATE WH WAT TOTAL FIELD MG/L AS HCO3 (00440)	CAR- BONATE WH WAT TOTAL FIELD MG/L AS CO3 (00445)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, TOTAL (MG/L AS F) (00951)	SOLIDS, RESIDUE AT 105 DEG. C, SUS- PENDE (MG/L) (00530)	SOLIDS, VOLA- TILE, SUS- PENDE (MG/L) (00535)	OIL AND GREASE, TOTAL RECOV. GRAVI- METRIC (MG/L) (00556)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N) (00605)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)
NOV 19...	197	240	0	34	16	0.1	61	9	1	--	3.30
FEB 19...	190	230	2	32	16	0.1	8	2	1	0.67	2.80
MAY 20...	148	--	--	40	18	0.2	15	4	1	1.0	0.890
SEP 01...	140	170	0	28	14	0.2	61	6	<1	0.97	2.50

MISSISSIPPI RIVER MAIN STEM

05474500 MISSISSIPPI RIVER AT KEOKUK, IA--Continued

WATER-QUALITY RECORDS

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	NITRO- GEN, AMMONIA TOTAL (MG/L AS N) (00610)	AMMONIA UN- IONIZED (MG/L AS N) (00619)	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)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CYANIDE TOTAL (MG/L AS CN) (00720)	SEDI- MENT, SUS- PENDE (MG/L) (80154)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)	ALUM- INUM, DIS- SOLVED (UG/L AS AL) (01106)
NOV 19...	<0.100	<0.003	1.0	0.200	0.090	7.7	<0.005	56	13000	99	<50
FEB 19...	0.130	0.003	0.80	0.150	0.050	6.1	<0.005	13	2110	91	<50
MAY 20...	0.370	0.006	1.4	0.090	0.060	7.6	<0.005	12	1840	91	120
SEP 01...	0.230	0.010	1.2	0.280	0.160	7.5	<0.005	71	15800	98	120

DATE	ALUM- INUM, TOTAL RECOV- ERABLE (UG/L AS AL) (01105)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	BARIUM, TOTAL RECOV- ERABLE (UG/L AS BA) (01007)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE) (01010)	BERYL- LIUM, TOTAL RECOV- ERABLE (UG/L AS BE) (01012)	BORON, DIS- SOLVED (UG/L AS B) (01020)	BORON, TOTAL RECOV- ERABLE (UG/L AS B) (01022)	CADMIUM, DIS- SOLVED (UG/L AS CD) (01025)	CADMIUM, TOTAL RECOV- ERABLE (UG/L AS CD) (01027)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR) (01030)	CHRO- MIUM, TOTAL RECOV- ERABLE (UG/L AS CR) (01034)
NOV 19...	1200	--	70	<0.5	<0.5	<50	<50	<3	<3	<5	<5
FEB 19...	110	45	50	<0.5	<0.5	<50	<50	<3	<3	<5	<5
MAY 20...	200	40	50	<0.5	<0.5	<50	<50	<3	<3	<10	<5
SEP 01...	1500	76	100	<0.5	<0.5	<50	<50	<3	<3	<5	<5

DATE	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	COBALT, TOTAL RECOV- ERABLE (UG/L AS CO) (01037)	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	COPPER, TOTAL RECOV- ERABLE (UG/L AS CU) (01042)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE) (01045)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB) (01051)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN) (01055)	MERCURY TOTAL RECOV- ERABLE (UG/L AS HG) (71900)
NOV 19...	<5	<5	<5	<5	<50	2000	<50	<50	6	150	<0.05
FEB 19...	<5	<5	5	<5	<50	290	<50	<50	10	47	0.11
MAY 20...	<5	<5	<5	<5	<50	310	<50	<50	<5	160	<0.05
SEP 01...	<5	<5	7	14	<50	2100	<50	<50	5	120	--

DATE	NICKEL, DIS- SOLVED (UG/L AS NI) (01065)	NICKEL, TOTAL RECOV- ERABLE (UG/L AS NI) (01067)	SILVER, DIS- SOLVED (UG/L AS AG) (01075)	SILVER, TOTAL RECOV- ERABLE (UG/L AS AG) (01077)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	STRON- TIUM, TOTAL RECOV- ERABLE (UG/L AS SR) (01082)	VANA- DIUM, DIS- SOLVED (UG/L AS V) (01085)	VANA- DIUM, TOTAL RECOV- ERABLE (UG/L AS V) (01087)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	ZINC, TOTAL RECOV- ERABLE (UG/L AS ZN) (01092)	PHENOLS TOTAL (UG/L (32730)
NOV 19...	<5	<5	<3	<3	120	120	<5	6	<50	<50	<5
FEB 19...	<5	<5	<3	<3	100	100	<5	<5	<50	<50	<5
MAY 20...	<5	<5	<3	<3	35	40	<5	<5	<50	<100	<5
SEP 01...	<5	<5	<3	<3	88	90	<5	6	<50	<50	<5

DES MOINES RIVER BASIN

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05476500 DES MOINES RIVER AT ESTHERVILLE, IA

LOCATION.--Lat 43°23'51", long 94°50'38", in SW1/4 SE1/4 sec.10, T.99 N., R.34 W., Emmet County, Hydrologic Unit 07100002, on right bank in city park, 1,200 ft downstream from bridge on State Highway 9 at Estherville, 0.1 mi upstream from School Creek, 2.3 mi upstream from Brown Creek, and at mile 404.2.

DRAINAGE AREA.--1,372 mi².

PERIOD OF RECORD.--October 1951 to current year. Prior to November 1951, monthly discharge only, published in WSP 1728.

REVISED RECORDS.--WSP 1438: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,247.55 ft above NGVD.

REMARKS.--Estimated daily discharges: Dec. 11-16, Dec. 28 to Jan. 11 and Jan. 18 to Feb. 10. Records good except those for estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--36 years, 397 ft³/s, 3.93 in/yr, 287,600 acre-ft/yr; median of yearly mean discharges, 250 ft³/s, 2.5 in/yr, 181,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,000 ft³/s Apr. 12, 1969, gage height, 17.68 ft, from flood-mark; no flow Jan. 16-18, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Apr. 2	1845	*2,370	*7.70	No other peak greater than base discharge.			

Minimum discharge, 49 ft³/s Sept. 30.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4170	863	694	260	120	181	2050	594	531	146	294	66
2	3960	823	683	240	125	174	2330	587	499	134	271	59
3	3800	790	678	230	130	179	2260	564	468	127	291	58
4	3630	776	637	240	130	204	1980	522	433	119	274	54
5	3420	733	411	245	130	197	1850	501	397	142	237	52
6	3170	715	434	250	130	211	1740	498	373	176	216	55
7	2940	701	474	240	135	224	1630	484	351	282	204	67
8	2750	721	527	230	140	245	1550	460	333	321	200	58
9	2560	742	518	225	145	252	1480	443	306	495	194	54
10	2370	743	371	220	150	241	1420	428	294	547	183	54
11	2260	461	335	215	154	219	1390	409	294	601	170	65
12	2200	421	300	196	165	241	1340	386	294	748	162	68
13	2040	376	280	230	180	249	1310	349	279	726	156	68
14	1880	789	290	267	188	238	1280	354	261	734	147	98
15	1750	1060	295	263	179	240	1260	349	256	810	136	146
16	1660	1120	305	250	168	238	1210	315	274	910	146	127
17	1550	982	283	185	151	240	1190	310	269	970	133	133
18	1470	1020	250	180	154	248	1150	300	271	964	124	125
19	1380	911	260	175	169	285	1090	285	253	961	112	113
20	1300	841	252	160	172	303	1050	282	241	921	104	104
21	1230	768	235	155	166	327	1000	331	249	838	97	100
22	1130	696	228	145	179	357	941	372	242	769	91	96
23	1070	608	225	140	177	584	901	367	227	683	86	89
24	1050	659	228	135	182	1070	873	340	226	612	83	82
25	1020	724	232	130	180	1510	824	362	235	550	85	74
26	1000	762	208	130	185	1780	795	494	225	493	85	68
27	982	759	172	125	188	1930	752	571	207	458	83	64
28	956	692	180	120	185	2050	705	581	187	422	85	61
29	927	714	200	120	---	2100	664	572	172	385	87	55
30	889	707	220	120	---	2080	642	558	161	354	81	52
31	868	---	250	120	---	1860	---	547	---	321	71	---
TOTAL	61382	22677	10655	5941	4457	20257	38657	13515	8808	16719	4688	2365
MEAN	1980	758	344	192	159	653	1289	436	294	539	151	78.8
MAX	4170	1120	694	267	188	2100	2330	594	531	970	294	146
MIN	868	376	172	120	120	174	642	282	161	119	71	52
AC-FT	121800	44980	21130	11780	8840	40180	76680	26810	17470	33160	9300	4690
CFSM	1.44	.55	.25	.14	.12	.48	.94	.32	.21	.39	.11	.06
IN.	1.66	.61	.29	.16	.12	.55	1.05	.37	.24	.45	.13	.06

CAL YR 1986 TOTAL 454065 MEAN 1244 MAX 4510 MIN 64 AC-FT 900600 CFSM .91 IN. 12.3
WTR YR 1987 TOTAL 210121 MEAN 576 MAX 4170 MIN 52 AC-FT 416800 CFSM .42 IN. 5.70

DES MOINES RIVER BASIN

05476750 DES MOINES RIVER AT HUMBOLDT, IA

LOCATION.--Lat 42°43'12", long 94°13'06", in SE1/4 SW1/4 sec.1, T.91 N., R.29 W., Humboldt County, Hydrologic Unit 07100002 on left bank 5 ft downstream from First Avenue in city of Humboldt, about 700 ft downstream from City of Humboldt water plant, 3.2 mi downstream from dam, 3.2 mi upstream from Indian Creek, 3.9 mi upstream from East Fork Des Moines River, and at mile 334.3 upstream from mouth of Des Moines River.

DRAINAGE AREA.--2,256 mi².

PERIOD OF RECORD.--October 1964 to current year. Prior to October 1970, published as West Fork Des Moines River at Humboldt.

GAGE.--Water-stage recorder. Datum of gage is 1,053.54 ft above NGVD. Prior to Oct. 3, 1966, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Nov. 9-17, Dec. 15-27 and Jan. 18 to Feb. 4. Records good except those for estimated daily discharges, which are poor. Daily nonrecording gage readings available in Iowa City district office for period Mar. 7, 1940, to Sept. 30, 1964. Discharge not published for this period because of extreme regulation at dam 3.2 mi upstream from gage. Power generation and streamflow regulation discontinued August 1964. Low-flow discharges occasionally affected by minor regulation. U.S. Army Corp of Engineers data collection platform at station.

AVERAGE DISCHARGE.--23 years, 976 ft³/s, 5.88 in/yr, 707,100 acre-ft/yr; median of yearly mean discharges, 900 ft³/s, 5.4 in/yr, 652,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 18,000 ft³/s Apr. 14, 1969, gage height, 15.40 ft; minimum daily discharge, 13 ft³/s Nov. 12, 1976, Jan. 12 to Feb. 2, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 23, 1947, reached a stage of 12.2 ft, discharge, 11,000 ft³/s at present site and datum.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,800 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 6	----	*5,700	unknown	Apr. 16	1730	2,970	6.73
Apr. 5	1445	3,100	6.84	July 14	0615	2,800	6.57

Minimum discharge, 158 ft³/s Feb. 16, result of freezeup.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4180	1680	1320	602	335	412	2560	1240	1480	357	604	196
2	4550	1620	1350	542	335	407	2770	1120	1370	337	562	191
3	4700	1570	1330	541	340	396	2930	1140	1260	317	527	183
4	5030	1550	1240	599	345	394	3010	1120	1170	303	517	174
5	5430	1480	1060	569	356	393	3080	1070	1080	295	509	172
6	5630	1440	1120	556	372	416	3030	1030	995	324	478	186
7	5600	1400	1030	566	381	433	2820	998	904	387	444	188
8	5250	1350	999	553	394	454	2620	966	848	418	473	177
9	4890	1300	986	517	344	471	2430	931	775	651	465	170
10	4480	1250	767	463	390	478	2280	900	737	1490	452	170
11	4380	1120	703	431	413	482	2170	865	722	1630	422	173
12	4740	1080	674	517	403	479	2110	821	693	1700	393	168
13	5180	950	631	572	389	468	2070	791	656	2400	390	162
14	5360	850	538	555	379	470	2140	767	635	2770	373	168
15	5110	780	620	448	388	492	2630	848	591	2470	357	191
16	4550	900	640	335	310	484	2930	829	547	2090	352	279
17	4020	1200	650	362	335	471	2860	769	535	1760	338	405
18	3700	1290	660	390	362	487	2620	721	538	1840	338	434
19	3340	1200	660	370	389	528	2410	708	554	2030	305	434
20	3090	1190	650	360	376	602	2240	689	550	1790	294	395
21	2850	1180	640	340	372	697	2090	667	543	1770	275	362
22	2530	1160	640	335	362	747	1930	667	513	1810	262	339
23	2350	1160	650	330	369	793	1850	704	481	1810	246	324
24	2220	1100	620	325	362	865	1760	730	456	1550	230	310
25	2110	1140	630	320	363	1240	1670	757	450	1360	233	294
26	2050	1190	620	320	364	1700	1600	1250	443	1200	234	278
27	2020	1280	630	320	366	2100	1520	2000	425	1020	234	265
28	1970	1340	646	320	388	2300	1450	2170	408	898	234	249
29	1910	1360	658	320	---	2360	1380	1980	387	811	227	232
30	1840	1320	637	325	---	2260	1300	1770	368	731	219	222
31	1750	---	614	330	---	2370	---	1620	---	666	211	---
TOTAL	116810	37430	24613	13433	10282	26649	68260	32638	21114	38985	11198	7491
MEAN	3768	1248	794	433	367	860	2275	1053	704	1258	361	250
MAX	5630	1680	1350	602	413	2370	3080	2170	1480	2770	604	434
MIN	1750	780	538	320	310	393	1300	667	368	295	211	162
AC-FT	231700	74240	48820	26640	20390	52860	135400	64740	41880	77330	22210	14860
CFSM	1.67	.55	.35	.19	.16	.38	1.01	.47	.31	.56	.16	.11
IN.	1.93	.62	.41	.22	.17	.44	1.13	.54	.35	.64	.18	.12

CAL YR 1986 TOTAL 777263 MEAN 2129 MAX 6770 MIN 200 AC-FT 1542000 CFSM .94 IN. 12.8
WTR YR 1987 TOTAL 408903 MEAN 1120 MAX 5630 MIN 162 AC-FT 811100 CFSM .50 IN. 6.74

DES MOINES RIVER BASIN

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05479000 EAST FORK DES MOINES RIVER AT DAKOTA CITY, IA

LOCATION.--Lat 42°43'26", long 94°11'30", in NW1/4 SE1/4 sec.6, T.91 N., R.28 W., Humboldt County, Hydrologic Unit 07100003, on right bank 50 ft upstream from old mill dam, in city park at east edge of Dakota City, 500 ft upstream from bridge on county highway P56, 0.6 mi downstream from bridge on State Highway 3, 3.4 mi upstream from confluence with Des Moines River, and at mile 333.8 upstream from mouth of Des Moines River.

DRAINAGE AREA.--1,308 mi².

PERIOD OF RECORD.--March 1940 to current year. Prior to October 1954, published as "near Hardy".

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1508: 1944, 1945-47 (M).

GAGE.--Water-stage recorder. Datum of gage is 1,038.71 ft above NGVD. Prior to Oct. 1, 1954, nonrecording gage at site 8 mi upstream at different datum.

REMARKS.--Estimated daily discharges: Nov. 14-19 and Dec. 11 to Feb. 15. Records good except those for estimated daily discharges, which are poor. U. S. Army Corps of Engineers data collection platform at station.

AVERAGE DISCHARGE.--47 years, 559 ft³/s, 5.80 in/yr, 405,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 18,800 ft³/s June 21, 1954, gage height, 16.95 ft, from flood-mark, site and datum then in use; minimum daily, 4.8 ft³/s Jan. 11-14, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 21, 1954, reached a stage of 24.02 ft, discharge, 17,400 ft³/s at present site. Flood of September 1938 reached a stage of 17.4 ft, discharge, about 22,000 ft³/s, site and datum in use during the period 1940-54.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,700 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 14	0030	*2,440	*11.94	Apr. 16	1430	2,070	11.44

Minimum discharge, 47 ft³/s Sept. 5, 14.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	473	796	658	190	130	175	884	784	764	112	203	74
2	446	756	687	185	125	170	1080	744	716	104	181	70
3	441	731	699	180	120	161	1240	711	645	93	169	62
4	776	700	693	175	120	153	1240	669	582	88	162	57
5	1110	679	611	170	120	160	1200	618	529	84	144	55
6	1170	665	550	170	120	172	1150	589	489	82	134	59
7	1130	641	600	170	125	185	1070	565	456	81	126	59
8	1070	659	594	170	125	199	991	544	412	82	148	82
9	977	666	571	170	130	206	909	522	377	99	155	66
10	886	658	341	180	130	203	829	503	347	206	149	58
11	1080	641	310	210	130	205	776	482	331	410	141	57
12	2010	562	280	180	140	197	735	451	323	556	133	54
13	2380	387	290	160	145	204	720	428	308	735	134	51
14	2410	500	330	150	150	216	841	410	292	997	142	50
15	2280	640	360	145	150	217	1660	390	269	1140	129	81
16	2210	610	340	145	184	211	2050	414	243	1270	134	122
17	2170	590	310	140	138	211	2000	467	230	1340	132	169
18	2080	580	300	135	183	225	1890	425	221	1350	126	177
19	1910	560	290	130	203	256	1790	392	241	1310	121	185
20	1680	548	280	130	173	298	1650	370	302	1120	116	175
21	1460	570	270	120	155	345	1460	355	316	889	115	168
22	1310	527	260	125	156	383	1310	339	265	819	108	160
23	1210	572	250	120	145	418	1210	324	243	811	99	145
24	1140	624	240	120	148	448	1130	310	217	731	93	134
25	1090	586	230	120	149	471	1100	304	196	628	97	126
26	1060	559	225	120	143	506	1070	553	181	507	96	120
27	1020	565	220	120	142	621	1020	868	160	418	93	112
28	979	596	210	120	155	781	951	916	147	359	90	106
29	928	625	205	120	---	765	898	906	133	308	85	101
30	884	646	200	120	---	693	831	888	122	269	81	95
31	848	---	195	120	---	703	---	828	---	236	77	---
TOTAL	40618	18439	11619	4610	4034	10158	35685	17069	10057	17234	3913	3030
MEAN	1310	615	375	149	144	328	1189	551	335	556	126	101
MAX	2410	796	699	210	203	781	2050	916	764	1350	203	185
MIN	441	387	195	120	120	153	720	304	122	81	77	50
AC-FT	80570	36570	23050	9140	8000	20150	70780	33860	19950	34180	7760	6010
CFSM	1.00	.47	.29	.11	.11	.25	.91	.42	.26	.43	.10	.08
IN.	1.16	.52	.33	.13	.11	.29	1.01	.49	.29	.49	.11	.09

CAL YR 1986	TOTAL 371567	MEAN 1018	MAX 4870	MIN 103	AC-FT 737000	CFSM .78	IN. 10.6
WTR YR 1987	TOTAL 176466	MEAN 483	MAX 2410	MIN 50	AC-FT 350000	CFSM .37	IN. 5.02

DES MOINES RIVER BASIN

05480500 DES MOINES RIVER AT FORT DODGE, IA

LOCATION.--Lat 42°30'22", long 94°12'04", in NW1/4 SW1/4 sec.19, T.89 N., R.28 W., Webster County, Hydrologic Unit 07100004, on right bank 400 ft upstream from Soldier Creek, 1,800 ft downstream from Illinois Central Railroad bridge in Fort Dodge, 2,000 ft downstream from Lizard Creek, and at mile 314.6.

DRAINAGE AREA.--4,190 mi².

PERIOD OF RECORD.--April 1905 to July 1906 (no winter records), October 1913 to September 1927 (published as "at Kalo"), October 1946 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1308: 1924, 1925 (M).

GAGE.--Water-stage recorder. Datum of gage is 969.38 ft above NGVD. See WSP 1728 for history of changes prior to Dec. 8, 1949.

REMARKS.--Estimated daily discharges: Nov. 12-18 and Dec. 9 to Jan. 29. Records good except those for estimated daily discharges, which are poor. Occasional minor regulation caused by dam 0.8 mi upstream from gage. U. S. Army Corps of Engineers rain-gage and data collection platform and City of Fort Dodge gage-height telemeter at station.

AVERAGE DISCHARGE.--55 years (water years 1914-27, 1947-87), 1,582 ft³/s, 5.13 in/yr, 1,146,000 acre-ft/yr; median of yearly mean discharges, 1,290 ft³/s, 4.1 in/yr, 935,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 35,600 ft³/s Apr. 8, 1965, gage height, 17.79 ft; maximum gage height, 19.62 ft, from floodmark, June 23, 1947, present site and datum; minimum daily discharge, 14 ft³/s Nov. 3, 1955.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 6,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 5	1115	8,860	7.53	Apr. 16	1115	7,570	7.02
Oct. 13	1000	*11,700	*8.74				

Minimum daily discharge, 266 ft³/s Sept. 13.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5740	2930	2320	1050	630	676	3840	2520	2950	512	930	333
2	5730	2810	2380	1000	612	649	4410	2370	2840	481	833	322
3	5780	2780	2360	1020	852	628	4990	2320	2570	448	778	300
4	6580	2710	2250	960	840	627	5150	2210	2320	413	735	279
5	7530	2600	2180	900	582	666	5150	2100	2120	394	699	277
6	7520	2530	1990	900	832	927	5010	2010	1970	396	664	295
7	7350	2450	1990	900	714	788	4610	1950	1820	465	615	307
8	7000	2530	1930	900	868	855	4230	1880	1640	476	737	295
9	6470	2560	1850	940	1000	713	3910	1810	1530	643	712	288
10	5900	2550	1900	920	785	849	3600	1740	1410	1650	676	274
11	7110	2480	1900	900	746	875	3450	1670	1370	2220	645	272
12	11000	2100	1700	860	677	869	3310	1580	1310	3210	607	270
13	11200	1700	1600	860	625	828	3240	1520	1230	3940	595	266
14	10400	2100	1500	840	600	844	3610	1480	1150	4370	576	380
15	9430	1900	1550	800	582	952	6650	1500	1050	4010	551	704
16	8360	2100	1450	740	459	1010	7480	1550	971	3680	562	915
17	7390	2150	1400	740	516	978	6740	1550	933	3450	539	1160
18	6560	2000	1400	760	636	1030	5870	1460	922	3330	551	1340
19	5960	1990	1400	800	626	1180	5270	1370	920	3560	513	1210
20	5390	2080	1350	800	618	1360	4780	1310	976	3800	491	1020
21	4900	1960	1250	770	591	1530	4310	1280	1090	3340	468	890
22	4520	1990	1200	720	574	1590	3950	1230	957	3110	438	793
23	4180	1970	1200	700	561	1640	3740	1240	876	3170	404	720
24	3960	2020	1150	700	557	1700	3520	1260	788	2820	382	667
25	3770	2170	1150	720	554	1990	3360	1270	750	2520	427	610
26	3660	2290	1180	720	555	2480	3250	2480	705	2090	465	572
27	3490	2460	1100	700	550	3000	3090	4370	663	1700	443	538
28	3410	2630	1050	600	601	3390	2940	4520	628	1530	416	507
29	3260	2350	1000	650	---	3380	2790	4030	590	1330	393	477
30	3130	2320	1000	661	---	3180	2620	3580	546	1180	371	444
31	3040	---	1050	774	---	3420	---	3280	---	1040	349	---
TOTAL	189720	69210	48730	25305	18343	44604	128870	64440	39595	65278	17565	16725
MEAN	6120	2307	1572	816	655	1439	4296	2079	1320	2106	567	557
MAX	11200	2930	2380	1050	1000	3420	7480	4520	2950	4370	930	1340
MIN	3040	1700	1000	600	459	627	2620	1230	546	394	349	266
AC-FT	376300	137300	96660	50190	36380	88470	255600	127800	78540	129500	34840	33170
CFSM	1.46	.55	.38	.19	.16	.34	1.03	.50	.31	.50	.14	.13
IN.	1.68	.61	.43	.22	.16	.40	1.14	.57	.35	.58	.16	.15

CAL YR 1986 TOTAL 1367030 MEAN 3745 MAX 13200 MIN 420 AC-FT 2711000 CFSM .89 IN. 12.1
WTR YR 1987 TOTAL 728385 MEAN 1996 MAX 11200 MIN 266 AC-FT 1445000 CFSM .48 IN. 6.47

DES MOINES RIVER BASIN

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05481000 BOONE RIVER NEAR WEBSTER CITY, IA

LOCATION.--Lat 42°26'01", long 93°48'12", in NW1/4 SE1/4 sec. 18, T.88 N., R.25 W., Hamilton County, Hydrologic Unit 07100005, on right bank 100 ft upstream from bridge on State Highway 17, 2.5 mi south of Webster City, and 3.2 mi downstream from Brewers Creek.

DRAINAGE AREA.--844 mi²

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

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1308: 1940 (M), WSP 1708: 1956.

GAGE.--Water-stage recorder. Datum of gage is 989.57 ft above NGVD. Prior to June 26, 1940, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Nov. 14-20 and Dec. 12 to Feb. 8. Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain-gage and gage-height satellite data collection platform at station.

AVERAGE DISCHARGE.--47 years, 421 ft³/s, 6.77 in/yr, 305,000 acre-ft/yr; median of yearly mean discharges, 370 ft³/s, 6.0 in/yr, 268,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 20,300 ft³/s June 22, 1954, gage height, 18.55 ft; no flow Feb. 7, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since 1896, 19.1 ft about June 10, 1918, from floodmarks, from information by local resident, discharge, 21,500 ft³/s. Flood of June 18, 1932, reached a stage of 16.0 ft, discharge, 15,000 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,200 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 13	0600	*6,370	*9.82	July 12	0900	2,200	5.74
Apr. 16	0115	2,570	6.18				

Minimum discharge, 39 ft³/s July 8.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1580	590	439	165	130	144	562	534	380	65	50	116
2	1370	555	487	165	130	130	716	515	375	59	53	100
3	1210	543	502	170	130	136	843	581	357	53	57	88
4	1400	530	476	160	130	144	905	515	339	48	54	79
5	1930	510	457	155	130	181	878	450	299	44	50	72
6	1830	490	428	150	130	220	817	425	268	41	50	72
7	1520	475	457	150	130	257	753	411	238	41	52	93
8	1260	477	435	140	130	284	681	393	213	42	153	100
9	997	453	388	135	131	286	610	376	191	53	111	82
10	907	422	196	135	149	267	548	367	175	50	87	95
11	2150	402	220	135	158	252	515	353	174	45	74	93
12	5490	333	250	145	154	240	480	331	172	1710	69	84
13	6050	233	280	185	146	235	463	310	157	1350	246	83
14	4900	270	290	180	161	230	660	300	135	762	451	82
15	3760	400	280	150	124	368	2140	286	125	568	321	424
16	2830	380	270	125	92	368	2480	269	111	434	229	882
17	2130	360	260	150	89	343	2220	256	101	320	187	705
18	1700	350	250	185	118	390	1930	252	95	244	276	600
19	1450	330	280	170	147	521	1620	247	92	338	248	388
20	1280	320	240	160	146	582	1340	240	94	458	280	497
21	1160	304	220	150	127	593	1150	232	120	321	164	427
22	1060	329	200	145	119	563	1020	211	213	225	128	372
23	985	362	280	145	115	536	936	199	239	168	167	338
24	916	344	280	140	109	511	843	188	197	131	94	310
25	852	335	200	145	106	489	770	189	177	153	137	279
26	808	337	190	140	103	461	723	303	132	182	312	253
27	761	334	180	140	103	480	679	340	107	142	318	234
28	719	340	180	140	119	528	628	401	92	109	260	216
29	668	374	175	135	---	467	602	464	83	90	218	200
30	626	404	180	135	---	345	575	451	72	77	172	185
31	607	---	180	135	---	384	---	420	---	66	135	---
TOTAL	54906	11886	8978	4670	3556	10935	29087	10809	5523	8389	5181	7710
MEAN	1771	396	290	151	127	353	970	349	184	271	167	257
MAX	6050	590	502	185	161	593	2480	581	360	1710	451	785
MIN	607	233	175	125	89	130	463	188	72	41	50	72
AC-FT	108900	23580	17810	9260	7050	21690	57690	21440	10950	16640	10280	15290
CFSM	2.10	.47	.34	.18	.15	.42	1.15	.41	.22	.32	.20	.30
IN.	2.42	.52	.40	.21	.16	.48	1.28	.48	.24	.37	.23	.34

CAL YR 1986 TOTAL 313507 MEAN 859 MAX 6050 MIN 53 AC-FT 621800 CFSM 1.02 IN. 13.8
WTR YR 1987 TOTAL 161630 MEAN 443 MAX 6050 MIN 41 AC-FT 320600 CFSM .52 IN. 7.12

DES MOINES RIVER BASIN

05481300 DES MOINES RIVER NEAR STRATFORD, IA

LOCATION.--Lat 42°15'04", long 93°59'52", in NW1/4 NE1/4 sec.21, T.86 N., R.27 W., Webster County, Hydrologic Unit 07100004, on right bank 6 ft downstream from bridge on State Highway 175, 0.1 mi downstream from Skillet Creek, 4.0 mi southwest of Stratford, 7.3 mi downstream from Boone River and at mile 276.7.

DRAINAGE AREA.--5,452 mi².

PERIOD OF RECORD.--April 1920 to current year in reports of Geological Survey. Published as "near Boone" 1920-67. Monthly discharge only for some periods, published in WSP 1308. December 1904 to April 1920 (fragmentary gage heights during high-water periods only) in reports of U.S. Weather Bureau.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1508: 1925-27, 1934. WSP 1708: 1955.

GAGE.--Water-stage recorder. Datum of gage is 894.00 ft above NGVD. Prior to May 1, 1920, nonrecording gage 16.6 mi downstream at datum 23.49 ft lower. Oct. 9, 1924, to Jan. 10, 1933, nonrecording gage 17.6 mi downstream at datum 28.53 ft lower. Jan. 11, 1933, to Sept. 30, 1934, nonrecording gage 17.9 mi downstream at datum 22.25 ft lower. Oct. 1, 1934 to Feb. 6, 1935, nonrecording gage and Feb. 7, 1935 to Sept. 30, 1967, water-stage recorder 17.9 mi downstream at datum 21.84 ft lower.

REMARKS.--Estimated daily discharges: Nov. 15-20 and Dec. 13 to Feb. 16. Records good except those for estimated daily discharges, which are poor. Occasional minor regulation caused by dam at Fort Dodge. U.S. Army Corps of Engineers rain-gage and satellite data collection platform at station.

AVERAGE DISCHARGE.--67 years, 2,001 ft³/s, 4.98 in/yr, 1,450,000 acre-ft/yr; median of yearly mean discharges, 1,720 ft³/s, 4.3 in/yr, 1,250,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 57,400 ft³/s June 22, 1954, gage height, 25.35 ft, from graph based on hourly gage readings, site and datum then in use; no flow for a short time on Jan. 9, 25, 1938, caused by manipulation of gates in control dam, site then in use; minimum unregulated daily discharge, 13 ft³/s Jan. 23, 24, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 30, 1903, reached a stage of 25.4 ft, from high-water mark, site and datum then in use, discharge, 43,600 ft³/s. Flood of June 22, 1954, reached a stage of 29.7 ft, from floodmark, present site and datum, discharge, 54,200 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 7,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 6	0500	10,200	13.50	Apr. 16	1100	12,200	14.50
Oct. 13	1800	*19,400	*18.16	July 12	1515	8,620	12.37

Minimum discharge, 413 ft³/s Sept. 14.

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

MEAN VALUES											
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	SEP
1	8010	3910	2770	1300	940	993	4450	3340	3630	717	1230
2	7630	3680	2860	1300	940	999	5180	3230	3500	663	1110
3	7430	3560	2920	1300	920	1010	5890	3080	3230	614	1030
4	8180	3480	2870	1280	900	1010	6300	3020	2930	569	987
5	9570	3340	2580	1280	900	1090	6380	2830	2690	527	902
6	10100	3240	2430	1210	900	1250	6300	2680	2480	496	856
7	9500	3140	2460	1200	900	1470	6000	2580	2300	498	816
8	8950	3120	2450	1200	920	1420	5530	2490	2120	552	1230
9	8290	3120	2350	1190	960	1470	5100	2410	1930	591	1170
10	7590	3090	2080	1150	940	1300	4710	2320	1800	800	999
11	8080	3000	1500	1120	880	1410	4390	2230	1740	1830	909
12	16300	2830	1410	1110	840	1420	4170	2120	1670	6780	879
13	19300	2290	1800	1100	820	1400	3970	2010	1600	7130	893
14	18300	1780	1820	1090	780	1390	4510	1930	1500	6400	1120
15	15900	2000	1500	1100	740	1730	9570	1860	1400	6280	1090
16	13600	2200	1600	1110	730	2160	12000	1880	1290	5250	951
17	11400	2500	1850	1180	710	2020	11200	1860	1200	4560	911
18	9710	2500	1700	1200	715	2040	9570	1850	1160	4100	1020
19	8550	2400	1600	1150	834	2420	8290	1780	1140	4490	1070
20	7700	2350	1550	1100	913	2650	7300	1700	1220	4900	948
21	6970	2280	1500	1100	877	2770	6470	1640	1560	4530	852
22	6350	2270	1500	1090	857	2790	5840	1590	1510	3780	764
23	5930	2390	1450	1090	835	2750	5360	1520	1400	3630	683
24	5590	2380	1450	1090	833	2740	4970	1530	1260	3370	619
25	5350	2360	1450	1090	825	2780	4640	1540	1230	3040	679
26	5130	2420	1400	1090	822	3050	4430	1900	1080	2670	1260
27	4890	2560	1400	1020	824	3480	4190	3730	970	2320	1400
28	4670	2670	1390	1000	849	4010	3930	4910	900	1920	1180
29	4450	2710	1390	1000	---	4260	3720	4870	873	1740	1000
30	4200	2770	1390	950	---	3840	3530	4380	791	1550	876
31	4020	---	1380	940	---	3860	---	4000	---	1380	751
TOTAL	271640	82340	57800	35130	23904	66982	177890	78810	52104	87677	30185
MEAN	8763	2745	1865	1133	854	2161	5930	2542	1737	2828	974
MAX	19300	3910	2920	1300	960	4260	12000	4910	3630	7130	1400
MIN	4020	1780	1380	940	710	993	3530	1520	791	496	619
AC-FT	538800	163300	114600	69680	47410	132900	352800	156300	103300	173900	59870
CFSM	1.61	.50	.34	.21	.16	.40	1.09	.47	.32	.52	.18
IN.	1.85	.56	.39	.24	.16	.46	1.21	.54	.36	.60	.21

CAL YR 1986 TOTAL 1843990 MEAN 5052 MAX 19300 MIN 669 AC-FT 3658000 CFSM .93 IN. 12.6
WTR YR 1987 TOTAL 994229 MEAN 2724 MAX 19300 MIN 425 AC-FT 1972000 CFSM .50 IN. 6.78

DES MOINES RIVER BASIN

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05481630 SAYLORVILLE LAKE NEAR SAYLORVILLE, IA

LOCATION.--Lat 41°42'13", long 93°41'21", in SE 1/4, SW 1/4 sec.30, T.80 N., R.24 W., Polk County, Hydrologic Unit 07100004, in control tower of Saylorville Dam, 3.2 mi northwest of Saylorville, 4.2 mi upstream from Beaver Creek, and at mile 213.7.

DRAINAGE AREA.--5,823 mi².

PERIOD OF RECORD.--April 1977 to current year.

GAGE.--Water-stage recorder. Datum of gage is at NGVD (levels by U.S. Army Corps of Engineers).

REMARKS.--Reservoir is formed by earthfill dam completed in 1976. Storage began in April 1977. Release controlled at intake structure to forechamber of 22 ft diameter concrete conduit through dam. Ungated chute spillway 430 ft in length at right end of dam at elevation 884 ft, contents, 570,000 acre-ft. Conservation pool at elevation 833 ft, contents, 74,000 acre-ft, surface area, 5,400 acres. Flood pool elevation at 890 ft, contents, 676,000 acre-ft, surface area, 16,700 acres. Reservoir is used for flood control, low-flow augmentation, conservation and recreation. Storage tables for water years 1985-1986 published as day second-feet instead of acre-feet storage.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum daily contents, 655,000 acre-ft June 22, 1984; maximum elevation, 889.25 ft June 22, 1984; minimum daily contents, 45,000 acre-ft May 15, 1985; minimum elevation, 832.61 ft Jan. 19, 1979.

EXTREMES FOR CURRENT YEAR.--Maximum daily contents, 282,000 acre-ft Oct. 17; maximum elevation, 860.4 ft Oct. 17; minimum daily contents, 89,700 acre-ft Apr. 23; minimum elevation, 835.9 ft Apr. 23.

Capacity table (elevation, in feet, and contents, in acre-feet)

805	360	833	74,000	884	570,000
810	2,300	840	116,000	890	676,000
815	7,700	850	190,000	900	938,000
820	19,000	860	278,000	910	1,320,000
830	58,600	880	511,000	915	1,530,000

RESERVOIR STORAGE (AC-FT), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	114000	271000	97200	92800	93500	94600	92500	91800	91800	92300	91500	115000
2	124000	269000	96000	92700	93500	94200	92600	93300	92200	92000	91400	113000
3	136000	266000	94900	92500	93400	94000	93200	93900	91500	91900	91700	110000
4	148000	263000	94000	92100	93400	93700	93900	94100	91100	91400	91700	108000
5	164000	259000	94200	91900	93400	93600	93900	93200	91400	91000	92500	107000
6	180000	256000	93700	92000	93300	93400	93700	92600	91500	91200	92600	107000
7	196000	251000	93400	91900	93600	93900	92800	91700	91500	92300	93200	107000
8	211000	245000	93300	91700	93600	95100	92300	91300	91700	94000	95200	107000
9	219000	237000	92600	91700	93500	94100	92100	90800	91800	94600	94300	106000
10	220000	227000	90500	91400	93700	92400	90800	90700	91400	94200	92900	106000
11	222000	217000	89800	90800	93900	91300	91000	90900	91500	95400	92100	106000
12	229000	209000	90800	90500	94200	91000	92100	91000	91500	101000	93000	107000
13	243000	200000	91400	91200	94400	90500	92800	91600	91400	104000	94300	107000
14	264000	193000	92200	92700	94300	90500	93700	92400	90900	100000	94500	107000
15	275000	187000	92800	94600	93800	90500	94400	92200	90500	96900	94400	107000
16	281000	183000	92800	94900	92900	90900	101000	92200	90700	94200	94500	108000
17	282000	178000	93600	93900	92400	91700	103000	92200	91400	92400	93700	108000
18	278000	173000	92700	92700	91900	92100	102000	92600	92400	91800	94600	109000
19	274000	168000	92700	92100	91900	91900	96900	92300	92400	91900	95300	109000
20	273000	160000	94000	91900	92100	92100	92400	92100	94000	93600	95000	109000
21	271000	151000	92900	92000	92800	92100	90100	92200	95100	95400	94900	108000
22	270000	144000	92300	93300	93000	92100	89800	91000	95300	96700	94300	107000
23	271000	136000	92100	93600	93200	92100	89700	91400	95000	96100	92500	105000
24	272000	129000	92400	93700	93500	91900	90700	92500	95100	95600	91900	105000
25	273000	125000	92500	93700	93600	92900	91600	93700	95200	94700	95700	105000
26	275000	114000	92500	93900	93700	92400	91700	95000	94200	92600	105000	105000
27	277000	107000	92200	94100	93800	92100	92300	94600	93000	91500	109000	105000
28	278000	102000	92000	94100	95300	94200	92300	94900	92400	91500	114000	105000
29	277000	99400	92300	93700	---	94600	92300	95300	92600	91700	115000	104000
30	275000	98100	92600	93700	---	94000	91900	94700	92400	91700	116000	104000
31	274000	---	92800	93600	---	92800	---	92900	---	91700	117000	---
MEAN	237000	187200	92880	92750	93410	92670	93320	92620	92430	94040	97220	107200
MAX	282000	271000	97200	94900	95300	95100	103000	95300	95300	104000	117000	115000
MIN	114000	98100	89800	90500	91900	90500	89700	90700	90500	91000	91400	104000

CAL YR 1986 MEAN 93600 MAX 282000 MIN 45300
WTR YR 1987 MEAN 114500 MAX 282000 MIN 89700

05481650 DES MOINES RIVER NEAR SAYLORVILLE, IA

LOCATION.--Lat 41°40'50", long 93°40'05", near center of sec.5, T.79 N., R.24 W., Polk County, Hydrologic Unit 07100004, on left bank 5 ft upstream of Fisher bridge on county highway R6F, 2.0 mi west of Saylorville, 2.1 mi downstream from Rock Creek, 2.3 mi downstream from Saylorville Dam, 2.3 mi upstream from Beaver Creek, and mile 211.4.

DRAINAGE AREA.--5.841 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1961 to current year.

GAGE.--Water-stage recorder. Datum of gage is 787.42 ft above NGVD (levels by U. S. Army Corps of Engineers).
Prior to Aug. 6, 1970, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharge: March 12. Records good. Flow regulated by Saylorville Lake (Station 05481630) 2.3 mi upstream since Apr. 12, 1977. U.S. Army Corps of Engineers satellite data collection platform at station.

AVERAGE DISCHARGE.--26 years, 2,947 ft³/s, 6.85 in/yr, 2,135,000 acre-ft/yr; median of yearly mean discharges, 2,480 ft³/s, 5.8 in/yr, 1,800,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 47,400 ft³/s Apr. 10, 1965, gage height, 24.02 ft; minimum daily discharge, 13 ft³/s Jan. 25, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1893, 24.5 ft June 24, 1954, from floodmarks, discharge, 60,000 ft³/s.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 12,800 ft³/s Oct. 16, gage height, 14.56 ft; minimum discharge, 227 ft³/s July 6. 7.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6640	5810	4060	1670	1030	1260	4400	3830	4860	784	1420	1950
2	4680	5790	4060	1670	1030	1370	4640	3650	3940	678	1430	2450
3	2780	5780	4040	1680	1020	1370	5190	3760	3800	673	1140	2400
4	2370	5760	3920	1680	1020	1380	5890	3910	3420	667	875	2240
5	2400	5730	3510	1670	1030	1370	6470	3960	2860	586	690	1460
6	2440	5710	3350	1660	1020	1400	6610	3600	2680	359	699	1110
7	2460	6170	3330	1650	1020	1390	6610	3340	2500	240	708	1100
8	2460	6620	3340	1650	1020	1390	6260	3170	2330	408	721	1120
9	3970	7500	3320	1590	1030	1930	5720	2970	2190	789	1190	1130
10	7140	8350	2990	1530	1030	2260	5450	2790	1950	1010	2070	897
11	8900	8260	1930	1470	1030	1920	4750	2470	1810	1010	1620	735
12	10100	7450	917	1210	1170	1580	4190	2200	1810	2300	1160	775
13	11900	6340	794	941	1230	1570	4190	2040	1810	5290	913	826
14	12500	5490	742	930	1320	1450	4520	2020	1800	7820	1120	863
15	12200	5080	1290	930	1350	1420	5800	1990	1620	8430	1450	1150
16	12500	5050	2240	1170	1350	1400	8050	1990	1150	7110	1450	1740
17	12800	5570	2240	1340	1110	1650	10700	2000	901	5990	1430	2270
18	12700	6030	2230	1350	946	2240	11700	1980	893	4510	1380	2650
19	11300	6010	2250	1350	873	2250	11600	1980	879	3930	766	2790
20	9570	6460	2770	1030	874	2420	10500	1980	906	3770	1450	2740
21	8590	6900	2830	799	883	2720	8420	1970	877	3770	1470	2680
22	7700	6870	2400	797	876	2720	6780	1950	1260	3780	1470	2550
23	6920	6770	2230	797	870	2740	5870	1460	1570	3770	1450	2460
24	6880	6720	2110	800	870	2730	5150	1130	1580	3740	1290	1940
25	6620	6620	2100	804	872	2730	5140	1120	1730	3770	652	1420
26	5660	6520	2100	808	879	3000	4900	1530	1680	3790	1660	1310
27	4940	6440	2110	811	1000	3230	4520	2610	1540	3790	1930	1320
28	5190	5770	1870	940	1050	3220	4450	4290	1210	2990	2140	1340
29	5920	4640	1670	1040	---	3360	4310	5220	925	2020	2310	1350
30	5890	4080	1680	1030	---	4350	4110	5460	907	1720	2040	1160
31	5870	---	1680	1040	---	4380	---	5460	---	1580	1790	---
TOTAL	221990	186290	76103	37837	28803	68200	186890	87830	57388	91074	41884	49926
MEAN	7161	6210	2455	1221	1029	2200	6230	2833	1913	2938	1351	1664
MAX	12800	8350	4060	1680	1350	4380	11700	5460	4860	8430	2310	2790
MIN	2370	4080	742	797	870	1260	4110	1120	877	240	652	735
AC-FT	440300	369500	151000	75050	57130	135300	370700	174200	113800	180600	83080	99030
CAL YR 1986	TOTAL 1989710		MEAN 5451	MAX 14700	MIN 250	AC-FT 3947000						
WTR YR 1987	TOTAL 1134210		MEAN 3107	MAX 12800	MIN 240	AC-FT 2250000						

05481650 DES MOINES RIVER NEAR SAYLORVILLE, IA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD: Water years 1962 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: December 1967 to September 1971, October 1971 to September 1980 (partial record station), October 1980 to current year.

WATER TEMPERATURES: October 1961 to September 1971, October 1971 to September 1980 (partial record station), October 1980 to current year.

SUSPENDED-SEDIMENT DISCHARGE: October 1961 to current year.

REMARKS.--Records of specific conductance are obtained from suspended-sediment samples at time of analysis. During periods of partial ice cover, sediment samples are collected in open water channel.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 1,400 microsiemens Feb. 18, 1977; minimum daily, 90 microsiemens Feb. 19, 1971.

WATER TEMPERATURES: Maximum daily, 36.0°C June 29, 1971; minimum daily, 0.0°C on many days during winter periods.

SEDIMENT CONCENTRATIONS: Maximum daily mean, 5,400 mg/L May 14, 1970; minimum daily mean, 1 mg/L Jan. 8, 1965.

SEDIMENT LOADS: Maximum daily, 148,000 tons June 12, 1966; minimum daily, 1 ton Jan. 8, 1965, Feb. 8-12, 23, 1967.

EXTREMES FOR CURRENT YEAR:

SPECIFIC CONDUCTANCE: Maximum daily, 660 microsiemens Jan. 30 and Feb. 28; minimum daily, 440 microsiemens Apr. 7.

WATER TEMPERATURES: Maximum daily, 30.0°C Aug. 1, 2.

SEDIMENT CONCENTRATIONS: Maximum daily mean, 277 mg/L Nov. 8; minimum daily mean, 4 mg/L Dec. 13.

SEDIMENT LOADS: Maximum daily, 5,210 tons Apr. 18; minimum daily, 8.6 tons Dec. 13.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	550	---	---	540	500	495	---	520	560	---	540	---
2	560	460	520	560	500	480	480	550	600	580	560	---
3	520	460	540	590	610	---	---	---	550	---	520	500
4	520	480	550	550	520	480	520	530	530	520	480	---
5	500	480	540	---	---	480	---	520	520	540	525	505
6	520	540	---	550	510	495	445	---	520	---	510	510
7	500	---	560	590	---	470	440	---	---	520	535	520
8	---	480	560	---	515	515	450	---	550	530	540	515
9	---	540	---	---	---	480	---	560	500	530	540	515
10	---	---	---	560	---	---	---	535	---	540	550	520
11	555	485	---	560	520	480	450	530	500	535	560	515
12	640	480	---	---	---	---	---	520	585	535	520	515
13	570	---	535	540	---	510	460	---	525	535	540	515
14	560	475	540	---	---	480	560	540	520	525	---	515
15	560	---	530	540	500	---	510	530	540	510	450	---
16	---	480	---	---	---	460	610	590	560	---	530	560
17	500	535	540	---	500	---	540	510	---	500	540	560
18	480	475	---	550	500	460	---	535	520	---	550	---
19	540	---	---	---	---	---	---	500	520	520	550	555
20	---	530	---	---	500	---	530	---	560	520	540	565
21	640	---	540	560	---	480	540	---	560	525	540	---
22	600	540	560	---	500	520	---	---	580	545	---	560
23	490	500	---	---	500	480	540	600	525	525	---	560
24	---	550	555	555	---	450	535	620	580	495	515	550
25	500	---	---	---	---	---	520	620	580	540	---	610
26	500	560	---	---	495	500	520	580	595	---	515	590
27	560	---	---	550	---	450	520	600	---	---	525	600
28	600	---	540	520	660	460	520	---	560	485	525	600
29	620	550	560	540	---	---	560	---	600	480	535	---
30	570	550	560	660	---	460	---	560	---	---	530	580
31	---	---	580	560	---	460	---	580	---	---	510	---

DES MOINES RIVER BASIN

05481650 DES MOINES RIVER AT SAYLORVILLE, IA--Continued

WATER-QUALITY RECORDS

TEMPERATURE, WATER, DEGREES CENTIGRADE WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22.0	---	---	4.0	5.0	10.0	---	16.0	22.0	---	30.0	---
2	21.0	10.0	4.0	4.0	5.0	7.0	2.0	16.0	24.0	---	30.0	---
3	21.0	10.0	4.0	5.0	4.0	---	---	---	24.0	---	29.0	25.0
4	20.0	9.0	4.0	4.0	4.0	7.0	---	16.0	24.0	26.0	29.0	---
5	21.0	9.0	4.0	---	---	7.0	---	16.0	24.0	26.0	29.0	25.0
6	20.0	8.0	---	4.0	4.0	7.0	---	---	24.0	---	29.0	25.0
7	20.5	---	3.0	4.0	---	7.0	---	---	---	26.0	29.0	23.0
8	---	8.0	3.0	---	4.0	7.0	---	---	25.0	27.0	28.0	21.0
9	---	6.0	---	---	---	5.0	---	18.0	25.0	---	28.0	21.0
10	---	---	---	2.0	---	---	---	19.0	---	29.0	28.0	21.0
11	20.0	6.0	---	2.0	4.0	7.0	5.0	20.0	25.0	28.0	27.0	20.0
12	15.0	5.0	---	---	---	---	---	20.0	25.0	29.0	27.0	20.0
13	12.0	---	5.0	2.0	---	7.0	8.0	---	26.0	26.0	28.0	20.0
14	10.0	6.0	5.0	---	---	7.0	10.0	20.0	26.0	26.0	---	21.0
15	10.0	---	4.0	2.0	5.0	---	9.0	20.0	26.0	26.0	28.0	---
16	---	5.0	---	---	---	6.0	---	20.0	26.0	---	29.0	21.0
17	11.0	5.0	4.0	---	5.0	---	14.0	20.0	---	27.0	29.0	21.0
18	11.0	5.0	---	2.0	5.0	6.0	---	20.0	25.0	---	28.0	---
19	11.0	---	---	---	---	---	---	23.0	26.0	28.0	28.0	21.0
20	---	5.0	---	---	5.0	---	13.0	---	26.0	28.0	28.0	20.0
21	11.0	---	3.0	2.0	---	6.0	13.0	---	26.0	28.0	27.0	---
22	11.0	6.0	3.0	---	5.0	6.0	---	---	26.0	28.0	---	19.0
23	---	6.0	---	---	5.0	6.0	13.0	22.0	26.0	28.0	---	19.0
24	---	5.0	3.0	3.0	---	6.0	13.0	22.0	25.0	28.0	27.0	19.0
25	11.0	---	---	---	---	9.0	15.0	22.0	25.0	28.0	---	19.0
26	11.0	5.0	---	---	7.0	6.0	15.0	---	26.0	---	27.0	19.0
27	11.0	---	---	3.0	---	6.0	15.0	21.0	---	---	26.0	20.0
28	11.0	---	3.0	3.0	10.0	6.0	16.0	---	26.0	28.0	27.0	21.0
29	10.0	5.0	3.0	3.0	---	---	16.0	---	26.0	29.0	27.0	---
30	10.0	5.0	3.0	3.0	---	5.0	---	21.0	---	---	26.0	20.0
31	---	---	4.0	5.0	---	3.0	---	21.0	---	---	25.0	---

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

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	41	735	160	2510	61	669	64	289	48	133	18	61
2	55	695	162	2530	48	526	66	298	47	131	11	41
3	54	405	159	2480	35	382	30	136	48	132	18	67
4	69	442	156	2430	27	286	34	154	48	132	26	97
5	84	544	137	2120	20	190	36	162	48	133	25	92
6	86	567	135	2080	27	244	35	157	48	132	26	98
7	86	571	167	2780	29	261	32	143	48	132	26	98
8	87	578	277	4950	28	253	34	151	48	132	20	75
9	107	1150	248	5020	28	251	50	215	48	133	20	104
10	96	1850	140	3160	22	178	52	215	49	136	15	92
11	54	1300	116	2590	15	78	137	544	49	136	8	41
12	24	654	110	2210	10	25	146	477	53	167	10	43
13	20	643	97	1660	4	8.6	35	89	55	183	11	47
14	34	1150	70	1040	21	42	31	78	57	203	7	27
15	45	1480	55	754	42	146	48	121	63	230	8	31
16	66	2230	54	736	72	435	67	212	62	226	10	38
17	92	3180	46	692	74	448	87	315	33	99	11	49
18	84	2880	40	651	74	446	87	317	54	138	11	67
19	90	2750	39	633	74	450	87	317	54	127	12	73
20	91	2350	41	715	62	464	80	222	52	123	28	183
21	50	1160	46	857	54	413	68	147	48	114	79	580
22	31	644	55	1020	57	369	61	131	44	104	57	419
23	91	1700	139	2540	57	343	51	110	38	89	75	555
24	134	2490	210	3810	58	330	43	93	34	80	105	774
25	117	2090	180	3220	58	329	37	80	29	68	102	752
26	95	1450	74	1300	58	329	34	74	25	59	81	656
27	67	894	55	956	58	330	29	64	16	43	104	907
28	75	1050	62	966	48	242	45	114	12	34	97	843
29	66	1050	70	877	41	185	64	180	---	---	101	916
30	130	2070	75	826	65	295	48	133	---	---	100	1170
31	149	2360	---	---	68	308	48	135	---	---	100	1180
TOTAL	---	43112	---	58113	---	9255.6	---	5873	---	3549	---	10176

DES MOINES RIVER BASIN

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05481650 DES MOINES RIVER NEAR SAYLORVILLE, IA--Continued

WATER-QUALITY RECORD

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

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)
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	98	1160	110	1140	95	1250	26	55	67	257	44	232
2	90	1130	115	1130	72	766	20	37	43	166	43	284
3	80	1120	105	1070	45	462	22	40	30	92	42	272
4	59	938	114	1200	50	462	22	40	37	87	40	242
5	79	1380	120	1280	60	463	18	28	25	47	30	118
6	83	1480	86	836	56	405	25	24	18	34	12	36
7	75	1340	41	370	46	310	27	17	18	34	22	65
8	78	1320	34	291	40	252	30	33	20	39	26	79
9	66	1020	16	128	55	325	60	128	18	58	27	82
10	60	883	21	158	61	321	83	226	10	56	27	65
11	51	654	40	267	63	308	53	145	10	44	26	52
12	95	1070	39	232	56	274	48	298	11	34	20	42
13	96	1090	14	77	57	279	36	514	12	30	22	49
14	86	1050	14	76	58	282	20	422	15	45	24	56
15	66	1030	16	86	47	206	15	341	18	70	35	109
16	60	1300	23	124	46	143	12	230	21	82	33	155
17	109	3150	37	200	56	136	16	259	23	89	18	110
18	165	5210	38	203	63	152	20	244	18	67	18	129
19	156	4890	37	198	69	164	19	202	17	35	18	136
20	106	3010	37	198	62	152	17	173	14	55	24	178
21	56	1270	36	191	59	140	21	214	10	40	26	188
22	54	989	36	180	45	153	27	276	9	36	30	207
23	60	951	30	118	30	127	12	122	8	31	31	206
24	53	737	25	76	27	115	10	101	9	31	29	152
25	76	1050	25	76	26	121	13	132	12	21	35	134
26	118	1560	25	103	26	118	13	133	34	152	35	124
27	128	1560	25	176	28	116	26	266	37	193	33	118
28	137	1650	50	579	32	105	46	371	37	214	25	90
29	110	1280	80	1130	33	82	34	185	33	206	20	73
30	76	843	100	1470	33	81	40	186	24	132	26	81
31	---	---	106	1560	---	---	66	282	36	174	---	---
TOTAL	---	46115	---	14933	---	8270	---	5724	---	2651	---	3864
TOTAL LOAD FOR YEAR: 211635.6 TONS.												

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	TEMPER- ATURE WATER (DEG C) (00010)	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	SEDI- MENT, SUS- PENDED (MG/L) (80154)	SEDI- MENT, DIS- CHARGE, SUS- PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. THAN .062 MM (70331)
OCT						
28...	1330	13.5	4920	13	173	83
NOV						
24...	1500	5.0	6900	208	3880	95
FEB						
02...	1600	7.0	998	36	97	89
MAR						
25...	1135	9.0	2700	40	292	74
APR						
28...	1010	16.0	4600	126	1560	91
JUN						
09...	0810	--	2250	56	340	66
JUL						
22...	1500	26.0	3940	63	670	89
SEP						
22...	1155	19.0	2170	28	164	88

DES MOINES RIVER BASIN

05481650 DES MOINES RIVER NEAR SAYLORVILLE, IA--Continued

WATER- QUALITY RECORDS

PARTICLE-SIZE DISTRIBUTION OF SURFACE BED MATERIAL, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	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. THAN .250 MM (80166)	BED MAT. SIEVE DIAM. THAN .500 MM (80167)
MAR 25...	1210	2700	3	2	4	19	39
JUN 03...	1250	3960	3	0	1	4	14

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. THAN 16.0 MM (80172)	BED MAT. SIEVE DIAM. THAN 32.0 MM (80173)
MAR 25...	47	53	66	87	100	--
JUN 03...	28	42	52	66	84	100

DES MOINES RIVER BASIN

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05481950 BEAVER CREEK NEAR GRIMES, IA

LOCATION.--Lat 41°41'18", long 93°44'08", in SW1/4 SW1/4 sec.35, T.80 N., R.25 W., Polk County, Hydrologic Unit 07100004, on right bank 6 ft upstream from bridge on Northwest 70th Avenue, 0.5 mi downstream from Little Beaver Creek, 2.5 mi east of Grimes and 6 mi upstream from mouth.

DRAINAGE AREA.--358 mi².

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

REVISED RECORDS.--WDR IA-77-1: 1974 (P).

GAGE.--Water-stage recorder and concrete and steel sheeting broad-crested control. Datum of gage is 806.98 ft above NGVD. Prior to Aug. 31, 1966, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Nov. 11-18, Dec. 10 to Feb. 4 and July 31 to Aug. 7. Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers satellite data collection platform at station.

AVERAGE DISCHARGE.--27 years, 216 ft³/s, 8.19 in/yr, 156,500 acre-ft/yr; median of yearly mean discharges, 200 ft³/s, 7.6 in/yr, 145,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,980 ft³/s June 30, 1986, gage height, 14.73 ft; no flow for several days in 1970 and 1971 and many days in 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 14	0445	1,830	9.58	Aug. 28	1200	*2,610	*11.50

Minimum daily discharge, 31 ft³/s Aug. 6.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	527	436	270	145	110	163	238	221	383	100	38	538
2	438	427	272	140	100	189	311	236	345	88	35	443
3	397	416	267	140	100	202	316	734	375	79	38	378
4	427	400	250	135	100	212	303	659	326	70	40	343
5	647	378	234	135	106	224	288	461	281	64	35	313
6	645	366	243	132	115	228	279	387	253	59	31	302
7	525	353	245	130	129	226	272	344	232	79	50	303
8	465	342	264	120	133	222	258	307	217	116	103	382
9	412	321	232	125	105	210	238	293	198	329	116	361
10	376	300	220	130	112	186	219	278	186	269	118	333
11	487	291	200	132	110	175	203	256	182	272	86	315
12	1230	260	180	135	104	169	194	242	175	893	75	292
13	1650	250	190	130	95	165	183	231	164	1290	204	276
14	1730	245	210	122	95	162	256	227	149	805	235	264
15	1160	240	230	118	95	156	584	213	136	453	193	311
16	826	260	225	112	83	146	827	203	124	335	230	385
17	683	230	220	110	81	142	722	208	114	274	197	468
18	592	230	215	112	84	160	560	193	109	235	159	446
19	537	232	210	115	114	181	465	184	104	215	144	398
20	492	245	200	115	113	192	404	184	117	181	233	356
21	452	229	190	110	91	209	360	172	158	153	210	332
22	422	235	180	100	93	211	340	159	135	127	181	310
23	416	273	180	80	89	203	331	151	116	108	147	293
24	629	288	175	86	86	201	309	148	105	94	123	282
25	820	289	170	94	84	200	291	151	387	85	208	266
26	846	293	165	100	82	184	280	180	280	80	1320	252
27	741	296	160	110	84	176	265	322	202	73	2100	241
28	630	298	150	120	99	177	248	374	158	62	2520	234
29	542	289	150	120	---	177	244	446	136	52	1980	223
30	490	280	150	120	---	130	234	434	117	45	1080	210
31	454	---	145	120	---	149	---	399	---	42	710	---
TOTAL	20688	8992	6392	3693	2792	5727	10022	8997	5964	7127	12939	9850
MEAN	667	300	206	119	99.7	185	334	290	199	230	417	328
MAX	1730	436	272	145	133	228	827	734	387	1290	2520	538
MIN	376	229	145	80	81	130	183	148	104	42	31	210
AC-FT	41030	17840	12680	7330	5540	11360	19880	17850	11830	14140	25660	19540
CFSM	1.86	.84	.58	.33	.28	.52	.93	.81	.56	.64	1.17	.92
IN.	2.15	.93	.66	.38	.29	.60	1.04	.93	.62	.74	1.34	1.02

CAL YR 1986	TOTAL 154051	MEAN 422	MAX 6880	MIN 2.2	AC-FT 305600	CFSM 1.18	IN. 16.0
WTR YR 1987	TOTAL 103183	MEAN 283	MAX 2520	MIN 31	AC-FT 204700	CFSM .79	IN. 10.7

DES MOINES RIVER BASIN

05482135 NORTH RACCOON RIVER NEAR NEWELL, IA

LOCATION.--Lat 42°36'16", long 95°02'42", in NE1/4 NW1/4 sec.24, T.90 N., R.36 W., Buena Vista County, Hydrologic Unit 07100005, on left bank 40 ft downstream from bridge on State Highway 7, 0.8 mi upstream from Outlet Creek, 2.2 mi west of Newell, and at mile 398.6 upstream from mouth of Des Moines River.

DRAINAGE AREA.--233 mi².

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

GAGE.--Water-stage recorder. Datum of gage is 1235.50 ft above NGVD.

REMARKS.--Estimated daily discharges: Nov. 10-15, Dec. 9 to Feb. 10 and Feb. 13-15. Records good except those for estimated daily discharges, which are poor. U.S. Geological Survey gage-height telemeter at station.

AVERAGE DISCHARGE.--5 years, 226 ft³/s, 13.17 in/yr, 163,740 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,850 ft³/s June 17, 1984, gage height, 16.73 ft, from flood mark, site and datum then in use; minimum daily discharge 3.9 ft³/s Sept. 25, 26, 1984.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 750 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 12	2000	1,190	14.22	July 22	0800	974	13.49
July 12	1100	1,160	14.13	Sept. 17	0315	*1,440	*14.81

Minimum discharge, 21 ft³/s Sept. 8, 9, 10.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	178	153	120	53	35	49	427	138	219	33	58	28
2	165	149	123	52	38	51	459	137	190	30	49	26
3	194	154	117	51	41	50	387	129	169	28	40	25
4	411	143	110	50	44	53	341	118	152	24	42	24
5	444	142	111	50	46	71	310	114	144	32	48	23
6	319	139	103	51	51	87	295	113	133	36	45	24
7	270	134	100	52	50	112	257	109	126	39	43	22
8	234	188	99	52	48	118	231	104	116	62	63	21
9	203	179	84	56	58	121	210	109	106	337	65	21
10	192	170	70	60	56	105	190	109	104	247	55	21
11	359	150	84	68	49	97	183	101	100	177	50	23
12	1120	120	90	70	47	91	169	94	87	1070	46	24
13	1060	80	94	53	45	87	163	94	81	918	46	23
14	824	96	96	42	48	83	201	87	71	484	44	23
15	516	200	94	38	56	78	405	81	72	327	41	60
16	411	119	94	37	76	77	393	82	71	227	45	382
17	348	120	92	36	66	78	320	79	66	166	47	1000
18	306	119	90	35	64	120	280	76	60	145	49	398
19	276	121	86	34	69	228	258	74	61	506	47	278
20	258	121	85	33	57	212	232	72	59	347	46	216
21	241	119	86	32	48	192	206	87	53	519	43	180
22	228	123	88	32	48	168	199	92	52	930	38	158
23	215	135	91	31	50	161	199	87	49	621	34	143
24	204	139	80	31	48	174	186	84	49	363	34	131
25	201	146	74	31	47	206	179	98	53	251	37	118
26	195	148	70	31	47	269	168	465	45	181	40	112
27	189	141	66	31	47	246	161	706	42	141	40	105
28	182	137	63	31	49	205	156	505	41	112	40	97
29	169	129	60	31	---	185	153	357	39	90	37	93
30	166	123	58	32	---	300	140	295	36	74	34	87
31	165	---	57	34	---	389	---	248	---	65	30	---
TOTAL	10243	4137	2735	1320	1428	4463	7458	5044	2646	8582	1376	3886
MEAN	330	138	88.2	42.6	51.0	144	249	163	88.2	277	44.4	130
MAX	1120	200	123	70	76	389	459	706	219	1070	65	1000
MIN	165	80	57	31	35	49	140	72	36	24	30	21
AC-FT	20320	8210	5420	2620	2830	8850	14790	10000	5250	17020	2730	7710
CFSM	1.42	.59	.38	.18	.22	.62	1.07	.70	.38	1.19	.19	.55
IN.	1.63	.66	.44	.21	.23	.71	1.19	.80	.42	1.37	.22	.62
CAL YR 1986	TOTAL 80961	MEAN 222	MAX 1680	MIN 17	AC-FT 160600	CFSM .95	IN. 12.9					
WTR YR 1987	TOTAL 53318	MEAN 146	MAX 1120	MIN 21	AC-FT 105800	CFSM .63	IN. 8.50					

DES MOINES RIVER BASIN

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05482170 BIG CEDAR CREEK NEAR VARINA, IA

LOCATION.--Lat. 42°41'16", long 94°47'52", in NE1/4 NE1/4 sec.24, T.91 N., R.34 W., Pocahontas County, Hydrologic Unit 07100006, on left bank 2 ft downstream from bridge on county highway N33, 2.0 mi downstream from Drainage ditch 21, 3.5 mi upstream from Drainage ditch 74, and 5.5 mi northeast of Varina.

DRAINAGE AREA.--80.0 mi².

PERIOD OF RECORD.--October 1959 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,225.12 ft above NGVD.

REMARKS.--Estimated daily discharges: Nov. 7-12, Dec. 2 to Feb. 24, Mar. 30 to Apr. 6 and May 5-10. Records good except those for estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--28 years, 43.5 ft³/s, 7.38 in/yr, 31,520 acre-ft/yr; median of yearly mean discharges, 36 ft³/s, 6.1 in/yr, 26,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,080 ft³/s Aug. 31, 1962, gage height, 13.68 ft; maximum gage height, 16.29 ft Mar. 24, 1979, backwater from ice; no flow at times most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 400 ft³/s and maximum (*):

Discharge				Gage height				Discharge				Gage height			
Date	Time	(ft ³ /s)	(ft)	Date	Time	(ft ³ /s)	(ft)	Date	Time	(ft ³ /s)	(ft)	Date	Time	(ft ³ /s)	(ft)
Oct. 12	0245	*632	*8.09	May 26	0745	528	7.40								

Minimum discharge, 0.99 ft³/s Sept. 6, 9, 10, 14.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	82	54	44	14	11	9.3	100	53	117	9.7	12	5.2
2	79	54	44	14	11	8.7	150	52	97	9.2	10	4.4
3	93	55	40	14	11	8.7	130	48	83	8.0	11	3.7
4	197	49	38	14	11	11	120	43	73	7.2	11	3.1
5	173	49	38	14	12	15	110	42	67	9.9	8.3	3.0
6	131	47	37	13	12	18	102	42	61	9.7	7.5	3.0
7	114	46	36	13	10	22	96	41	56	12	7.5	4.1
8	97	34	31	13	9.6	25	83	40	50	24	16	3.8
9	84	34	26	13	9.4	23	73	39	46	149	12	3.1
10	80	34	22	13	9.6	21	64	38	45	70	9.1	3.1
11	245	35	21	24	9.0	21	60	36	44	51	8.0	5.7
12	553	42	23	16	8.2	19	55	33	39	264	7.8	3.8
13	377	45	25	14	7.6	19	57	34	36	152	8.9	4.0
14	283	51	24	13	8.0	20	105	33	33	90	7.7	14
15	219	42	22	12	7.0	19	310	31	31	73	6.8	170
16	181	40	20	12	11	19	233	31	29	54	12	177
17	148	39	20	12	13	19	170	31	27	41	9.3	278
18	131	37	19	12	14	31	135	29	26	37	9.7	177
19	115	39	18	12	10	51	117	28	27	144	8.2	120
20	108	37	17	12	7.2	54	100	27	34	80	7.7	91
21	106	36	17	11	7.2	51	92	31	28	102	7.0	73
22	102	39	17	10	7.2	47	86	27	25	101	5.8	61
23	92	40	16	10	7.0	47	85	26	22	63	5.0	56
24	86	43	16	11	7.0	48	80	26	20	46	4.8	50
25	81	52	15	11	7.0	58	76	100	20	38	7.3	44
26	77	53	15	11	7.3	78	72	480	16	31	7.6	42
27	73	53	15	11	7.9	72	65	442	15	26	6.6	38
28	68	51	15	11	9.1	47	61	296	13	22	6.0	35
29	62	48	15	11	---	26	59	223	13	18	8.6	33
30	62	45	15	11	---	35	53	178	11	16	7.9	32
31	61	---	15	11	---	60	---	142	---	13	6.3	---
TOTAL	4360	1323	736	393	261.3	1002.7	3099	2722	1204	1770.7	263.4	1541.0
MEAN	141	44.1	23.7	12.7	9.33	32.3	103	87.8	40.1	57.1	8.50	51.4
MAX	553	55	44	24	14	78	310	480	117	264	16	278
MIN	61	34	15	10	7.0	8.7	53	26	11	7.2	4.8	3.0
AC-FT	8650	2620	1460	780	518	1990	6150	5400	2390	3510	522	3060
CFSM	1.76	.55	.30	.16	.12	.40	1.29	1.10	.50	.71	.11	.64
IN.	2.03	.62	.34	.18	.12	.47	1.44	1.27	.56	.82	.12	.72

CAL YR 1986 TOTAL 32325.3 MEAN 88.6 MAX 1070 MIN 6.0 AC-FT 64120 CFSM 1.11 IN. 15.0
WTR YR 1987 TOTAL 18676.0 MEAN 51.2 MAX 553 MIN 3.0 AC-FT 37040 CFSM .64 IN. 8.68

DES MOINES RIVER BASIN

05482300 NORTH RACCOON RIVER NEAR SAC CITY, IA

LOCATION.--Lat 42°20'28", long 94°59'05", in NE1/4 NW1/4 sec.24, T.87 N., R.36 W., Sac County, Hydrologic Unit 07100006, on right bank 15 ft downstream from bridge on county highway, 0.2 mi upstream from Indian Creek, 0.9 mi downstream from Drainage ditch 73, 5.6 mi south of Sac City, and at mile 365.9 upstream from mouth of Des Moines River.

DRAINAGE AREA.--713 mi².

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

GAGE.--Water-stage recorder. Datum of gage is 1,144.60 ft above NGVD (levels by Iowa Natural Resources Council).

REMARKS.--Estimated daily discharges: Nov. 11-16, Dec. 10 to Feb. 4 and Feb. 15-19. Records good except those for estimated daily discharges, which are poor. U.S. National Weather Service gage-height telemeter at station.

AVERAGE DISCHARGE.--29 years, 370 ft³/s, 7.05 in/yr, 268,100 acre-ft/yr; median of yearly mean discharges, 300 ft³/s, 5.7 in/yr, 217,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,100 ft³/s Mar. 23, 1979, gage height, 18.02 ft; maximum gage height, 18.12 ft Sept. 1, 1962; no flow Jan. 30 to Feb. 4, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 21, 1954, reached a stage of 15.61 ft, from floodmark, discharge, 7,000 ft³/s

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 12	2400	3,670	12.85	July 12	2400	*4,570	*14.01
Apr. 15	2230	2,460	10.61	Sept. 17	0145	2,740	11.25
May 27	1245	2,930	11.64				

Minimum discharge, 131 ft³/s Sept. 14.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	822	619	428	230	215	369	1340	518	1040	150	351	204
2	775	579	468	230	220	360	1490	509	887	142	298	189
3	750	555	458	230	230	363	1500	486	768	137	273	178
4	1020	530	428	220	235	371	1370	448	674	134	262	169
5	1360	514	409	210	231	401	1310	421	616	135	237	160
6	1110	490	418	200	219	448	1280	445	579	245	213	153
7	935	458	399	195	199	496	1120	445	540	284	198	147
8	828	523	384	195	191	537	980	417	493	355	311	143
9	721	618	380	200	207	532	855	400	454	1300	377	137
10	681	559	380	205	190	503	765	409	413	1240	314	135
11	1110	490	320	210	181	506	703	379	412	824	270	135
12	3340	450	290	280	167	495	657	357	383	3240	240	132
13	3380	350	270	320	159	478	647	345	352	4050	274	138
14	2760	370	290	230	156	482	834	339	329	2700	244	134
15	2080	400	320	200	150	556	2060	316	306	1850	227	212
16	1640	430	330	210	140	605	2140	307	286	1410	249	1390
17	1360	446	340	220	140	601	1630	309	270	1090	321	2540
18	1170	424	330	220	150	694	1300	305	255	889	422	1990
19	1030	383	310	215	290	1070	1120	298	257	2370	394	1410
20	950	398	300	210	396	1120	1000	290	267	2380	342	1090
21	889	370	280	200	355	1090	890	304	249	1860	310	890
22	831	380	300	180	353	1080	816	303	252	2380	264	763
23	849	464	290	180	338	1070	794	300	229	2110	233	670
24	883	500	285	190	341	1040	748	294	209	1530	210	608
25	883	495	280	200	336	956	704	357	218	1170	242	551
26	811	513	260	200	333	1050	675	1760	219	948	354	515
27	788	509	260	205	337	1120	644	2840	190	778	346	488
28	752	489	270	205	349	969	596	2410	179	653	314	464
29	677	459	260	200	---	822	576	1810	175	562	291	428
30	637	436	260	210	---	991	545	1510	159	484	259	400
31	615	---	270	210	---	1150	---	1240	---	408	224	---
TOTAL	36437	14201	10267	6610	6808	22325	31089	20871	11660	37808	8864	16563
MEAN	1175	473	331	213	243	720	1036	673	389	1220	286	552
MAX	3380	619	468	320	396	1150	2140	2840	1040	4050	422	2540
MIN	615	350	260	180	140	360	545	290	159	134	198	132
AC-FT	72270	28170	20360	13110	13500	44280	61670	41400	23130	74990	17580	32850
CFSM	1.65	.66	.46	.30	.34	1.01	1.45	.94	.55	1.71	.40	.77
IN.	1.90	.74	.54	.34	.36	1.16	1.62	1.09	.61	1.97	.46	.86

CAL YR 1986 TOTAL 279215 MEAN 765 MAX 5110 MIN 80 AC-FT 553800 CFSM 1.07 IN. 14.6
WTR YR 1987 TOTAL 223503 MEAN 612 MAX 4050 MIN 132 AC-FT 443300 CFSM .86 IN. 11.7

DES MOINES RIVER BASIN

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05482315 BLACK HAWK LAKE AT LAKE VIEW, IA

LOCATION.--Lat 42°18'15", long 95°02'30", in NW1/4 SE1/4 sec.33, T.87 N., R.36 W., Sac County, Hydrologic Unit 07100006, on south shore across from swimming beach at Lake View and 2 mi upstream from lake outlet.

DRAINAGE AREA.--23.3 mi².

PERIOD OF RECORD.--April 1970 to September 1975, April 1978 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,218.50 ft above NGVD and 2.00 ft below crest of spillway of dam at outlet. Prior to June 25, 1970, nonrecording gage at lake outlet.

REMARKS.--Lake is formed by concrete dam with ungated overflow spillway at elevation 1,220.50 ft above NGVD. Lake is used for conservation and recreation. Area of lake is approximately 957 acres.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 4.08 ft Mar. 20, 1979; minimum, 0.02 ft Sept. 26, 1981.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 2.88 ft Oct 14; minimum, 2.08 ft July 4.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.48	2.62	2.46	2.35	2.29	2.33	2.47	2.44	2.70	2.16	2.20	2.41
2	2.47	2.60	2.46	2.35	2.30	2.34	2.48	2.44	2.64	2.14	2.18	2.40
3	2.47	2.57	2.43	2.35	2.30	2.34	2.51	2.48	2.58	2.13	2.18	2.39
4	2.50	2.56	2.44	2.35	2.30	2.33	2.53	2.47	2.54	2.13	2.16	2.36
5	2.49	2.54	2.44	2.35	2.30	2.34	2.56	2.44	2.51	2.13	2.15	2.35
6	2.49	2.54	2.43	2.35	2.30	2.35	2.58	2.42	2.48	2.15	2.12	2.34
7	2.48	2.54	2.44	2.35	2.30	2.35	2.60	2.41	2.45	2.17	2.15	2.33
8	2.47	2.51	2.45	2.34	2.30	2.34	2.60	2.40	2.43	2.22	2.31	2.31
9	2.46	2.50	2.44	2.34	2.30	2.34	2.58	2.38	2.42	2.30	2.31	2.30
10	2.46	2.51	2.42	2.34	2.29	2.33	2.56	2.37	2.42	2.34	2.30	2.30
11	2.57	2.50	2.41	2.33	2.30	2.33	2.56	2.35	2.40	2.36	2.29	2.28
12	2.71	2.49	2.40	2.33	2.30	2.33	2.55	2.35	2.40	2.54	2.28	2.27
13	2.83	2.48	2.39	2.33	2.30	2.34	2.56	2.32	2.38	2.62	2.29	2.28
14	2.86	2.46	2.38	2.34	2.31	2.36	2.62	2.30	2.36	2.67	2.29	2.31
15	2.84	2.46	2.38	2.34	2.31	2.40	2.75	2.30	2.35	2.68	2.28	2.38
16	2.80	2.46	2.38	2.33	2.30	2.41	2.82	2.28	2.33	2.66	2.33	2.53
17	2.77	2.47	2.38	2.33	2.30	2.44	2.83	2.27	2.31	2.62	2.34	2.56
18	2.73	2.49	2.38	2.32	2.29	2.46	2.81	2.26	2.31	2.61	2.42	2.55
19	2.69	2.48	2.38	2.32	2.29	2.46	2.79	2.27	2.29	2.57	2.44	2.52
20	2.65	2.48	2.38	2.32	2.29	2.49	2.71	2.29	2.29	2.53	2.45	2.50
21	2.62	2.47	2.37	2.32	2.29	2.47	2.66	2.29	2.29	2.50	2.44	2.48
22	2.61	2.47	2.37	2.31	2.29	2.47	2.64	2.27	2.29	2.46	2.41	2.46
23	2.64	2.46	2.37	2.31	2.29	2.48	2.64	2.28	2.27	2.42	2.39	2.44
24	2.67	2.45	2.37	2.30	2.30	2.49	2.63	2.30	2.25	2.38	2.37	2.43
25	2.71	2.46	2.37	2.29	2.29	2.47	2.58	2.38	2.25	2.37	2.44	2.41
26	2.73	2.46	2.36	2.29	2.30	2.46	2.56	2.60	2.21	2.34	2.47	2.40
27	2.73	2.46	2.36	2.29	2.30	2.46	2.52	2.72	2.20	2.32	2.49	2.38
28	2.71	2.45	2.36	2.28	2.32	2.48	2.50	2.76	2.18	2.29	2.50	2.36
29	2.69	2.45	2.36	2.28	---	2.54	2.47	2.77	2.18	2.27	2.49	2.32
30	2.68	2.47	2.36	2.29	---	2.51	2.46	2.75	2.17	2.25	2.46	2.31
31	2.64	---	2.36	2.29	---	2.48	---	2.75	---	2.23	2.44	---
MEAN	2.63	2.50	2.40	2.32	2.30	2.41	2.60	2.42	2.36	2.37	2.33	2.39
MAX	2.86	2.62	2.46	2.35	2.32	2.54	2.83	2.77	2.70	2.68	2.50	2.56
MIN	2.46	2.45	2.36	2.28	2.29	2.33	2.46	2.26	2.17	2.13	2.12	2.27

CAL YR 1986 MEAN 2.38 MAX 2.97 MIN 1.85
WTR YR 1987 MEAN 2.42 MAX 2.86 MIN 2.12

DES MOINES RIVER BASIN

05482500 NORTH RACCOON RIVER NEAR JEFFERSON, IA

LOCATION.--Lat 41°59'17", long 94°22'36", in SW1/4 NW1/4 sec. 20, T.83 N., R.30 W., Greene County, Hydrologic Unit 07100006, on right bank 5 ft downstream from bridge on State Highway 4, 0.1 mi downstream from Drainage ditch 33 and 40, 1.9 mi south of Jefferson, 4.2 mi upstream from Hardin Creek, and at mile 292.5 upstream from mouth of Des Moines River.

DRAINAGE AREA.--1,619 mi².

PERIOD OF RECORD.--March 1940 to current year. Prior to April 1940, monthly discharge only, published in WSP 1308. Prior to October 1955, published as Raccoon River near Jefferson.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1508: 1940 (M), 1950-51.

GAGE.--Water-stage recorder. Datum of gage is 967.09 ft above NGVD. Prior to Apr. 22, 1946, nonrecording gage at site 4 mi upstream at different datum. Apr. 22 to June 25, 1946, nonrecording gage, June 26, 1946 to Sept. 30, 1955, water-stage recorder, Oct. 1, 1955 to Apr. 30, 1958, nonrecording gage, at present site and datum.

REMARKS.--Estimated daily discharges: Nov. 9-13, Dec. 2 to Feb. 7, Feb. 15-19 and Apr. 14. Records fair except those for estimated daily discharges, which are poor. U.S. National Weather Service gage-height telemeter and U.S. Army Corps of Engineers data collection platform at station.

AVERAGE DISCHARGE.--47 years, 752 ft³/s, 6.31 in/yr, 544,800 acre-ft/yr; median of yearly mean discharges, 600 ft³/s, 5.0 in/yr, 435,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 29,100 ft³/s June 23, 1947, gage height, 22.3 ft; minimum daily, 0.6 ft³/s Oct. 5, 1956.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 15	0245	*8,840	*14.03	July 15	0215	5,320	11.46
Apr. 17	0715	5,420	11.54	Sept. 18	1530	4,250	10.56
May 28	2000	4,600	10.74				

Minimum daily discharge, 280 ft³/s Feb. 18.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3150	1680	1170	480	380	391	1180	1260	2360	374	644	643
2	2930	1570	1080	490	370	410	1550	1350	2100	346	574	565
3	2470	1510	1020	495	360	419	2620	1370	1830	324	511	513
4	2370	1470	970	500	360	428	2890	1240	1620	312	463	470
5	2790	1410	880	510	360	451	2710	1120	1470	304	424	430
6	3040	1370	910	480	360	483	2620	1060	1350	295	402	406
7	2640	1320	920	460	370	506	2500	1010	1250	320	409	393
8	2230	1310	840	430	401	558	2220	981	1160	443	511	396
9	1960	1480	700	410	369	624	1970	950	1080	602	682	434
10	1750	1140	510	420	353	644	1750	925	996	1070	690	396
11	2090	1020	540	390	350	627	1560	901	951	1510	614	365
12	4710	1080	490	410	386	597	1400	860	905	2500	523	344
13	6860	1150	470	420	374	585	1310	806	851	4020	493	325
14	8380	1090	620	460	371	565	1420	772	786	5070	483	310
15	8340	1140	780	420	360	554	2620	742	724	4690	472	308
16	5870	1330	750	320	310	559	4760	707	673	2910	460	449
17	4090	1300	700	300	290	787	5240	676	633	2230	542	2570
18	3350	1220	680	310	280	1040	4220	676	602	1800	595	4110
19	2910	1150	640	360	320	1060	3310	672	581	1530	804	3540
20	2600	1120	620	390	391	1410	2750	662	564	2660	864	2600
21	2340	1100	600	400	396	1730	2390	651	564	3360	712	2050
22	2160	1080	580	390	378	1700	2120	637	645	2470	615	1700
23	2060	1130	620	350	363	1540	1960	614	574	2730	537	1470
24	2400	1220	580	360	354	1380	1860	601	602	2570	470	1320
25	2940	1280	590	390	349	1320	1750	736	559	2080	522	1200
26	3010	1290	520	400	345	1290	1640	816	499	1670	1050	1100
27	2630	1310	540	405	341	1310	1570	2700	464	1380	1460	1010
28	2340	1300	520	420	356	1390	1450	4410	427	1160	1260	948
29	2110	1270	510	400	---	1250	1390	4240	407	989	1050	877
30	1920	1220	500	390	---	823	1340	3210	392	858	878	813
31	1780	---	520	380	---	739	---	2780	---	744	746	---
TOTAL	100220	38060	21370	12740	9997	27170	68070	40135	27619	53321	20460	32055
MEAN	3233	1269	689	411	357	876	2269	1295	921	1720	660	1068
MAX	8380	1680	1170	510	401	1730	5240	4410	2360	5070	1460	4110
MIN	1750	1020	470	300	280	391	1180	601	392	295	402	308
AC-FT	198800	75490	42390	25270	19830	53890	135000	79610	54780	105800	40580	63580
CFSM	2.00	.78	.43	.25	.22	.54	1.40	.80	.57	1.06	.41	.66
IN.	2.30	.87	.49	.29	.23	.62	1.56	.92	.63	1.23	.47	.74

CAL YR 1986 TOTAL 568615 MEAN 1558 MAX 8380 MIN 140 AC-FT 1128000 CFSM .96 IN. 13.1
WTR YR 1987 TOTAL 451217 MEAN 1236 MAX 8380 MIN 280 AC-FT 895000 CFSM .76 IN. 10.4

DES MOINES RIVER BASIN

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05483000 EAST FORK HARDIN CREEK NEAR CHURDAN, IA

LOCATION.--Lat 42°06'27", long 94°22'12", in SE1/4 SW1/4 sec. 5, T.84 N., R.30 W., Greene County, Hydrologic Unit 07100006, on left bank 35 ft upstream from bridge on county highway E26, 1.6 mi upstream from small left-bank tributary, 4.4 mi upstream from mouth, and 6.5 mi southeast of Churdan.

DRAINAGE AREA.--24.0 mi².

PERIOD OF RECORD.--July 1952 to current year.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1708: 1954-55, 1957 (M).

GAGE.--Water-stage recorder. Datum of gage is 1,050.90 ft above NGVD.

REMARKS.--Estimated daily discharges: Dec. 31, Jan. 16, 20, 20-23, Feb. 16-18 and Mar. 29-30. Records good except those for estimated daily discharges, which are poor. Small diversion for irrigation upstream from station.

AVERAGE DISCHARGE.--35 years, 10.7 ft³/s, 6.05 in/yr, 7,750 acre-ft/yr; median of yearly mean discharges, 8.9 ft³/s, 5.0 in/yr, 6,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 870 ft³/s June 30, 1986 gage height, 10.78 ft, from flood mark, No flow at times most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 150 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 11	2015	*260	*6.17	Aug. 26	1215	171	5.05
July 12	1015	152	5.83				

Minimum discharge, 0.26 ft³/s Oct. 5, 6.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.46	21	14	6.5	4.4	5.6	23	14	21	3.1	2.1	18
2	.48	23	14	6.6	4.4	6.8	22	13	26	3.1	1.7	14
3	1.2	23	12	6.4	4.1	12	20	13	21	2.7	1.6	12
4	.66	20	11	6.4	4.0	13	19	15	18	2.7	1.4	10
5	.39	20	11	6.8	4.0	15	20	16	17	2.6	1.2	9.5
6	.40	19	11	7.2	4.2	15	19	16	15	2.4	1.1	14
7	11	18	11	6.0	4.6	14	17	14	14	2.6	.97	40
8	18	18	11	6.4	4.2	13	15	14	12	3.5	37	25
9	15	15	9.9	7.1	4.2	11	14	14	11	4.7	22	20
10	15	15	9.6	6.3	4.5	9.9	13	13	11	3.9	9.6	18
11	122	15	11	6.3	4.4	9.7	13	12	10	4.0	6.2	15
12	213	13	8.7	6.3	4.2	8.7	11	11	8.9	120	4.7	14
13	159	13	8.9	7.7	4.3	8.9	11	11	8.2	67	4.1	13
14	105	15	9.3	8.9	4.4	9.0	36	9.8	7.5	29	3.5	12
15	67	13	8.8	7.4	4.0	8.3	92	9.1	6.9	17	3.0	33
16	51	12	8.6	7.0	4.1	8.6	60	9.4	6.5	11	3.0	76
17	41	11	8.6	7.4	4.2	9.3	44	9.2	6.1	8.0	3.7	60
18	34	10	8.4	7.1	4.3	13	37	8.7	5.6	6.8	78	46
19	30	12	8.7	6.7	4.0	23	32	8.2	5.4	5.6	75	38
20	28	9.9	7.9	6.5	3.9	26	27	8.0	5.3	4.5	40	31
21	25	10	7.4	6.2	4.2	24	24	7.7	5.0	4.0	25	26
22	24	11	7.7	6.0	4.2	22	23	6.7	4.7	3.6	14	24
23	23	12	8.0	5.5	3.9	21	20	6.6	4.3	3.4	11	23
24	28	13	7.9	5.2	3.8	20	19	6.8	4.1	3.1	8.8	21
25	34	17	7.3	4.7	3.8	18	18	7.3	5.4	23	36	19
26	33	17	6.9	4.5	3.9	17	17	34	4.2	8.7	159	18
27	29	17	7.1	4.5	4.1	17	15	62	3.8	5.0	107	17
28	26	16	7.2	4.2	4.6	16	15	39	3.6	3.6	65	16
29	23	15	7.1	4.5	---	14	15	30	3.5	3.1	44	16
30	23	14	6.6	4.0	---	14	13	26	3.1	3.2	30	15
31	21	---	6.6	4.1	---	15	---	23	---	2.9	23	---
TOTAL	1201.59	457.9	283.2	190.4	116.9	437.8	724	487.5	278.1	367.8	822.67	713.5
MEAN	38.8	15.3	9.14	6.14	4.17	14.1	24.1	15.7	9.27	11.9	26.5	23.8
MAX	213	23	14	8.9	4.6	26	92	62	26	120	159	76
MIN	.39	9.9	6.6	4.0	3.8	5.6	11	6.6	3.1	2.4	.97	9.5
AC-FT	2380	908	562	378	232	868	1440	967	552	730	1630	1420
CFSM	1.62	.64	.38	.26	.17	.59	1.01	.66	.39	.49	1.11	.99
IN.	1.86	.71	.44	.30	.18	.68	1.12	.76	.43	.57	1.28	1.11

CAL YR 1986 TOTAL 7188.05 MEAN 19.7 MAX 460 MIN .00 AC-FT 14260 CFSM .82 IN. 11.1
WTR YR 1987 TOTAL 6081.32 MEAN 16.7 MAX 213 MIN .39 AC-FT 12060 CFSM .69 IN. 9.43

DES MOINES RIVER BASIN

05483450 MIDDLE RACCOON RIVER NEAR BAYARD, IA

LOCATION.--Lat 41°46'43", long 94°29'33", in SW1/4 SW1/4 sec. 32, T.81 N., R.31 W., Guthrie County, Hydrologic Unit 07100007, on left bank 15 ft, downstream from bridge on State Highway 25, 0.2 mi downstream from Battle Run Creek, 1.8 mi upstream from Springbrook Creek, 5.8 mi southeast of Bayard, 10.4 mi upstream from dam at Lake Panorama, and at mile 279.2 upstream from mouth of Des Moines River.

DRAINAGE AREA.--375 mi².

PERIOD OF RECORD.--March 1979 to current year. Occasional low-flow measurements, water years 1976,77. Contracted-opening measurement of July 3, 1973 flood.

GAGE.--Water-stage recorder. Datum of gage is 1,040.00 ft above NGVD. Prior to June 23, 1979, nonrecording gage on downstream side of State Highway 25 bridge.

REMARKS.--Estimated daily discharges: Nov. 11-16, Dec. 10-20, Jan. 1, 9-12, Jan. 14 to Feb. 3, Feb. 10, 17-18 and Sept. 17. Records good except those for estimated daily discharges, which are poor. Gage-height telemeter at station.

AVERAGE DISCHARGE.--8 years, 248 ft³/s, 8.98 in/yr 179,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,300 ft³/s June 30, 1986, gage height, 24.70 ft, minimum daily discharge, 5.5 ft³/s, June 13, 14, 1981.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of July 3, 1973 reached a stage of 21.63 ft, from contracted-opening measurement, discharge, 14,600 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,200 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 12	1245	*3,350	*18.24	Aug. 26	1230	2,180	16.54
July 12	2115	1,970	16.12	Sept. 17	unknown	1,330	14.35
Aug. 13	1745	1,310	14.11				

Minimum discharge, 96 ft³/s Mar. 30.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	278	404	274	190	180	152	332	278	324	122	111	392
2	263	387	275	196	200	146	399	320	321	118	106	340
3	262	382	265	196	190	156	433	413	280	118	103	298
4	425	365	252	195	180	161	406	353	255	114	109	272
5	481	352	273	195	173	166	417	315	243	115	104	257
6	363	347	254	201	169	166	451	297	230	122	99	248
7	314	336	253	197	171	166	429	284	221	128	104	242
8	286	374	256	191	168	161	381	270	212	150	212	256
9	257	391	250	185	156	153	337	262	201	296	248	245
10	241	347	230	180	155	144	310	255	199	314	152	226
11	945	320	250	160	165	146	293	245	200	180	139	207
12	2900	300	230	185	159	144	276	236	194	1080	141	196
13	1560	290	220	217	154	150	265	240	183	1080	673	188
14	1030	320	235	206	157	151	407	226	177	568	400	183
15	768	370	260	180	151	146	988	212	175	395	372	286
16	633	340	270	150	139	143	962	206	170	314	373	827
17	551	313	280	160	135	137	739	203	164	250	557	1240
18	492	290	260	160	140	163	611	198	163	224	330	954
19	454	274	240	150	153	213	530	197	158	205	384	689
20	428	283	230	140	143	222	478	205	161	185	307	523
21	401	267	225	160	139	216	429	219	160	173	287	436
22	386	297	218	130	137	203	409	204	166	166	258	392
23	378	332	216	110	132	196	388	192	173	155	229	357
24	440	320	214	120	131	200	362	192	158	144	219	333
25	665	317	212	120	129	207	345	198	165	146	542	308
26	642	306	207	130	128	202	332	273	154	163	1890	299
27	566	292	204	135	128	203	315	495	138	133	1480	286
28	501	288	204	140	136	203	298	463	130	127	1020	281
29	450	281	203	160	---	143	297	394	130	122	741	265
30	418	277	198	160	---	119	283	351	125	117	561	245
31	406	---	204	170	---	178	---	343	---	115	454	---
TOTAL	18184	9762	7362	5169	4298	5256	12902	8539	5730	7639	12705	11271
MEAN	587	325	237	167	153	170	430	275	191	246	410	376
MAX	2900	404	280	217	200	222	988	495	324	1080	1890	1240
MIN	241	267	198	110	128	119	265	192	125	114	99	183
AC-FT	36070	19360	14600	10250	8530	10430	25590	16940	11370	15150	25200	22360
CFSM	1.56	.87	.63	.44	.41	.45	1.15	.73	.51	.66	1.09	1.00
IN.	1.80	.97	.73	.51	.43	.52	1.28	.85	.57	.76	1.26	1.12

CAL YR 1986	TOTAL 161746	MEAN 443	MAX 10400	MIN 37	AC-FT 320800	CFSM 1.18	IN. 16.0
WTR YR 1987	TOTAL 108817	MEAN 298	MAX 2900	MIN 99	AC-FT 215800	CFSM .80	IN. 10.8

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LOCATION.--Lat 41°41'44", long 94°22'53", in SW1/4 NE1/4 sec.31, T.80 N., R.30 W., Guthrie County, Hydrologic Unit 07100007, in gate control building of dam on Middle Raccoon River, 0.5 mi upstream from State Highway 44, 1.0 mi west of Panora, 4.4 mi upstream from Bay Branch, and at mile 268.8 upstream from mouth of Des Moines River.

GAGE.--Water-stage recorder. Datum of gage is 1,000.00 ft above NGVD.

REMARKS.--Lake is formed by earthfill dam with 100 ft bascule gate and concrete chute spillway, and 300 ft earthen emergency spillway. Low-flow outlet is 30-inch conduit and gate valve through dam. Dam was completed in August, 1970 and began filling April 27, 1971. Total storage, 60,000 acre-ft, surface area, 2,900 acres, at top of dam, elevation 1,068 ft. Storage unknown at top of spillway, elevation 1,048 ft. Normal storage, 19,700 acre-ft, surface area, 1,270 acres with bascule gate closed, elevation 1,045 ft. Dead storage unknown with bascule gate open, elevation 1,036 ft. Present lake classification is utility (industrial) but is also used for recreation. Gate-height telemeter at station.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 46.27 ft Oct. 11; minimum recorded, 44.01 ft May 13.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	45.43	45.58	45.43	44.96	44.96	45.12	45.26	45.18	45.13	45.03	45.29	45.64
2	45.34	45.52	45.54	44.96	44.97	45.12	45.46	45.21	45.24	45.08	45.23	45.69
3	45.57	45.48	45.40	45.05	44.98	45.13	45.44	45.35	45.26	45.23	45.19	45.66
4	45.77	45.46	45.28	45.10	44.96	45.14	45.40	45.36	45.26	45.30	45.21	45.72
5	45.85	45.41	45.18	45.11	44.95	45.17	45.37	45.35	45.38	45.34	45.23	45.52
6	45.71	45.38	45.20	45.13	44.93	45.18	45.39	45.31	45.40	45.37	45.24	45.60
7	45.55	45.34	45.22	45.12	44.92	45.19	45.40	45.22	45.37	45.42	45.23	45.63
8	45.46	45.36	45.23	45.11	44.92	45.20	45.35	45.05	45.27	45.43	45.47	45.58
9	45.51	45.41	45.21	45.11	44.88	45.15	45.26	45.05	45.19	45.47	45.65	45.55
10	45.51	45.37	45.10	45.09	44.88	45.11	45.17	45.01	45.33	45.58	45.54	45.61
11	45.82	45.31	44.97	45.00	44.89	45.09	45.12	44.85	45.43	45.30	45.40	45.63
12	46.17	45.27	44.99	45.03	44.89	45.09	45.05	44.48	45.46	45.62	45.39	45.62
13	45.72	45.12	45.02	45.10	44.88	45.08	45.02	44.10	45.45	45.63	45.49	45.64
14	45.53	45.07	45.05	45.13	44.88	45.09	45.21	44.13	45.42	45.52	45.47	45.63
15	45.19	45.17	45.11	45.12	44.87	45.09	45.37	44.43	45.39	45.44	45.46	45.66
16	45.35	45.27	45.13	45.02	44.84	45.07	45.45	44.74	45.36	45.46	45.59	45.84
17	45.36	45.61	45.13	44.95	44.82	45.04	45.15	45.04	45.35	45.46	45.58	45.71
18	45.27	45.77	45.14	44.99	44.80	45.15	45.39	45.32	45.32	45.39	45.46	45.24
19	45.18	45.63	45.14	45.02	44.82	45.25	45.34	45.53	45.30	45.29	45.67	45.42
20	45.19	45.58	45.13	44.99	44.84	45.31	45.27	45.70	45.28	45.20	45.66	45.31
21	45.46	45.52	45.10	44.98	44.83	45.35	45.14	45.65	45.29	45.24	45.56	45.47
22	45.58	45.53	45.07	44.98	44.83	45.33	45.07	45.49	45.32	45.30	45.43	45.56
23	45.63	45.57	45.06	44.95	44.81	45.29	45.09	45.48	45.31	45.32	45.35	45.44
24	45.68	45.57	45.06	44.92	44.80	45.30	45.20	45.46	45.31	45.37	45.37	45.55
25	45.77	45.43	45.04	44.91	44.80	45.33	45.22	45.47	45.33	45.41	45.60	45.57
26	45.78	45.32	45.02	44.91	44.80	45.30	45.19	45.50	45.25	45.44	45.88	45.55
27	45.67	45.24	45.00	44.91	44.90	45.27	45.12	45.50	45.17	45.35	45.81	45.58
28	45.54	45.21	44.99	44.91	45.03	45.29	45.09	45.46	45.13	45.33	45.59	45.62
29	45.46	45.19	44.99	44.92	---	45.26	45.14	45.37	45.12	45.28	45.68	45.55
30	45.54	45.20	44.97	44.94	---	45.05	45.14	45.48	45.07	45.34	45.49	45.59
31	45.58	---	44.97	44.94	---	45.04	---	45.32	---	45.31	45.25	

DES MOINES RIVER BASIN

05483600 MIDDLE RACCOON RIVER AT PANORA, IA

LOCATION.--Lat 41°41'14", long 94°22'15", in NE1/4 NW1/4 sec.5, T.79 N., R.30 W., Guthrie County, Hydrologic Unit 07100007, on left bank 15 ft downstream from bridge on county highway, 0.2 mi southwest of Panora, 1.5 mi upstream from Andy's Branch, 1.6 mi downstream from Lake Panorama, 18.2 mi upstream from mouth, and at mile 267.2 upstream from mouth of Des Moines River.

DRAINAGE AREA.--440 mi².

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

REVISED RECORDS.--WDR IOWA 1974: 1973 (P).

GAGE.--Water-stage recorder and concrete control. Datum of gage is 991.20 ft above NGVD.

REMARKS.--No estimated daily discharges. Records good. City of Panora diverts approximately 100 acre ft/yr above station. Flow regulated by dam on Lake Panorama since August 1970.

AVERAGE DISCHARGE.--29 years, 226 ft³/s, 6.98 in/yr 163,700 acre-ft/yr; median of yearly mean discharges, 170 ft³/s, 5.2 in/yr, 123,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 15,300 ft³/s June 30, 1986, gage height, 15.50 ft, no flow June 9, 10, 1977, result of gate operation at Lake Panorama; minimum daily discharge excluding regulation at Lake Panorama, 3.0 ft³/s July 9, 14, 22-23, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 10, 1953, reached a stage of 14.3 ft, from floodmark, discharge, about 14,000 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 12	0700	*3,320	*8.42	Aug. 26	1545	2,960	8.07

Minimum discharge, 35 ft³/s July 2.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	472	477	190	191	145	156	260	265	348	97	82	248
2	224	448	293	155	153	155	434	286	303	69	147	367
3	225	434	357	130	155	155	521	411	331	61	78	259
4	447	418	301	158	151	160	506	367	212	76	69	312
5	586	398	259	172	148	174	493	352	222	92	61	374
6	511	383	262	178	143	181	497	338	243	102	73	191
7	432	369	272	180	142	188	508	383	246	146	76	249
8	332	379	278	176	144	192	480	300	239	214	138	310
9	255	407	272	176	135	188	438	261	150	319	217	239
10	270	398	234	176	129	171	390	305	141	497	208	223
11	955	377	184	147	134	164	368	367	178	283	139	214
12	3140	369	184	147	137	164	336	463	195	1090	120	223
13	1980	302	197	175	133	164	322	317	197	1500	710	179
14	1410	275	207	186	135	164	597	147	188	674	370	202
15	925	309	230	186	133	167	1020	39	176	428	580	317
16	632	252	239	161	126	161	1310	38	169	302	520	1160
17	636	137	242	130	119	151	877	38	166	295	638	1800
18	585	324	247	140	117	189	595	59	162	302	231	1030
19	534	354	249	155	121	222	626	106	158	279	334	836
20	353	338	246	148	127	245	578	177	155	196	362	565
21	313	308	233	145	126	262	513	271	162	135	286	366
22	375	313	224	147	126	256	469	222	182	110	269	491
23	412	341	219	140	123	244	366	166	184	108	179	347
24	539	392	215	129	120	251	346	177	185	85	179	330
25	726	434	212	126	121	267	373	190	202	121	478	330
26	801	379	205	126	85	255	365	395	177	151	2100	313
27	714	336	200	126	70	245	357	532	152	116	1910	260
28	635	320	196	127	107	260	278	616	138	115	1240	342
29	488	309	197	131	---	263	290	428	140	109	705	236
30	411	206	192	138	---	182	263	362	136	95	900	275
31	458	---	188	141	---	171	---	580	---	95	415	---
TOTAL	20776	10486	7224	4743	3605	6167	14776	8958	5837	8262	13814	12588
MEAN	670	350	233	153	129	199	493	289	195	267	446	420
MAX	3140	477	357	191	155	267	1310	616	348	1500	2100	1800
MIN	224	137	184	126	70	151	260	38	136	61	61	179
AC-FT	41210	20800	14330	9410	7150	12230	29310	17770	11580	16390	27400	24970

CAL YR 1986 TOTAL 177349 MEAN 486 MAX 11100 MIN 38 AC-FT 351800
WTR YR 1987 TOTAL 117236 MEAN 321 MAX 3140 MIN 38 AC-FT 232500

DES MOINES RIVER BASIN

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05484000 SOUTH RACCOON RIVER AT REDFIELD, IA

LOCATION.--Lat 41°35'22", long 94°09'33", in NE1/4 NE1/4 sec. 2, T.78 N., R.28 W., Dallas County, Hydrologic Unit 07100007, on right bank 20 ft upstream from bridge on county highway at Redfield, 3.2 mi downstream from bridge on U.S. Highway 6, 3.4 mi downstream from Middle Raccoon River, 14.0 mi upstream from mouth, and at mile 245.6 upstream from mouth of Des Moines River.

DRAINAGE AREA.--994 mi².

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

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1508: 1940.

GAGE.--Water-stage recorder. Datum of gage is 876.43 ft above NGVD. Prior to June 12, 1946, nonrecording gage, June 12, 1946 to Sept. 30, 1966, water-stage recorder at site 20 ft upstream at same datum. Sept. 30, 1966, to Sept. 30, 1986 water-stage recorder at site 1.5 mi upstream at datum 20.0 ft higher.

REMARKS.--Estimated daily discharges: Oct. 12, 13, Dec. 2-15 and Jan. 24-28. Records good except those for estimated daily discharges, which are poor. U.S. National Weather Service gage-height telemeter at station.

AVERAGE DISCHARGE.--47 years, 473 ft³/s, 6.46 in/yr, 342,700 acre-ft/yr; median of yearly mean discharges, 420 ft³/s, 5.7 in/yr, 304,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 35,000 ft³/s July 2, 1958, gage height, 29.04 ft, from flood-mark; minimum daily discharge, 17 ft³/s Aug. 4, 1977 at site 1.5 mi upstream from present site.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 5,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
July 12	1430	7,290	11.44	Sept. 16	1800	6,340	11.10
Aug. 26	1630	*10,900	*14.30				

Minimum discharge, 229 ft³/s Aug. 6.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1370	1180	492	422	364	417	702	520	1820	319	251	667
2	1010	1080	530	406	375	395	869	751	820	283	255	760
3	843	989	550	362	373	391	913	1290	838	271	295	701
4	1360	963	510	378	353	397	883	886	669	272	241	566
5	1560	923	510	393	350	404	857	719	570	326	241	682
6	1190	894	500	399	342	408	879	673	578	295	231	530
7	1010	840	520	406	343	401	879	652	546	349	242	572
8	898	855	540	394	350	401	819	658	529	529	644	545
9	703	878	500	391	320	396	749	527	489	1190	539	532
10	670	808	470	393	317	371	679	533	390	1600	398	483
11	2340	762	430	404	323	363	635	587	434	1070	344	505
12	4630	743	470	376	323	363	602	634	455	3890	335	472
13	3190	613	510	402	318	362	581	656	451	3000	573	428
14	2590	585	560	407	325	367	1950	458	424	1460	1080	441
15	1980	640	560	400	324	362	2950	323	397	1070	725	540
16	1320	692	555	378	302	358	2300	307	375	757	1080	2850
17	1320	510	553	355	298	352	1800	307	371	626	1350	2590
18	1220	628	552	404	303	418	1220	307	370	652	886	2100
19	1130	712	600	408	302	500	1210	345	363	606	592	1350
20	1020	714	507	376	310	473	1120	430	380	480	656	1140
21	802	644	488	388	307	467	1010	517	415	367	579	797
22	866	704	480	367	307	454	927	539	473	326	512	760
23	948	765	472	325	303	449	881	413	384	317	423	763
24	1970	716	466	340	298	471	745	417	455	298	362	627
25	2110	813	453	345	297	604	752	434	1280	297	1660	608
26	2100	759	452	350	297	538	731	812	525	313	8210	607
27	1670	675	438	350	268	495	706	1630	397	322	4580	542
28	1440	653	436	350	294	493	627	1440	358	281	2990	534
29	1260	641	434	345	---	498	583	1300	344	304	1830	560
30	1010	610	419	361	---	420	570	1060	337	261	1580	457
31	1010	---	415	395	---	466	---	1600	---	274	1170	---
TOTAL	46540	22989	15372	11770	8986	13254	30129	21725	16237	22405	34854	24709
MEAN	1501	766	496	380	321	428	1004	701	541	723	1124	824
MAX	4630	1180	600	422	375	604	2950	1630	1820	3890	8210	2850
MIN	670	510	415	325	268	352	570	307	337	261	231	428
AC-FT	92310	45600	30490	23350	17820	26290	59760	43090	32210	44440	69130	49010
CFSM	1.52	.78	.50	.38	.32	.43	1.02	.71	.55	.73	1.14	.83
IN.	1.75	.87	.58	.44	.34	.50	1.13	.82	.61	.84	1.31	.93

CAL YR 1986	TOTAL 394053	MEAN 1080	MAX 18500	MIN 84	AC-FT 781600	CFSM 1.09	IN. 14.8
WTR YR 1987	TOTAL 268970	MEAN 737	MAX 8210	MIN 231	AC-FT 533500	CFSM .75	IN. 10.1

DES MOINES RIVER BASIN

05484500 RACCOON RIVER AT VAN METER, IA

LOCATION.--Lat 41°32'02", long 93°56'59", in SW1/4 SW1/4 sec.22, T.78 N., R.27 W., Dallas County, Hydrologic Unit 07100007, on right bank 10 ft downstream from bridge on county highway R16, 0.3 mi northeast of Van Meter, 0.7 mi upstream from small left bank tributary, 1.1 mi downstream from confluence of North and South Raccoon Rivers, 29.0 mi upstream from mouth, and at mile 230.5 upstream from mouth of Des Moines River.

DRAINAGE AREA.--3,441 mi².

PERIOD OF RECORD.--April 1915 to current year. Prior to October 1934, monthly discharge only, published in WSP 1308.

REVISED RECORDS.--WSP 1308: 1927 (M), WSP 1438: Drainage area, WSP 1508: 1915 (M), 1925 (M), 1926, 1933 (M), 1939 (M), 1947 (M), 1949 (M).

GAGE.--Water-stage recorder. Datum of gage is 841.16 ft above NGVD. See WSP 1308 for history of changes prior to Aug. 8, 1934.

REMARKS.--Estimated daily discharges: Nov. 11-13, Dec. 12-17, and Jan. 18-30. Records fair except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain-gage, gage-height telemeter and data collection platform at station.

AVERAGE DISCHARGE.--72 years, 1,430 ft³/s, 5.64 in/yr, 1,036,000 acre-ft/yr; median of yearly mean discharges, 1,150 ft³/s, 4.5 in/yr, 833,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 41,200 ft³/s June 13, 1947, gage height, 21.37 ft, from flood-mark; maximum gage height, 22.69 ft July 1, 1986; minimum daily discharge, 10 ft³/s Jan. 22-31, 1940.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 8,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 12	1030	11,500	12.42	Aug. 26	2130	*14,700	*13.97
July 12	2015	8,730	10.64				

Minimum daily discharge, 690 ft³/s Jan. 19.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5970	4080	2260	1400	1410	1140	2290	2860	5890	901	1530	3100
2	5270	3940	2270	1420	1120	1140	2940	2800	5390	850	1520	2900
3	4740	3680	2330	1310	975	1180	3710	3870	3830	812	1510	2660
4	4700	3490	2240	1310	1010	1220	4500	3740	3410	776	1280	2280
5	5350	3330	2090	1340	1010	1260	4730	3150	2980	780	1230	2370
6	5380	3220	2060	1350	975	1310	4610	2940	2760	759	1250	2310
7	5280	3090	2120	1350	896	1350	4520	2740	2580	788	1210	2170
8	4770	3010	2200	1310	975	1390	4040	2670	2410	927	1720	2020
9	4170	2980	2150	1220	935	1390	4000	2480	2260	1800	1750	2290
10	3760	3030	1870	1140	935	1390	3670	2400	2080	2170	1960	2110
11	4270	2600	1520	1050	935	1390	3370	2340	2000	2850	1830	1960
12	10600	2200	1250	1050	935	1390	3180	2340	1950	5770	1620	1820
13	10500	2300	1100	1100	896	1310	3020	2340	1860	7100	1940	1710
14	10000	2340	1200	1240	975	1310	4150	2060	1750	6910	1840	1560
15	10700	2460	1300	1300	935	1260	6720	1780	1590	7010	1950	1590
16	10700	2480	1450	1110	896	1260	6910	1670	1470	6390	2490	3430
17	9910	2520	1650	925	820	1260	8170	1640	1410	4690	2890	4460
18	7200	2430	2030	760	858	1600	8220	1580	1360	3940	2400	6190
19	5820	2500	1890	690	820	2090	7370	1580	1310	3450	1940	6430
20	5210	2420	1760	790	858	2200	5850	1640	1300	2940	2630	5940
21	4640	2310	1590	860	858	2620	5200	1730	1350	3580	2690	4730
22	4370	2310	1480	810	896	2870	4720	1780	1480	4360	2270	3970
23	4150	2390	1560	780	896	2730	4410	1710	1340	3540	2000	3660
24	5540	2460	1530	760	896	2630	3990	1670	1290	3770	1690	3140
25	6280	2570	1510	740	658	2740	3750	1680	2080	3580	2920	2950
26	6870	2590	1440	730	828	2610	3540	1800	1520	3140	11600	2780
27	6240	2520	1440	790	822	2470	3360	3030	1230	2780	10400	2580
28	5550	2520	1450	900	975	2460	3220	4640	1110	2370	8710	2450
29	5000	2490	1520	1100	---	2590	3050	6290	1020	2130	6580	2480
30	4440	2430	1490	1300	---	2340	2980	6160	963	1910	5000	2210
31	4140	---	1410	1780	---	1990	---	5390	---	1730	4400	---
TOTAL	191520	82690	53160	33715	26198	55890	134190	84500	62973	94503	94750	90250
MEAN	6178	2756	1715	1088	936	1803	4473	2726	2099	3048	3056	3008
MAX	10700	4080	2330	1780	1410	2870	8220	6290	5890	7100	11600	6430
MIN	3760	2200	1100	690	820	1140	2290	1580	963	759	1210	1560
AC-FT	379900	164000	105400	66870	51960	110900	266200	167600	124900	187400	187900	179000
CFSM	1.80	.80	.50	.32	.27	.52	1.30	.79	.61	.69	.89	.87
IN.	2.07	.89	.57	.36	.28	.60	1.45	.91	.68	1.02	1.02	.98

CAL YR 1986	TOTAL 1268910	MEAN 3476	MAX 36400	MIN 185	AC-FT 2517000	CFSM 1.01	IN. 13.7
WTR YR 1987	TOTAL 1004340	MEAN 2752	MAX 11600	MIN 690	AC-FT 1992000	CFSM .80	IN. 10.9

DES MOINES RIVER BASIN

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05484500 RACCOON RIVER AT VAN METER, IA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD: Chemical analyses: Partial record station September 1968 to September 1973, February 1974 to September 1979 and October 1986 to current year.
 Water temperatures: Partial record station September 1988 to September 1973 and February 1974 to September 1979.
 Biological analyses: February 1974 to September 1979.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	TEMPER- ATURE AIR (DEG C) (00020)	TUR- BID- ITY (NTU) (00076)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	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)
DEC 16...	1030	1820	776	8.50	1.0	1.0	7.1	102	732	749	150	440
FEB 26...	1100	809	665	8.50	5.0	2.0	4.3	12.7	101	750	83	110
MAY 07...	1000	2680	688	8.40	18.0	15.0	38	10.0	108	750	440	450
JUL 07...	1200	790	483	8.30	25.0	25.0	70	8.4	105	740	5300	K13000
AUG 27...	1100	790	495	8.20	16.5	19.0	250	8.2	86	749	12000	K34000

DATE	HARD- NESS NONCARB WH WAT TOT FLD MG/L AS CACO3 (00902)	HARD- NESS (MG/L AS CACO3) (00900)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM AD- SORP- TION RATIO (00931)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	ALKA- LINITY WH WAT TOTAL FIELD MG/L AS CACO3 (00410)	BICAR- BONATE WH WAT TOTAL FIELD MG/L AS HCO3 (00440)	CAR- BONATE WH WAT TOTAL FIELD MG/L AS CO3 (00445)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)
DEC 16...	100	420	110	35	11	5	0.2	1.6	319	410	19	47
FEB 26...	100	370	95	33	12	7	0.3	1.7	274	300	17	52
MAY 07...	83	350	88	32	10	6	0.2	1.3	269	300	12	41
JUL 07...	57	230	48	26	11	9	0.3	2.4	170	210	0	43
AUG 27...	41	230	61	20	8.0	7	0.2	4.7	194	240	0	22

DATE	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG C DIS- SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N) (00605)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N) (00610)
DEC 16...	17	0.40	22	434	490	0.59	2130	1.1	11.0	0.020	0.070	0.070
FEB 26...	22	0.40	14	425	410	0.58	928	0.98	9.00	0.050	0.030	0.020
MAY 07...	21	0.40	19	405	390	0.55	2930	1.8	10.0	0.020	0.020	0.040
JUL 07...	38	0.40	15	312	290	0.42	665	1.8	4.20	0.030	0.070	0.080
AUG 27...	12	0.30	18	286	260	0.39	610	2.3	5.00	0.040	0.080	0.080

DES MOINES RIVER BASIN

05484500 RACCOON RIVER AT VAN METER, IA--Continued

WATER-QUALITY RECORDS

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	NITRO- GEN, AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P) (00671)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS, TOTAL (MG/L AS P) (00665)	SEDI- MENT, SUS- PENDED (MG/L) (80154)	SEDI- MENT, DIS- CHARGE, SUS- PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	ALUM- INUM, DIS- SOLVED (UG/L AS AL) (01106)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE) (01010)
DEC 16...	1.2	0.080	0.080	0.090	135	663	52	--	--	--	--
FEB 26...	1.0	0.060	0.080	0.120	39	85	72	1	<10	110	<0.5
MAY 07...	1.8	0.050	0.020	0.200	241	1740	69	2	10	110	<0.5
JUL 07...	1.9	0.020	0.050	0.310	328	700	100	--	--	--	--
AUG 27...	2.4	0.150	0.180	0.430	1380	2940	88	2	20	100	<0.5

DATE	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR) (01030)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MERCURY DIS- SOLVED (UG/L AS HG) (71890)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	NICKEL, DIS- SOLVED (UG/L AS NI) (01065)
DEC 16...	--	--	--	--	--	--	--	--	--	--	--
FEB 26...	<1	<1	<3	5	5	<5	22	15	0.4	<10	2
MAY 07...	<1	<1	<3	3	<3	<5	24	2	0.2	<10	<1
JUL 07...	--	--	--	--	--	--	--	--	--	--	--
AUG 27...	<1	<1	<3	4	14	<5	8	6	0.6	<10	4

DATE	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)	ATRA- ZINE, TOTAL (UG/L) (39630)	CYAN- AZINE TOTAL (UG/L) (81757)	METRI- BUZIN IN WHOLE WATER (UG/L) (81408)	ALA- CHLOR TOTAL RECOVER (UG/L) (77825)	METOLA- CHLOR IN WHOLE WATER (UG/L) (39356)	TRI- FLURA- LIN TOTAL RECOVER (UG/L) (39030)
DEC 16...	--	--	--	--	--	--	--	--	--	--	--
FEB 26...	2	<1	260	<6	3	--	--	--	--	--	--
MAY 07...	3	<1	260	<6	7	0.26	0.50	<0.10	0.60	<0.10	<0.10
JUL 07...	--	--	--	--	--	<0.10	0.10	<0.10	<0.10	0.10	<0.10
AUG 27...	2	<1	170	<6	3	0.43	0.21	<0.10	0.16	0.29	<0.10

DES MOINES RIVER BASIN

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05484800 WALNUT CREEK AT DES MOINES, IA

LOCATION.--Lat 41°35'14", long 93°42'11", in SW1/4 SE1/4 sec.2, T.78 N., R.25 W., Polk County, Hydrologic Unit 07100006, on left bank, 25 ft downstream from bridge on 63rd Street in Des Moines, and 2.2 mi upstream from Raccoon River.

DRAINAGE AREA.--78.4 mi².

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

REVISED RECORDS.--WDR Iowa 1973: 1972. WDR IA-75-1: 1973-74.

GAGE.--Water-stage recorder. Datum of gage is 801.04 ft above NGVD (levels by Iowa Natural Resources Council).

REMARKS.--Estimated daily discharges: Oct. 1, 24-26, Nov. 11-15, Nov. 21 to Dec. 8, Dec. 11-17, 27, Jan. 6 to Feb. 4, Feb. 10 and 14-26. Records good except those for estimated daily discharges, which are poor. U.S. National Weather Service gage-height telemeter at station.

AVERAGE DISCHARGE.--16 years, 65.0 ft³/s, 11.2 in/yr, 47,090 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,500 ft³/s, May 10, 1986, gage height, 18.32 ft from rating curve extended above 3,500 ft³/s on basis of contracted-opening measurement of peak flow; no flow for many days in 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 600 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Apr. 14	1100	740	8.09	July 12	0430	*1,970	*11.87
June 18	0415	735	8.09	Aug. 8	0530	732	8.02
June 25	0015	645	7.75	Aug. 25	2300	1,150	9.50
July 8	1700	964	8.92	Aug. 26	0933	1,440	10.42

Minimum daily discharge, 8.4 ft³/s, Feb. 19.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	200	149	39	35	32	82	113	58	106	27	14	98
2	118	132	42	34	31	64	124	65	87	27	12	86
3	115	121	44	34	30	62	106	208	77	26	19	76
4	141	111	41	33	29	60	97	131	68	24	13	71
5	124	103	39	32	27	58	92	106	63	24	11	75
6	101	97	38	31	26	55	89	94	57	24	10	78
7	92	92	42	28	26	53	83	84	53	67	11	68
8	84	89	46	22	26	50	77	77	48	207	155	91
9	73	82	63	26	25	47	73	72	42	91	31	75
10	68	76	57	30	25	45	70	69	42	315	21	91
11	245	70	52	32	25	44	69	65	42	159	17	80
12	380	74	50	33	24	45	64	59	36	1050	108	74
13	215	70	56	34	23	43	73	59	31	261	155	71
14	167	66	64	33	20	45	304	55	27	142	119	68
15	136	62	60	32	16	52	242	51	25	102	113	126
16	119	58	56	31	12	44	166	49	22	74	83	104
17	107	54	54	30	10	43	139	48	33	58	64	93
18	96	55	51	28	9.0	86	121	58	200	63	56	81
19	91	52	47	27	8.4	59	107	56	56	48	47	73
20	87	62	44	26	9.4	54	96	57	118	40	45	67
21	85	51	42	25	11	55	87	52	59	36	41	61
22	82	53	41	24	13	53	90	42	39	33	37	56
23	92	56	42	23	15	53	90	39	34	31	35	52
24	352	54	42	21	18	66	75	41	59	28	33	49
25	283	50	41	23	19	58	71	43	195	26	420	46
26	263	48	39	25	20	52	69	97	58	24	927	43
27	242	44	38	27	21	52	66	185	43	22	394	40
28	224	42	38	28	62	82	64	114	37	20	265	36
29	202	40	37	29	---	83	66	301	34	18	196	33
30	180	39	36	30	---	73	60	164	30	16	149	31
31	164	---	35	33	---	84	---	137	---	16	115	---
TOTAL	4928	2152	1416	899	612.8	1802	3043	2736	1821	3099	3716	2093
MEAN	159	71.7	45.7	29.0	21.9	58.1	101	88.3	60.7	100	120	69.8
MAX	380	149	64	35	62	86	304	301	200	1050	927	126
MIN	68	39	35	21	8.4	43	60	39	22	16	10	31
AC-FT	9770	4270	2810	1780	1220	3570	6040	5430	3610	6150	7370	4150
CFSM	2.03	.91	.58	.37	.28	.74	1.29	1.13	.77	1.28	1.53	.89
IN.	2.34	1.02	.67	.43	.29	.86	1.44	1.30	.86	1.47	1.76	.99
CAL YR 1986	TOTAL 38794.4	MEAN 106	MAX 2390	MIN 1.7	AC-FT 76950	CFSM 1.36	IN. 18.4					
WTR YR 1987	TOTAL 28317.8	MEAN 77.6	MAX 1050	MIN 8.4	AC-FT 56170	CFSM .99	IN. 13.4					

DES MOINES RIVER BASIN

05485500 DES MOINES RIVER BELOW RACCOON RIVER AT DES MOINES, IA

LOCATION.--Lat 41°34'30", long 93°35'48", in NE1/4 SE1/4 sec.10, T.78 N., R.24 W., Polk County, Hydrologic Unit 07100008, on right bank 10 ft downstream from bridge on Southeast 14th Street at Des Moines, 0.8 mi downstream from Raccoon River and Scott Street Dam, and at mile 200.7.

DRAINAGE AREA.--9,879 mi².

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

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1508: 1943 (P).

GAGE.--Water-stage recorder. Datum of gage is 762.52 ft above NGVD. Prior to Oct. 1, 1951, and Oct. 1, 1953, to Sept. 30, 1959, water-stage recorder upstream of Scott Street Dam, 0.8 mi upstream at datum 11.16 ft higher. Oct. 1, 1951, to Sept. 30, 1953, and Oct. 1, 1959 to Sept. 30, 1961, nonrecording gage at present site and datum.

REMARKS.--Estimated daily discharges: June 2 to July 15 and July 28-29. Records good except those for estimated daily discharges, which are poor. Des Moines municipal water supply is taken from infiltration galleries on Raccoon River, 3.5 mi upstream from station. Average daily pumpage was about 58 ft³/s. At times, water is pumped from Raccoon River into recharge basins, or into Waterworks Reservoir, capacity, 4,800 acre-ft. Effluent from sewage treatment plant enters the river 2.3 mi downstream from station. Net effect diversions not known. Flow regulated by Saylorville Lake (station 05481630) 13.0 mi upstream, since Apr. 12, 1977. U.S. Army Corps of Engineers data collection platform at station.

COOPERATION.--Average monthly pumpage from galleries provided by Des Moines Water Works.

AVERAGE DISCHARGE.--47 years, 4,548 ft³/s, 6.25 in/yr, 3,295,000 acre-ft/yr; median of yearly mean discharges, 3,770 ft³/s, 5.2 in/yr, 2,730,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 77,000 ft³/s June 26, 1947, gage height, 20.8 ft in gage well, 21.6 ft from outside floodmark, site and datum then in use; minimum daily discharge, 26 ft³/s Jan. 16-29, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1893, that of June 26, 1947, site and datum then in use. Flood of May 31, 1903, reached a stage of 20.9 ft. from flood profile, at Scott Street site and datum, by office of Des Moines City Engineer.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 26,800 ft³/s Oct. 17, gage height, 22.61 ft; minimum daily discharge, 1500 ft³/s July 8.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14200	10900	7220	3750	2610	2770	6970	7660	14500	2750	3170	6120
2	11500	10700	7070	3730	2620	3080	7840	7350	11300	2500	2970	5860
3	8480	10400	7050	3690	2720	3130	9030	8690	9800	2200	2630	5570
4	7660	10200	7000	3640	2630	3150	10400	9540	8900	2000	2380	5090
5	8290	9960	6510	3630	2550	3200	11800	8510	8000	1900	1710	4210
6	8680	9790	6150	3650	2520	3240	11900	7660	7400	1800	1840	3900
7	8550	9960	6220	3630	2520	3250	11800	6970	6800	1700	1820	3590
8	8090	10500	6320	3610	2580	3270	11300	6610	6300	1500	2600	3610
9	8430	11000	6310	3530	2500	3600	10300	6220	5800	2900	3290	3720
10	11000	12200	5780	3420	2470	4070	9610	5850	5300	5270	3480	3590
11	13500	12200	4640	3220	2460	3880	8670	5490	4900	7300	3110	3170
12	20900	11600	3190	3050	2500	3580	7650	5130	4500	10000	3000	3000
13	25400	9820	3060	2810	2580	3490	7450	4860	4100	13200	3130	2870
14	26100	8540	3110	2850	2650	3370	8630	4840	3700	15000	3720	2740
15	26100	8130	3410	2890	2730	3380	13700	4680	3500	16400	3710	3060
16	26500	8130	4890	2900	2680	3300	15700	4420	3400	14700	3720	3580
17	26500	8590	5030	2990	2480	3360	20300	4390	3280	12000	3840	6530
18	24000	9150	5110	2770	2200	4260	22200	4430	3200	9020	3620	7610
19	20300	9120	5000	2770	2120	4760	21500	4300	3100	7770	3020	9080
20	17100	9490	5210	2590	2130	4990*	19100	4360	3100	6990	3510	9000
21	15100	10000	5460	2240	2140	5470	15700	4560	3020	6810	4020	7830
22	13600	9910	4840	2310	2170	5920	12900	4670	4070	7970	3760	6880
23	12500	9910	4630	2120	2170	5920	11600	4540	3910	7600	3500	6470
24	14000	9960	4470	2020	2150	5820	10300	3990	3770	7210	2960	5750
25	15200	9990	4400	1980	2120	5810	9900	4000	6600	7320	3730	4880
26	14700	10000	4300	2010	2110	5980	9560	4480	5030	6930	12900	4550
27	13300	9890	4230	2130	2160	6040	9020	6770	4000	6160	16400	4380
28	12300	9320	4140	2310	2370	6100	8700	10100	3600	4940	12900	4160
29	12300	8120	3880	2530	---	6760	8400	14700	3300	4290	10900	4060
30	11600	7360	3840	2600	---	7270	8000	15500	2960	3750	8300	3850
31	11000	---	3760	2580	---	6890	---	14400	---	3260	7060	---
TOTAL	466880	294840	156230	89950	67640	139110	349930	209670	161140	203140	146700	148720
MEAN	15060	9828	5040	2902	2416	4487	11660	6764	5371	6553	4732	4957
MAX	26500	12200	7220	3750	2730	7270	22200	15500	14500	16400	16400	9080
MIN	7660	7360	3060	1980	2110	2770	6970	3990	2960	1500	1710	2740
AC-FT	926100	584800	309900	178400	134200	275900	694100	415900	319600	402900	291000	295000
CAL YR 1986	TOTAL 3616240		MEAN 9908	MAX 44800	MIN 640	AC-FT 7173000						
WTR YR 1987	TOTAL 2433950		MEAN 6668	MAX 26500	MIN 1500	AC-FT 4828000						

DES MOINES RIVER BASIN

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05485640 FOURMILE CREEK AT DES MOINES, IA

LOCATION.--Lat 41°36'50", long 93°32'43", in NE1/4 NE1/4 sec.32, T.79 N., R.23 W., Polk County, Hydrologic Unit 07100008, on right bank 20 ft downstream from bridge on Easton Blvd., 4.4 mi downstream from Muchikino Creek and 5.0 mi upstream from Des Moines River.

DRAINAGE AREA.--92.7 mi².

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

REVISED RECORDS.--WDR IA-75-1: 1974 (P).

GAGE.--Water-stage recorder. Datum of gage is 795.87 ft above NGVD.

REMARKS.--Estimated daily discharges: Nov. 12 to Dec. 16, Dec. 26 to Jan. 7, Jan. 9, 11-15, Jan. 17 to Feb. 4, Feb. 17-24, Mar. 13-31 and Sept. 23-27. Records fair except those for estimated daily discharges, which are poor. U.S. National Weather Service gage-height telemeter at station.

AVERAGE DISCHARGE.--16 years, 78.0 ft³/s, 11.4 in/yr, 56,510 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,340 ft³/s June 9, 1974, gage height, 14.84 ft; no flow for many days in 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 12	0630	739	7.76	July 12	0845	667	7.56
Oct. 24	0230	1,040	8.90	Aug. 12	1930	1,000	8.77
May 3	0530	2,230	11.71	Aug. 26	1450	*2,490	*12.13

Minimum discharge, 7.6 ft³/s Aug. 7.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	345	174	63	43	40	93	120	56	82	23	13	203
2	276	152	66	42	39	94	153	414	71	21	12	174
3	222	147	72	41	38	123	129	62	20	10	157	157
4	239	129	78	40	36	121	114	498	55	19	11	132
5	244	118	74	39	35	115	108	349	51	18	9.8	118
6	180	113	70	37	34	103	103	269	49	18	8.8	125
7	159	104	80	35	36	97	97	217	47	30	8.0	110
8	140	107	76	33	35	92	86	189	44	90	66	121
9	117	89	72	32	33	82	80	164	42	298	62	114
10	106	86	68	34	38	70	75	139	40	153	31	109
11	230	83	65	33	37	66	74	123	41	101	19	100
12	607	80	62	31	37	63	69	109	39	502	245	92
13	370	78	70	29	36	61	67	100	38	353	557	85
14	276	77	80	28	38	58	199	87	35	192	419	77
15	219	75	74	29	35	55	329	75	33	133	272	99
16	184	74	69	29	33	62	236	71	32	94	180	121
17	159	72	65	34	31	56	186	70	38	67	128	127
18	136	70	57	32	29	90	152	75	40	53	101	125
19	122	66	56	31	27	110	132	66	46	46	86	105
20	113	64	54	30	26	74	115	62	47	40	74	104
21	106	61	52	29	28	68	102	58	37	33	72	90
22	103	70	53	28	29	66	99	51	33	29	59	81
23	148	76	53	27	30	68	94	48	29	26	48	77
24	853	84	53	26	31	76	82	49	29	42	45	73
25	583	78	54	27	32	82	77	49	36	68	312	70
26	504	74	52	29	33	70	73	58	32	31	1990	68
27	359	70	50	31	34	65	71	83	26	25	1040	66
28	281	66	48	32	47	96	65	85	26	22	482	64
29	227	62	46	34	---	105	64	93	25	18	359	62
30	196	60	45	35	---	100	59	118	24	16	299	58
31	182	---	44	37	---	94	---	97	---	15	256	---
TOTAL	7986	2659	1921	1017	957	2575	3410	5212	1229	2596	7274.6	3107
MEAN	258	88.6	62.0	32.8	34.2	83.1	114	168	41.0	83.7	235	104
MAX	853	174	80	43	47	123	329	1290	82	502	1990	203
MIN	103	60	44	26	26	55	59	48	24	15	8.0	58
AC-FT	15840	5270	3810	2020	1900	5110	6760	10340	2440	5150	14430	6160
CFSM	2.78	.96	.67	.35	.37	.90	1.23	1.81	.44	.90	2.53	1.12
IN.	3.20	1.07	.77	.41	.38	1.03	1.37	2.09	.49	1.04	2.92	1.25

CAL YR 1986 TOTAL 45527.1 MEAN 125 MAX 2050 MIN 2.3 AC-FT 90300 CFSM 1.35 IN. 18.3
WTR YR 1987 TOTAL 39943.6 MEAN 109 MAX 1990 MIN 8.0 AC-FT 79230 CFSM 1.18 IN. 16.0

DES MOINES RIVER BASIN

05486000 NORTH RIVER NEAR NORWALK, IA

LOCATION.--Lat 41°27'25", long 93°39'10", in NW1/4 SW1/4 sec.20, T.77 N., R.24 W., Warren County, Hydrologic Unit 07100008, on left bank 10 ft downstream from bridge on county highway R57, 1.7 mi southeast of Norwalk, 5.2 mi upstream from Middle Creek, and 6.2 mi downstream from Badger Creek.

DRAINAGE AREA.--349 mi².

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

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1508: 1946. WDR IA-76-1: 1975 (P).

GAGE.--Water-stage recorder. Datum of gage is 788.45 ft above NGVD (levels by U.S. Army Corps of Engineers). Prior to June 12, 1946, nonrecording gage at same site and datum. Jan. 7 to Oct. 11, 1960, nonrecording gage at site 2.1 mi upstream at different datum.

REMARKS.--Estimated daily discharges: Oct. 12, 13, 24-26, Nov. 13-18, Dec. 11-19, 27-30, Jan. 11-20, Feb. 7-10, 16-22, Apr. 14-16 and July 11-13. Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers data collection platform at station.

AVERAGE DISCHARGE.--47 years, 188 ft³/s, 7.32 in/yr, 136,200 acre-ft/yr; median of yearly mean discharges, 170 ft³/s, 6.6 in/yr, 123,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 32,000 ft³/s June 13, 1947, gage height, 25.3 ft, from floodmark, from rating curve extended above 9,100 ft³/s on basis of velocity-area studies. No flow at times during period 1954-58.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,700 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 13	----	unknown	unknown	Apr. 15	----	unknown	unknown
Oct. 26	----	unknown	unknown	Aug. 28	0345	*7,100	*22.50

Minimum discharge, 23 ft³/s Aug. 7, 8.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	521	516	171	102	94	217	846	206	411	99	35	357
2	444	559	180	105	97	347	980	199	364	88	31	300
3	345	452	193	104	96	297	755	296	274	80	29	256
4	442	408	172	105	88	293	585	881	224	73	26	221
5	701	367	118	104	82	259	513	507	188	67	25	195
6	430	346	153	98	79	232	469	360	169	81	24	174
7	331	325	201	96	76	206	437	306	150	211	23	167
8	283	318	261	93	74	187	385	270	133	213	79	157
9	257	312	291	85	72	170	341	243	119	195	114	140
10	229	278	208	72	65	148	304	222	110	277	132	131
11	282	261	150	73	71	134	283	203	109	720	62	140
12	1300	251	160	78	73	129	266	186	111	1000	45	131
13	1450	180	200	83	72	133	258	172	103	1200	63	110
14	696	190	230	86	72	131	1500	161	89	480	188	99
15	517	200	220	80	69	127	2200	153	78	295	204	103
16	431	200	210	78	55	120	1600	141	68	240	273	135
17	375	210	200	76	50	115	1050	134	61	192	176	345
18	336	210	190	82	45	130	684	132	63	163	98	424
19	308	221	180	84	48	254	548	130	67	162	69	220
20	287	226	171	80	50	325	468	139	69	172	59	174
21	272	230	160	76	52	256	419	146	154	132	56	150
22	262	236	144	74	54	221	382	148	233	108	53	133
23	262	249	143	75	57	198	397	123	211	96	47	121
24	948	231	137	65	56	196	376	113	100	85	38	115
25	1700	211	126	58	53	410	323	116	471	75	265	107
26	1760	203	118	58	56	495	297	128	649	67	2290	101
27	1040	191	110	61	56	381	276	253	243	60	3660	92
28	713	180	105	67	71	349	252	541	165	54	6210	88
29	571	175	100	72	---	718	233	519	133	49	3780	82
30	474	174	98	84	---	667	222	723	114	45	984	79
31	427	---	95	92	---	590	---	426	---	41	464	---
TOTAL	18395	8110	5195	2546	1883	8435	17649	8277	5433	6820	19602	5047
MEAN	593	270	168	82.1	67.2	272	588	267	181	220	632	168
MAX	1760	559	291	105	97	718	2200	881	649	1200	6210	424
MIN	229	174	95	58	45	115	222	113	61	41	23	79
AC-FT	36490	16090	10300	5050	3730	16730	35010	16420	10780	13530	38880	10010
CFSM	1.70	.77	.48	.24	.19	.78	1.69	.77	.52	.63	1.81	.48
IN.	1.96	.86	.55	.27	.20	.90	1.88	.88	.58	.73	2.09	.54

CAL YR 1986	TOTAL	83916	MEAN	230	MAX	1760	MIN	12	AC-FT	166400	CFSM	.66	IN.	8.94
WTR YR 1987	TOTAL	107392	MEAN	294	MAX	6210	MIN	23	AC-FT	213000	CFSM	.84	IN.	11.4

DES MOINES RIVER BASIN

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05486490 MIDDLE RIVER NEAR INDIANOLA, IA

LOCATION.--Lat 41°25'27", long 93°35'09", in SW1/4 SE1/4 sec.35, T.77 N., R.24 W., Warren County, Hydrologic Unit 07100008, on right bank 10 ft downstream from bridge on county highway, 0.4 mi upstream from Cavitt Creek, 1.5 mi upstream from bridge on U.S. Highway 69, and 4.6 mi northwest of Indianola.

DRAINAGE AREA.--503 mi².

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

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1508: 1940 (M), 1941, 1944, 1946, 1949 (M).

GAGE.--Water-stage recorder. Datum of gage is 776.15 ft above NGVD (U.S. Army Corps of Engineers bench mark). Prior to June 11, 1946, June 9, 1947, to Nov. 23, 1948, and Sept. 8, 1951, to Oct. 30, 1952, nonrecording gage and June 11, 1946, to June 8, 1947 (destroyed by flood), Nov. 24, 1948, to Sept. 7, 1951, Sept. 1, 1952, to Sept. 30, 1962, water-stage recorder at site 1.6 mi downstream at datum 2.81 ft lower.

REMARKS.--Estimated daily discharges: Nov. 14, 16-18, Dec. 12-25, Dec. 28 to Jan. 8, Jan. 12-15, Jan. 17 to Feb. 5, Feb. 15-23, Apr. 1-13 and July 8-21. Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers data collection platform at station.

AVERAGE DISCHARGE.--47 years, 266 ft³/s, 7.18 in/yr, 192,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 34,000 ft³/s June 13, 1947, gage heights: 26.40 ft, from floodmark, former site and datum; 28.27 ft, from floodmark, present site and datum; minimum daily discharge, 0.11 ft³/s July 2, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Apr. 15	0200	4,690	16.75	Aug. 27	0215	*15,500	*23.79

Minimum daily discharge, 50 ft³/s Feb. 18.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1010	575	201	145	140	341	670	266	1360	100	74	798
2	735	715	217	140	135	415	1600	252	775	92	68	688
3	637	534	245	135	130	478	1000	1260	571	83	66	616
4	882	445	217	140	125	353	700	2070	409	77	67	557
5	966	401	165	140	120	293	600	844	335	77	63	503
6	662	371	185	135	110	257	540	590	294	102	62	467
7	474	353	264	130	106	232	480	486	260	800	62	432
8	397	357	475	125	103	207	420	416	226	531	153	426
9	350	341	464	123	105	186	400	318	201	400	295	380
10	316	308	278	117	89	165	380	281	207	800	416	371
11	555	278	172	113	87	150	360	250	203	1100	190	356
12	3000	262	190	120	97	144	340	221	194	1500	131	340
13	1680	198	250	125	97	141	330	202	177	2000	176	298
14	915	230	330	125	90	140	1940	191	156	700	196	299
15	695	210	320	120	84	139	3210	173	136	350	395	337
16	598	230	310	113	72	136	1700	158	120	200	764	321
17	524	250	290	110	56	133	1180	147	109	170	359	1070
18	463	260	280	120	50	191	925	138	110	220	335	827
19	422	265	260	125	54	1050	768	141	132	270	367	469
20	395	275	240	120	64	586	641	509	110	240	220	349
21	366	264	220	110	68	390	566	331	218	210	192	294
22	349	301	200	105	72	311	511	244	253	188	160	261
23	341	317	190	100	74	270	504	185	178	173	137	209
24	1300	287	180	90	72	325	475	168	113	152	116	190
25	1770	260	170	100	70	1030	425	168	667	132	2520	168
26	1850	243	161	110	68	596	386	176	321	120	11700	155
27	1060	228	154	115	70	436	356	460	282	107	13500	144
28	775	218	170	120	93	417	323	760	166	98	5990	135
29	633	210	165	125	---	1440	303	1620	123	94	1700	124
30	538	205	160	130	---	919	282	1040	108	86	1200	119
31	482	---	150	135	---	693	---	940	---	70	952	---
TOTAL	25140	9391	7273	3761	2501	12564	22315	15005	8514	11242	42626	11703
MEAN	811	313	235	121	89.3	405	744	484	284	363	1375	390
MAX	3000	715	475	145	140	1440	3210	2070	1360	2000	13500	1070
MIN	316	198	150	90	50	133	282	138	108	70	62	119
AC-FT	49870	18630	14430	7460	4960	24920	44260	29760	16890	22300	84550	23210
CFSM	1.61	.62	.47	.24	.18	.81	1.48	.96	.56	.72	2.73	.78
IN.	1.86	.69	.54	.28	.18	.93	1.65	1.11	.63	.83	3.15	.87

CAL YR 1986	TOTAL 158799	MEAN 435	MAX 3700	MIN 28	AC-FT 315000	CFSM .86	IN. 11.7
WTR YR 1987	TOTAL 172035	MEAN 471	MAX 13500	MIN 50	AC-FT 341200	CFSM .94	IN. 12.7

DES MOINES RIVER BASIN

05487470 SOUTH RIVER NEAR ACKWORTH, IA

LOCATION.--Lat 41°20'14", long 93°29'10", in SE1/4 SE1/4 sec.34, T.76 N., R.23 W., Warren County, Hydrologic Unit 07100008, on right bank 15 ft downstream from bridge on county highway, 0.5 mi downstream from Otter Creek, and 2.2 mi southwest of Ackworth.

DRAINAGE AREA.--460 mi².

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

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1508: 1941, 1945 (M), 1946.

GAGE.--Water-stage recorder. Datum of gage is 769.97 ft above NGVD. Prior to June 12, 1946, nonrecording gage, June 13, 1946, to Apr. 13, 1960, water-stage recorder, and Apr. 14, 1960 to Sept. 30, 1961, nonrecording gage, all at site 4.0 mi downstream at datum 8.06 ft lower.

REMARKS.--Estimated daily discharges: Nov. 14-18, Dec. 12 to Feb. 5 and Feb. 14-24. Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers data collection platform at station.

AVERAGE DISCHARGE.--47 years, 252 ft³/s, 7.44 in/yr, 182,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 34,000 ft³/s June 5, 1947, gage height, 24.60 ft, site and datum then in use; maximum gage height, 32.85 ft July 5, 1981; no flow Sept. 19 to Oct. 13, 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1930 reached a stage of 24.5 ft, from information by local residents, discharge, about 30,000 ft³/s, at site 4.0 mi downstream.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 5,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Apr. 14	2015	5,270	16.98	July 12	1100	7,830	20.88
May 3	2100	8,750	21.59	Aug. 27	0145	*19,900	*29.55
July 10	1015	8,180	21.23				

Minimum discharge, 24 ft³/s Aug. 7, 24, 25.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1160	319	149	100	170	860	955	100	1510	130	34	422
2	508	425	191	92	150	854	621	91	492	97	31	382
3	764	307	267	86	130	1160	455	3150	352	84	30	347
4	684	254	194	82	110	573	389	3320	228	73	30	317
5	519	218	133	78	121	425	354	770	166	68	27	294
6	318	203	181	76	113	339	323	464	139	96	25	282
7	243	187	350	74	120	289	294	342	119	1840	24	267
8	196	194	864	74	131	258	272	268	103	1760	83	257
9	159	199	1000	74	102	230	261	224	941	2440	179	241
10	141	158	580	68	98	198	240	190	478	5180	69	237
11	379	142	261	76	105	193	242	164	236	2090	38	231
12	2840	133	250	120	102	190	237	146	195	4940	45	223
13	825	119	310	150	91	182	243	131	148	1880	544	208
14	430	140	330	170	88	175	2350	122	118	547	393	201
15	300	160	360	90	80	186	3450	108	100	424	526	677
16	240	170	330	70	60	219	1260	101	88	377	389	575
17	201	160	290	68	52	193	687	94	82	240	129	689
18	168	150	260	66	66	429	475	90	89	190	147	393
19	148	159	220	65	62	1160	368	105	186	163	90	267
20	137	221	200	64	76	529	330	625	117	139	53	223
21	125	240	190	64	72	372	809	313	633	114	51	198
22	119	278	180	62	68	303	493	180	1080	99	43	184
23	129	285	170	60	66	266	411	125	357	87	33	177
24	1270	232	170	58	72	529	332	113	180	78	25	171
25	1650	196	150	56	77	1410	244	121	2880	70	3890	161
26	2170	186	140	56	75	617	202	143	1270	61	14700	152
27	767	159	130	58	80	418	171	400	257	55	11500	147
28	463	155	120	70	137	537	137	430	171	49	1420	137
29	338	157	110	90	---	2630	124	462	137	46	842	129
30	271	155	100	110	---	1070	110	537	150	41	612	121
31	240	---	115	160	---	881	---	348	---	37	490	---
TOTAL	17902	6061	8295	2587	2674	17675	16839	13777	13002	23496	36492	8310
MEAN	577	202	268	83.5	95.5	570	561	444	433	758	1177	277
MAX	2840	425	1000	170	170	2630	3450	3320	2880	5180	14700	689
MIN	119	119	100	56	52	175	110	90	82	37	24	121
AC-FT	35510	12020	16450	5130	5300	35060	33400	27330	25790	46600	72380	16480
CFSM	1.26	.44	.58	.18	.21	1.24	1.22	.97	.94	1.65	2.56	.60
IN.	1.45	.49	.67	.21	.22	1.43	1.36	1.11	1.05	1.90	2.95	.67

CAL YR 1986 TOTAL 135460 MEAN 371 MAX 6930 MIN 9.7 AC-FT 268700 CFSM .81 IN. 11.0
WTR YR 1987 TOTAL 167110 MEAN 458 MAX 14700 MIN 24 AC-FT 331500 CFSM .99 IN. 13.5

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LOCATION.--Lat 41°29'19", long 93°20'17", in SE1/4 NW1/4 sec.12, T.77 N., R.22 W., Polk County, Hydrologic Unit 07100008, on left bank 10 ft downstream from bridge on State Highway 316, 0.2 miles downstream from South River, 0.5 mile upstream from Camp Creek, 2.2 miles southeast of Runnells, 37.2 miles upstream from Red Rock Dam and at mile 179.5.

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

REMARKS.--Estimated daily discharges: Oct. 13 to Nov. 19, Jan. 23-30 and Apr. 8 to May 3. Records good except those for estimated daily discharges, which are poor. Flow regulated by Saylorville Lake (station 05481630) 34.2 mi upstream. U.S. Army Corps of Engineers data collection platform at station. Stage-discharge relation is affected at times by backwater from Lake Red Rock (05488100).

EXTREMES OUTSIDE PERIOD OF RECORD.--Floods occurred on May 31, 1903; June 14, 1947; June 26, 1947; and June 24, 1954. No gage height or discharge was determined for this site.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 42,200 ft³/s Aug. 27, gage height, 57.45 ft; maximum gage height, 57.65 ft Oct. 28, (backwater from Lake Red Rock); minimum daily discharge, 1,830 ft³/s, Aug. 6.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	19200	12000	7940	4040	2840	3570	9980	8100	16600	3100	3420	12400
2	15600	11500	7940	3960	2800	4640	10600	9100	14000	2700	3210	10700
3	12400	11000	7930	3880	2780	5210	11000	18000	11000	2450	2810	9420
4	11400	11000	7720	3820	2830	4600	11800	16100	10100	2250	2570	8330
5	11800	10500	7230	3860	2690	4220	13100	12100	8530	2100	2240	6940
6	12000	10500	6790	3920	2620	4060	13600	9840	7490	1930	1830	5980
7	12000	11000	7030	3820	2610	3970	13400	8530	7040	4730	2030	5380
8	11900	11500	8100	3850	2610	3890	12500	7810	6490	6260	2670	5040
9	11800	12000	8550	3670	2630	3840	11800	7390	6620	6810	3570	4930
10	13600	13000	7180	3570	2510	4410	10700	6900	6330	12300	4500	4870
11	16400	14000	5770	3420	2480	4400	9900	6570	5230	11100	4040	4350
12	25600	15000	4430	3350	2510	3910	8900	5850	5020	17600	3650	3970
13	27000	13000	3800	3160	2580	3820	8300	5640	4830	20300	5920	3690
14	28000	10000	7660	3230	2670	3630	10500	5550	4610	18100	5810	3470
15	28000	9000	9610	3200	2790	3650	16000	5130	4360	18400	5910	3640
16	27000	9100	8650	2860	2680	3590	21000	4860	3830	17200	6190	4430
17	26000	9600	6710	3020	2540	3430	26500	4700	3170	14900	5490	6710
18	25000	10200	6070	3090	2280	4040	29000	4660	3310	11500	5200	8970
19	24000	10800	5600	2890	2150	6510	27000	4730	3150	9540	4270	10100
20	22000	10900	5510	2940	2140	6550	24000	5740	3000	8510	4090	9980
21	20000	11200	6040	2630	2160	6450	21000	5270	3670	7850	4780	9200
22	18000	11100	5460	2580	2180	6590	17000	4800	4160	8210	4700	7890
23	16000	11200	5210	2400	2170	6670	13300	4550	4380	8570	4240	7130
24	15000	11100	5000	2200	2140	6560	12000	3740	3700	7860	3920	6740
25	17000	11100	4680	2100	2110	8410	11000	3590	8870	8010	8270	5570
26	19000	10900	4660	2200	2100	7800	10500	3730	9570	7690	31800	5040
27	18000	10700	4480	2300	2080	7410	10000	5590	5610	7170	40300	4780
28	16000	10500	4620	2400	2280	7130	9600	9630	4610	5760	36100	4540
29	14000	9280	4230	2600	---	12400	9000	13600	3680	4680	26700	4300
30	13000	8390	4170	2700	---	11000	8500	17600	3270	4210	20700	4170
31	12500	---	4060	2730	---	9680	---	15400	---	3760	15500	---
TOTAL	559200	331070	192830	96390	68960	176040	421480	245000	186230	265550	276430	192660
MEAN	18040	11040	6220	3109	2463	5679	14050	7903	6208	8566	8917</	

CAL YR 1986	TOTAL	4157880	MEAN	11390	MAX	48000	MIN	1050	AC-FT	8247000
WTR YR 1987	TOTAL	3011840	MEAN	8252	MAX	40300	MIN	1830	AC-FT	5974000

DES MOINES RIVER BASIN

05487980 WHITE BREAST CREEK NEAR DALLAS, IA

LOCATION.--Lat 41°14'41", long 93°16'08", in NW1/4 NW1/4 sec.3, T.74 N., R.21 W., Marion County, Hydrologic Unit 07100008, on left bank 15 ft downstream from bridge on county highway, 0.5 mi downstream from Kirk Branch, and 1.7 mi northwest of Dallas.

DRAINAGE AREA.--342 mi².

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

GAGE.--Water-stage recorder. Datum of gage is 759.21 ft above NGVD.

REMARKS.--Estimated daily discharges: Oct. 1-15, Nov. 13-18, 22-23, Dec. 11 to Jan. 8, Jan. 10 to Feb. 4, 7-9, 17-22, Mar. 1-5, 25, 29-30, Apr. 14-16, Apr. 21 to May 13, May 21 to June 29, July 7-14, Aug. 13-16, 25-26 and Sept. 14-16. Records poor. U.S. Army Corps of Engineers data collection platform at station.

AVERAGE DISCHARGE.--25 years, 210 ft³/s, 8.34 in/yr, 152,100 acre-ft/yr; median of yearly mean discharges, 160 ft³/s, 6.4 in/yr, 116,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 37,300 ft³/s July 16, 1982, gage height, 33.45 ft; minimum daily discharge, 0.07 ft³/s Sept. 29, 1968.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 11, 1962, reached a stage of 28.87 ft, from floodmark, discharge, about 12,000 ft³/s. Flood of June 6, 1947, may have been slightly higher.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Aug. 26	2100	*10,200	*24.93	No other peak greater than base discharge.			

Minimum discharge, 12 ft³/s Aug. 2, 3, 4, 6, 7, 8.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1340	197	85	80	90	627	393	94	372	162	14	208
2	762	192	109	76	96	769	314	90	523	127	12	184
3	607	199	136	74	90	879	259	350	534	114	12	166
4	620	162	134	72	82	534	231	1200	459	107	14	153
5	504	139	96	70	74	334	212	560	334	103	14	142
6	385	126	96	68	71	243	198	250	264	132	12	137
7	305	117	222	65	70	194	188	180	228	343	12	134
8	263	125	625	62	68	164	178	140	207	389	27	126
9	239	128	634	54	66	143	168	120	201	958	146	115
10	224	104	254	70	64	122	159	100	370	2170	86	109
11	273	95	230	80	70	116	156	88	300	1760	33	107
12	813	91	250	84	70	111	151	78	260	1210	30	103
13	1200	96	220	88	61	108	156	68	220	1410	386	97
14	500	110	190	94	66	104	746	64	200	509	570	200
15	350	105	170	82	64	113	1510	56	180	228	414	500
16	249	98	180	68	53	123	1250	52	170	191	554	316
17	213	95	170	64	42	117	517	49	180	106	147	482
18	187	90	160	62	36	267	327	46	220	71	91	413
19	172	96	150	60	42	826	234	58	310	56	63	148
20	159	113	140	58	47	434	177	192	500	45	52	78
21	149	115	130	56	50	263	393	87	660	39	51	57
22	143	125	120	54	52	207	601	66	760	34	52	47
23	161	135	110	52	50	180	400	67	540	30	41	42
24	448	122	100	50	50	285	240	56	240	26	34	38
25	753	115	95	49	49	1000	180	65	521	24	920	33
26	954	102	90	48	48	460	140	71	705	22	7310	30
27	736	88	86	49	50	284	120	85	400	20	8880	28
28	340	87	90	52	93	317	110	259	260	19	5860	26
29	230	86	86	60	---	1580	105	312	141	17	904	25
30	178	85	84	76	---	995	98	164	219	16	392	24
31	155	---	82	84	---	494	---	148	---	15	267	---
TOTAL	13612	3538	5324	2061	1764	12393	9911	5215	10458	10453	27400	4268
MEAN	439	118	172	66.5	63.0	400	330	168	349	337	884	142
MAX	1340	199	634	94	96	1580	1510	1200	760	2170	8880	500
MIN	143	85	82	48	36	104	98	46	141	15	12	24
AC-FT	27000	7020	10560	4090	3500	24580	19660	10340	20740	20730	54350	8470
CFSM	1.28	.34	.50	.19	.18	1.17	.97	.49	1.02	.99	2.58	.42
IN.	1.48	.38	.58	.22	.19	1.35	1.08	.57	1.14	1.14	2.98	.46

CAL YR 1986	TOTAL 98004	MEAN 269	MAX 5380	MIN 5.3	AC-FT 194400	CFSM .79	IN. 10.7
WTR YR 1987	TOTAL 106397	MEAN 291	MAX 8880	MIN 12	AC-FT 211000	CFSM .85	IN. 11.6

DES MOINES RIVER BASIN

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05488100 LAKE RED ROCK NEAR PELLA, IA

LOCATION.--Lat 41°22'11", long 92°58'48", in NE1/4 NW1/4 sec.19, T.76 N., R.18 W., Marion County, Hydrologic Unit 07100008, at outlet works near right end of Red Rock Dam on Des Moines River, 1.4 mi upstream from Lake Creek, 4.5 mi southwest of Pella and at mile 142.3.

DRAINAGE AREA.--12,323 mi².

PERIOD OF RECORD.--March 1969 to current year.

GAGE.--Water-stage recorder. Datum of gage is at NGVD (levels by U.S. Army Corps of Engineers).

REMARKS.--Reservoir is formed by earthfill dam completed in 1969. Storage began in March 1969. Releases controlled through 14 concrete conduits extending through the concrete ogee spillway section into the stilling basin. Inlet invert elevation at 690 ft above NGVD. Maximum design discharge through the conduits is 37,500 ft³/s but normal flood control operation limits maximum outflow to 30,000 ft³/s. Spillway section consists of 5 tainter gates, 41 ft wide and 46 ft high, on concrete ogee crest at elevation 736 ft. The storage capacity of the reservoir at full flood-control pool level, 780 ft, is 1,790,000 acre-ft, surface area, 65,500 acres and that of conservation pool level, 728 feet, is 89,000 acre-feet, surface area, 9,980 acres. Reservoir is used for flood control, low-flow augmentation, conservation and recreation. Normal operation will maintain an elevation of 728 ft with minimum release of 300 ft³/s and maximum release of 30,000 ft³/s during the non-growing season, providing discharges at Ottumwa and Keosauqua do not exceed 30,000 ft³/s and 35,000 ft³/s respectively. Storage tables for water years 1985-1986 published as day second-feet instead of acre-feet storage.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum daily contents, 1,765,000 acre-ft June 25, 1984; maximum elevation, 779.61 ft June 25, 1984; minimum daily contents, 43,900 acre-ft May 24, 1985, minimum elevation, 719.68 ft Feb. 17, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum daily contents, 668,000 acre-ft Oct. 27; maximum elevation, 757.3 ft Oct. 28; minimum daily contents, 72,800 acre-ft June 3; minimum elevation, 727.7 June 3.

Capacity table (elevation, in feet, and contents, in acre-feet)

722	45,600	740	256,000	760	789,000
725	63,400	745	357,000	765	983,000
730	110,000	750	479,000	770	1,213,000
735	174,000	755	623,000		

RESERVOIR STORAGE (AC-FT), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	246000	615000	108000	77400	79100	82300	86800	77700	81800	75600	74900	326000
2	272000	600000	97400	76500	80200	86400	81400	79100	78300	75900	75700	305000
3	290000	587000	88100	76100	79400	88200	78000	87900	72800	75200	76900	281000
4	303000	572000	82900	75800	77900	85800	76300	117000	74100	75100	77500	257000
5	315000	556000	80800	76100	77500	80100	74500	115000	75800	75200	77100	229000
6	327000	540000	80400	77100	77500	77200	75500	98500	75900	75900	75500	204000
7	339000	526000	80100	77500	77600	76200	77200	85000	75500	92700	77900	181000
8	350000	511000	80800	77900	77300	77200	77900	80800	75200	98500	78800	157000
9	357000	491000	81100	78500	77000	77800	78300	79400	74500	94500	80100	139000
10	370000	480000	76100	78200	76600	78000	76200	76700	78000	102000	81800	126000
11	395000	463000	73800	77200	76300	77100	75400	76700	78100	103000	82100	114000
12	441000	450000	74600	77300	75800	77000	75200	76200	76600	103000	80800	105000
13	494000	430000	76700	78100	75500	77200	75500	76600	75400	114000	81700	96900
14	542000	410000	78500	79100	75300	75600	83300	76500	74900	118000	80100	96100
15	580000	390000	80200	79600	76100	76200	99600	76600	75000	116000	77100	97800
16	606000	367000	79300	78900	77600	75500	115000	77000	76000	115000	78700	98400
17	626000	345000	79800	77700	78500	75200	107000	76900	76600	107000	76600	96500
18	642000	325000	81000	77300	78700	77800	99200	76600	76900	91700	76100	95700
19	655000	309000	80400	76900	78600	79400	93800	79500	77200	76600	75400	95400
20	652000	293000	77600	75300	78300	79300	96300	81800	77800	73200	76200	96600
21	645000	277000	76200	74800	78100	79400	102000	80000	79300	77200	78400	96300
22	635000	262000	75900	74100	77900	79100	101000	76500	80600	82300	79300	94800
23	624000	243000	75800	74600	77600	79400	90200	76500	79400	82900	79000	94400
24	624000	224000	76300	75000	77300	80100	79200	76400	76800	78300	78000	94400
25	639000	209000	76200	75500	77200	81800	76000	75500	88500	76300	85600	95400
26	660000	191000	75600	76600	76900	78900	77500	75500	96100	77400	162000	96000
27	668000	173000	75400	78300	76900	77300	78400	76700	83100	78900	267000	95400
28	664000	155000	77200	78300	79400	77800	77200	78700	76200	78700	345000	94200
29	654000	136000	79200	77800	---	89800	75900	77000	74900	77000	367000	93300
30	639000	120000	79200	78000	---	94800	76200	82800	74700	76600	364000	93000
31	630000	---	78400	78500	---	90200	---	84600	---	76400	348000	---
MEAN	512400	375000	80100	77100	77570	80260	84530	81670	77870	87750	123000	138200
MAX	668000	615000	108000	79600	80200	94800	115000	117000	96100	118000	367000	326000
MIN	246000	120000	73800	74100	75300	75200	74500	75500	72800	73200	74900	93000

CAL YR 1986 MEAN 166600 MAX 668000 MIN 36600
WTR YR 1987 MEAN 150000 MAX 668000 MIN 72800

DES MOINES RIVER BASIN

05488200 ENGLISH CREEK NEAR KNOXVILLE, IA

LOCATION.--Lat 41°16'00", long 93°05'00", in NE1/4 NE1/4 SE1/4 SEC.16, T.75 N., R.19 W., Marion County, Hydrologic Unit 07100009, on left bank 30 ft from left upstream abutment of bridge on State Highway 92, 3 miles east of Knoxville, and 11.4 miles upstream from mouth at Des Moines River.

DRAINAGE AREA.--90.1 mi².

PERIOD OF RECORD.--July 1, 1985 to current year.

GAGE.--Water-stage recorder. Datum of gage is 721.79 ft above NGVD.

REMARKS.--Estimated daily discharges: Nov. 12-13, 20-21, Dec. 10-18, 20, 24-30, Jan. 1, 3, 9-31 and Feb. 6-15. Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers satellite data collection platform at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,270 ft³/s May 17, 1986, gage height, 21.76 ft; no flow for part of each day Aug. 2, 3, 1987.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of July 16, 1982 reached a stage of 30.28 ft, gage datum, discharge 28,000 ft³/s, from contracted-opening indirect computations.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 600 ft³/s and maximum (*);

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 12	1945	1,220	18.02	Aug. 27	1500	*1,680	*20.00
Oct. 24	1530	668	15.09	Sept. 15	1100	740	15.52
Oct. 26	1100	1,040	17.16	Sept. 17	1100	860	16.20
Mar. 29	1045	930	16.58				

No flow for part of each day Aug. 2, 3.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	367	76	26	18	17	206	82	20	25	2.6	.11	17
2	102	68	38	18	18	203	64	20	25	2.2	.04	14
3	183	53	40	18	17	258	51	40	10	1.9	.08	12
4	178	45	29	17	15	104	45	251	7.3	1.7	.36	8.9
5	107	41	25	17	13	77	41	83	4.6	.94	.28	7.8
6	56	38	26	19	12	58	38	43	2.8	.95	.22	11
7	40	36	70	17	14	48	36	33	2.1	25	.14	96
8	33	50	200	16	17	42	33	26	1.5	42	3.7	21
9	27	37	183	15	15	37	32	22	.95	31	2.5	8.3
10	25	30	45	15	17	31	32	19	.94	19	2.1	5.8
11	107	28	54	15	18	29	29	16	1.1	24	.98	4.9
12	1040	27	45	16	17	29	28	14	.84	146	.58	4.0
13	243	25	39	18	16	29	27	13	1.4	53	2.0	3.7
14	90	22	36	19	16	28	288	12	1.2	16	9.7	3.6
15	59	23	38	20	17	27	370	10	1.2	9.8	14	362
16	45	24	39	19	15	29	142	8.3	.62	6.9	6.9	107
17	37	25	38	18	17	26	80	7.2	.62	5.4	4.9	478
18	31	26	35	17	12	34	57	7.1	.63	4.6	4.7	93
19	28	24	32	16	12	110	45	7.7	1.6	3.7	2.4	43
20	26	29	31	15	13	57	39	28	43	3.2	1.3	27
21	23	36	29	14	13	42	47	16	15	2.8	.62	19
22	22	41	28	14	12	36	61	9.3	6.1	2.1	.42	15
23	25	50	27	13	11	32	55	7.3	6.5	1.7	.37	12
24	388	39	26	12	10	33	53	7.2	4.1	1.3	.25	9.7
25	324	32	23	12	9.9	81	38	10	128	1.0	235	7.7
26	855	32	20	13	9.8	55	33	12	36	.51	1220	6.1
27	238	27	19	14	11	40	31	18	10	.39	1320	4.5
28	109	26	20	14	24	56	27	15	5.5	.34	113	4.4
29	71	27	20	15	---	701	25	9.2	4.0	.30	51	3.6
30	55	26	20	16	---	200	22	7.1	3.1	.22	32	2.7
31	50	---	19	16	---	108	---	5.8	---	.16	24	---
TOTAL	4984	1063	1320	496	408.7	2846	1951	797.2	350.70	410.71	3053.65	1412.7
MEAN	161	35.4	42.6	16.0	14.6	91.8	65.0	25.7	11.7	13.2	98.5	47.1
MAX	1040	76	200	20	24	701	370	251	128	146	1320	478
MIN	22	22	19	12	9.8	26	22	5.8	.62	.16	.04	2.7
AC-FT	9890	2110	2620	984	811	5650	3870	1580	696	815	6060	2800
CFSM	1.78	.39	.47	.18	.16	1.02	.72	.29	.13	.15	1.09	.52
IN.	2.06	.44	.54	.20	.17	1.18	.81	.33	.14	.17	1.26	.58

CAL YR 1986 TOTAL 28615.81 MEAN 78.4 MAX 1860 MIN .31 AC-FT 56760 CFSM .87 IN. 11.8
WTR YR 1987 TOTAL 19093.57 MEAN 52.3 MAX 1320 MIN .04 AC-FT 37870 CFSM .58 IN. 7.88

DES MOINES RIVER BASIN

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05488500 DES MOINES RIVER NEAR TRACY, IA

LOCATION.--Lat 41°16'53", long 92°51'34", in NW1/4 SE1/4 sec.19, T.75 N., R.17 W., Mahaska County, Hydrologic Unit 07100009, on right bank 250 ft upstream from abandoned Bellefontaine Bridge, 0.8 mi east of Tracy, 3.1 mi upstream from Cedar Creek, 3.8 mi downstream from bridge on newly located State Highway 92, 6.4 mi downstream from English Creek, and at mile 130.4.

DRAINAGE AREA.--12,479 mi².

PERIOD OF RECORD.--March, 1920 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 1438: Drainage area. WSP 1508: 1920 (M), 1922 (M), 1933.

GAGE.--Water-stage recorder. Datum of gage is 670.91 ft above NGVD. Prior to June 26, 1940, and June 30, 1952, to Nov. 4, 1960, nonrecording gage, and June 27, 1940, to June 29, 1952, water-stage recorder, at site 250 ft downstream at same datum.

REMARKS.--No estimated daily discharges. Records good. Flow regulated by Lake Red Rock (station 05488100) 11.9 mi upstream, since March 12, 1969. U.S. Army Corps of Engineers gage-height telemeter and data collection platform at station.

AVERAGE DISCHARGE.--67 years, 5,136 ft³/s, 5.59 in/yr, 3,721,000 acre-ft/yr; median of yearly mean discharges, 4,190 ft³/s, 4.6 in/yr, 3,040,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 155,000 ft³/s, June 14, 1947, gage height, 26.5 ft; minimum daily discharge, 40 ft³/s Jan. 29 to Feb. 1, 1940.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since 1851, that of June 14, 1947. Flood of May 31, 1903, reached a stage of about 25 ft, discharge, about 130,000 ft³/s. Minimum daily discharge since at least 1910, that of Jan. 29 to Feb. 1, 1940.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 25,500 ft³/s Apr. 16, gage height, 13.45 ft; minimum daily discharge, 1,710 ft³/s Jan. 27.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6190	19600	13900	4720	2890	2620	11900	7880	15900	2830	4120	18400
2	5650	19500	12700	4510	2900	3910	12400	7870	16900	2830	3430	18200
3	5720	19400	12100	4260	3210	5300	12600	7890	14700	2820	2700	18200
4	5820	19300	10700	4200	3660	6750	11500	10000	10100	2620	2690	18000
5	5650	19400	9290	4050	3340	7570	12700	15600	8450	2390	2680	17600
6	5480	19500	7390	3840	2890	6590	12500	17000	7680	2130	2680	17600
7	5460	19500	7890	3820	2880	4870	12300	15200	7360	1940	2240	16400
8	5460	19500	6440	3620	2660	4400	12300	11300	6790	3200	2020	14500
9	5460	19500	9830	3840	2890	3570	12100	8330	6460	8360	2770	13600
10	5460	19500	9460	3910	2870	4110	11700	8140	5880	11400	3270	11300
11	5570	19600	7880	4000	2870	5030	11100	7220	5900	12700	3840	9790
12	6720	19500	4640	3640	2880	4680	9580	6170	5870	16500	4420	8520
13	6110	19500	3410	3190	2890	4160	8670	5940	5680	18100	4860	6630
14	5640	19600	3070	3200	2760	4150	9600	5640	5200	18100	7040	5160
15	6680	19500	3140	3200	2530	4040	13900	5300	4660	18200	7410	3260
16	12200	19400	4460	3280	2450	3850	19700	4770	4090	16200	6410	4990
17	15900	19200	5960	3260	2460	3870	23800	4750	3620	18200	6400	7800
18	18300	19000	6290	3260	2460	3900	25400	4740	3610	18000	5910	8920
19	18400	18900	7150	3250	2460	5140	25200	4600	3600	16200	4940	10400
20	16600	18700	7860	3160	2450	7240	23500	5220	3610	11300	4220	9600
21	19300	16500	7330	2820	2440	6980	19700	6570	3640	7070	3470	9590
22	19400	16800	6420	2580	2440	6600	19100	6750	3830	5960	4360	9090
23	19000	19500	5940	2110	2450	6610	19000	5180	5290	7400	4370	7990
24	19200	19600	5260	1840	2450	6650	17800	4220	6450	9590	4370	7270
25	19600	19300	5320	1780	2380	7900	14300	4210	3370	8900	4960	6150
26	19000	19100	5280	1740	2290	9100	10800	4080	4950	7650	8200	5400
27	15800	18800	5020	1710	2290	8720	10100	4290	10800	6920	8770	5380
28	17600	18600	4350	2040	2330	7690	10000	6020	9060	6410	13000	5370
29	19400	16300	3970	2690	---	9020	9710	10100	4480	5910	16900	5070
30	19400	16700	4280	2870	---	10600	8740	12600	3610	4890	18000	4480
31	19600	---	4750	2890	---	12000	---	12800	---	4140	18500	---
TOTAL	377770	574800	213500	99680	75690	188020	431700	240380	201540	280860	188950	304860
MEAN	12190	19160	6887	3215	2703	6065	14390	7754	6718	9060	6095	10160
MAX	19600	19600	13900	4720	3660	12000	25400	17000	16900	18200	18500	18400
MIN	5460	16700	3070	1710	2290	2820	8670	4080	3370	1940	2020	3260
AC-FT	749300	1140000	423500	197700	150100	372900	856300	476800	399800	557100	374800	604700

CAL YR 1986 TOTAL 4374910 MEAN 11990 MAX 26200 MIN 365 AC-FT 8678000
WTR YR 1987 TOTAL 3177750 MEAN 8706 MAX 25400 MIN 1710 AC-FT 6303000

DES MOINES RIVER BASIN

05489000 CEDAR CREEK NEAR BUSSEY, IA

LOCATION.--Lat 41°13'09", long 92°54'38", at SW corner sec.11, T.74 N., R.18 W., Marion County, Hydrologic Unit 07100009, on left bank 10 ft downstream from bridge on State Highway 156, 0.8 mi downstream from North Cedar Creek, 1.6 mi northwest of Bussey, 3.0 mi upstream from Honey Creek, and 8.9 mi upstream from mouth.

DRAINAGE AREA.--374 mi².

PERIOD OF RECORD.--October 1947 to current year.

REVISED RECORDS.--WSP 1438: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 682.15 ft above NGVD (levels by U.S. Army Corps of Engineers). Prior to Feb. 21, 1949, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Oct. 1, 3, 12, 28, Nov. 21, Dec. 10-13, 20, 24, 25, 28-30, Jan. 1, 4, Jan. 11 to Feb. 5, Feb. 7-9 and Sept. 17-22. Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers satellite data collection platform and gage-height telemeter at station.

AVERAGE DISCHARGE.--40 years, 221 ft³/s, 8.02 in/yr, 160,100 acre-ft/yr; median of yearly mean discharges, 180 ft³/s, 6.5 in/yr, 130,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 96,000 ft³/s July 3, 1982, gage height, 34.61 ft; no flow Sept. 6-20, 1955, Oct. 11, 12, 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1946 reached a stage of 28.45 ft on upstream side and 28.05 ft on downstream side of bridge, levels to floodmarks by U.S. Army Corps of Engineers, discharge, 31,500 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Aug. 27	0445	*8,200	*21.66	No other peak greater than peak discharge.			

Minimum discharge, 3.3 ft³/s Aug. 1, 2.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1900	193	94	62	84	1100	301	76	728	11	3.5	64
2	603	215	112	58	86	981	246	75	229	11	3.4	52
3	1300	191	124	62	84	974	201	153	128	9.9	7.2	44
4	1080	171	90	66	80	381	180	1010	84	9.1	15	39
5	470	154	66	70	74	268	166	489	54	8.6	9.3	35
6	313	145	90	81	70	215	156	202	42	17	6.6	37
7	252	137	195	78	66	183	146	144	34	30	5.6	83
8	223	300	830	66	60	161	137	113	30	65	20	133
9	201	271	683	50	52	142	129	94	44	46	27	76
10	186	163	150	52	47	115	123	80	66	82	32	45
11	335	138	120	62	65	110	118	70	37	58	14	33
12	2800	125	145	72	67	111	114	58	33	172	18	29
13	961	106	130	78	62	108	112	50	30	321	32	25
14	376	100	122	90	62	108	387	47	26	86	65	45
15	288	101	111	80	69	103	1100	44	21	41	62	191
16	241	115	127	72	51	104	423	38	18	29	41	875
17	217	126	138	62	38	103	254	36	16	22	30	3100
18	195	130	141	55	39	134	197	37	32	16	18	1900
19	182	119	120	54	47	471	164	91	46	13	12	1000
20	172	132	115	52	52	244	145	86	52	11	8.2	400
21	164	120	110	50	53	181	146	81	100	9.1	7.7	200
22	157	142	101	48	57	154	178	51	51	8.1	7.2	80
23	159	150	95	45	54	137	166	36	59	7.2	5.9	64
24	301	132	88	40	47	135	145	32	35	6.7	5.6	58
25	376	114	82	37	49	364	121	34	64	6.1	539	52
26	2540	115	79	36	48	260	112	40	71	5.7	6000	46
27	1240	99	68	38	50	188	108	154	30	5.2	5140	42
28	422	96	72	40	82	171	94	183	18	5.0	362	37
29	276	102	76	50	---	2290	87	96	14	4.5	184	34
30	214	97	71	60	---	866	84	51	12	4.2	120	32
31	189	---	67	80	---	394	---	47	---	3.9	84	---
TOTAL	18333	4299	4612	1846	1695	11276	6040	3798	2204	1124.3	12885.2	8851
MEAN	591	143	149	59.5	60.5	364	201	123	73.5	36.3	416	295
MAX	2800	300	830	90	86	2290	1100	1010	728	321	6000	3100
MIN	157	96	66	36	38	103	84	32	12	3.9	3.4	25
AC-FT	36360	8530	9150	3660	3360	22370	11980	7530	4370	2230	25560	17560
CFSM	1.58	.38	.40	.16	.16	.97	.54	.33	.20	.10	1.11	.79
IN.	1.82	.43	.46	.18	.17	1.12	.60	.38	.22	.11	1.28	.88
CAL YR 1986	TOTAL 120003.9	MEAN 329	MAX 10800	MIN 9.9	AC-FT 238000	CFSM .88	IN. 11.9					
WTR YR 1987	TOTAL 76963.4	MEAN 211	MAX 6000	MIN 3.4	AC-FT 152700	CFSM .56	IN. 7.66					

DES MOINES RIVER BASIN

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05489500 DES MOINES RIVER AT OTTUMWA, IA

LOCATION.--Lat 41°00'39", long 92°24'40", in SE1/4 NE1/4 sec.25, T.72 N., R.14 W., Wapello County, Hydrologic Unit 07100009, on right bank 15 ft downstream from Wabash Railroad Bridge at Ottumwa, 0.4 mi downstream from Ottumwa powerplant, 6.5 mi upstream from Village Creek, 9.5 mi downstream from South Avery Creek, and at mile 94.1.

DRAINAGE AREA.--13,374 mi².

PERIOD OF RECORD.--March 1917 to current year (published as "at Eldon" October 1930 to March 1935). Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 525: 1917-20. WSP 1308: 1917-23 (M), 1925-27 (M), 1931. WSP 1438: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 622.00 ft above NGVD. Prior to Sept. 30, 1930, nonrecording gages at Market Street Bridge 1,700 ft upstream at datum 0.83 ft higher. Oct. 1, 1930, to Mar. 31, 1935, nonrecording Mar. 31, 1935, nonrecording gage at Eldon 15 mi downstream at different datum. Apr. 1, 1935, to Oct. 25, 1963, water-stage recorder at site 1,100 ft downstream at Vine Street Bridge at datum 0.77 ft higher.

REMARKS.--No estimated daily discharges. Records good. Prior to Dec. 12, 1958, and since Nov. 30, 1960, diurnal fluctuation at low and medium stages are caused by powerplant upstream of station about 1/2 mile. Flow regulated by Lake Red Rock (station 05488100) 48.2 mi upstream, since March 12, 1969. U.S. Army Corps of Engineers satellite data collection platform at station.

AVERAGE DISCHARGE.--70 years, 5,558 ft³/s, 5.64 in/yr, 4,027,000 acre-ft/yr; median of yearly mean discharges, 4,690 ft³/s, 4.8 in/yr, 3,400,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 135,000 ft³/s June 7, 1947, gage height, 20.2 ft, site and datum then in use; minimum daily discharge, 30 ft³/s Jan. 27-29, 31, Feb. 2, 3, 5-7, 1940.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1850, that of June 7, 1947. Flood of May 31, 1903, reached a stage of 19.4 ft, former site and datum at Vine Street Bridge or about 22 ft at Market Street Bridge, from information by U.S. Army Corps of Engineers and U.S. National Weather Service, discharge, about 140,000 ft³/s.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 30,700 ft³/s Apr. 18, gage height, 10.96 ft; minimum daily discharge 1,670 ft³/s Jan. 24.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13600	19700	15500	4950	3410	4780	13700	8540	16200	3150	4130	18300
2	8150	19800	13700	4920	3330	6250	13500	8370	17300	2800	4120	18200
3	9320	19700	13300	4560	3310	7230	14400	8500	16700	2700	3050	18000
4	8950	19500	12000	4460	3890	7960	12900	9540	12100	2860	2570	17900
5	7510	19400	10700	4450	4160	8880	13800	14700	9450	2370	2600	17700
6	6670	19600	8420	4140	3700	8820	14000	17300	8170	2360	2600	17500
7	6450	19500	8550	4140	3310	6230	13700	17000	7950	2030	2620	17200
8	6280	19600	9820	4110	3370	5670	13500	14000	7140	2440	1860	15300
9	6230	19700	11500	4140	3380	4450	13500	9840	6790	5250	2200	14600
10	6260	19500	10900	4070	3300	4140	13000	8870	6180	11000	3090	12700
11	6130	19500	9440	4310	3300	5370	12800	8420	5950	12300	3420	10800
12	9490	19400	6180	4160	3290	5580	11600	6660	5940	15600	4150	10000
13	10500	19300	4340	3680	3350	4880	10000	6330	5880	18200	4780	7230
14	7460	19500	3560	3460	3310	4730	11800	5890	5490	18000	6170	6640
15	6800	19500	3340	3580	2990	4670	15200	5710	4910	18000	8300	4160
16	10500	19300	3780	3470	2940	4440	18700	5070	4400	18000	6960	4730
17	15800	19200	5730	3570	2820	4460	22600	4820	3710	18000	6700	10600
18	18600	19000	6180	3650	2700	4690	25400	4870	3560	17900	6570	11200
19	19400	18900	6960	3540	2710	5100	25000	4890	3610	17600	5410	11100
20	19400	18900	8150	3520	2800	8110	24400	4850	3600	14600	4870	10600
21	19800	18700	8370	3250	2930	8560	21300	6500	3780	8960	3790	10400
22	20500	18600	6990	3150	2700	7720	19700	7400	3640	6460	3820	10300
23	20000	19300	6630	2570	2780	7590	19500	6170	4280	6190	4410	9120
24	20100	19600	5660	1670	2750	7710	19200	4480	6520	9400	4440	7980
25	21100	19500	5510	1780	2750	8580	17200	4370	5150	9990	5410	7270
26	25100	19200	5500	1830	2690	10400	13000	4450	3460	8530	15700	5880
27	19100	19000	5460	2110	2580	10800	11200	7800	8730	7390	15400	5590
28	17500	18700	4780	2120	2710	9260	10900	5410	11200	6780	13500	5560
29	19200	18500	4210	2870	---	12300	10800	8800	6510	6520	16100	5520
30	19600	18000	4140	3650	---	13500	10100	13200	4150	5550	17600	4950
31	19800	---	4910	3640	---	13800	---	12600	---	4360	18300	---
TOTAL	425300	577600	234210	109520	87260	226660	466400	255350	212450	285290	204640	327030
MEAN	13720	19250	7555	3533	3116	7312	15550	8237	7082	9203	6601	10900
MAX	25100	19800	15500	4950	4160	13800	25400	17300	17300	18200	18300	18300
MIN	6130	18000	3340	1670	2580	4140	10000	4370	3460	2030	1860	4160
AC-FT	843600	1146000	464600	217200	173100	449600	925100	506500	421400	565900	405900	648700

CAL YR 1986 TOTAL 4635180 MEAN 12700 MAX 31600 MIN 503 AC-FT 9194000
WTR YR 1987 TOTAL 3411710 MEAN 9347 MAX 25400 MIN 1670 AC-FT 6767000

DES MOINES RIVER BASIN

05490500 DES MOINES RIVER AT KEOSAUQUA, IA

LOCATION.--Lat 40°43'40", long 91°57'34", in SE1/4 SW1/4 sec.36, T.69 N., R.10 W., Van Buren County, Hydrologic Unit 071000009, on right bank 10 ft upstream from bridge on State Highway 1 at Keosauqua, 4.0 mi downstream from Chequest Creek, and at mile 51.3.

DRAINAGE AREA.--14,038 mi².

PERIOD OF RECORD.--May 1903 to July 1906, April to December 1910, August 1911 to current year. Monthly discharge only for some periods, published in WSP 1308.

REVISED RECORDS.--WSP 525: 1913-20. WSP 1438: Drainage area. WSP 1508: 1903, 1905-6, 1915-18 (M), 1922 (M), 1924-26 (M), 1932-34 (M), 1937, 1942 (M).

GAGE.--Water-stage recorder. Datum of gage is 547.36 ft above NGVD. Prior to Dec. 24, 1933, nonrecording gage, and Dec. 25, 1933, to Sept. 30, 1972, water-stage recorder, at same site at datum 10.00 ft higher.

REMARKS.--Estimated daily discharges: Jan. 24 to Feb. 2 and Mar. 28, 30. Records good except those for estimated daily discharges, which are poor. Prior to Dec. 21, 1958, and since Nov. 30, 1960, some diurnal fluctuation at medium and low stages caused by power plant at Ottumwa. Flow regulated by Lake Red Rock (station 05488100) 91.0 mi upstream, since March 12, 1969. U.S. Army Corps of Engineers satellite data collection platform at station.

AVERAGE DISCHARGE.--78 years (water years 1904-05, 1912-87), 5,936 ft³/s, 5.74 in/yr, 4,301,000 acre-ft/yr;
median of yearly mean discharges, 5,020 ft³/s, 4.9 in/yr, 3,640,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 148,000 ft³/s June 1, 1903, gage height, 27.85 ft, from flood-mark, datum then in use; minimum daily discharge, 40 ft³/s Jan. 30, 1940.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 1, 1851, reached a stage of 24 ft, discharge not determined.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 36,100 ft³/s, Oct. 26, gage height, 20.90 ft; minimum daily discharge, 1,800 ft³/s, Jan. 25.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24700	20000	16800	4940	3600	5590	13900	9510	17300	4170	4460	18800
2	15000	19900	14400	4930	3500	6950	13500	8540	17600	3130	4370	18600
3	21800	19800	13300	4770	3350	7090	13800	8630	17600	2810	4260	18400
4	14500	19700	12600	4510	3340	7580	13900	9420	14900	2880	3400	18200
5	9190	19600	11000	4480	3970	8080	12700	12600	10400	3030	2840	18100
6	7530	19700	9590	4450	3920	8590	13900	16900	8660	2540	2830	18000
7	674C	19700	8300	4220	3500	7790	13700	17800	7800	2450	2830	17700
8	6490	19700	9740	4220	3250	6020	13500	16000	7540	2220	2900	16500
9	6360	19900	10800	4160	3230	5630	13400	12400	6930	2550	2260	15000
10	6240	19700	11100	4200	3220	4610	13200	9200	6650	7560	2630	13900
11	6210	19600	9960	4190	3160	4760	12700	8960	6090	11300	3400	11600
12	6690	19500	8200	4430	3200	5780	12100	8200	6040	13300	3700	10000
13	10800	19300	5270	4170	3210	5650	11200	7000	6020	17300	4750	8900
14	8970	19300	3810	3790	3280	5110	13100	6800	5890	18100	5330	6960
15	7050	19500	3850	3660	3260	5160	18000	6380	5470	18000	7140	6470
16	7330	19400	3850	3690	3010	5040	18000	6170	4920	18000	7910	4650
17	12800	19300	4690	3570	2840	4780	21600	5520	4400	18000	7000	7160
18	16400	19200	6110	3640	2840	5380	24800	5380	3810	18000	6770	11700
19	18300	19000	6260	3820	2770	6890	25900	5360	3820	17800	6430	10100
20	18500	18900	7000	3680	2880	6820	25200	5380	3880	16200	5430	10800
21	18600	18800	7770	3780	2770	8410	23600	5790	3890	11900	4940	10000
22	19300	18500	7460	3370	3000	8070	20500	7150	4040	7440	3890	9790
23	19300	18900	6490	2840	2850	7580	20000	7340	3870	6200	4460	9420
24	19300	19400	6210	1900	2930	776Q	19700	6040	5050	6970	4770	8300
25	20600	19500	5490	1800	2900	8420	18500	4880	6650	9600	4980	7550
26	33600	19200	5480	2000	2910	9320	15300	4870	4350	9080	10600	6660
27	25000	19000	5410	2300	2870	10200	12000	8340	4300	7870	17800	5730
28	18100	18800	5250	2500	2940	11000	10900	7000	10300	7120	14300	5690
29	19100	18500	4720	3300	---	9600	10700	8910	9350	6590	14500	5760
30	20000	18300	4320	3800	---	13000	10400	10800	5210	6370	17600	5470
31	19900	---	4390	3800	---	13300	---	13000	---	5410	18500	---
TOTAL	464400	579600	239620	114910	88500	229960	479700	268270	222730	283890	206980	335910
MEAN	14980	19320	7730	3707	3161	7418	15990	8654	7424	9158	6677	11200
MAX	33600	20000	16800	4940	3970	13300	25900	17800	17600	18100	18500	18800
MIN	6210	18300	3810	1800	2770	4610	10400	4870	3810	2220	2260	4650
AC-FT	921100	1150000	475300	227900	175500	456100	951500	532100	441800	563100	410500	866300
CAL YR	1986	TOTAL	4916940	MEAN	13470	MAX	50000	MIN	812	AC-FT	9753000	
WTR YR	1987	TOTAL	3514470	MEAN	9629	MAX	33600			AC-FT	6971000	

MISSOURI RIVER BASIN

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BIG SIOUX RIVER BASIN

06483500 ROCK RIVER NEAR ROCK VALLEY, IA

LOCATION.--Lat 43°12'52", long 96°17'39", in SW1/4 SW1/4 sec.16, T.97 N., R.46 W., Sioux County, Hydrologic Unit 10170204, on left bank 3 ft upstream from bridge on county highway K30, 0.3 mi north of Rock Valley and at mile 19.1.

DRAINAGE AREA.--1,592 mi².

PERIOD OF RECORD.--June 1948 to current year.

REVISED RECORDS.--WSP 1439: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,222.54 ft above NGVD. Prior to Aug. 13, 1952, nonrecording gage with supplementary water-stage recorder operating above 6.2 ft gage height June 4, 1949 to Aug. 12, 1952, and Aug. 13, 1952 to May 4, 1976, water-stage recorder, at site 3.2 mi downstream at datum 10.73 ft lower.

REMARKS.--Estimated daily discharges: Nov. 10 to Feb. 23. Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain-gage and satellite data collection platform at station.

AVERAGE DISCHARGE.--39 years, 424 ft³/s, 3.62 in/yr, 307,200 acre-ft/yr; median of yearly mean discharges, 330 ft³/s, 2.8 in/yr, 239,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 40,400 ft³/s Apr. 7, 1969, gage height, 17.32 ft; site and datum then in use, no flow for many days during winter period in 1959 and 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in 1897 reached a stage of 17.0 ft, former site and datum, discharge not determined, from information by State Highway Commission.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 25	1245	*4,990	*13.59	No other peak greater than base discharge.			

Minimum discharge, 78 ft³/s Sept. 10, 11.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1460	615	910	250	280	304	1820	590	642	198	197	93
2	1360	591	800	260	275	295	1670	590	595	184	183	90
3	1340	586	680	270	270	289	1510	625	553	172	170	87
4	1330	580	560	280	270	294	1430	630	513	164	162	65
5	1320	575	470	270	270	312	1370	604	482	193	153	84
6	1250	563	540	260	280	336	1310	583	441	247	149	83
7	1160	564	580	250	290	366	1270	552	414	658	144	81
8	1090	730	560	250	310	392	1230	521	434	614	142	81
9	1030	886	470	250	300	374	1210	495	432	560	149	80
10	982	700	400	250	310	329	1180	485	415	731	170	80
11	981	600	200	260	330	326	1170	456	403	761	168	79
12	1030	545	400	270	350	347	1150	428	395	839	148	80
13	1110	520	360	290	330	350	1140	410	377	1090	136	80
14	1100	510	340	310	290	344	1150	413	353	1250	129	82
15	1030	500	330	280	250	341	1150	402	328	1110	125	102
16	962	530	330	270	240	338	1120	384	301	858	138	294
17	919	570	330	260	240	340	1060	364	282	701	127	623
18	872	560	330	260	250	403	1010	361	271	625	125	1230
19	836	550	320	270	260	574	951	357	260	561	120	979
20	804	540	315	270	260	634	912	371	255	477	115	681
21	781	560	300	270	270	752	871	459	252	448	113	547
22	767	600	300	260	270	899	839	486	262	432	109	461
23	775	580	300	250	280	1680	823	466	244	677	104	399
24	774	620	300	250	303	3750	786	454	234	557	101	352
25	765	660	290	250	299	4860	752	515	281	458	104	319
26	752	680	285	260	287	4460	724	657	274	391	106	291
27	733	800	280	270	292	3740	690	819	247	345	106	268
28	719	900	270	280	300	2910	656	856	226	306	107	248
29	680	960	270	300	---	2280	637	827	217	271	104	229
30	648	970	265	310	---	2020	615	757	208	243	100	217
31	632	---	260	300	---	1940	---	692	---	218	96	---
TOTAL	29992	19145	12345	8330	7956	36579	32206	16609	10591	16339	4100	8405
MEAN	967	638	398	269	284	1180	1074	536	353	527	132	280
MAX	1460	970	910	310	350	4860	1820	856	642	1250	197	1230
MIN	632	500	200	250	240	289	615	357	208	164	96	79
AC-FT	59490	37970	24490	16520	15780	72550	63880	32940	21010	32410	8130	16670
CFSM	.61	.40	.25	.17	.18	.74	.67	.34	.22	.33	.08	.18
IN.	.70	.45	.29	.19	.19	.85	.75	.39	.25	.38	.10	.20
CAL YR 1986	TOTAL 435642	MEAN 1194	MAX 10900	MIN 140	AC-FT 864100	CFSM .75	IN. 10.2					
WTR YR 1987	TOTAL 202597	MEAN 555	MAX 4860	MIN 79	AC-FT 401900	CFSM .35	IN. 4.73					

BIG SIOUX RIVER BASIN

06485500 BIG SIOUX RIVER AT AKRON, IA
(National stream-quality accounting network station)

LOCATION.--Lat 42°50'14", long 96°33'41", in SW1/4SE1/4SW1/4 sec.30, T.93 N., R.48 W., Plymouth County, on left bank 15 ft downstream from Iowa Highway 403 bridge, 0.5 mi northwest of Akron, and 2.9 mi upstream from Union Creek.

DRAINAGE AREA.--8,424 mi², approximately, of which about 1,487 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1928 to current year.

REVISED RECORDS.--WSP 1309: 1929(M), 1931-33(M), 1936(M), 1938(M), 1940(M). WSP 1389: Drainage area. WDR SD-84-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,118.90 ft above National Geodetic Vertical Datum of 1929. Prior to Dec. 3, 1934, nonrecording gage at bridge 0.5 mi downstream at same datum. From Dec. 3, 1934, to Oct. 31, 1985, water-stage recorder at site 0.6 mi downstream at same datum.

REMARKS.--Records good except for periods of estimated record, which are poor. Estimated daily discharges during water year: Nov. 12-29 and Dec. 4 to Feb. 21. U.S. Army Corps of Engineers satellite data-collection platform at station. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--59 years, 1,050 ft³/s, 760,700 acre-ft/yr; median of yearly mean discharges, 790 ft³/s, 572,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 80,800 ft³/s, Apr. 9, 1969, gage height, 22.99 ft; minimum daily, 4.0 ft³/s, Jan. 17, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 27	1700	*12,200	*18.50	No other peak greater than base discharge.			

Minimum daily discharge, 323 ft³/s, Sept. 11.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9310	2570	2410	900	700	1080	6930	1880	1660	697	795	397
2	7630	2520	2410	900	800	1090	6610	1810	1550	670	725	384
3	6790	2460	2350	800	800	1090	6110	1770	1410	633	727	374
4	6160	2400	2000	800	800	1070	5580	1950	1300	605	669	364
5	5680	2360	1800	800	800	1070	5170	2000	1200	695	607	356
6	5290	2320	1700	800	800	1090	4830	1840	1130	639	580	349
7	4960	2290	1700	800	850	1130	4570	1740	1090	696	547	341
8	4600	2380	1700	750	900	1170	4360	1650	1040	978	547	334
9	4330	2540	1700	700	900	1220	4160	1550	1040	1050	550	329
10	4070	2720	1200	700	900	1240	4000	1470	1040	1100	535	326
11	3880	2600	800	700	900	1220	3910	1430	1060	1370	554	323
12	3820	1500	800	700	1000	1190	3810	1320	1040	1420	606	334
13	3820	1000	900	800	1000	1200	3740	1250	1020	1520	570	341
14	3860	1000	1200	900	1000	1200	3720	1190	993	1830	534	336
15	3740	1000	1200	800	1000	1190	3710	1140	966	2630	514	345
16	3550	1500	1250	750	900	1190	3720	1110	940	2780	579	454
17	3380	1800	1300	700	800	1190	3640	1060	914	2400	567	789
18	3250	1800	1300	600	750	1250	3490	1030	895	2150	518	869
19	3140	1700	1300	700	900	1400	3330	997	899	2070	505	1370
20	3040	1600	1200	700	1000	1910	3150	1030	913	1870	485	1270
21	2950	1700	1100	700	1000	2530	2970	1140	879	1590	475	1040
22	2900	1800	1050	700	1050	2940	2840	1170	862	1440	468	929
23	2880	1900	1000	700	1030	3900	2720	1200	848	1440	450	872
24	2860	1900	1000	700	1020	5720	2610	1170	826	1570	432	810
25	2860	1900	950	700	1010	7600	2500	1210	858	1430	429	751
26	2890	2000	950	700	1050	10100	2390	1450	852	1300	432	710
27	2830	2000	900	700	1050	11800	2270	1570	898	1190	443	667
28	2790	2100	900	700	1050	11900	2160	1740	834	1090	444	624
29	2710	2300	900	700	---	10300	2080	1760	770	1000	430	587
30	2640	2420	900	700	---	8600	1970	1700	723	936	420	555
31	2590	---	900	700	---	7360	---	1610	---	851	406	---
TOTAL	125200	60080	40770	23000	25760	106940	113050	44937	30450	41640	16543	17530
MEAN	4039	2003	1315	742	920	3450	3768	1450	1015	1343	534	584
MAX	9310	2720	2410	900	1050	11900	6930	2000	1660	2780	795	1370
MIN	2590	1000	800	600	700	1070	1970	997	723	605	406	323
AC-FT	248300	119200	80870	45620	51090	212100	224200	89130	60400	82590	32810	34770
CAL YR 1986	TOTAL	1542350		MEAN	4226	MAX	22400	MIN	470	AC-FT	3059000	
WTR YR 1987	TOTAL	645900		MEAN	1770	MAX	11900	MIN	323	AC-FT	1281000	

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LOCATION.--Lat. 42°29'09", long 96°24'49", in NW1/4 SE1/4 sec.16 T.29 N., R.9 E., sixth principal meridian, Dakota County, Nebraska, Hydrologic Unit 10230001, on right bank on upstream side of bridge on U.S. Highway 20 and 77 at South Sioux City, Nebraska. 1.9 mi downstream from Big Sioux River, and at mile 732.2.

WATER-DISCHARGE RECORDS

REVISÉD RECORDS.--WSP 716: 1929-30. WSP 876: Drainage area.

REMARKS.--Estimated daily discharges: Nov. 11 and Jan. 15-27. Records good except those for estimated daily discharges, which are poor. Flow regulated by upstream main-stem reservoirs. U.S. National Weather Service gage-height telemeter and U.S. Army Corps of Engineers rain-gage and satellite data collection platform at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 441,000 ft³/s Apr. 14, 1952, gage height, 24.28 ft, datum then in use; minimum, 2,500 ft³/s Dec. 29, 1941; minimum gage height, 9.00 ft Jan. 8, 1980, based on gage readings at site 14 mi downstream.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 57,000 ft³/s Oct. 1, gage-height, 23.19 ft; minimum daily discharge, 22,800 ft³/s May 30; minimum gage height, 13.66 ft, May 30.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	55600	46300	47400	31200	24300	24600	43000	34200	25500	30700	31000	31000
2	52500	46100	46800	30700	24300	24300	43500	34500	25200	30900	31200	30900
3	50200	45900	44100	31400	24100	24500	41000	34800	27300	31000	31300	30800
4	48300	45700	43200	31600	24100	24600	40600	35000	28700	30800	31800	30400
5	46300	45800	42000	30900	24200	24600	40100	35100	27100	31300	31800	30100
6	45100	45800	41800	31100	24100	24700	39400	34700	30900	31600	32000	29800
7	44400	45900	39700	31200	24200	25000	38400	34000	31500	31900	32700	30500
8	43900	46700	38000	31200	24200	24800	38000	33900	31200	31700	33000	31100
9	42700	46200	37500	31600	24100	24700	39300	33500	31100	31900	32300	30700
10	42300	45200	35800	31200	24300	24400	40600	33200	31500	32100	31400	30900
11	44700	45300	36100	31000	24500	24500	41300	32600	31700	30700	31300	30800
12	44200	44700	37800	33000	24400	24600	41600	32700	31500	30600	31500	30900
13	43000	44000	36200	31200	24600	24600	41600	32600	31600	31000	31800	30700
14	42800	44300	35700	28100	24600	24600	41100	32500	31500	31700	31600	30700
15	42700	44100	41200	27000	24500	24500	40400	32200	31000	31900	31500	30800
16	42400	44100	39300	26000	24400	24300	40500	32100	30700	32300	31500	31400
17	43900	45200	38300	25500	24200	24300	40000	32100	31000	32000	31400	32500
18	46000	46700	38200	26500	24000	25000	39300	32200	31300	32000	31200	31600
19	47200	47200	34800	26000	24200	25600	37300	32100	31100	31700	30900	31500
20	48100	48600	32600	25500	24500	26200	36100	32000	31200	31900	31000	31700
21	49200	47500	33400	25000	24400	29400	34500	31900	30800	31600	30700	31600
22	50400	46500	34400	24500	24400	31300	33500	32000	30700	31300	30700	31600
23	51300	46100	34300	24000	24400	33700	32100	31400	30800	31400	30800	31500
24	51700	45500	33900	23500	24400	34900	31600	31200	31000	32000	30800	31400
25	51500	45100	33000	24000	24700	34500	31800	32000	31700	32700	31600	31400
26	51200	46500	31100	24500	24500	36400	31800	33900	31600	31800	31600	31400
27	49400	47600	30900	24600	24700	38700	31400	32300	31100	30900	29900	31400
28	46800	48600	30500	24700	24700	40400	31400	26400	31400	30700	30500	31500
29	46800	48500	30200	24300	---	46600	32800	24300	31400	31000	31200	31500
30	46600	47900	30400	24300	---	46100	33900	22800	31000	31200	30900	31200
31	46600	---	31300	23900	---	44200	---	24700	---	31100	31100	

MISSOURI RIVER MAIN STEM

06486000 MISSOURI RIVER AT SIOUX CITY, IA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year. Daily sediment loads October 1954 to September 1971 in reports of U.S. Army Corps of Engineers. Samples for particle-size distribution were collected from boat cross-section 0.2 mile downstream from gage.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1972 to September 1976, November 1977 to September 1981.

WATER TEMPERATURES: October 1971 to September 1976, November 1977 to September 1981.

SUSPENDED-SEDIMENT DISCHARGE: October 1971 to September 1976.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 950 microsiemens June 17, 19, 1981; minimum daily, 410 microsiemens Mar. 22, 1978.

WATER TEMPERATURES: Maximum daily, 28.0°C July 30, 1976 and Aug. 7, 1979; minimum daily, 0.0°C on many days during the winter periods.

SEDIMENT CONCENTRATIONS: Maximum daily mean, 1,620 mg/L Nov. 20, 1972; minimum daily mean, 42 mg/L Dec. 29, 1975.

SEDIMENT LOADS: Maximum daily, 222,000 tons Nov. 20, 1972; minimum daily, 2,970 tons Dec. 29, 1975.

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	SAMPLE LOC- ATION, CROSS SECTION (FT FM L BANK) (00009)	DEPTH AT SAMPLE LOC- ATION, TOTAL (FEET) (81903)	SAM- PLING DEPTH (FEET) (00003)	STREAM VELOC- ITY, POINT (FPS) (81904)	SEDI- MENT, SUS- PENDED (MG/L) (80154)	SED. SUSP. FALL DIAM. % FINER THAN .004 MM (70338)	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)
OCT												
09...	09...	WATER TEMPERATURE, 16.0° C (1015-1410 HOURS);				DISCHARGE, 42,700 ft ³ /s.						
09...	1015	130	18.6	4.30	3.57	188	--	91	97	100	--	--
09...	1017	130	--	9.30	3.39	190	--	88	97	100	--	--
09...	1019	130	--	13.3	3.07	205	--	84	91	97	100	--
09...	1021	130	--	15.5	2.89	196	--	81	91	100	--	--
09...	1023	130	--	16.7	2.89	252	--	73	84	97	100	--
09...	1025	130	--	17.5	2.46	250	--	68	76	100	--	--
09...	1250	505	21.8	5.00	5.35	152	--	39	55	96	100	--
09...	1253	505	--	10.9	4.83	204	--	35	47	95	100	--
09...	1256	505	--	15.6	4.93	300	--	18	35	93	100	--
09...	1259	505	--	18.2	4.72	275	--	21	35	94	100	--
09...	1302	505	--	19.6	4.44	339	--	17	33	90	100	--
09...	1305	505	--	20.5	4.48	522	--	13	22	80	100	--
09...	1308	505	--	21.0	3.83	370	--	17	30	88	100	--
09...	1325	250	18.2	4.20	4.59	177	--	60	74	98	100	--
09...	1328	250	--	9.10	4.15	184	--	54	72	97	100	--
09...	1331	250	--	13.0	3.76	235	--	47	62	95	100	--
09...	1334	250	--	15.2	3.26	302	--	38	47	86	100	--
09...	1337	250	--	16.4	2.96	380	--	28	36	71	100	--
09...	1340	250	--	17.1	2.59	401	--	27	38	80	100	--
09...	1347	345	20.2	4.70	4.89	--	--	--	--	--	--	--
09...	1349	345	--	10.1	4.63	--	--	--	--	--	--	--
09...	1351	345	--	14.4	4.04	--	--	--	--	--	--	--
09...	1352	345	--	--	--	303	7	13	--	--	--	--
09...	1353	345	--	16.8	3.55	--	--	--	--	--	--	--
09...	1355	345	--	18.2	3.39	--	--	--	--	--	--	--
09...	1357	345	--	19.0	3.28	--	--	--	--	--	--	--
09...	1358	425	22.8	5.30	5.19	172	--	34	56	98	100	--
09...	1400	425	--	11.4	4.85	302	--	22	38	91	100	--
09...	1402	425	--	16.3	4.04	330	--	22	39	94	100	--
09...	1404	425	--	19.0	3.78	599	--	10	23	85	100	--
09...	1406	425	--	20.5	3.57	1200	--	4	16	62	100	--
09...	1408	425	--	21.5	3.35	--	--	--	--	--	--	--
09...	1410	425	--	22.0	3.35	--	--	--	--	--	--	--

06486000 MISSOURI RIVER AT SIOUX CITY, IA--Continued

WATER-QUALITY RECORDS

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	SAMPLE LOC- ATION, CROSS SECTION (FT FM L BANK) (00009)	DEPTH AT SAMPLE LOCATION, TOTAL (FEET) (81903)	SAM- PLING DEPTH (FEET) (00003)	STREAM VELOC- ITY, POINT (FPS) (81904)	SEDI- MENT, SUS- PENDED (MG/L) (80154)	SED. SUSP. FALL DIAM. % FINER THAN .004 MM (70338)	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)
MAY												
07...	0840	WATER TEMPERATURE, 17.0° C (0840-1145 HOURS); DISCHARGE, 33,800 ft ³ /s.										
07...	0840	40.0	20.0	4.60	5.15	91	--	60	84	100	--	--
07...	0844	40.0	--	10.0	4.87	137	--	43	53	87	100	--
07...	0848	40.0	--	14.3	3.83	191	--	33	46	85	100	--
07...	0852	40.0	--	16.7	3.89	216	--	27	42	70	100	--
07...	0856	40.0	--	18.0	3.18	251	--	24	36	69	100	--
07...	0900	40.0	--	18.8	3.09	329	--	16	25	58	100	--
07...	0915	120	21.2	4.90	4.96	151	--	39	62	95	100	--
07...	0918	120	--	10.6	4.70	205	--	27	46	96	100	--
07...	0921	120	--	15.1	4.17	278	--	25	41	95	100	--
07...	0924	120	--	17.7	3.35	361	--	17	30	86	100	--
07...	0927	120	--	19.1	3.15	445	--	14	27	77	100	--
07...	0930	120	--	20.0	2.92	395	--	15	30	84	100	--
07...	0935	120	--	20.4	2.63	422	--	15	29	81	100	--
07...	0950	190	20.2	4.70	4.48	--	--	--	--	--	--	--
07...	0954	190	--	10.1	4.04	--	--	--	--	--	--	--
07...	0958	190	--	14.4	3.24	--	--	--	--	--	--	--
07...	1002	190	--	16.8	3.24	--	--	--	--	--	--	--
07...	1006	190	--	18.2	2.70	--	--	--	--	--	--	--
07...	1010	190	--	19.0	2.09	--	--	--	--	--	--	--
07...	1015	190	--	--	--	405	6	9	--	--	--	--
07...	1020	275	16.8	3.90	4.41	156	--	43	66	100	--	--
07...	1025	275	--	8.40	4.04	237	--	25	50	95	100	--
07...	1030	275	--	12.0	3.61	257	--	25	51	98	100	--
07...	1035	275	--	14.0	3.31	314	--	20	42	90	100	--
07...	1040	275	--	15.1	3.13	367	--	19	42	97	100	--
07...	1045	275	--	15.8	2.42	519	--	13	33	88	100	--
07...	1115	380	12.6	2.90	3.96	131	--	55	75	100	--	--
07...	1120	380	--	6.30	3.24	158	--	39	63	96	100	--
07...	1125	380	--	9.00	3.24	197	--	34	58	97	100	--
07...	1130	380	--	10.5	2.85	251	--	26	46	95	100	--
07...	1135	380	--	11.3	2.46	296	--	26	46	91	100	--
JUN												
11...	0740	WATER TEMPERATURE, 20.5° C (0740-1015 HOURS); DISCHARGE, 31,700 ft ³ /s.										
11...	0740	40.0	19.2	4.40	5.04	101	--	74	86	100	--	--
11...	0744	40.0	--	9.60	4.74	110	--	63	83	97	100	--
11...	0748	40.0	--	13.7	3.83	190	--	41	53	91	100	--
11...	0752	40.0	--	16.0	4.13	188	--	38	52	82	100	--
11...	0756	40.0	--	17.3	3.96	225	--	33	42	79	100	--
11...	0800	40.0	--	18.1	3.55	410	--	17	24	56	98	100
11...	0815	110	19.0	4.40	5.28	177	--	48	61	100	--	--
11...	0819	110	--	9.50	4.98	188	--	46	61	100	--	--
11...	0823	110	--	13.6	4.17	265	--	36	50	98	100	--
11...	0827	110	--	15.8	4.33	314	--	27	44	92	100	--
11...	0831	110	--	17.1	3.65	469	--	15	27	75	100	--
11...	0835	110	--	17.9	3.42	465	--	22	34	80	100	--
11...	0840	185	--	--	--	270	9	14	--	--	--	--
11...	0845	185	19.2	4.40	4.93	--	--	--	--	--	--	--
11...	0850	185	--	9.60	4.30	--	--	--	--	--	--	--
11...	0855	185	--	13.7	3.87	--	--	--	--	--	--	--
11...	0900	185	--	16.0	3.09	--	--	--	--	--	--	--
11...	0905	185	--	17.3	2.53	--	--	--	--	--	--	--
11...	0910	185	--	18.1	2.27	--	--	--	--	--	--	--
11...	0920	260	16.8	3.90	4.63	145	--	59	76	100	--	--
11...	0925	260	--	8.40	4.15	183	--	49	64	100	--	--
11...	0930	260	--	12.0	3.63	185	--	46	63	100	--	--
11...	0935	260	--	14.0	3.31	278	--	33	51	98	100	--
11...	0940	260	--	15.1	2.85	455	--	20	30	82	100	--
11...	0945	260	--	15.8	2.76	597	--	14	23	81	100	--
11...	1000	380	12.2	2.80	3.70	130	--	70	86	100	--	--
11...	1004	380	--	6.10	3.39	158	--	58	71	100	--	--
11...	1008	380	--	8.70	2.96	187	--	50	64	100	--	--
11...	1012	380	--	10.2	2.96	216	--	42	54	98	100	--
11...	1015	380	--	11.0	2.46	268	--	36	50	98	100	--

MISSOURI RIVER MAIN STEM

06486000 MISSOURI RIVER AT SIOUX CITY, IA--Continued

WATER-QUALITY RECORDS

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	SAMPLE LOC- ATION, CROSS SECTION (FT FM L BANK) (000009)	DEPTH AT SAMPLE ATION, TOTAL (FEET) (81903)	SAM- FLING DEPTH (FEET) (000003)	STREAM VELOC- ITY, POINT (FPS) (81904)	SEDI- MENT, SUS- PENDED (MG/L) (80154)	SED. SUSP. FALL DIAM. % FINER THAN .004 MM (70338)	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)
JUL												
30...	0755	145	21.6	5.00	4.98	91	--	90	94	100	--	--
30...	0800	145	--	10.8	4.07	91	--	79	87	100	--	--
30...	0805	145	--	15.4	3.72	106	--	68	76	98	100	--
30...	0810	145	--	18.0	3.50	256	--	33	42	88	100	--
30...	0815	145	--	19.4	3.20	238	--	35	42	85	100	--
30...	0820	145	--	20.3	2.63	499	--	22	27	76	100	--
30...	0825	145	--	20.8	1.50	625	--	15	18	70	99	100
30...	0830	195	20.4	4.70	5.24	99	--	82	90	99	100	--
30...	0835	195	--	10.2	4.76	140	--	64	76	98	100	--
30...	0840	195	--	14.6	4.59	180	--	58	69	100	--	--
30...	0845	195	--	17.0	3.89	195	--	40	54	96	100	--
30...	0850	195	--	18.4	3.72	308	--	39	47	91	100	--
30...	0855	195	--	19.2	3.68	374	--	22	32	94	100	--
30...	0857	255	--	--	--	225	14	21	--	--	--	--
30...	0900	255	19.6	4.50	4.96	--	--	--	--	--	--	--
30...	0905	255	--	9.80	4.63	--	--	--	--	--	--	--
30...	0910	255	--	14.0	4.20	--	--	--	--	--	--	--
30...	0915	255	--	16.3	3.50	--	--	--	--	--	--	--
30...	0920	255	--	17.6	3.59	--	--	--	--	--	--	--
30...	0925	255	--	18.4	2.81	--	--	--	--	--	--	--
30...	0930	350	17.2	4.00	4.59	153	--	66	80	100	--	--
30...	0935	350	--	8.60	4.24	177	--	51	65	98	100	--
30...	0940	350	--	12.3	3.50	253	--	32	50	95	100	--
30...	0945	350	--	14.3	2.76	444	--	19	31	90	100	--
30...	0950	350	--	15.5	2.63	663	--	11	20	80	99	100
30...	0955	350	--	16.2	2.63	1420	--	8	13	70	99	100
30...	1000	475	12.4	2.90	3.94	124	--	57	69	94	100	--
30...	1005	475	--	6.20	3.59	141	--	59	75	100	--	--
30...	1010	475	--	8.90	2.72	182	--	44	56	97	100	--
30...	1015	475	--	10.3	2.63	230	--	34	49	95	100	--
30...	1020	475	--	11.2	2.33	402	--	23	35	86	100	--
SEP												
03...	0745	40.0	22.0	5.10	4.91	75	--	77	89	100	--	--
03...	0750	40.0	--	11.0	4.57	128	--	56	69	96	100	--
03...	0755	40.0	--	15.7	3.65	161	--	35	47	91	100	--
03...	0800	40.0	--	18.3	3.33	386	--	22	30	81	100	--
03...	0805	40.0	--	19.8	2.76	351	--	23	30	77	100	--
03...	0810	40.0	--	20.7	2.18	329	--	18	26	87	100	--
03...	0815	40.0	--	21.2	1.85	384	--	20	28	83	100	--
03...	0830	100	21.2	4.90	4.80	121	--	56	75	100	--	--
03...	0835	100	--	10.6	4.37	126	--	56	68	100	--	--
03...	0840	100	--	15.1	3.65	230	--	41	54	98	100	--
03...	0845	100	--	17.7	3.37	260	--	21	36	94	100	--
03...	0850	100	--	19.1	3.07	352	--	17	30	96	100	--
03...	0855	100	--	20.0	2.68	332	--	22	34	94	100	--
03...	0900	100	--	20.4	2.72	335	--	25	38	95	100	--
03...	0905	180	--	--	--	354	6	15	--	--	--	--
03...	0910	180	18.2	4.20	4.61	--	--	--	--	--	--	--
03...	0914	180	--	9.10	4.15	--	--	--	--	--	--	--
03...	0918	180	--	13.0	3.72	--	--	--	--	--	--	--
03...	0922	180	--	15.2	3.39	253	--	--	--	--	--	--
03...	0926	180	--	16.4	3.18	--	--	--	--	--	--	--
03...	0930	180	--	17.1	2.98	--	--	--	--	--	--	--
03...	0945	265	13.6	3.10	4.37	157	--	50	70	100	--	--
03...	0949	265	--	6.80	4.02	204	--	27	48	95	100	--
03...	0953	265	--	9.70	3.65	302	--	28	46	94	100	--
03...	0956	265	--	11.3	3.42	288	--	22	40	94	100	--
03...	1000	265	--	12.2	3.31	456	--	16	32	91	100	--
03...	1005	265	--	12.8	3.28	358	--	20	39	93	100	--
03...	1020	425	10.2	2.40	3.96	82	--	67	86	94	100	--
03...	1025	425	--	5.10	3.83	130	--	61	75	96	100	--
03...	1030	425	--	7.30	3.28	180	--	37	48	87	100	--
03...	1035	425	--	8.50	3.09	182	--	30	43	76	100	--
03...	1040	425	--	9.20	2.89	303	--	19	27	60	100	--

06486000 MISSOURI RIVER AT SIOUX CITY, IA--Continued

WATER-QUALITY RECORDS

PARTICLE-SIZE DISTRIBUTION OF SURFACE BED MATERIAL, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	NUMBER OF SAM- PLING POINTS	BED MAT. SIEVE DIAM.	BED MAT. SIEVE DIAM.	BED MAT. SIEVE DIAM.	BED MAT. SIEVE DIAM.	BED MAT. SIEVE DIAM.	BED MAT. SIEVE DIAM.	BED MAT. SIEVE DIAM.	BED MAT. SIEVE DIAM.
			% FINER THAN .062 MM (80164)	% FINER THAN .125 MM (80165)	% FINER THAN .250 MM (80166)	% FINER THAN .500 MM (80167)	% FINER THAN 1.00 MM (80168)	% FINER THAN 2.00 MM (80169)	% FINER THAN 4.00 MM (80170)	% FINER THAN 8.00 MM (80171)
OCT 09...	1030	5	0	1	18	90	99	100	--	--
MAY 07...	1200	5	--	0	11	83	96	99	100	--
JUN 11...	1130	5	0	1	10	70	96	99	99	100
JUL 30...	1040	5	--	0	17	79	96	98	99	100
SEP 03...	1155	4	0	1	18	91	99	100	--	--

PERRY CREEK BASIN

06600000 PERRY CREEK AT 38th STREET, SIOUX CITY, IA

LOCATION.--Lat 42°32'08", long 96°24'39", in SE1/4 SE1/4 sec.8, T.89 N., R. 47 W., Woodbury County, Hydrologic Unit 10230001, on left bank at downstream side of bridge on 38th Street in Sioux City, 1.9 mi downstream from West Branch, and 3.6 mi upstream from mouth.

DRAINAGE AREA.--65.1 mi².

PERIOD OF RECORD.--October 1945 to September 1969, June 1981 to current year.

REVISED RECORDS.--WSP 1440: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,112.04 ft above NGVD (city of Sioux City benchmark). Prior to May 20, 1954, nonrecording gage with supplementary water-stage recorder in operation above 5.0 ft gage height and May 20, 1954 to Sept. 30, 1969, water-stage recorder at present site at datum 5.0 ft higher.

REMARKS.--Estimated daily discharges: Nov. 10-15, 18-20, Dec. 5-15, 19-23, 26, Dec. 29 to Jan. 5, Jan. 8-11, 15-28, Feb. 3, 4, 8-10, 16-19, 22, 23, Mar. 30 and May 11-13. Records good except those for estimated daily discharges, which are poor. U. S. National Weather Service gage-height telemeter at station.

AVERAGE DISCHARGE.--30 years (water years 1946-69, 1982-87), 17.4 ft³/s, 3.63 in/yr, 12,610 acre-ft/yr; median of yearly mean discharges, 15 ft³/s, 3.1 in/yr, 10,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,780 ft³/s Sept. 10, 1949, gage height, 26.80 ft, present datum, from rating curve extended above 1,700 ft³/s on basis of slope-area measurement of peak flow; no flow at times in 1946, 1958-60.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of July 7, 1944, reached a stage of about 30.5 ft, from floodmarks, present datum, discharge, 9,600 ft³/s, on basis of contracted-opening measurement of peak flow by U.S. Army Corps of Engineers.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 800 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 25	2315	*1,060	*11.94	No other peak greater than base discharge.			

Minimum discharge 7.8 ft³/s Sept. 26-27.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	28	20	21	14	17	17	75	20	39	16	8.8	9.1
2	23	20	21	12	16	15	54	23	34	15	9.0	9.0
3	35	21	20	12	13	15	51	27	33	15	13	9.0
4	52	20	19	13	14	15	48	43	31	15	11	8.7
5	31	20	18	15	15	15	45	43	30	16	9.7	8.5
6	27	20	19	16	17	17	42	34	28	16	9.8	8.7
7	26	25	19	15	16	18	39	29	26	15	16	11
8	24	41	19	15	14	17	37	24	25	16	23	9.2
9	25	24	15	14	13	16	36	23	24	19	13	9.0
10	25	21	11	12	14	16	34	19	27	42	11	9.0
11	39	19	17	14	15	17	37	15	29	21	10	9.0
12	39	18	14	18	14	18	35	16	26	20	11	9.4
13	29	17	12	17	15	19	39	16	26	17	10	11
14	27	20	14	17	15	20	41	15	22	16	9.8	10
15	27	21	16	14	14	20	36	15	21	15	10	10
16	26	23	17	12	13	19	34	16	20	14	12	18
17	25	23	18	11	12	24	33	15	20	14	14	24
18	24	21	18	11	13	47	31	16	21	19	11	13
19	24	19	16	13	14	40	29	17	21	16	12	9.9
20	23	21	15	10	16	32	28	42	23	14	12	9.5
21	24	23	13	12	14	46	28	194	22	13	11	9.1
22	26	25	15	10	13	41	28	40	19	12	10	8.7
23	27	26	16	9.4	12	283	29	33	18	11	9.3	8.7
24	25	24	17	9.4	15	119	27	32	19	15	9.2	8.7
25	25	24	16	10	14	96	25	142	23	16	13	8.1
26	23	24	16	12	15	74	25	275	19	12	13	7.9
27	23	22	16	14	15	64	24	157	18	11	12	8.1
28	22	22	17	13	16	55	23	62	18	10	11	8.1
29	21	22	17	18	---	37	22	53	17	9.4	11	8.1
30	22	22	15	17	---	31	20	46	16	9.3	10	9.0
31	21	---	17	16	---	69	---	42	---	9.3	9.4	---
TOTAL	838	668	514	415.8	406	1332	1055	1544	715	479.0	355.0	299.5
MEAN	27.0	22.3	16.6	13.4	14.5	43.0	35.2	49.8	23.8	15.5	11.5	9.98
MAX	52	41	21	18	18	283	75	275	39	42	23	24
MIN	21	17	11	9.4	12	15	20	15	16	9.3	8.8	7.9
AC-FT	1660	1320	1020	825	805	2640	2090	3060	1420	950	704	594
CFSM	.42	.34	.25	.21	.22	.66	.54	.77	.37	.24	.18	.15
IN.	.48	.38	.29	.24	.23	.76	.60	.88	.41	.27	.20	.17

CAL YR 1986	TOTAL	13756.0	MEAN	37.7	MAX	1310	MIN	11	AC-FT	27290	CFSM	.58	IN.	7.86
WTR YR 1987	TOTAL	8621.3	MEAN	23.6	MAX	283	MIN	7.9	AC-FT	17100	CFSM	.36	IN.	4.93

FLOYD RIVER BASIN

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06600100 FLOYD RIVER AT ALTON, IA

LOCATION.--Lat 42°58'55", long 96°00'03", in NE1/4 NE1/4 sec.11, T.94 N., R.44 W., Sioux County, Hydrologic Unit 10230002, on left bank 270 ft downstream from South County Road at east edge of Alton, 34.3 mi upstream from West Branch Floyd River, and at mile 58.1.

DRAINAGE AREA.--268 mi².

PERIOD OF RECORD.--October 1955 to current year. Prior to December 1955, monthly discharge only, published in WSP 1730.

REVISED RECORDS.--WDR IA-82-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,269.55 ft above NGVD.

REMARKS.--Estimated daily discharges: Nov. 10-15, 18-27, Dec. 3-18, 20, 21, 25-26, Dec. 29 to Jan. 5, Jan. 8-11, 15-30, Feb. 2-4, 6-11, 15-23 and Mar. 31. Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain-gage and satellite data collection platform at station.

AVERAGE DISCHARGE.--32 years, 72.6 ft³/s, 3.68 in/yr, 52,600 acre-ft/yr; median of yearly mean discharges, 58 ft³/s, 2.8 in/yr, 40,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,300 ft³/s June 20, 1983, gage height 18.54 ft, from flood-mark, from rating curve extended above 8,500 ft³/s; no flow at times in 1956, 1958-59, 1965, 1968, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1953 reached a discharge of about 45,500 ft³/s, from information by U. S. Army Corps of Engineers.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 800 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 24	1845	*1,610	*12.35	No other peak greater than base discharge.			

Minimum discharge, 17 ft³/s Aug. 3.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	231	108	117	54	36	37	455	118	182	43	24	42
2	193	103	115	48	37	30	373	122	167	34	20	37
3	214	104	100	49	35	35	324	123	155	28	81	33
4	315	102	70	52	35	43	295	116	143	25	174	29
5	350	99	90	55	35	51	271	113	136	39	118	25
8	279	99	105	57	38	58	254	113	128	39	85	24
7	236	98	100	57	43	63	239	112	120	71	70	24
8	210	111	94	57	40	62	228	110	112	102	68	24
9	186	122	82	56	40	47	220	111	106	87	72	29
10	172	110	40	54	42	48	209	116	109	74	87	28
11	178	90	94	60	46	60	207	112	116	67	73	25
12	221	88	80	66	50	55	200	105	107	99	61	52
13	249	86	76	62	45	52	192	103	99	150	55	50
14	223	100	74	57	45	53	194	101	91	115	50	42
15	198	115	72	52	41	53	191	91	83	98	44	41
16	179	112	72	42	35	52	184	85	77	81	98	124
17	169	110	76	38	33	54	177	82	73	68	149	308
18	159	105	78	37	34	71	167	82	69	75	150	514
19	151	100	78	37	36	107	160	82	65	103	145	259
20	145	96	74	37	40	124	156	87	70	89	121	185
21	140	98	66	37	50	137	148	113	70	78	105	171
22	139	105	68	37	38	146	146	116	70	157	92	151
23	142	110	70	35	36	632	147	107	61	158	80	135
24	138	115	70	33	34	1470	139	102	60	117	71	125
25	133	120	68	32	29	1180	134	167	78	96	70	114
26	129	115	64	33	29	896	131	390	78	82	71	106
27	126	110	62	35	31	654	127	374	64	69	89	100
28	123	122	64	36	35	518	123	299	55	58	65	81
29	116	119	82	37	---	260	125	253	50	48	61	88
30	111	117	60	38	---	497	120	224	43	39	54	81
31	112	---	60	37	---	200	---	200	---	31	46	---
TOTAL	5667	3189	2401	1417	1068	7745	6036	4428	2837	2420	2529	3063
MEAN	183	106	77.5	45.7	38.1	250	201	143	94.6	78.1	81.6	102
MAX	350	122	117	86	50	1470	455	390	182	158	174	514
MIN	111	88	40	32	29	30	120	82	43	25	20	24
AC-FT	11240	6330	4760	2810	2120	15360	11970	8780	5630	4800	5020	6080
CFSM	.68	.40	.29	.17	.14	.93	.75	.53	.35	.29	.30	.38
IN.	.78	.44	.33	.20	.15	1.08	.84	.61	.39	.34	.35	.43

CAL YR 1986	TOTAL 56352	MEAN 154	MAX 2230	MIN 21	AC-FT 111800	CFSM .58	IN. 7.82
WTR YR 1987	TOTAL 42801	MEAN 117	MAX 1470	MIN 20	AC-FT 84900	CFSM .44	IN. 5.94

FLOYD RIVER BASIN

06600300 WEST BRANCH FLOYD RIVER NEAR STRUBLE, IA

LOCATION.--Lat 42°55'25", long 96°10'34", in NE1/4 NE1/4 sec. 32, T.94 N., R.45 W., Sioux County, Hydrologic Unit 10230002, on left bank near wingwall at downstream side of bridge on county highway B62, 0.1 mi west of U.S. Highway 75, 0.8 mi downstream from Orange City slough, 2.2 mi northeast of Struble, 21.4 mi upstream from Floyd River, and at mile 45.2, upstream from mouth of Floyd River.

DRAINAGE AREA.--180 mi².

PERIOD OF RECORD.--October 1955 to current year. Prior to December 1955, monthly discharge only, published in WSP 1730.

REVISED RECORDS.--WDR IA-82-1: Drainage area, 1978-81 (P).

GAGE.--Water-stage recorder. Datum of gage is 1,239.40 ft above NGVD (State Highway Commission bench mark). Prior to Jan. 5, 1978, at site 721 ft right at old channel at same datum.

REMARKS.--Estimated daily discharges: Nov. 10-24, 27, Dec. 3 to Jan. 12, Jan. 15 to Feb. 6, Feb. 9, 10, 14-20, 22, 23 and Mar. 30. Records good except those for estimated daily discharges, which are poor. U.S. National Weather Service gage-height telemeter at station.

AVERAGE DISCHARGE.--32 years, 47.0 ft³/s, 3.55 in/yr, 34,050 acre-ft/yr; median of yearly mean discharges, 36 ft³/yr, 2.7 in/yr, 26,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,060 ft³/s Mar. 28, 1962, gage height, 15.63 ft; maximum gage height, 15.86 ft June 20, 1983; no flow at times most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 400 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 24	0230	*422	*7.27	No other peak greater than base discharge.			

Minimum discharge, 14.0 ft³/s Sept. 12-15.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	48	46	67	33	32	33	242	75	107	31	26	18
2	46	48	68	29	27	30	211	74	101	33	24	18
3	61	48	58	31	22	30	197	71	95	33	53	18
4	85	48	50	37	25	32	185	68	91	37	51	20
5	84	50	48	45	28	33	174	67	88	94	34	20
6	76	50	56	44	29	33	165	67	83	49	31	18
7	74	51	56	42	35	32	155	65	79	51	31	17
8	67	56	52	40	31	29	149	64	75	45	31	16
9	63	53	44	34	27	26	142	64	75	49	27	18
10	62	47	35	29	30	30	135	66	78	44	25	18
11	63	40	47	31	33	32	131	61	78	41	24	18
12	71	34	42	37	31	28	125	60	74	63	24	16
13	71	31	38	50	33	30	123	60	69	61	24	15
14	69	40	36	46	30	29	123	57	65	52	23	15
15	66	50	36	36	27	28	119	55	59	45	23	23
16	64	54	37	33	25	27	114	55	58	38	53	118
17	61	56	39	30	24	29	110	54	56	35	48	94
18	59	38	40	29	26	38	106	54	54	44	39	57
19	58	37	37	28	29	48	103	54	52	110	38	42
20	58	38	33	27	31	49	96	55	51	75	34	36
21	56	45	30	25	35	52	92	78	51	56	30	33
22	57	52	33	23	31	52	93	62	47	46	26	33
23	57	56	34	22	29	258	92	61	43	43	23	32
24	55	64	37	22	34	405	88	62	42	43	21	30
25	54	67	38	23	32	357	86	113	53	40	24	28
26	53	68	38	24	33	333	84	187	47	37	23	27
27	54	64	42	25	33	297	79	151	43	34	25	26
28	52	69	40	27	34	257	78	137	42	33	24	25
29	50	67	36	29	---	189	78	127	39	31	24	26
30	50	67	33	31	---	150	75	120	34	29	20	25
31	49	---	38	33	---	247	---	113	---	27	19	---
TOTAL	1893	1534	1318	995	836	3243	3750	2457	1929	1449	922	900
MEAN	61.1	51.1	42.5	32.1	29.9	105	125	79.3	64.3	46.7	29.7	30.0
MAX	85	69	68	50	35	405	242	187	107	110	53	118
MIN	46	31	30	22	22	26	75	54	34	27	19	15
AC-FT	3750	3040	2610	1970	1660	6430	7440	4870	3830	2870	1830	1790
CFSM	.34	.28	.24	.18	.17	.58	.69	.44	.36	.26	.17	.17
IN.	.39	.32	.27	.21	.17	.67	.77	.51	.40	.30	.19	.19

CAL YR 1986	TOTAL 33893	MEAN 92.9	MAX 3090	MIN 22	AC-FT 67230	CFSM .52	IN. 7.00
WTR YR 1987	TOTAL 21226	MEAN 58.2	MAX 405	MIN 15	AC-FT 42100	CFSM .32	IN. 4.39

FLOYD RIVER BASIN

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06600500 FLOYD RIVER AT JAMES, IA

LOCATION.--Lat 42°34'36", long 96°18'43", in SE1/4 SE1/4 sec.30, T.90 N., R.46 W., Plymouth County, Hydrologic Unit 10230002, on right bank at downstream side of bridge on county highway C70, 0.2 mi east of James, 14.3 mi downstream from West Branch Floyd River, and at mile 7.5.

DRAINAGE AREA.--886 mi².

PERIOD OF RECORD.--December 1934 to current year.

REVISED RECORDS.--WSP 1240: 1935 (M), 1936, 1937-38 (M), 1942, 1945. WSP 1440: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,092.59 ft above NGVD. Prior to Sept. 11, 1938, June 9 to Nov. 5, 1953, and Oct. 1, 1955, to May 22, 1957, nonrecording gage and May 23, 1957, to Sept. 30, 1970, water-stage recorder at same site at datum 10.0 ft higher.

REMARKS.--Estimated daily discharges: Nov. 9-25, Dec. 3 to Jan. 13, Jan. 16 to Feb. 6, Feb. 15-20 and Mar. 30. Records good except those for estimated daily discharges, which are poor. U. S. Army Corps of Engineers rain-gage and satellite data collection platform at station.

AVERAGE DISCHARGE.--52 years (water years 1936-87), 225 ft³/s, 3.45 in/yr, 163,000 acre-ft/yr; median of yearly mean discharges, 160 ft³/s, 2.4 in/yr, 116,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 71,500 ft³/s June 8, 1953, gage height, 25.3 ft, from flood-marks, datum then in use, from rating curve extended above 16,000 ft³/s on basis of contracted-opening and flow-over-embankment measurement of peak flow; minimum daily discharge, 0.90 ft³/s Jan. 10-22, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage and discharge since 1892, that of June 8, 1953, from information by U. S. Army Corps of Engineers.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 25	1345	*2,700	*15.04	No other peak greater than base discharge.			

Minimum discharge, 128 ft³/s Sept. 12.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	523	328	315	210	210	183	1420	402	677	230	178	167
2	433	317	315	200	210	176	1240	404	615	218	169	157
3	437	315	290	205	200	171	1080	422	575	214	165	152
4	551	314	230	210	210	175	995	432	531	204	222	147
5	662	313	200	220	230	188	925	406	507	416	298	145
6	660	312	210	220	300	202	868	384	478	753	274	147
7	575	315	250	215	397	207	823	376	449	504	235	142
8	513	365	260	220	320	208	776	362	421	382	252	137
9	468	350	210	215	189	195	746	352	402	398	219	135
10	436	300	160	200	191	185	720	346	400	405	202	137
11	448	240	250	210	202	194	710	347	414	332	202	140
12	511	230	240	260	201	204	686	325	404	308	197	139
13	540	220	230	350	199	202	668	315	384	333	188	143
14	565	230	220	465	191	201	662	309	363	378	178	149
15	523	270	210	419	170	205	649	306	340	350	172	147
16	487	310	210	250	150	203	627	293	318	311	177	191
17	459	350	210	230	150	207	603	287	306	279	248	493
18	439	300	220	210	160	242	581	285	305	270	286	525
19	417	260	200	200	170	295	557	290	301	626	291	649
20	403	250	200	190	180	340	544	317	296	577	294	451
21	393	270	200	190	196	381	530	527	268	397	268	365
22	391	300	205	170	190	398	508	436	213	334	242	328
23	406	320	215	140	173	1160	508	400	266	348	223	303
24	394	360	215	145	179	2450	494	384	256	376	205	273
25	387	380	220	150	176	2630	473	519	302	341	208	254
26	375	339	220	155	170	2180	460	1490	328	298	211	239
27	368	332	225	165	169	1850	439	1220	300	265	210	226
28	361	349	225	180	175	1520	427	1010	275	240	208	216
29	352	338	225	190	---	1020	419	883	265	222	199	212
30	342	323	215	200	---	740	414	805	250	203	186	212
31	330	---	220	210	---	1390	---	737	---	189	176	---
TOTAL	14149	9200	7015	6794	5658	19902	20552	15371	11209	10701	6783	7121
MEAN	456	307	226	219	202	642	685	496	374	345	219	237
MAX	662	380	315	465	397	2630	1420	1490	677	753	298	649
MIN	330	220	160	140	150	171	414	285	213	189	165	135
AC-FT	28060	18250	13910	13480	11220	39480	40760	30490	22230	21230	13450	14120
CFSM	.52	.35	.26	.25	.23	.72	.77	.56	.42	.39	.25	.27
IN.	.59	.39	.29	.29	.24	.84	.86	.65	.47	.45	.28	.30

CAL YR 1986	TOTAL 178539	MEAN 489	MAX 6920	MIN 131	AC-FT 354100	CFSM .55	IN. 7.50
WTR YR 1987	TOTAL 134455	MEAN 368	MAX 2630	MIN 135	AC-FT 266700	CFSM .42	IN. 5.65

MONONA-HARRISON DITCH BASIN

06602020 WEST FORK DITCH AT HORNICK, IA

LOCATION.--Lat 42°13'37", long 96°04'40", in SW1/4 sec.27, T.86 N., R.45 W., Woodbury County, Hydrologic Unit 10230004, on left bank at upstream side of State Highway 141 bridge, 1.0 mi east of Hornick, 9.2 mi upstream from Wolf Creek, and 13.5 mi north of Onawa.

DRAINAGE AREA.--403 mi².

PERIOD OF RECORD.--April 1939 to September 1969 (published as "at Holly Springs"), July 1974 to current year.

REVISED RECORDS.--WSP 1240: 1943, 1945 (M). WSP 1310: 1941 (M) 1944-46 (M). WSP 1440: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,045.82 ft above NGVD. Prior to June 16, 1959, nonrecording gage at site 3.0 mi upstream and June 16, 1959 to Sept. 30, 1969, recording gage at site 2.2 mi upstream at datum 7.0 ft higher.

REMARKS.--Estimated daily discharges: Nov. 11-24, Dec. 5 to Jan. 12, Jan. 16 to Feb. 4, Feb. 6-8 and 15-19. Records good except those for estimated daily discharges, which are poor. West Fork ditch is a dredged channel which diverts flow of West Fork Little Sioux River at Holly Springs 5.5 mi south, then southeast 6.5 mi to a point 1.2 mi west of Kennebec, where Wolf Creek enters from left. From this point, ditch roughly parallels the Little Sioux River and is known as Monona-Harrison ditch. U.S. National Weather Service gage-height telemeter at station.

AVERAGE DISCHARGE.--43 years (water years 1940-69, 1975-87), 111 ft³/s, 3.74 in/yr, 80,420 acre-ft/yr; median of yearly mean discharges, 94 ft³/s, 3.2 in/yr, 68,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,400 ft³/s Mar. 28, 1962, gage height, 22.46 ft, site and datum then in use; maximum gage height, 25.2 ft Mar. 30, 1960, from floodmark, site and datum then in use; minimum daily discharge, 0.2 ft³/s July 30, Aug. 17, 1956.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,800 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
July 19	1240	*1,430	*13.19				

Minimum daily discharge, 68 ft³/s, Jan. 23-24.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	109	146	144	105	96	91	605	181	210	103	118	83
2	108	143	146	105	94	88	595	184	193	101	114	81
3	125	144	142	105	84	86	534	205	183	99	108	79
4	174	144	139	110	80	89	484	207	176	98	106	78
5	179	143	100	115	90	89	449	206	170	119	105	75
6	156	144	135	110	100	92	418	203	164	434	102	76
7	143	144	150	105	105	92	380	198	158	330	103	75
8	136	159	140	100	94	92	353	192	152	271	142	74
9	129	164	120	95	85	91	329	188	148	188	141	72
10	125	151	92	90	90	88	308	182	149	259	118	72
11	145	130	70	96	96	91	299	175	157	180	107	71
12	285	110	150	110	95	93	296	170	153	180	102	70
13	246	115	145	119	90	91	283	168	144	152	101	71
14	201	145	145	115	90	90	289	166	138	137	100	73
15	183	150	145	108	84	93	289	149	132	132	104	77
16	171	155	140	96	74	95	280	156	126	128	103	86
17	166	155	140	88	70	94	267	153	124	118	98	120
18	163	150	140	92	74	105	256	150	123	113	126	140
19	160	145	140	90	80	131	247	136	124	809	120	112
20	158	140	135	89	90	131	234	162	131	503	108	102
21	156	140	135	88	87	134	227	177	130	264	102	97
22	153	140	130	78	87	136	223	220	123	213	98	94
23	159	145	130	68	84	735	230	178	117	209	92	92
24	158	150	125	68	86	1240	226	170	117	197	89	91
25	157	155	125	70	86	860	214	185	122	186	96	89
26	156	156	120	70	84	675	209	212	133	168	104	87
27	156	148	120	72	85	546	201	290	116	150	100	86
28	154	148	120	76	88	469	195	282	112	141	96	83
29	151	145	115	82	---	238	193	244	111	136	95	82
30	148	145	115	86	---	220	186	249	107	129	91	81
31	146	---	110	92	---	533	---	231	---	123	86	---
TOTAL	4956	4349	4003	2893	2448	7698	9299	5969	4243	6370	3275	2569
MEAN	160	145	129	93.3	87.4	248	310	193	141	205	106	85.6
MAX	285	164	150	119	105	1240	605	290	210	809	142	140
MIN	108	110	70	68	70	86	186	136	107	98	86	70
AC-FT	9830	8630	7940	5740	4860	15270	18440	11840	8420	12630	6500	5100
CFSM	.40	.36	.32	.23	.22	.62	.77	.48	.35	.51	.26	.21
IN.	.46	.40	.37	.27	.23	.71	.86	.55	.39	.59	.30	.24

CAL YR 1986	TOTAL 82339	MEAN 226	MAX 6690	MIN 65	AC-FT 163300	CFSM .56	IN. 7.60
WTR YR 1987	TOTAL 58072	MEAN 159	MAX 1240	MIN 68	AC-FT 115200	CFSM .39	IN. 5.36

MONONA-HARRISON DITCH BASIN

193

06602400 MONONA-HARRISON DITCH NEAR TURIN, IA

LOCATION.--Lat 41°57'52", long 95°59'30", in NW1/4 NE1/4 sec.32, T.83 N., R.44 W., Monona County, Hydrologic Unit 10230004, on left pier at downstream side of bridge on county highway E54, 1.0 mi west of gaging station on Little Sioux River near Turin, 4 mi southwest of Turin, 5.2 mi northeast of Blencoe, and 12.5 mi upstream from mouth.

DRAINAGE AREA.--900 mi².

PERIOD OF RECORD.--April 1939 to current year. Records for April 1939 to January 1958 not equivalent owing to diversion from Little Sioux River through equalizer ditch 1.5 mi upstream. Prior to May 1942, published as "near Blencoe".

GAGE.--Water-stage recorder. Datum of gage is 1,015.00 ft above NGVD (U. S. Army Corps of Engineers bench mark). Prior to May 7, 1942, nonrecording gage at site 4.8 mi downstream at datum 5.40 ft lower. May 7, 1942 to Oct. 13, 1953, nonrecording gage and Oct. 14, 1953 to Sept. 30, 1975, recording gage at same site at datum 5.00 ft higher.

REMARKS.--Estimated daily discharges: Jan. 18-26. Records good except those for estimated daily discharges, which are poor. Monona-Harrison ditch is a dug channel and is a continuation of West Fork ditch, paralleling the Little Sioux River, and discharging into the Missouri River 1.5 mi upstream from the mouth of the Little Sioux River. U. S. Army Corps of Engineers rain-gage and satellite data collection platform at station.

AVERAGE DISCHARGE.--29 years (water years 1959-87), 254 ft³/s, 3.83 in/yr, 184,000 acre-ft/yr; median of yearly mean discharges, 200 ft³/s, 3.0 in/yr, 145,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 19,900 ft³/s Feb. 19, 1971, gage height, 28.03 ft, present datum; minimum daily discharge, 8.5 ft³/s Jan. 3-11, 1959.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 24	0400	*4,740	*16.30	No other peak greater than base discharge.			

Minimum discharge, 57 ft³/s Jan. 11, result of freezeup.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	227	227	230	170	175	168	1070	314	566	203	202	175
2	221	224	230	143	180	161	1350	319	457	196	191	173
3	234	232	224	136	179	148	1810	612	402	188	187	169
4	340	226	191	168	153	149	1930	572	376	184	194	167
5	393	224	135	182	153	152	1680	625	360	220	189	160
6	329	228	197	189	178	159	1310	454	348	568	178	161
7	299	231	244	180	178	163	1030	393	329	751	177	171
8	282	257	229	170	184	160	844	356	309	566	260	161
9	267	293	207	159	161	150	744	337	300	440	306	156
10	258	245	177	116	157	140	675	316	302	1490	247	151
11	318	150	160	118	178	142	617	299	327	1660	217	153
12	993	171	207	149	182	152	604	280	321	1170	230	149
13	796	280	252	229	170	156	576	278	292	712	326	148
14	499	290	172	193	174	153	612	266	273	449	238	154
15	392	228	177	169	160	154	735	244	257	347	265	158
16	340	233	184	139	129	166	620	250	250	310	385	177
17	309	236	195	91	125	163	553	242	245	275	315	264
18	285	233	194	120	138	182	518	234	236	254	312	283
19	266	225	189	140	148	262	502	222	240	645	339	220
20	256	221	181	130	162	268	457	287	261	976	320	190
21	256	234	170	130	155	263	426	359	256	545	271	178
22	254	258	165	120	151	289	415	429	239	527	229	171
23	260	282	178	110	139	2780	435	350	225	386	198	166
24	272	256	182	115	151	4490	437	311	285	329	183	164
25	303	265	179	130	148	3200	413	396	600	538	260	161
26	303	262	171	135	142	2190	392	1170	371	420	540	157
27	279	241	177	128	149	1490	377	1730	263	286	327	155
28	263	247	190	137	157	1120	361	1110	230	254	246	148
29	249	235	181	140	---	497	351	701	226	238	219	141
30	240	232	168	153	---	279	335	574	218	225	202	139
31	236	---	168	170	---	825	---	603	---	211	184	---
TOTAL	10219	7166	5904	4559	4456	20771	22179	14633	9364	15563	7937	5120
MEAN	330	239	190	147	159	670	739	472	312	502	256	171
MAX	993	293	252	229	184	4490	1930	1730	600	1660	540	283
MIN	221	150	135	91	125	140	335	222	218	184	177	139
AC-FT	20270	14210	11710	9040	8840	41200	43990	29020	18570	30870	15740	10160
CFSM	.37	.27	.21	.16	.18	.74	.82	.52	.35	.56	.28	.19
IN.	.42	.30	.24	.19	.18	.86	.92	.60	.39	.64	.33	.21

CAL YR 1986	TOTAL 158553	MEAN 434	MAX 6620	MIN 95	AC-FT 314500	CFSM .48	IN. 6.55
WTR YR 1987	TOTAL 127871	MEAN 350	MAX 4490	MIN 91	AC-FT 253600	CFSM .39	IN. 5.29

LITTLE SIOUX RIVER BASIN

195

06605000 OCHEYEDAN RIVER NEAR SPENCER, IA

LOCATION.--Lat 43°07'44", long 95°12'37", in SW1/4SW1/4 sec.15, T.96N., R.37W., Clay County, Hydrologic Unit 10230003, on left bank 3 ft downstream from bridge on county highway M38, 3.4 mi west by southwest of Spencer, and at mile 4.1.

DRAINAGE AREA.--426 mi².

PERIOD OF RECORD.--October 1977 to current year. Occasional low-flow measurements, water years 1957-61, 1964, 1966-68, 1970, 1971, 1974-77.

GAGE.--Water-stage recorder. Datum of gage is 1,311.66 ft above NGVD.

REMARKS.--Estimated daily discharges: Nov. 11-20 and Dec. 5 to Feb. 20. Records good except those for estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--10 years, 263 ft³/s, 8.38 in/yr, 190,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,450 ft³/s June 21, 1983, gage height, 10.49 ft; no flow Jan. 24 to Mar. 9, 1979.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 8, 1953 reached a stage of 12.89 ft, discharge, 26,000 ft³/s on basis of contracted-opening measurement of peak flow.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,700 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 25	0545	7,190	8.59	Sept. 18	1645	*3,230	*9.31

Minimum discharge, 52 ft³/s July 4.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	326	234	212	130	55	94	715	207	256	63	119	71
2	300	226	214	120	55	93	629	205	232	59	109	68
3	363	228	211	125	55	96	581	204	212	56	117	64
4	535	226	208	130	56	102	546	196	194	53	257	62
5	566	221	200	130	56	116	517	184	182	58	162	64
6	467	220	190	125	60	129	492	181	169	66	130	67
7	417	216	180	120	62	139	470	176	159	83	112	72
8	381	243	175	115	65	133	449	171	150	111	112	71
9	347	230	170	110	68	125	430	161	140	353	152	67
10	332	190	160	110	74	121	410	154	141	355	173	64
11	356	145	150	110	78	122	395	146	149	284	139	75
12	516	155	140	120	80	124	382	135	143	432	121	73
13	518	150	135	125	84	120	371	132	136	467	115	69
14	458	190	170	130	88	126	391	138	127	346	108	76
15	408	240	190	98	90	123	402	125	116	286	102	842
16	379	250	185	74	100	128	394	120	109	245	181	1380
17	352	260	180	76	140	125	375	120	106	208	260	1940
18	330	265	180	76	130	153	347	119	102	184	206	2920
19	315	290	175	74	135	198	326	119	98	190	166	1980
20	305	330	170	72	140	244	314	119	98	185	142	1000
21	296	322	160	72	98	254	299	192	96	400	128	780
22	288	348	160	64	99	282	288	208	90	828	113	657
23	285	335	150	56	105	776	289	183	85	572	102	578
24	278	290	140	55	97	1760	273	170	79	407	95	519
25	273	207	130	55	92	2060	259	179	93	333	98	466
26	267	223	125	55	93	1860	254	344	89	289	100	426
27	262	225	120	55	93	1450	246	421	81	245	97	392
28	257	220	120	55	96	1110	230	378	75	204	94	360
29	247	217	120	55	---	853	226	334	74	175	88	332
30	239	215	120	55	---	788	220	302	68	151	81	312
31	248	---	125	55	---	724	---	277	---	133	75	---
TOTAL	10911	7111	5065	2802	2444	14528	11520	6100	3849	7821	4054	15847
MEAN	352	237	163	90.4	87.3	469	384	197	128	252	131	528
MAX	566	348	214	130	140	2060	715	421	256	828	260	2920
MIN	239	145	120	55	55	93	220	119	68	53	75	62
AC-FT	21640	14100	10050	5560	4850	28820	22850	12100	7630	15510	8040	31430
CFSM	.83	.56	.38	.21	.20	1.10	.90	.46	.30	.59	.31	1.24
IN.	.95	.62	.44	.24	.21	1.27	1.01	.53	.34	.68	.35	1.38

CAL YR 1986 TOTAL 127606 MEAN 350 MAX 4080 MIN 66 AC-FT 253100 CFSM .82 IN. 11.1
WTR YR 1987 TOTAL 92052 MEAN 252 MAX 2920 MIN 53 AC-FT 182600 CFSM .59 IN. 8.04

LITTLE SIOUX RIVER BASIN

06605850 LITTLE SIOUX RIVER AT LINN GROVE, IA

LOCATION.--Lat 42°53'24", long 95°14'30", in SW1/4 SW1/4 sec.5, T.93 N., R.37 W., Buena Vista County, Hydrologic Unit 10230003, on right bank at downstream side of bridge on State Highway 264, in Linn Grove, and at mile 123.7.

DRAINAGE AREA.--1,548 mi².

PERIOD OF RECORD.--October 1972 to current year.

REVISED RECORDS.--WDR IA-80-1: 1978-79.

GAGE.--Water-stage recorder. Datum of gage is 1,223.60 ft above NGVD.

REMARKS.--Estimated daily discharges: Oct. 12-14, Nov. 11-17, Dec. 2 to Feb. 9 and Feb. 14-21. Records good except those for estimated daily discharges, which are poor. Records fair for periods of Aug. 8 to Sept. 17 due to repairs to dam upstream of bridge. U.S. Army Corps of Engineers rain-gage and satellite data collection platform at station.

AVERAGE DISCHARGE.--15 years, 754 ft³/s, 6.62 in/yr, 546,300 acre-ft/yr; median of yearly mean discharges, 700 ft³/s, 6.1 in/yr, 507,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,100 ft³/s June 17, 1984, gage height, 19.58 ft; maximum gage height, 19.58 ft June 17, 1984; minimum daily discharge, 0.70 ft³/s Feb. 4, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 15	1200	2,290	11.67	July 17	1245	2,560	12.30
Mar. 28	1830	*3,720	*14.52	July 24	2330	2,460	12.03
May 29	0115	1,510	9.30	Sept. 21	2315	2,770	12.75

Minimum daily discharge, 183 ft³/s Sept. 13.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1130	842	753	250	245	240	2920	693	1140	229	669	258
2	1030	808	740	255	250	236	2890	671	1020	221	600	261
3	1100	797	700	260	250	233	2710	645	906	204	555	230
4	1380	776	610	260	250	239	2480	676	820	188	525	206
5	1630	755	480	270	255	266	2230	659	746	201	640	204
6	1730	740	470	275	255	297	1990	628	684	205	641	205
7	1430	724	440	265	260	341	1790	605	623	242	560	206
8	1460	756	430	260	275	367	1640	583	562	390	556	205
9	1350	830	420	250	290	375	1520	557	518	824	549	227
10	1260	840	410	245	274	361	1430	533	494	1270	554	216
11	1200	680	390	240	280	358	1360	506	488	1480	595	214
12	1350	510	370	260	296	342	1320	475	484	1620	553	210
13	1700	450	360	270	302	336	1280	455	463	1680	506	183
14	1950	520	370	290	280	329	1290	440	431	1620	484	197
15	2300	680	400	245	260	327	1380	439	398	2070	448	413
16	2020	700	380	250	220	325	1440	421	366	2380	467	920
17	1740	710	370	250	210	322	1420	404	344	2540	489	1550
18	1540	718	350	245	220	332	1340	394	327	2440	616	1910
19	1410	697	345	245	240	414	1240	378	322	2200	593	2140
20	1320	662	340	240	260	565	1140	374	310	1870	524	2360
21	1240	701	330	240	265	686	1060	402	305	1870	468	2650
22	1190	673	340	240	260	766	1020	624	295	2200	425	2680
23	1140	700	320	220	242	909	1020	845	282	2360	389	1920
24	1110	738	310	205	240	1370	976	774	275	2420	360	1360
25	1080	716	300	215	236	1840	920	714	269	2420	347	1170
26	1060	754	290	225	237	2300	863	861	284	1990	341	1050
27	1010	762	280	230	225	3010	822	1210	282	1450	344	953
28	980	766	275	240	227	3610	789	1440	269	1170	334	870
29	938	770	270	240	---	3610	762	1500	258	993	320	797
30	895	766	260	240	---	3200	721	1410	245	860	312	736
31	868	---	255	240	---	2930	---	1280	---	756	283	---
TOTAL	41541	21541	12358	7660	7104	30836	43763	21596	14210	42563	15047	26501
MEAN	1340	718	399	247	254	995	1459	697	474	1373	485	883
MAX	2300	842	753	290	302	3610	2920	1500	1140	2540	669	2680
MIN	868	450	255	205	210	233	721	374	245	188	283	183
AC-FT	82400	42730	24510	15190	14090	61160	86800	42840	28190	84420	29850	52560
CFSM	.87	.46	.26	.16	.16	.64	.94	.45	.31	.89	.31	.57
IN.	.99	.52	.30	.18	.17	.74	1.05	.52	.34	1.02	.36	.64

CAL YR 1986 TOTAL 454158 MEAN 1244 MAX 5120 MIN 205 AC-FT 900800 CFSM .80 IN. 10.9
WTR YR 1987 TOTAL 284720 MEAN 780 MAX 3610 MIN 183 AC-FT 564700 CFSM .50 IN. 6.84

LITTLE SIOUX RIVER BASIN

197

06606600 LITTLE SIOUX RIVER AT CORRECTIONVILLE, IA

LOCATION.--Lat 42°28'20", long 95°47'49", in NE1/4 NW1/4 sec.1, T.88 N., R.43 W., Woodbury County, Hydrologic Unit 10230003 on right bank 50 ft upstream from bridge on State Highway 31, 0.3 mi upstream from Bacon Creek, 0.5 mi west of Correctionville, 0.8 mi downstream from Pierson Creek, and at mile 56.0.

DRAINAGE AREA.--2,500 mi².

PERIOD OF RECORD.--May 1918 to July 1925, October 1928 to July 1932, June 1936 to current year. Monthly discharge only for some periods, published in WSP 1310.

REVISED RECORDS.--WSP 856: 1919. WSP 1240: 1924-25, 1931, 1932 (M), 1937, 1945 (M), 1947 (M), 1949 (M). WSP 1440: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,096.49 ft above NGVD. May 28, 1918, to July 1, 1925 and Oct. 29, 1928 to July 15, 1929, nonrecording gage 0.2 mi downstream at datum 1.25 ft lower. July 16, 1929, to July 2, 1932, and June 15, 1936, to Nov. 7, 1938, nonrecording gage at present site and datum.

REMARKS.--Estimated daily discharges: Nov. 10-24, Dec. 4 to Jan. 12, Jan. 15 to Feb. 7 and Feb. 16-21. Records good except those for estimated daily discharges, which are poor. U. S. Army Corps of Engineers rain-gage and satellite data collection platform at station.

AVERAGE DISCHARGE.--60 years (water years 1919-24, 1927-31, 1937-87), 834 ft³/s, 4.53 in/yr, 604,200 acre-ft/yr; median of yearly mean discharges, 710 ft³/s, 3.9 in/yr, 514,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 29,800 ft³/s Apr. 7, 1965, gage height, 25.86 ft; minimum daily discharge, 2.6 ft³/s July 17, 25, 1936, caused by construction dam above gage; minimum daily discharge excluding regulation, 4.0 ft³/s Oct. 9, 12, 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 23 or 24, 1891, reached a stage of 29.34 ft, present datum, from levels to floodmark by U.S. Soil Conservation Service (discharge not determined).

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Apr. 1	0030	5,230	13.92	July 21	1545	4,480	12.94
July 19	1145	*5,420	*14.16				

Minimum daily discharge, 440 ft³/s Jan. 24, 25 and Feb. 18.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1680	1390	1230	500	520	525	5140	1350	2120	601	1400	627
2	1660	1360	1220	520	540	517	4930	1320	1970	565	1270	589
3	1670	1320	1200	520	520	512	4750	1400	1810	533	1170	555
4	1850	1280	1000	520	520	526	4580	1290	1610	513	1110	545
5	2120	1260	940	540	500	550	4270	1240	1460	548	1040	513
6	2410	1230	940	540	520	588	3880	1240	1370	841	1030	495
7	2520	1220	940	540	540	635	3480	1190	1280	877	1130	477
8	2540	1240	860	520	577	677	3120	1150	1190	762	1220	473
9	2400	1250	750	500	566	700	2860	1110	1110	868	1150	467
10	2150	1200	700	500	568	686	2650	1080	1040	1150	1050	462
11	2090	1100	760	560	579	676	2540	1060	1000	1510	1000	469
12	2420	860	740	600	590	679	2430	1000	976	2330	989	471
13	2840	680	700	618	594	671	2330	956	942	2080	1050	495
14	3140	740	700	633	622	654	2310	924	901	2190	964	487
15	3270	860	720	580	601	663	2300	897	853	2240	896	528
16	3260	1000	700	520	480	649	2300	863	804	2360	918	735
17	3050	1200	700	500	450	635	2350	846	763	2590	959	1820
18	2680	1160	680	490	440	678	2330	821	722	2930	1040	3250
19	2370	1030	660	490	470	736	2230	821	728	5020	1090	3040
20	2180	1000	640	490	500	796	2110	836	924	3560	1100	2750
21	2040	1050	640	520	530	931	1980	942	911	3870	1040	2830
22	1940	1100	640	480	561	1090	1890	950	789	3840	952	3010
23	1880	1120	620	450	553	1810	1820	945	744	3780	874	3200
24	1810	1150	600	440	539	3360	1790	1130	692	3570	807	2960
25	1780	1210	580	440	531	4070	1760	1280	747	3440	790	2130
26	1740	1250	560	450	508	4020	1650	1450	747	3370	797	1800
27	1650	1270	560	450	505	4120	1570	1540	737	3070	760	1600
28	1600	1290	540	460	511	4270	1490	1840	694	2420	736	1470
29	1540	1250	540	480	---	4350	1440	2080	668	1990	715	1350
30	1490	1240	520	490	---	4520	1390	2190	635	1750	685	1260
31	1430	---	520	500	---	5070	---	2210	---	1550	655	---
TOTAL	67200	34310	23100	15841	14935	50364	79670	37951	30937	66718	30387	40858
MEAN	2168	1144	745	511	533	1625	2656	1224	1031	2152	980	1362
MAX	3270	1390	1230	633	622	5070	5140	2210	2120	5020	1400	3250
MIN	1430	680	520	440	440	512	1390	821	635	513	655	462
AC-FT	133300	68050	45820	31420	29620	99900	158000	75280	61360	132300	60270	81040
CFSM	.87	.46	.30	.20	.21	.65	1.06	.49	.41	.86	.39	.54
IN.	1.00	.51	.34	.24	.22	.75	1.19	.56	.46	.98	.45	.61

CAL YR 1986	TOTAL 730693	MEAN 2002	MAX 8520	MIN 320	AC-FT 1449000	CFSM .80	IN. 10.9
WTR YR 1987	TOTAL 492271	MEAN 1349	MAX 5140	MIN 440	AC-FT 976400	CFSM .54	IN. 7.32

LITTLE SIOUX RIVER BASIN

06607200 MAPLE RIVER AT MAPLETON, IA

LOCATION.--Lat 42°09'25", long 95°48'35", in SE1/4 SE1/4 sec. 23, T.85 N., R.43 W., Monona County, Hydrologic Unit 10230005, on right bank at downstream side of bridge on State Highway 175, 1.0 mi downstream from Simmons Creek, 1.1 mi southwest of intersection of State Highways 175 and 141 in Mapleton, 2.1 mi upstream from McCleery Creek, and 16.0 mi upstream from mouth.

DRAINAGE AREA.--669 mi².

PERIOD OF RECORD.--October 1941 to current year.

REVISED RECORDS.--WSP 1310: 1942 (M), 1946 (M), 1948 (M). WSP 1440: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,085.86 ft above NGVD. See WSP 1730 for history of changes prior to Sept. 20, 1956.

REMARKS.--Estimated daily discharges: Nov. 10-24, Dec. 4 to Feb. 6 and Feb. 12-19. Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain-gage and satellite data collection platform at station.

AVERAGE DISCHARGE.--46 years, 270 ft³/s, 5.48 in/yr, 195,600 acre-ft/yr; median of yearly mean discharges, 240 ft³/s, 4.9 in/yr, 174,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 20,800 ft³/s Sept. 12, 1978, gage height, 16.74 ft; maximum gage-height, 22.1 ft June 12, 1950; no flow Sept. 21, 22, 1945 caused by temporary dam above gage; minimum daily discharge excluding regulation, 2.5 ft³/s Feb. 17-20, 1959.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
July 12	1800	*3,440	*6.81				

Minimum discharge, 99 ft³/s, Dec. 10, result of freezeup.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	260	336	295	180	200	193	790	458	690	344	522	409
2	247	326	297	180	200	184	854	462	643	332	492	394
3	249	324	293	180	180	178	883	594	599	323	466	379
4	269	325	260	190	190	184	917	499	564	314	452	368
5	337	325	250	190	200	203	980	468	546	341	432	354
6	373	325	280	190	220	228	1080	454	528	430	410	345
7	335	324	300	180	257	234	997	444	509	464	412	338
8	305	388	280	180	216	233	909	428	492	472	548	337
9	286	384	220	175	181	222	828	417	479	491	621	323
10	274	330	160	170	184	203	743	407	475	650	519	316
11	382	280	100	175	190	197	716	395	483	594	458	312
12	799	240	290	200	180	201	674	380	473	2870	1090	307
13	837	230	280	250	170	198	644	380	455	1770	1540	300
14	670	290	270	310	170	201	698	376	438	1030	704	307
15	557	340	260	250	160	223	873	364	421	1020	588	320
16	495	350	250	210	130	250	906	352	405	735	927	540
17	453	350	240	180	130	239	833	345	391	652	675	1210
18	425	330	240	170	140	259	780	344	377	798	999	1270
19	402	320	240	160	150	305	740	345	386	2040	810	877
20	388	300	230	160	173	335	709	358	402	1690	694	695
21	375	320	220	160	173	345	699	505	556	1760	613	623
22	371	340	210	150	173	350	741	443	475	2480	549	571
23	385	360	200	120	165	631	788	422	450	1730	503	539
24	435	370	200	120	167	689	700	408	441	1310	474	515
25	438	352	200	130	163	779	660	669	502	1090	524	491
26	426	335	190	140	161	720	611	1660	552	867	603	473
27	405	324	190	150	165	688	569	1370	421	776	563	456
28	387	317	190	160	177	650	529	990	387	705	520	442
29	367	308	190	170	---	316	501	867	388	644	491	422
30	351	300	180	180	---	187	474	782	366	600	463	406
31	343	---	180	190	---	394	---	734	---	561	432	---
TOTAL	12626	9743	7185	5550	4965	10219	22826	17120	14294	29883	19094	14639
MEAN	407	325	232	179	177	330	761	552	476	964	616	488
MAX	837	388	300	310	257	779	1080	1660	690	2870	1540	1270
MIN	247	230	100	120	130	178	474	344	366	314	410	300
AC-FT	25040	19330	14250	11010	9850	20270	45280	33960	28350	59270	37870	29040
CFSM	.61	.49	.35	.27	.27	.49	1.14	.83	.71	1.44	.92	.73
IN.	.70	.54	.40	.31	.28	.57	1.27	.95	.79	1.66	1.06	.81

CAL YR 1986	TOTAL 182093	MEAN 499	MAX 4960	MIN 100	AC-FT 361200	CFSM .75	IN. 10.1
WTR YR 1987	TOTAL 168144	MEAN 461	MAX 2870	MIN 100	AC-FT 333500	CFSM .69	IN. 9.35

LITTLE SIOUX RIVER BASIN

199

06607500 LITTLE SIOUX RIVER NEAR TURIN, IA

LOCATION.--Lat 41°57'52", long 95°58'21", in NW1/4 NE1/4 sec.33, T.83 N., R.44 W., Monona County, Hydrologic Unit 10230003, on left bank on downstream side of bridge on county highway E54, 1.0 mi east of gaging station on Monona-Harrison ditch near Turin, 2.5 mi downstream from Maple River, 3.8 mi south of Turin, 6.2 mi northeast of Blencoe, and at mile 13.5.

DRAINAGE AREA.--3,526 mi². Prior to Jan. 15, 1958, 4,426 mi², combined area above this station and Monona-Harrison ditch station 1.0 mi west.

PERIOD OF RECORD.--January 1958 to current year. April 1939 to May 1942 at site 4.7 mi downstream, published as "near Blencoe" June 1942 to January 1958 at site 1,200 ft east on old river channel; records not equivalent owing to diversion into Monona-Harrison ditch through equalizer ditch 1.5 mi upstream.

GAGE.--Water-stage recorder. Datum of gage is 1,019.85 ft above NGVD (U. S. Army Corps of Engineers bench mark). Prior to July 15, 1958, nonrecording gages near present site at different datums. July 15 to Sept. 3, 1958, nonrecording gage at present site and datum.

REMARKS.--Estimated daily discharges: Nov. 11-26 and Dec. 5 to Feb. 16. Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain-gage and satellite data collection platform at station.

AVERAGE DISCHARGE.--29 years (water years 1959-87), 1,442 ft³/s, 5.55 in/yr, 1,045,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 31,200 ft³/s June 21, 1983 gage height, 26.54 ft; maximum gage height, 27.44 ft Feb. 19, 1971, backwater from ice; minimum daily discharge, 17 ft³/s Jan. 18-20, Jan. 28 to Feb. 1, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 5,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 25	2200	5,900	12.71	July 20	0315	*13,800	*16.80
Apr. 1	2030	7,740	13.84	July 21	2145	12,900	16.42
July 13	0200	9,260	14.67	Sept. 19	0615	5,880	12.74

Minimum daily discharge, 620 ft³/s Jan. 25.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2130	1910	1750	780	770	876	7340	2050	3240	1120	2220	1260
2	2110	1860	1750	760	800	888	7480	2010	2960	1070	2060	1200
3	2110	1840	1730	780	820	854	7340	2220	2650	1020	1940	1130
4	2170	1800	1690	780	780	864	7070	2140	2460	965	1840	1090
5	2340	1780	1400	790	790	871	6810	1970	2310	962	1750	1060
6	2640	1760	1350	810	780	919	6500	1910	2190	1100	1670	1030
7	2890	1740	1350	810	820	965	5900	1890	2060	1610	1680	1010
8	2960	1790	1350	800	890	1010	5170	1830	1990	1590	2000	963
9	2920	1800	1270	780	900	1060	4560	1770	1880	1570	2060	937
10	2660	1780	1080	760	880	1080	4110	1740	1790	2230	1890	927
11	2600	1700	960	750	880	1060	3770	1700	1770	2260	1740	914
12	3120	1500	960	820	900	1050	3540	1650	1750	5520	1860	912
13	3700	1200	1150	890	880	1060	3340	1580	1690	6730	3840	905
14	4110	1000	1090	970	880	1020	3270	1550	1620	3730	2090	928
15	4280	1150	1080	1050	900	1030	3480	1480	1550	3690	1880	924
16	4290	1350	1080	920	800	1070	3570	1440	1460	3340	2200	1140
17	4140	1500	1060	810	836	1080	3540	1420	1380	3390	2000	1950
18	3690	1700	1050	760	809	1110	3500	1400	1330	3900	2040	3870
19	3200	1650	1020	730	802	1190	3310	1380	1340	6790	2230	5420
20	2870	1500	1000	720	866	1250	3150	1430	1330	10900	2030	4070
21	2640	1450	970	720	896	1360	2910	1530	1620	8480	1950	3780
22	2510	1500	960	760	914	1490	2700	1640	1610	11200	1820	3870
23	2450	1600	950	700	916	2220	2630	1580	1430	8220	1670	4110
24	2430	1650	910	630	904	3110	2550	1590	1450	7350	1560	4190
25	2390	1700	890	620	886	5480	2490	1880	1710	6530	1580	3330
26	2300	1750	870	630	867	5750	2430	3790	1530	5530	1710	2550
27	2210	1810	830	660	843	5590	2330	3520	1380	5110	1620	2290
28	2160	1820	830	670	851	5670	2210	3060	1300	4230	1520	2130
29	2090	1800	810	690	---	5320	2150	3230	1250	3230	1460	1980
30	2020	1770	810	720	---	5060	2100	3390	1200	2690	1400	1850
31	1960	---	780	740	---	5980	---	3410	---	2420	1320	---
TOTAL	86090	49160	34780	23810	23860	67337	121250	63180	53230	128477	58630	61720
MEAN	2777	1639	1122	768	852	2172	4042	2038	1774	4144	1891	2057
MAX	4290	1910	1750	1050	916	5980	7480	3790	3240	11200	3840	5420
MIN	1960	1000	780	620	770	854	2100	1380	1200	962	1320	905
AC-FT	170800	97510	68990	47230	47330	133600	240500	125300	105600	254800	116300	122400
CFSM	.79	.46	.32	.22	.24	.62	1.15	.58	.50	1.18	.54	.58
IN.	.91	.52	.37	.25	.25	.71	1.28	.67	.56	1.36	.62	.65

CAL YR 1986 TOTAL 1141140 MEAN 3126 MAX 18800 MIN 700 AC-FT 2263000 CFSM .89 IN. 12.0
WTR YR 1987 TOTAL 771524 MEAN 2114 MAX 11200 MIN 620 AC-FT 1530000 CFSM .60 IN. 8.14

SOLDIER RIVER BASIN

06608500 SOLDIER RIVER AT PISGAH, IA

LOCATION.--Lat 41°49'50", long 95°55'54", in NW1/4 NE1/4 sec.14, T.81 N., R.44 W., Harrison County, Hydrologic Unit 10230001, on right bank at downstream side of bridge on county highway F20, at west edge of Pisgah, 0.4 mi downstream from Cobb Creek, 0.5 mi upstream from Mogger Ditch, and 13.1 mi upstream from mouth.

DRAINAGE AREA.--407 mi².

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

REVISED RECORDS.--WSP 956: 1940 (M). WSP 1240: 1940, 1941 (M), 1947. WSP 1440: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,036.53 ft above NGVD. Prior to Oct. 11, 1954, nonrecording gage at same site and datum with supplementary water-stage recorder operating above 8.2 ft gage height Mar. 2, 1946 to Sept. 24, 1953. Prior to Feb. 1954, on left bank at downstream side of bridge.

REMARKS.--Estimated daily discharges: Nov. 11-24, Dec. 5-29, Jan. 1 to Feb. 2 and Mar. 30. Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain-gage and satellite data collection platform at station.

AVERAGE DISCHARGE.--47 years, 136 ft³/s, 4.54 in/yr, 98,530 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,500 ft³/s June 12, 1950, gage height, 28.17 ft; minimum daily discharge, 2.0 ft³/s Jan. 2-10, 1945.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 5,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
July 12	0615	*10,200	*19.95	No other peak greater than base discharge.			

Minimum daily discharge, 80 ft³/s Jan. 11, 24, 25.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	138	156	135	110	180	144	323	254	321	178	190	258
2	130	154	139	105	150	132	296	262	290	175	179	253
3	135	155	131	100	138	134	292	335	268	171	331	250
4	222	151	119	105	128	130	301	287	251	165	253	248
5	157	155	100	110	133	136	339	260	246	219	182	238
6	127	155	120	120	130	136	406	252	238	262	173	231
7	125	159	130	115	135	133	401	243	228	505	193	272
8	123	253	120	105	134	129	376	228	223	215	1250	212
9	120	183	110	100	123	125	352	220	227	720	348	238
10	117	151	100	90	129	119	337	212	228	1120	248	229
11	384	110	90	80	127	118	333	207	244	321	219	219
12	627	120	130	95	126	117	311	199	235	3430	622	209
13	224	130	125	110	124	116	307	198	228	556	777	205
14	181	140	125	105	131	116	370	194	215	369	278	207
15	170	150	120	100	126	123	537	183	208	692	610	213
16	163	150	120	100	118	131	375	183	204	328	1050	315
17	160	150	120	100	121	126	339	182	206	287	407	372
18	155	145	120	100	123	163	320	178	199	657	676	253
19	150	140	115	100	122	189	305	182	233	411	408	221
20	149	135	110	100	120	150	291	199	210	308	343	213
21	147	135	105	95	119	162	282	342	209	261	302	209
22	149	140	105	90	120	159	282	240	208	280	273	201
23	206	140	105	85	118	382	304	197	198	229	255	204
24	245	145	105	80	118	322	276	208	434	225	243	201
25	242	148	105	80	114	270	265	312	796	862	436	194
26	188	148	105	85	116	224	264	1900	250	286	658	194
27	170	139	110	90	120	210	253	1370	211	243	371	194
28	163	139	110	100	127	216	243	449	205	226	325	265
29	160	134	115	110	---	134	249	402	195	214	307	212
30	159	136	119	125	---	120	248	343	187	201	281	193
31	161	---	122	150	---	213	---	413	---	192	269	---
TOTAL	5747	4446	3585	3140	3570	5079	9577	10634	7595	14308	12457	6923
MEAN	185	148	116	101	127	164	319	343	253	462	402	231
MAX	627	253	139	150	180	382	537	1900	796	3430	1250	372
MIN	117	110	90	80	114	116	243	178	187	165	173	193
AC-FT	11400	8820	7110	6230	7080	10070	19000	21090	15060	28380	24710	13730
CFSM	.46	.36	.28	.25	.31	.40	.78	.84	.62	1.13	.99	.57
IN.	.53	.41	.33	.29	.33	.46	.88	.97	.69	1.31	1.14	.63

CAL YR 1986	TOTAL 87547	MEAN 240	MAX 6220	MIN 72	AC-FT 173600	CFSM .59	IN. 8.00
WTR YR 1987	TOTAL 87061	MEAN 239	MAX 3430	MIN 80	AC-FT 172700	CFSM .59	IN. 7.96

BOYER RIVER BASIN

201

06609500 BOYER RIVER AT LOGAN, IA

LOCATION.--Lat 41°38'33", long 95°46'57", in SE1/4 NW1/4 sec.19, T.79 N., R.42 W., Harrison County, Hydrologic Unit 10230007, on left bank 9 ft downstream from Chicago Central and Pacific Railroad bridge at Logan, 0.4 mi downstream from Elk Grove Creek, 10.5 mi upstream from Willow Creek, and 15.8 mi upstream from mouth.

DRAINAGE AREA.--871 mi².

PERIOD OF RECORD.--May 1918 to July 1925, November 1937 to current year. Monthly discharge only for some periods, published in WSP 1310.

REVISED RECORDS.--WSP 956: 1938-39. WSP 1240: 1918-19, 1920 (M), 1921, 1922 (M), 1924-25, 1938 (M), 1945. WSP 1440: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,009.38 ft above NGVD (Chicago and Northwestern Railway Company bench mark). See WSP 1918 for history of changes prior to Oct. 18, 1960.

REMARKS.--Estimated daily discharges: Nov. 11-27, Dec. 11-29, Jan. 1 to Feb. 5, Mar. 29-31, May 27-30 and June 20-21. Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain-gage and satellite data collection platform at station.

AVERAGE DISCHARGE.--55 years (water years 1919-24, 1939-87), 334 ft³/s, 5.21 in/yr, 242,000 acre-ft/yr; median of yearly mean discharges, 280 ft³/s, 4.4 in/yr, 203,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 25,000 ft³/s Feb. 19, 1971, gage height, 22.65 ft, from floodmark; maximum gage height, 25.22 ft Mar. 1, 1965, backwater from ice; minimum daily discharge, 1.5 ft³/s July 16, 1938.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 6,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s) *10,000	Gage height (ft) *15.10	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
July 12	0700			No other peak greater than base discharge.			

Minimum daily discharge, 250 ft³/s Jan. 17, 25-27.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	446	636	468	355	280	320	781	675	1270	393	411	579
2	397	600	476	310	290	308	846	664	1060	384	385	554
3	383	583	467	310	290	290	966	727	945	375	379	520
4	460	582	430	310	300	295	1080	711	875	370	394	489
5	529	562	410	330	338	305	1190	647	826	671	367	467
6	395	543	422	330	308	315	1360	624	762	649	351	509
7	366	548	453	320	320	317	1440	601	714	660	346	548
8	350	667	452	310	329	324	1310	574	674	566	1480	482
9	330	628	435	300	297	316	1140	548	648	1330	921	490
10	310	560	396	300	297	292	1020	541	641	2150	608	522
11	1390	450	340	300	308	294	947	544	654	949	499	459
12	3130	400	440	320	301	308	897	521	638	4770	506	434
13	1500	475	410	390	288	306	827	505	608	2690	572	426
14	1100	540	400	370	293	311	956	503	579	1850	610	408
15	876	510	380	330	287	316	1570	489	557	1910	1240	496
16	747	500	380	300	264	349	1620	478	528	1010	1700	1000
17	873	480	380	250	252	347	1360	480	523	851	1110	1240
18	615	490	360	280	262	398	1200	477	508	1000	838	1710
19	569	490	360	290	273	473	1090	488	481	834	1150	1070
20	547	500	360	310	280	471	1010	511	490	1710	790	804
21	527	500	360	290	275	483	950	773	480	1100	662	696
22	511	510	360	280	272	461	916	657	471	809	586	633
23	990	540	360	270	266	476	961	525	497	864	524	591
24	1030	520	360	260	268	562	905	513	470	690	487	564
25	1080	500	360	250	267	578	842	572	810	1740	900	538
26	915	490	340	250	261	536	830	2770	478	796	2340	507
27	822	480	340	250	264	515	816	2200	433	635	1240	487
28	762	476	340	260	281	529	751	1700	415	556	932	541
29	703	474	340	265	---	540	714	1400	412	502	796	489
30	671	470	350	270	---	400	692	1300	413	462	709	455
31	650	---	344	280	---	700	---	1440	---	433	631	---
TOTAL	23774	15704	12073	9240	8011	12435	30987	25158	18860	33709	24464	18708
MEAN	767	523	389	298	286	401	1033	812	629	1087	789	624
MAX	3130	667	476	390	338	700	1620	2770	1270	4770	2340	1710
MIN	310	400	340	250	252	290	692	477	412	370	346	408
AC-FT	47160	31150	23950	18330	15890	24660	61460	49900	37410	66860	48520	37110
CFSM	.88	.60	.45	.34	.33	.46	1.19	.93	.72	1.25	.91	.72
IN.	1.02	.67	.52	.39	.34	.53	1.32	1.07	.81	1.44	1.04	.80

CAL YR 1986 TOTAL 223628 MEAN 613 MAX 7860 MIN 130 AC-FT 443600 CFSM .70 IN. 9.55
WTR YR 1987 TOTAL 233123 MEAN 639 MAX 4770 MIN 250 AC-FT 462400 CFSM .73 IN. 9.96

202

LOCATION.--Lat 41°15'32", long 95°55'20", in SE1/4 NW1/4 sec.23, T.15 N., R.13 E., Douglas County, Hydrologic Unit 10230006, on right bank on left side of concrete floodwall, at foot of Douglas Street, 275 ft downstream from Interstate 480 Highway bridge in Omaha, and at mile 615.9.

WATER-DISCHARGE RECORDS

REVISÉD RECORDS.--WSP 761: Drainage area.

REMARKS.--Estimated daily discharge: May 3. Records good except for estimated daily discharge, which is poor. Flow regulated by upstream main-stem reservoirs. U.S. National Weather Service gage-height telemeter and U.S. Army Corps of Engineers rain-gage and satellite data collection platform at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 396,000 ft³/s Apr. 18, 1952, gage height, 40.20 ft, present datum; minimum, about 2,200 ft³/s Jan. 6, 1937; minimum gage height observed, 7.23 ft, present datum, Jan. 10, 1957, result of freezeup.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	61700	54300	56000	37000	28800	28400	55100	39700	35000	36200	35400	34200
2	61100	53300	56300	37000	29000	28800	56900	39700	36400	35500	35300	33600
3	58500	52800	55300	36000	29700	28100	58500	40500	34500	35300	35800	33800
4	56000	52800	52000	36600	29400	27900	55300	40700	34300	35400	36600	33900
5	53800	53100	50200	36900	28500	28100	52700	40700	38200	35000	35800	34400
6	50700	53800	49700	37600	28200	28200	51300	40100	33100	37000	36100	35300
7	49900	54700	48200	37900	28100	28100	50900	38700	34700	38200	36500	36300
8	48600	56400	45900	37700	28100	28200	49800	37200	37800	38500	43700	35800
9	47800	57800	44400	37800	28300	28100	48800	37400	36800	38700	44000	35900
10	46500	57400	43200	37400	28000	27800	49300	38200	35800	41900	38600	36100
11	52900	56000	41300	36500	27800	27400	50600	38000	36100	47200	36500	35500
12	65400	54300	42300	36700	28000	27000	51000	37400	36600	51700	36000	34800
13	60200	52000	43100	37700	28300	27000	51200	37500	36100	46800	40000	34000
14	54400	51000	41500	35600	28300	26700	52100	38300	36600	40800	40300	33700
15	52100	50000	41800	34300	28600	26700	55500	38400	37300	39700	36400	33500
16	51900	49400	45900	33300	28700	26800	53200	37900	37400	41000	38700	34200
17	52600	50300	45000	31400	28500	27000	51400	38100	37200	40100	40600	36400
18	52400	52300	44400	30700	28400	27700	50000	38600	37500	40100	36400	40100
19	53200	53800	43700	32200	27900	29000	49500	37900	38700	40400	37700	42400
20	53900	54600	39700	31400	27400	30000	47900	37400	38300	42800	36700	41000
21	55200	54400	36900	30900	27800	30800	46300	37600	37900	43700	36400	39700
22	56500	52600	37500	29800	27900	33800	44700	38900	37800	41000	36400	39200
23	59400	51900	37800	29500	27900	40300	43300	37800	36500	41600	35600	38900
24	60200	52600	36900	28200	27600	50900	41300	36800	36100	39600	35500	39300
25	61000	53000	36300	27700	27400	51500	39400	36200	39700	41200	37800	38900
26	61300	53800	35800	28700	27600	51000	40300	44900	38600	43000	44000	37700
27	60200	54200	35100	29200	27700	51300	40600	55200	37200	39500	43300	37000
28	57800	55000	35100	29500	27700	54400	40000	49500	36100	37100	37300	37000
29	55500	55000	34600	28900	---	56800	38900	39100	37000	35900	34800	36800
30	54500	55400	34800	28200	---	58800	38800	35500	36500	35600	35600	36600
31	54800	---	36100	28600	---	58000	---	33100	---	35700	35000	---
TOTAL	1720000	1608000	1326800	1030900	789600	1094600	1454600	1217000	1101800	1236200	1168800	1096000
MEAN	55480	53600	42800	33250	28200	35310	48490	39260	36730	39880	37700	36530
MAX	65400	57800	56300	37900	29000	58800	58500	55200	39700	51700	44000	42400
MIN	46500	49400	34600	27700	27400	26700	38800	33100	33100	35000	34800	33500
AC-FT	3412000	3189000	2632000	2045000	1566000	2171000	2885000	2414000	2185000	2452000	2318000	2174000
CAL YR 1986	TOTAL 16468700		MEAN 45120		MAX 76300		MIN 17000		AC-FT 32670000			
WTR YR 1987	TOTAL 14844300		MEAN 40670		MAX 65400		MIN 26700		AC-FT 29440000			

06610000 MISSOURI RIVER AT OMAHA, NE--Continued

WATER-QUALITY RECORDS

LOCATION.--Water quality samples were collected from Interstate 80 highway bridge 2.0 mi downstream from gaging station. Samples for particle-size distribution were collected from boat cross-section 3.6 mi downstream from gaging station.

PERIOD OF RECORD.--Water years 1969-76, 1978 to current year. Daily sediment loads for April 1939 to September 1971 are in reports of U.S. Army Corps of Engineers.

PERIOD OF DAILY RECORD.--

CHEMICAL ANALYSES: July 1969 to June 1972.

SPECIFIC CONDUCTANCE: October 1972 to September 1976, January 1978 to September 1981.

WATER TEMPERATURES: October 1971 to September 1976, January 1978 to September 1981.

SUSPENDED-SEDIMENT DISCHARGE: October 1971 to September 1976.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 950 microsiemens Dec. 4, 5, 1980; minimum daily, 335 microsiemens Mar. 22, 1978.

WATER TEMPERATURES: Maximum daily, 32.0°C July 24, 1972; minimum daily, 0.0°C on many days during winter period.

SEDIMENT CONCENTRATIONS: Maximum daily mean, 8,180 mg/L May 19, 1974; minimum daily mean, 165 mg/L Sept. 13, 1976.

SEDIMENT LOADS: Maximum daily, 1,060,000 tons May 19, 1974; minimum daily, 3,990 tons Jan. 14, 1975.

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	SAMPLE LOC- ATION, CROSS SECTION (FT FM L BANK) (00009)	DEPTH AT SAMPLE LOC- ATION, TOTAL (FEET) (81903)	SAM- PLING DEPTH (FEET) (00003)	STREAM VELOC- ITY, POINT (FPS) (81904)	SEDI- MENT, SUS- PENDED (MG/L) (80154)	SED. SUSP. FALL DIAM. % FINER THAN .004 MM (70338)	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)
OCT												
08...	1145	200	14.4	3.30	4.26	293	--	65	77	99	100	--
08...	1150	200	--	7.20	4.07	311	--	62	73	98	100	--
08...	1155	200	--	10.3	3.50	384	--	50	61	96	100	--
08...	1200	200	--	12.0	3.07	425	--	48	57	86	100	--
08...	1205	200	--	13.0	3.07	496	--	38	46	87	100	--
08...	1210	200	--	13.6	2.63	552	--	33	43	88	100	--
08...	1220	375	14.4	3.30	5.45	325	--	56	69	99	100	--
08...	1225	375	--	7.20	5.35	403	--	48	61	98	100	--
08...	1230	375	--	10.3	4.37	504	--	38	50	97	100	--
08...	1235	375	--	12.0	4.50	605	--	33	45	97	100	--
08...	1240	375	--	13.0	3.94	901	--	22	31	94	100	--
08...	1245	375	--	13.6	3.94	678	--	29	39	91	100	--
08...	1255	475	20.4	4.70	5.37	--	--	--	--	--	--	--
08...	1300	475	--	10.2	4.80	--	--	--	--	--	--	--
08...	1305	475	--	14.6	4.54	--	--	--	--	--	--	--
08...	1310	475	--	17.0	4.37	--	--	--	--	--	--	--
08...	1315	475	--	18.4	3.50	--	--	--	--	--	--	--
08...	1320	475	--	19.2	3.18	--	--	--	--	--	--	--
08...	1325	475	--	--	--	530	12	28	--	--	--	--
08...	1350	560	22.4	5.20	5.85	275	--	66	78	100	--	--
08...	1354	560	--	11.2	5.63	339	--	54	69	99	100	--
08...	1358	560	--	16.0	4.80	366	--	52	68	99	100	--
08...	1402	560	--	18.7	4.22	719	--	27	41	94	100	--
08...	1406	560	--	20.2	4.59	559	--	38	51	96	100	--
08...	1410	560	--	21.1	3.94	744	--	27	39	91	100	--
08...	1414	560	--	21.6	3.96	894	--	22	30	91	100	--
08...	1420	660	23.2	5.40	4.98	267	--	75	83	100	--	--
08...	1425	660	--	11.6	4.80	262	--	75	83	100	--	--
08...	1430	660	--	16.6	3.76	293	--	65	76	100	--	--
08...	1435	660	--	19.3	3.39	323	--	59	69	99	100	--
08...	1440	660	--	20.9	3.46	375	--	55	62	95	100	--
08...	1445	660	--	21.8	2.79	352	--	55	63	97	100	--
08...	1450	660	--	22.3	2.63	--	--	--	--	--	--	--

MISSOURI RIVER MAIN STEM
06610000 MISSOURI RIVER AT OMAHA, NE--Continued
WATER-QUALITY RECORD

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	SAMPLE LOC- ATION, CROSS SECTION (FT FM L BANK) (00009)	DEPTH AT SAMPLE LOC- ATION, TOTAL (FEET) (81903)	SAM- PLING DEPTH (FEET) (00003)	STREAM VELOC- ITY, POINT (FPS) (81904)	SEDI- MENT, SUS- PENDED (MG/L) (80154)	SED. SUSP. FALL DIAM. % FINER THAN (70338)	SED. SUSP. FALL DIAM. % FINER THAN (70342)	SED. SUSP. FALL DIAM. % FINER THAN (70343)	SED. SUSP. FALL DIAM. % FINER THAN (70344)	SED. SUSP. FALL DIAM. % FINER THAN (70345)	SED. SUSP. FALL DIAM. % FINER THAN (70346)
MAY												
06...	1000	190	13.2	3.10	3.83	260	--	56	69	98	100	--
06...	1005	190	--	6.60	3.55	345	--	41	53	95	100	--
06...	1010	190	--	9.40	3.46	400	--	37	50	89	100	--
06...	1015	190	--	11.0	3.28	104	--	40	52	94	100	--
06...	1020	190	--	11.9	2.98	624	--	24	35	84	100	--
06...	1025	190	--	12.4	2.63	509	--	29	40	88	100	--
06...	1040	325	13.4	3.10	4.80	347	--	41	52	87	100	--
06...	1044	325	--	6.70	4.63	396	--	37	48	93	100	--
06...	1048	325	--	9.60	3.68	530	--	28	39	90	100	--
06...	1052	325	--	11.2	3.39	894	--	17	23	82	100	--
06...	1056	325	--	12.1	2.98	973	--	15	22	84	100	--
06...	1100	325	--	12.6	2.85	858	--	17	24	88	99	100
06...	1115	450	17.6	4.10	4.91	--	--	--	--	--	--	--
06...	1119	450	--	8.80	4.26	--	--	--	--	--	--	--
06...	1123	450	--	12.6	4.04	--	--	--	--	--	--	--
06...	1127	450	--	14.7	3.61	--	--	--	--	--	--	--
06...	1131	450	--	15.8	3.68	--	--	--	--	--	--	--
06...	1135	450	--	16.6	3.24	--	--	--	--	--	--	--
06...	1140	450	--	--	--	502	--	23	--	--	--	--
06...	1145	530	19.0	4.40	4.80	219	--	59	74	97	100	--
06...	1149	530	--	9.50	4.80	312	--	42	50	98	100	--
06...	1153	530	--	13.6	4.48	319	--	41	54	98	100	--
06...	1157	530	--	15.8	3.96	506	--	27	38	98	100	--
06...	1201	530	--	17.1	3.52	609	--	22	31	94	100	--
06...	1205	530	--	17.9	3.28	815	--	18	25	88	100	--
06...	1220	610	21.8	5.00	4.91	183	--	68	71	95	100	--
06...	1230	610	--	15.6	3.78	271	--	50	61	98	100	--
06...	1234	610	--	18.2	3.39	352	--	37	52	98	100	--
06...	1238	610	--	19.6	3.07	292	--	44	58	96	100	--
06...	1242	610	--	20.5	3.07	400	--	33	44	95	100	--
06...	1245	610	--	21.0	2.76	403	--	38	48	97	100	--
JUN												
10...	1055	220	13.2	3.10	4.15	224	--	75	91	100	--	--
10...	1100	220	--	6.60	3.87	272	--	69	81	99	100	--
10...	1105	220	--	9.40	3.57	290	--	60	69	99	100	--
10...	1110	220	--	11.0	3.22	334	--	55	70	99	100	--
10...	1115	220	--	11.9	3.02	411	--	45	59	90	100	--
10...	1120	220	--	12.4	2.68	384	--	45	59	94	100	--
10...	1130	340	15.0	3.50	4.07	326	--	56	69	99	100	--
10...	1135	340	--	7.50	3.61	335	--	54	69	99	100	--
10...	1140	340	--	10.7	3.11	503	--	38	52	91	100	--
10...	1145	340	--	12.5	2.87	608	--	34	48	94	100	--
10...	1150	340	--	13.5	2.55	619	--	34	49	95	100	--
10...	1155	340	--	14.1	1.92	702	--	28	42	95	100	--
10...	1230	465	--	--	--	372	13	34	--	--	--	--
10...	1300	465	18.0	4.20	4.93	--	--	--	--	--	--	--
10...	1304	465	--	9.00	4.44	--	--	--	--	--	--	--
10...	1308	465	--	12.9	4.57	--	--	--	--	--	--	--
10...	1312	465	--	15.0	4.41	--	--	--	--	--	--	--
10...	1316	465	--	16.2	4.15	--	--	--	--	--	--	--
10...	1320	465	--	17.0	4.04	--	--	--	--	--	--	--
10...	1330	535	17.8	4.10	4.76	276	--	62	78	100	--	--
10...	1334	535	--	8.90	4.37	257	--	66	83	100	--	--
10...	1338	535	--	12.7	4.39	310	--	56	74	99	100	--
10...	1342	535	--	14.8	4.11	376	--	46	61	98	100	--
10...	1346	535	--	16.0	3.44	426	--	40	57	94	100	--
10...	1350	535	--	16.8	3.33	504	--	32	48	97	100	--
10...	1405	635	19.6	4.50	4.54	212	--	82	94	100	--	--
10...	1410	635	--	9.80	4.41	206	--	79	94	100	--	--
10...	1415	635	--	14.0	3.78	214	--	76	90	100	--	--
10...	1420	635	--	16.3	3.65	244	--	77	88	100	--	--
10...	1425	635	--	17.6	3.59	250	--	76	91	100	--	--
10...	1430	635	--	18.4	3.28	252	--	70	86	100	--	--

MISSOURI RIVER MAIN STEM

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06610000 MISSOURI RIVER AT OMAHA, NE--Continued

WATER-QUALITY RECORDS

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	SAMPLE LOC- ATION, CROSS SECTION (FT FM L BANK) (000009)	DEPTH AT SAMPLE LOC- ATION, TOTAL (FEET) (81903)	SAM- PLING DEPTH (FEET) (000003)	STREAM VELOC- ITY, POINT (FPS) (81904)	SEDI- MENT, SUS- PENDED (MG/L) (80154)	SED. SUSP. FALL DIAM. % FINER THAN (70338)	SED. SUSP. FALL DIAM. % FINER THAN (70342)	SED. SUSP. FALL DIAM. % FINER THAN (70343)	SED. SUSP. FALL DIAM. % FINER THAN (70344)	SED. SUSP. FALL DIAM. % FINER THAN (70345)	SED. SUSP. FALL DIAM. % FINER THAN (70346)
JUL												
29...		WATER TEMPERATURE, 29.0° C (1045-1345 HOURS); DISCHARGE, 36,000 ft ³ /s.										
29...	1045	190	13.6	3.10	3.98	241	--	86	93	100	--	--
29...	1050	190	--	6.80	3.78	258	--	86	94	100	--	--
29...	1055	190	--	9.70	3.52	303	--	73	79	97	100	--
29...	1105	190	--	12.2	2.40	463	--	46	53	90	100	--
29...	1110	190	--	12.8	2.13	684	--	34	41	82	100	--
29...	1120	290	13.4	3.10	4.15	265	--	76	87	99	100	--
29...	1125	290	--	6.70	3.59	326	--	62	70	98	100	--
29...	1130	290	--	9.60	3.39	444	--	49	60	97	100	--
29...	1135	290	--	11.2	3.22	494	--	40	48	92	100	--
29...	1140	290	--	12.1	3.07	537	--	39	48	94	100	--
29...	1145	290	--	12.6	2.94	577	--	37	46	91	100	--
29...	1155	415	15.6	3.60	4.37	--	--	--	--	--	--	--
29...	1200	415	--	7.80	4.24	--	--	--	--	--	--	--
29...	1205	415	--	11.1	3.85	--	--	--	--	--	--	--
29...	1210	415	--	13.0	3.42	--	--	--	--	--	--	--
29...	1215	415	--	14.0	3.91	--	--	--	--	--	--	--
29...	1220	415	--	14.7	3.50	--	--	--	--	--	--	--
29...	1225	415	--	--	--	443	15	39	--	--	--	--
29...	1230	500	20.2	4.70	4.70	283	--	71	85	100	--	--
29...	1235	500	--	10.1	4.24	354	--	60	71	99	100	--
29...	1240	500	--	14.4	3.44	359	--	58	71	99	100	--
29...	1245	500	--	16.8	3.02	504	--	42	55	93	100	--
29...	1250	500	--	18.2	2.29	646	--	35	46	91	100	--
29...	1255	500	--	19.0	1.85	810	--	28	36	84	100	--
29...	1310	580	20.0	4.60	4.00	233	--	85	95	100	--	--
29...	1315	580	--	10.0	4.52	272	--	73	82	99	100	--
29...	1320	580	--	14.3	3.83	364	--	62	72	100	--	--
29...	1325	580	--	16.7	3.59	346	--	58	68	98	100	--
29...	1330	580	--	18.0	3.07	420	--	48	59	96	100	--
29...	1335	580	--	18.8	3.07	442	--	46	57	94	100	--
SEP												
02...		WATER TEMPERATURE, 21.0° C (1020-1235 HOURS); DISCHARGE, 34,200 ft ³ /s.										
02...	1020	150	12.0	2.80	3.39	183	--	69	82	98	100	--
02...	1030	150	--	6.00	3.07	265	--	53	61	95	100	--
02...	1035	150	--	8.60	2.66	229	--	46	59	94	100	--
02...	1040	150	--	10.0	2.55	418	--	29	40	91	100	--
02...	1045	150	--	10.8	2.29	414	--	30	41	92	100	--
02...	1100	315	11.8	2.70	4.70	229	--	50	62	100	--	--
02...	1105	315	--	5.90	4.26	320	--	37	53	97	100	--
02...	1110	315	--	8.40	3.96	323	--	36	51	98	100	--
02...	1115	315	--	9.80	3.83	388	--	31	48	96	100	--
02...	1120	315	--	10.6	3.96	453	--	26	42	96	100	--
02...	1125	420	--	--	--	444	7	19	--	--	--	--
02...	1130	420	15.8	3.70	4.33	--	--	--	--	--	--	--
02...	1133	420	--	7.90	4.15	--	--	--	--	--	--	--
02...	1136	420	--	11.3	3.85	--	--	--	--	--	--	--
02...	1139	420	--	13.2	3.85	--	--	--	--	--	--	--
02...	1142	420	--	14.2	3.50	--	--	--	--	--	--	--
02...	1145	420	--	14.9	3.46	--	--	--	--	--	--	--
02...	1155	505	16.8	3.90	4.80	192	--	64	77	100	--	--
02...	1158	505	--	8.40	4.67	236	--	51	70	100	--	--
02...	1201	505	--	12.0	4.15	251	--	43	61	97	100	--
02...	1204	505	--	14.0	3.81	357	--	34	53	98	100	--
02...	1207	505	--	15.1	3.55	450	--	30	46	98	100	--
02...	1210	505	--	15.8	3.50	362	--	29	46	97	100	--
02...	1220	605	19.4	4.50	4.37	153	--	80	93	100	--	--
02...	1223	605	--	9.70	4.20	167	--	72	86	98	100	--
02...	1226	605	--	13.9	3.42	152	--	69	84	100	--	--
02...	1229	605	--	16.2	3.07	147	--	74	88	100	--	--
02...	1232	605	--	17.5	2.68	162	--	68	82	100	--	--
02...	1235	605	--	18.3	2.46	192	--	63	78	100	--	--

MISSOURI RIVER MAIN STEM

06610000 MISSOURI RIVER AT OMAHA, NE--Continued

WATER-QUALITY RECORDS

PARTICLE-SIZE DISTRIBUTION OF SURFACE BED MATERIAL, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	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)	BED MAT. SIEVE DIAM. % FINER THAN 8.00 MM (80171)
OCT 08...	1215	5	0	1	30	95	98	98	99	100
MAY 06...	1300	5	0	1	23	90	98	99	100	--
JUN 10...	1530	4	0	1	29	99	100	--	--	--
JUL 29...	1345	5	0	1	30	97	100	--	--	--
SEP 02...	1350	4	0	1	35	99	100	--	--	--

MISSOURI RIVER MAIN STEM

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06807000 MISSOURI RIVER AT NEBRASKA CITY, NE

LOCATION.--Lat 40°40'55", long 95°50'48", in NW1/4 NE1/4 sec.9, T.8 N., R.14 E., Otoe County, Hydrologic Unit 10240001, on right bank 0.7 mi upstream from Waubonsie Highway Bridge at Nebraska City, and at mile 562.6.

DRAINAGE AREA.--410,000 mi², approximately. The 3,959 mi² in Great Divide basin are not included.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1929 to current year. Gage-height records collected in this vicinity from August 1878 to December 1899 are contained in reports of Missouri River Commission.

REVISED RECORDS.--WSP 761: Drainage area.

GAGE--Water-stage recorder. Datum of gage is 905.36 ft above NGVD, supplementary adjustment of 1954. See WSP 1918 or 1919 for history of changes prior to Apr. 1, 1963.

REMARKS.--No estimated daily discharges. Records good. Flow regulated by upstream main-stem reservoirs. U.S. National Weather Service gage-height telemeter and U.S. Army Corps of Engineers rain-gage and satellite data collection platform at station.

AVERAGE DISCHARGE.--58 years, 37,130 ft³/s, 26,901,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 414,000 ft³/s Apr. 19, 1952; maximum gage height, 27.66 ft Apr. 18, 1952; minimum discharge, 1,600 ft³/s Dec. 31, 1946 (discharge measurement); minimum gage height observed, -0.28 ft Dec. 24, 1960, result of freezeup.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 121,000 ft³/s Mar. 25, gage-height, 20.96 ft; minimum daily discharge, 33,200 ft³/s Jan. 25; minimum gage height, 7.57 ft Jan. 24-26.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	73800	63800	63100	45000	37200	36900	84300	48400	51200	39600	37900	41300
2	73300	64000	63900	45100	36000	36600	90100	49000	54000	38900	36800	40200
3	72700	63600	63900	44900	37400	37600	98600	49500	55000	38200	36200	39400
4	71600	63700	61800	44600	37200	37300	94700	51100	49600	38200	36600	38600
5	69700	62500	59400	45300	37000	36200	90700	53100	48800	38200	36100	38000
6	67600	62400	58300	45200	36800	36000	87200	54800	48500	38900	35800	38300
7	66500	61600	58900	45700	36600	35800	83400	54600	45000	40800	36500	39200
8	63400	63100	58000	46400	36500	35400	77800	53000	47000	42400	48700	39400
9	60900	64300	56700	45700	36800	35300	73000	51700	47200	44300	47200	39000
10	58300	64300	54900	45700	36700	35100	70300	51300	46300	42900	43400	40100
11	71000	63000	52200	45300	36600	35500	69700	50900	46500	46800	40300	40400
12	99700	61100	50600	44200	37400	35400	68400	49100	46200	50200	38800	39200
13	91800	59200	50700	44800	37400	35300	68400	48400	50800	51000	40900	38700
14	77500	57200	49400	45000	37800	35500	70600	46700	48800	46000	41500	38500
15	70900	56100	48000	41800	37800	35700	80500	46500	47900	43400	39600	38900
16	67700	56400	52600	40800	37900	35300	76000	46000	46800	43200	39300	40600
17	65900	57300	54400	38600	38100	36500	70400	45500	45500	42000	40800	44600
18	64700	59500	54300	37100	37100	38800	67100	45600	45500	42700	39300	48400
19	64600	62600	54300	36100	36400	58100	66000	45200	48200	42300	37900	47600
20	64500	64100	51000	35700	35400	57600	64400	46400	46500	42600	39700	46800
21	63900	64200	46800	35200	35700	56500	62300	48200	45200	44900	38600	45700
22	63300	63200	45400	34600	35800	58500	61100	49500	45500	42500	37400	43900
23	65300	62800	47100	34600	35300	69400	58900	48300	43600	42900	36500	44100
24	68100	63400	47300	34000	35800	105000	57100	47800	42200	42400	36000	42100
25	69800	63000	47200	33200	35600	119000	53600	47400	44700	41900	51700	42900
26	73800	62700	47700	33300	35700	116000	52200	66900	45000	44500	72200	42500
27	71300	62400	46100	33500	35700	104000	51500	98100	42600	43400	67000	41600
28	68100	62600	45700	33700	36200	95100	50000	85700	41300	42200	52600	41100
29	65100	62200	45600	34300	---	91100	49300	67800	40800	41100	45600	41100
30	64000	62200	45000	34500	---	85300	48000	56600	40300	39500	43400	40600
31	63800	---	44500	35300	---	84600	---	54100	---	38600	42000	---
TOTAL	2152600	1858500	1624800	1239200	1025900	1750400	2095600	1657200	1396500	1316500	1316300	1242800
MEAN	69440	61950	52410	39970	36640	56460	69850	53460	46550	42470	42460	41430
MAX	99700	64300	63900	46400	38100	119000	98600	98100	55000	51000	72200	48400
MIN	58300	56100	44500	33200	35300	35100	48000	45200	40300	38200	35800	38000
AC-FT	4270000	3686000	3223000	2458000	2035000	3472000	4157000	3287000	2770000	2611000	2611000	2465000
CAL YR 1986	TOTAL 19770700	MEAN 54170	MAX 99700	MIN 22800	AC-FT 39220000							
WTR YR 1987	TOTAL 18676300	MEAN 51170	MAX 119000	MIN 33200	AC-FT 37040000							

MISSOURI RIVER MAIN STEM

06807000 MISSOURI RIVER AT NEBRASKA CITY, NB--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--May 1951 to current year. Daily sediment loads August 1957 to September 1971 in reports of U.S. Army Corps of Engineers.

REMARKS.--Samples for particle size distribution were collected from boat cross-section 0.7 mi upstream from gage.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: May 1951 to September 1976.

WATER TEMPERATURES: May 1951 to September 1976.

SEDIMENT DISCHARGE: October 1971 to September 1976.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 984 microsiemens Dec. 17, 1962; minimum daily, 273 microsiemens June 17, 1964.

WATER TEMPERATURES: Maximum daily, 31°C July 26, 1977; minimum, 0.0°C on many days during winter periods.

SEDIMENT CONCENTRATIONS: Maximum daily mean, 8,220 mg/L May 19, 1974; minimum daily mean, 137 mg/L Jan. 14, 1975.

SEDIMENT LOADS: Maximum daily, 1,590,000 tons May 19, 1974; minimum daily, 4,050 tons Jan. 17, 1972.

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	SAMPLE LOC- ATION, CROSS SECTION (FT FM L BANK) (00009)	DEPTH AT SAMPLE LOC- ATION, TOTAL (FEET) (81903)	SAM- PLING DEPTH (FEET) (00003)	STREAM VELOC- ITY, POINT (FPS) (81904)	SEDI- MENT, SUS- PENDE (MG/L) (80154)	SED. SUSP. FALL DIAM. % FINER THAN (70338)	SED. SUSP. FALL DIAM. % FINER THAN (70342)	SED. SUSP. FALL DIAM. % FINER THAN (70343)	SED. SUSP. FALL DIAM. % FINER THAN (70344)	SED. SUSP. FALL DIAM. % FINER THAN (70345)	SED. SUSP. FALL DIAM. % FINER THAN (70346)
OCT												
07...		WATER TEMPERATURE, 16.0° C (1115-1430 HOURS); DISCHARGE, 66,700 ft ³ /s.										
07...	1115	70.0	22.8	5.30	6.00	314	--	78	89	100	--	--
07...	1120	70.0	--	11.4	5.45	327	--	73	83	100	--	--
07...	1125	70.0	--	16.3	5.28	400	--	66	75	99	100	--
07...	1130	70.0	--	19.0	4.48	419	--	59	71	99	100	--
07...	1135	70.0	--	20.5	4.41	458	--	56	68	95	100	--
07...	1140	70.0	--	21.5	3.72	517	--	51	61	95	100	--
07...	1145	70.0	--	22.0	3.46	777	--	33	44	82	94	100
07...	1200	180	19.2	4.40	6.86	438	--	59	69	98	100	--
07...	1203	180	--	9.60	6.97	592	--	45	56	94	100	--
07...	1206	180	--	13.7	6.17	641	--	41	52	93	100	--
07...	1209	180	--	16.0	6.37	797	--	32	42	83	100	--
07...	1212	180	--	17.3	6.04	704	--	34	43	83	100	--
07...	1215	180	--	18.1	5.67	907	--	29	37	83	100	--
07...	1230	290	18.0	4.20	7.40	--	--	--	--	--	--	--
07...	1235	290	--	9.00	6.69	--	--	--	--	--	--	--
07...	1240	290	--	12.9	6.43	--	--	--	--	--	--	--
07...	1245	290	--	15.0	5.82	--	--	--	--	--	--	--
07...	1250	290	--	16.2	5.80	--	--	--	--	--	--	--
07...	1255	290	--	17.0	5.45	--	--	--	--	--	--	--
07...	1300	290	--	--	--	729	12	31	--	--	--	--
07...	1305	405	17.6	4.10	6.45	464	--	57	65	98	100	--
07...	1310	405	--	8.80	6.00	540	--	51	62	100	--	--
07...	1315	405	--	12.6	5.50	847	--	33	43	99	100	--
07...	1320	405	--	14.7	5.09	1010	--	27	36	97	100	--
07...	1325	405	--	15.8	4.63	1070	--	26	34	97	100	--
07...	1330	405	--	16.6	4.63	1570	--	18	27	89	100	--
07...	1340	525	20.8	4.80	5.02	314	--	86	94	100	--	--
07...	1345	525	--	10.4	4.70	315	--	84	93	99	100	--
07...	1350	525	--	14.9	3.83	331	--	81	91	100	--	--
07...	1355	525	--	17.3	3.76	358	--	78	88	98	100	--
07...	1400	525	--	18.7	3.02	357	--	75	87	98	100	--
07...	1405	525	--	19.6	2.79	396	--	71	80	98	100	--

MISSOURI RIVER MAIN STEM

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06807000 MISSOURI RIVER AT NEBRASKA CITY, NE--CONTINUED

WATER-QUALITY RECORDS

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	SAMPLE LOC- ATION, CROSS SECTION (FT FM L BANK) (00009)	DEPTH AT SAMPLE LOC- ATION, TOTAL (FEET) (81903)	SAM- PLING DEPTH (FEET) (00003)	STREAM VELOC- ITY, POINT (FPS) (81904)	SEDI- MENT, SUS- PENDED (MG/L) (80154)	SED. SUSP. FALL DIAM. % FINER THAN .004 MM (70338)	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)
MAY												
05...	05...	WATER TEMPERATURE, 17.0° C (1055-1340 HOURS); DISCHARGE, 53,000 ft ³ /s.										
05...	1055	120	20.8	4.80	5.76	290	--	63	77	100	--	--
05...	1059	120	--	10.4	5.56	387	--	52	68	97	100	--
05...	1103	120	--	14.9	5.04	508	--	36	47	96	100	--
05...	1107	120	--	17.3	4.54	691	--	28	39	92	100	--
05...	1111	120	--	18.7	3.26	685	--	28	40	92	100	--
05...	1115	120	--	19.6	3.39	662	--	29	38	95	100	--
05...	1130	200	19.6	4.50	6.00	372	--	51	67	100	--	--
05...	1135	200	--	9.80	5.45	514	--	39	56	99	100	--
05...	1140	200	--	14.0	4.87	642	--	32	50	98	100	--
05...	1150	200	--	16.3	4.52	751	--	27	42	97	100	--
05...	1200	200	--	17.6	4.50	842	--	25	41	95	100	--
05...	1205	200	--	18.4	4.11	1670	--	13	24	86	99	99
05...	1226	300	20.4	4.70	5.89	--	--	--	--	--	--	--
05...	1227	300	--	10.2	5.61	--	--	--	--	--	--	--
05...	1228	300	--	14.6	4.74	--	--	--	--	--	--	--
05...	1229	300	--	17.0	4.26	--	--	--	--	--	--	--
05...	1230	300	--	18.4	3.18	--	--	--	--	--	--	--
05...	1235	300	--	--	--	933	9	21	--	--	--	--
05...	1245	400	17.4	4.00	5.82	449	--	51	72	100	--	--
05...	1250	400	--	8.70	5.13	631	--	37	60	97	100	--
05...	1255	400	--	12.4	4.48	603	--	36	61	99	100	--
05...	1300	400	--	14.5	4.17	794	--	30	51	93	100	--
05...	1303	400	--	15.7	3.89	956	--	24	46	96	100	--
05...	1305	400	--	16.4	3.68	1160	--	20	41	94	100	--
05...	1325	530	17.8	4.10	4.54	305	--	70	87	100	--	--
05...	1329	530	--	8.90	3.89	364	--	61	78	99	100	--
05...	1333	530	--	12.7	3.81	418	--	54	72	100	--	--
05...	1337	530	--	14.8	3.24	439	--	51	69	96	100	--
05...	1340	530	--	16.0	2.94	571	--	39	58	96	100	--
JUN												
09...	09...	WATER TEMPERATURE, 23.5° C (1055-1455 HOURS); DISCHARGE, 46,800 ft ³ /s.										
09...	1055	70.0	19.2	4.40	5.43	355	--	82	90	100	--	--
09...	1100	70.0	--	9.60	5.35	360	--	79	86	100	--	--
09...	1105	70.0	--	13.7	4.91	382	--	72	83	100	--	--
09...	1110	70.0	--	16.0	4.02	444	--	68	76	96	100	--
09...	1115	70.0	--	17.3	3.76	483	--	58	68	91	100	--
09...	1120	70.0	--	18.1	3.37	483	--	62	71	90	100	--
09...	1135	150	16.4	3.80	6.08	470	--	68	78	99	100	--
09...	1139	150	--	8.20	5.56	496	--	58	71	97	100	--
09...	1143	150	--	11.7	5.13	630	--	50	62	96	100	--
09...	1147	150	--	13.7	4.70	677	--	46	58	92	100	--
09...	1151	150	--	14.8	4.52	760	--	38	48	87	100	--
09...	1155	150	--	15.4	4.11	831	--	40	51	87	100	--
09...	1230	260	--	--	--	876	13	35	--	--	--	--
09...	1300	260	16.8	3.90	5.67	--	--	--	--	--	--	--
09...	1305	260	--	8.40	4.96	--	--	--	--	--	--	--
09...	1310	260	--	12.0	4.54	--	--	--	--	--	--	--
09...	1315	260	--	14.0	4.00	--	--	--	--	--	--	--
09...	1320	260	--	15.1	3.59	--	--	--	--	--	--	--
09...	1325	260	--	15.8	3.55	--	--	--	--	--	--	--
09...	1345	385	15.2	3.50	5.65	498	--	82	90	100	--	--
09...	1351	385	--	7.60	5.32	629	--	71	81	100	--	--
09...	1357	385	--	10.9	4.59	685	--	60	70	99	100	--
09...	1403	385	--	12.7	4.17	1030	--	44	54	98	100	--
09...	1409	385	--	13.7	2.59	1110	--	39	49	96	100	--
09...	1415	385	--	14.3	1.92	1900	--	26	34	89	100	--
09...	1430	515	16.0	3.70	4.85	513	--	90	96	100	--	--
09...	1435	515	--	8.00	4.30	543	--	86	92	100	--	--
09...	1440	515	--	11.4	3.85	568	--	81	88	100	--	--
09...	1445	515	--	13.3	3.72	586	--	81	87	99	100	--
09...	1450	515	--	14.4	3.35	594	--	77	83	100	--	--
09...	1455	515	--	15.1	3.11	776	--	62	69	98	100	--

MISSOURI RIVER MAIN STEM

06807000 MISSOURI RIVER AT NEBRASKA CITY, NE--Continued

WATER-QUALITY RECORDS

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	SAMPLE LOC- ATION, CROSS SECTION (FT FM L BANK) (000009)	DEPTH AT SAMPLE LOC- ATION, TOTAL (FEET) (81903)	SAM- PLING DEPTH (FEET) (000003)	STREAM VELOC- ITY, POINT (FPS) (81904)	SEDI- MENT, SUS- PENDED (MG/L) (80154)	SED. SUSP. FALL DIAM. % FINER THAN .004 MM (70338)	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)
JUL												
28...		WATER TEMPERATURES, 28.5° C (1030-1335 HOURS); DISCHARGE, 42,300 ft ³ /s.										
28...	1030	80.0	17.4	4.00	4.80	282	--	88	95	99	100	--
28...	1035	80.0	--	8.70	4.74	313	--	83	90	100	--	--
28...	1040	80.0	--	12.4	4.37	316	--	84	90	99	100	--
28...	1045	80.0	--	14.5	4.41	388	--	72	79	96	100	--
28...	1050	80.0	--	15.8	3.94	393	--	68	70	89	100	--
28...	1100	80.0	--	16.4	3.55	424	--	65	73	92	100	--
28...	1110	175	16.2	3.70	5.45	406	--	71	78	98	100	--
28...	1115	175	--	8.10	4.89	634	--	48	60	98	100	--
28...	1120	175	--	11.6	4.30	695	--	44	53	91	100	--
28...	1125	175	--	13.5	4.37	714	--	42	54	92	100	--
28...	1130	175	--	14.6	4.54	1340	--	24	30	87	99	100
28...	1135	175	--	15.2	3.91	1460	--	22	29	77	100	--
28...	1145	265	14.8	3.40	5.54	--	--	--	--	--	--	--
28...	1150	265	--	7.40	5.15	--	--	--	--	--	--	--
28...	1155	265	--	10.6	4.96	--	--	--	--	--	--	--
28...	1200	265	--	12.3	4.74	--	--	--	--	--	--	--
28...	1205	265	--	13.3	4.44	--	--	--	--	--	--	--
28...	1210	265	--	13.9	4.37	--	--	--	--	--	--	--
28...	1215	265	--	--	--	721	12	36	--	--	--	--
28...	1230	410	14.0	3.20	4.85	397	--	74	82	98	100	--
28...	1235	410	--	7.00	4.72	461	--	63	73	98	100	--
28...	1240	410	--	10.0	4.20	539	--	54	63	99	100	--
28...	1245	410	--	11.7	3.94	538	--	52	60	97	100	--
28...	1250	410	--	12.6	4.04	662	--	45	55	98	100	--
28...	1255	410	--	13.2	3.61	727	--	41	48	93	100	--
28...	1310	540	18.4	4.30	4.20	262	--	92	98	100	--	--
28...	1315	540	--	9.20	3.83	271	--	95	98	100	--	--
28...	1320	540	--	13.1	3.48	304	--	89	96	100	--	--
28...	1325	540	--	15.3	3.46	314	--	88	97	100	--	--
28...	1330	540	--	16.6	2.70	327	--	82	91	100	--	--
28...	1335	540	--	17.3	2.79	314	--	88	96	100	--	--
SEP												
01...		WATER TEMPERATURE, 21.5° C (1030-1350 HOURS); DISCHARGE, 41,300 ft ³ /s.										
01...	1030	50.0	19.0	9.50	4.96	265	--	67	80	97	100	--
01...	1050	50.0	--	13.6	4.20	307	--	61	73	96	100	--
01...	1100	50.0	--	15.8	3.76	278	--	60	74	94	100	--
01...	1105	50.0	--	17.1	3.61	325	--	53	65	94	100	--
01...	1110	50.0	--	17.9	3.28	438	--	42	55	84	100	--
01...	1115	130	--	--	--	627	9	25	--	--	--	--
01...	1120	130	17.6	4.10	5.35	--	--	--	--	--	--	--
01...	1125	130	--	8.80	4.98	--	--	--	--	--	--	--
01...	1130	130	--	12.6	4.41	--	--	--	--	--	--	--
01...	1135	130	--	14.7	3.81	--	--	--	--	--	--	--
01...	1140	130	--	15.8	3.33	--	--	--	--	--	--	--
01...	1145	130	--	16.6	3.18	--	--	--	--	--	--	--
01...	1205	235	18.4	4.30	5.28	329	--	55	72	98	100	--
01...	1210	235	--	9.20	4.80	526	--	36	55	97	100	--
01...	1215	235	--	13.1	4.74	632	--	31	48	95	100	--
01...	1220	235	--	15.3	3.55	946	--	21	35	90	100	--
01...	1245	325	17.4	4.00	5.39	289	--	60	77	98	100	--
01...	1250	325	--	8.70	4.74	423	--	45	61	96	100	--
01...	1255	325	--	12.4	3.96	524	--	38	52	96	100	--
01...	1300	325	--	14.5	2.74	1200	--	16	23	77	100	--
01...	1305	325	--	15.7	2.33	2890	--	7	12	77	99	100
01...	1315	325	--	16.4	2.22	3650	--	7	11	66	95	100
01...	1330	460	14.0	3.20	5.02	291	--	66	78	100	--	--
01...	1334	460	--	7.00	4.59	289	--	61	72	98	100	--
01...	1338	460	--	10.0	3.91	439	--	46	59	97	100	--
01...	1342	460	--	11.7	3.39	474	--	41	50	92	99	100
01...	1346	460	--	12.6	2.48	634	--	31	41	92	100	--
01...	1350	460	--	13.2	2.96	679	--	29	37	84	100	--

MISSOURI RIVER MAIN STEM

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06807000 MISSOURI RIVER AT NEBRASKA CITY, NE--Continued

WATER-QUALITY RECORDS

PARTICLE-SIZE DISTRIBUTION OF SURFACE BED MATERIAL, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	NUMBER OF SAM- PLING POINTS (00063)	BED MAT. SIEVE DIAM. % FINER THAN (80164)	BED MAT. SIEVE DIAM. % FINER THAN (80165)	BED MAT. SIEVE DIAM. % FINER THAN (80166)	BED MAT. SIEVE DIAM. % FINER THAN (80167)	BED MAT. SIEVE DIAM. % FINER THAN (80168)	BED MAT. SIEVE DIAM. % FINER THAN (80169)	BED MAT. SIEVE DIAM. % FINER THAN (80170)	BED MAT. SIEVE DIAM. % FINER THAN (80171)	BED MAT. SIEVE DIAM. % FINER THAN (80172)
OCT 07...	1150	5	--	0	4	41	57	81	93	97	100
MAY 05...	1400	5	0	1	22	67	82	93	99	100	--
JUN 09...	1530	5	0	1	14	53	74	88	97	99	100
JUL 28...	1345	5	0	1	18	63	86	96	99	100	--
SEP 01...	1455	5	0	1	20	70	85	95	99	100	--

NISHNABOTNA RIVER BASIN

06807410 WEST NISHNABOTNA RIVER AT HANCOCK, IA

LOCATION.--Lat 41°23'24", long 95°22'17", in NW1/4 NE1/4 sec.18, T.76 N., R.39 W., Pottawattamie County, Hydrologic Unit 10240002, on right bank at upstream side of bridge on county highway G30, 0.6 mi west of Hancock school, 3.0 mi downstream from Jim Creek, 59.6 mi upstream from confluence with East Nishnabotna River, and at mile 75.1 mi upstream from mouth of Nishnabotna River.

DRAINAGE AREA.--609 mi².

PERIOD OF RECORD.--October 1959 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,085.83 ft above NGVD. Prior to Sept. 15, 1980, on downstream end of right pier at same datum.

REMARKS.--Estimated daily discharges: Nov. 10-15, Dec. 9-15, Jan. 17 to Feb. 2 and Feb. 16-20. Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain-gage and satellite satellite data collection platform at station.

AVERAGE DISCHARGE.--28 years, 303 ft³/s, 6.76 in/yr, 219,500 acre-ft/yr; median of yearly mean discharges, 260 ft³/s, 5.8 in/yr, 188,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 26,400 ft³/s Sept. 13, 1972, gage height, 22.12 ft; minimum daily, 2.2 ft³/s Feb. 8, 9, 1971.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 11	2215	*7,510	*12.39	Aug. 26	0745	4,870	9.97

Minimum discharge, 159 ft³/s March 29.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	528	757	492	340	250	247	475	463	628	311	219	641
2	502	716	491	330	280	228	515	460	654	305	210	594
3	552	699	474	330	264	215	553	542	580	308	211	555
4	638	680	455	327	252	217	576	485	520	303	213	524
5	630	661	438	326	249	222	622	465	500	347	202	490
6	553	662	441	329	247	227	776	448	481	401	194	519
7	521	655	448	320	246	229	818	440	459	734	201	617
8	503	830	467	313	244	229	750	423	447	601	1050	488
9	486	742	440	316	231	223	682	414	436	1210	607	466
10	470	650	390	304	241	216	643	404	440	1380	339	506
11	3440	520	350	288	243	216	609	406	444	828	294	447
12	3660	430	370	317	238	217	568	389	426	1620	276	423
13	1670	400	330	311	232	218	538	375	411	866	314	405
14	1370	475	350	310	238	222	626	368	391	570	303	393
15	1160	585	410	298	230	220	910	356	377	962	465	510
16	1060	570	401	274	210	220	900	352	367	550	1100	1110
17	969	563	397	230	200	222	799	348	365	450	759	1160
18	886	564	390	200	200	288	744	342	352	514	440	726
19	830	545	380	200	210	347	698	355	347	495	541	633
20	790	550	377	275	215	321	660	369	345	392	429	579
21	751	533	369	310	217	315	622	408	344	357	391	542
22	725	564	366	270	218	300	611	391	333	333	345	511
23	1010	571	369	200	211	295	625	349	616	310	310	493
24	1070	525	373	190	216	334	583	350	371	300	290	475
25	1120	517	365	178	212	372	558	432	721	329	572	454
26	967	513	357	179	210	342	544	568	404	352	3330	438
27	899	497	354	180	213	334	521	1240	350	285	1530	426
28	856	494	353	188	222	347	497	746	340	266	1120	464
29	798	493	351	195	---	219	493	680	334	251	928	414
30	766	494	343	205	---	230	477	658	323	239	799	389
31	746	---	345	220	---	338	---	759	---	229	703	---
TOTAL	30926	17455	12236	8253	6439	8170	18993	14785	13106	16398	18685	16392
MEAN	998	582	395	266	230	264	633	477	437	529	603	546
MAX	3660	830	492	340	280	372	910	1240	721	1620	3330	1160
MIN	470	400	330	178	200	215	475	342	323	229	194	389
AC-FT	61340	34620	24270	16370	12770	16210	37670	29330	26000	32530	37060	32510
CFSM	1.64	.96	.65	.44	.38	.43	1.04	.78	.72	.87	.99	.90
IN.	1.89	1.07	.75	.50	.39	.50	1.16	.90	.80	1.00	1.14	1.00

CAL YR 1986 TOTAL 248755 MEAN 682 MAX 7850 MIN 66 AC-FT 493400 CFSM 1.12 IN. 15.2
WTR YR 1987 TOTAL 181838 MEAN 498 MAX 3660 MIN 178 AC-FT 360700 CFSM .82 IN. 11.1

NISHNABOTNA RIVER BASIN

213

06808500 WEST NISHNABOTNA RIVER AT RANDOLPH, IA

LOCATION.--Lat 40°52'23", long 95°34'48", in NE1/4 NE1/4 sec.17, T.70 N., R.41 W., Fremont County, Hydrologic Unit 10240002, on right bank at upstream side of bridge on State Highway 184, 0.3 mi downstream from Deer Creek, 0.5 mi west of Randolph, and 16.0 mi upstream from confluence with East Nishnabotna River and at mile 31.5 upstream from mouth of Nishnabotna River.

DRAINAGE AREA.--1,326 mi².

PERIOD OF RECORD.--June 1948 to current year.

REVISED RECORDS.--WSP 1440: Drainage area. WDR IA-74-1: 1973 (M). WDR IA-76-1: 1975 (P).

GAGE.--Water-stage recorder. Datum of gage is 932.99 ft above NGVD, unadjusted. Prior to Aug. 26, 1955, non-recording gage with supplementary water-stage recorder operating above 8.4 ft June 30, 1949 to Aug. 25, 1955 at same site and datum.

REMARKS.--Estimated daily discharges: Jan. 16, 17, Jan. 21 to Feb. 3 and May 29 to June 5. Records good except those for estimated daily discharges, which are poor. U. S. National Weather Service gage-height telemeter at station.

AVERAGE DISCHARGE.--39 years, 600 ft³/s, 6.14 in/yr, 434,700 acre-ft/yr; median of yearly mean discharges, 530 ft³/s, 5.4 in/yr, 384,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 40,800 ft³/s May 26, 1987, gage height, 24.50 ft, from rating curve extended above 35,800 ft³/s; maximum gage height, 24.8 ft Mar. 5, 1949, from graph based on gage readings (backwater from ice); minimum daily discharge, 10 ft³/s Dec. 17-21, 1955.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1947 reached a stage of about 24 ft, discharge not determined, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 6,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 12	0345	12,600	19.30	Aug. 8	1515	15,100	20.43
May 26	1415	*40,800	*24.50	Aug. 25	1330	18,300	21.38
May 31	----	10,000	(a)	Aug. 26	1715	9,850	17.97
July 9	1330	14,100	20.07				

(a) - peak occurred during period of surging.
Minimum daily discharge, 380 ft³/s Jan. 25, 26.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1070	1510	1080	776	530	606	1150	1170	2700	796	650	1350
2	1000	1500	1090	762	600	564	1340	1140	2990	760	631	1250
3	1420	1450	1040	760	580	523	1350	1170	2240	730	633	1170
4	1480	1420	986	765	559	501	1360	1230	1960	713	660	1100
5	1240	1370	937	766	558	504	1400	1180	1830	721	636	1060
6	1100	1350	945	779	553	506	1510	1150	1750	950	623	1160
7	980	1340	1090	763	552	508	1610	1100	1650	1040	641	1150
8	917	1420	1160	736	550	505	1590	1080	1550	1380	8110	1180
9	887	1550	1110	736	528	499	1470	1050	1620	7270	2970	1040
10	846	1390	988	722	517	481	1370	1030	1470	3300	1480	1010
11	4470	1300	941	675	527	473	1300	1010	1490	2610	1080	1010
12	9290	1260	918	682	527	475	1260	1030	1450	2840	938	907
13	3700	1190	890	712	519	481	1240	971	1360	2700	1700	864
14	2810	1180	903	706	522	484	1640	957	1260	1660	1090	839
15	2410	1190	898	688	518	482	2170	916	1180	1430	976	1030
16	2160	1230	951	640	495	477	2080	897	1120	1760	1270	2760
17	1990	1200	927	600	469	491	1900	889	1390	1240	1530	2360
18	1840	1200	922	571	465	639	1740	877	1150	2010	1260	1860
19	1740	1180	908	584	487	802	1630	883	1310	1500	991	1460
20	1660	1200	885	563	485	797	1540	994	1070	1210	1090	1310
21	1590	1160	862	550	479	766	1460	1490	1030	1050	973	1220
22	1550	1160	844	480	479	724	1440	1180	978	977	890	1150
23	1620	1170	843	430	473	707	1470	1030	919	920	833	1100
24	2090	1140	848	400	469	732	1410	976	1220	876	789	1060
25	2040	1110	843	380	467	827	1340	1410	1720	833	8910	1020
26	2000	1090	823	380	467	883	1300	22500	1410	839	7280	994
27	1810	1060	801	390	477	833	1280	14800	970	881	4170	973
28	1710	1050	797	400	517	889	1230	4120	878	765	2480	1260
29	1610	1040	801	420	---	800	1220	3280	1050	728	1980	1210
30	1530	1030	784	440	---	626	1190	2540	881	701	1710	1000
31	1500	---	778	480	---	853	---	5680	---	672	1490	---
TOTAL	62060	37440	28593	18736	14369	19438	43990	79730	43596	45862	60464	36857
MEAN	2002	1248	922	604	513	627	1466	2572	1453	1479	1950	1229
MAX	9290	1550	1160	779	600	889	2170	22500	2990	7270	8910	2760
MIN	846	1030	778	380	465	473	1150	877	878	672	623	839
AC-FT	123100	74260	56710	37160	28500	38560	87250	158100	86470	90970	119900	73110
CFSM	1.51	.94	.70	.46	.39	.47	1.11	1.94	1.10	1.12	1.47	.93
IN.	1.74	1.05	.80	.53	.40	.55	1.23	2.24	1.22	1.29	1.70	1.03

CAL YR 1986 TOTAL 435789 MEAN 1194 MAX 9290 MIN 150 AC-FT 864400 CFSM .90 IN. 12.2
WTR YR 1987 TOTAL 491135 MEAN 1346 MAX 22500 MIN 380 AC-FT 974200 CFSM 1.01 IN. 13.8

NISHNABOTNA RIVER BASIN

06809210 EAST NISHNABOTNA RIVER NEAR ATLANTIC, IA

LOCATION.--Lat 41°20'46", long 95°04'36", in NW1/4 NW1/4 sec.35, T.76 N., R.37 W., Cass County, Hydrologic Unit 10240003, on left bank at downstream side of bridge on county highway, 1.6 mi upstream from Turkey Creek, 5.2 mi southwest of junction of U.S. Highway 6 and State Highway 83 in Atlantic, 69.1 mi upstream from confluence with West Nishnabotna River, and at mile 84.6 upstream from mouth of Nishnabotna River.

DRAINAGE AREA.--436 mi².

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

GAGE.--Water-stage recorder. Datum of gage is 1,105.83 ft above NGVD. Prior to Oct. 1, 1970, at site 2.2 mi upstream at datum 5.00 ft higher.

REMARKS.--Estimated daily discharges: Nov. 11-14, Dec. 9-16, Dec. 27-29, Jan. 2, 3, Jan. 16 to Feb. 3, Feb. 17, 18, 22 and Aug. 28 to Sept. 2. Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain-gage and satellite data collection platform at station.

AVERAGE DISCHARGE.--27 years, 231 ft³/s, 7.20 in/yr, 167,400 acre-ft/yr; median of yearly mean discharges, 230 ft³/s, 7.2 in/yr, 167,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 26,700 ft³/s Sept. 12, 1972, gage height, 22.81 ft; minimum daily discharge, 2.5 ft³/s July 10, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of July 2, 1958 (corrected) reached a stage of 22.49 ft, from flood-mark, discharge, 34,200 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 11	1945	*9,090	*13.55	Aug. 26	1415	3,970	9.59
July 12	0945	4,440	10.05				

Minimum discharge, 104 ft³/s Feb. 16.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	942	748	425	236	195	177	418	328	509	163	144	380
2	747	669	427	220	185	156	460	335	414	160	140	340
3	995	658	412	220	180	159	477	463	398	167	137	319
4	1500	625	386	230	171	161	479	351	340	162	142	299
5	986	602	367	235	168	168	495	315	329	155	138	279
6	741	594	389	241	161	167	522	303	315	183	127	318
7	656	582	407	238	157	164	466	288	289	244	127	295
8	599	624	421	223	154	157	422	269	272	341	840	270
9	543	577	330	224	139	150	391	259	263	796	353	248
10	514	527	250	211	149	142	348	249	263	1010	199	267
11	3860	350	280	214	150	142	333	245	288	802	169	243
12	3070	250	250	245	142	141	318	239	278	2200	154	224
13	1910	350	230	232	133	143	314	233	251	966	201	218
14	1400	400	250	230	135	141	467	234	235	558	188	212
15	1170	475	270	219	134	138	1310	224	222	606	173	231
16	1030	451	290	195	119	138	883	219	214	423	274	537
17	933	453	325	170	122	142	732	215	211	356	279	684
18	857	457	323	140	120	210	637	211	207	350	280	396
19	807	448	316	150	133	253	576	213	207	341	261	332
20	768	466	306	165	127	234	535	270	205	285	229	295
21	730	441	286	170	121	227	491	344	206	258	228	274
22	713	521	273	145	115	214	478	247	193	240	191	264
23	864	546	266	125	122	205	474	217	182	221	180	260
24	1040	485	268	110	129	228	442	207	176	204	180	262
25	1110	479	263	120	123	276	417	255	273	198	587	254
26	963	467	258	130	123	251	403	424	218	190	2990	247
27	850	440	240	140	126	237	378	856	183	183	1390	241
28	781	437	230	150	142	242	350	573	175	177	950	272
29	716	433	230	170	---	162	351	472	178	173	700	234
30	680	432	239	180	---	188	340	429	168	161	550	215
31	668	---	249	200	---	282	---	512	---	153	450	---
TOTAL	33143	14987	9456	5878	3975	5795	14707	9999	7662	12426	12951	8910
MEAN	1069	500	305	190	142	187	490	323	255	401	418	297
MAX	3860	748	427	245	195	282	1310	856	509	2200	2990	684
MIN	514	250	230	110	115	138	314	207	168	153	127	212
AC-FT	65740	29730	18760	11660	7880	11490	29170	19830	15200	24650	25690	17670
CFSM	2.45	1.15	.70	.43	.33	.43	1.12	.74	.59	.92	.96	.68
IN.	2.83	1.28	.81	.50	.34	.49	1.25	.85	.65	1.06	1.10	.76

CAL YR 1986 TOTAL 205371 MEAN 563 MAX 4060 MIN 40 AC-FT 407400 CFSM 1.29 IN. 17.5
WTR YR 1987 TOTAL 139889 MEAN 383 MAX 3860 MIN 110 AC-FT 277500 CFSM .88 IN. 11.9

NISHNABOTNA RIVER BASIN

215

06809500 EAST NISHNABOTNA RIVER AT RED OAK, IA

LOCATION.--Lat 41°00'31", long 95°14'29", in NW1/4 SE1/4 sec.29, T.72 N., R.38 W., Montgomery County, Hydrologic Unit 10240003, on left bank on downstream side of Coolbaugh Street bridge in Red Oak, and 0.2 mi upstream from Red Oak Creek, 38.0 mi upstream from confluence with West Nishnabotna River, and at mile 53.6 upstream from mouth of Nishnabotna River.

DRAINAGE AREA.--894 mi².

PERIOD OF RECORD.--May 1918 to July 1925, May 1936 to current year. Monthly discharge only for some periods, published in WSP 1310.

REVISED RECORDS.--WSP 1240: 1921, 1922-23 (M), 1924, 1942 (M), 1944 (M), 1946. WSP 1440: Drainage area. WSP 1710: 1957.

GAGE.--Water-stage recorder. Datum of gage is 1,005.45 ft above NGVD. Prior to July 5, 1925, nonrecording gage at present site at datum 4.60 ft higher. May 29, 1936, to Nov. 13, 1952, nonrecording gage with supplementary water-stage recorder in operation above 3.2 ft gage height July 30, 1939, to Nov. 13, 1952, and Nov. 14, 1952, to June 13, 1966, water-stage recorder, all at site 0.5 mi upstream at datum 5.00 ft higher. June 14, 1966, to Sept. 30, 1969, at present site at datum 5.00 ft higher.

REMARKS.--Estimated daily discharges: Oct. 11-16, Oct. 25 to Nov. 15, Nov. 29 to Dec. 3, Dec. 9-15, Dec. 23 to Jan. 11, Jan. 17 to Feb. 11, Feb 18-19 and 22. Records good except those for estimated daily discharges, which are poor. U.S. National Weather Service gage-height telemeter at station.

AVERAGE DISCHARGE.--57 years (water years 1919-24, 1937-87), 400 ft³/s, 6.08 in/yr, 289,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 38,000 ft³/s Sept. 13, 1972, gage height, 27.43 ft; maximum gage height, 28.23 ft June 13, 1947, present datum; minimum daily discharge, 6 ft³/s Aug. 18, 1936.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 12	----	unknown	unknown	July 12	1730	6,930	14.74
May 26	1045	*9,820	*17.08	Aug. 8	1030	5,490	13.39
July 9	0800	6,460	14.32	Aug. 26	2100	6,280	14.15

Minimum discharge, 205 ft³/s Aug. 7.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2170	1300	700	440	364	372	800	576	1470	378	265	838
2	1390	1320	740	430	420	367	939	572	1120	364	250	749
3	2130	1220	640	420	370	325	907	679	1030	355	237	686
4	2200	1210	577	420	346	328	871	750	892	383	241	634
5	2200	1120	539	410	343	321	885	615	811	354	238	594
6	1500	1080	565	390	342	330	913	582	754	416	214	720
7	1290	1020	617	370	336	326	897	564	698	392	219	735
8	1160	1060	709	360	338	316	789	543	652	812	3140	600
9	1060	1080	600	340	320	302	722	520	704	3280	1420	544
10	971	920	450	340	308	288	674	507	625	1700	622	538
11	2000	660	480	350	324	277	639	505	625	2670	469	539
12	4800	460	460	403	317	286	635	504	625	3730	413	489
13	3700	390	420	432	305	287	601	473	586	2570	433	459
14	2900	430	470	410	306	291	879	461	549	1330	496	445
15	2400	760	540	401	315	286	1950	446	511	1140	425	584
16	1900	839	598	344	296	280	1870	431	805	1050	456	2350
17	1750	751	585	260	275	289	1430	426	718	778	480	2090
18	1580	717	575	240	260	361	1220	419	555	1050	487	1160
19	1450	693	560	250	270	570	1060	438	516	857	542	889
20	1350	686	544	280	298	497	978	566	531	655	483	757
21	1270	657	526	290	284	465	898	746	484	558	440	679
22	1200	703	511	270	270	444	849	647	466	497	404	629
23	1210	804	500	250	283	419	848	489	436	462	352	599
24	2300	766	490	230	277	424	801	466	438	431	334	575
25	1930	693	480	220	280	533	744	637	567	406	2300	551
26	1720	686	450	230	266	549	704	5220	651	386	5270	530
27	1570	652	450	250	266	499	664	3870	455	361	3590	516
28	1420	627	440	270	292	549	625	2220	412	344	1990	743
29	1320	615	430	290	---	482	609	1600	412	324	1460	605
30	1240	600	430	310	---	367	600	1280	396	305	1160	517
31	1200	---	450	340	---	580	---	2150	---	283	972	---
TOTAL	56281	24519	16526	10240	8671	12010	27001	29902	19494	28621	29802	22344
MEAN	1816	817	533	330	310	387	900	965	650	923	961	745
MAX	4800	1320	740	440	420	580	1950	5220	1470	3730	5270	2350
MIN	971	390	420	220	260	277	600	419	396	283	214	445
AC-FT	111600	48630	32780	20310	17200	23820	53560	59310	38670	56770	59110	44320
CFSM	2.03	.91	.60	.37	.35	.43	1.01	1.08	.73	1.03	1.08	.83
IN.	2.34	1.02	.69	.43	.36	.50	1.12	1.24	.81	1.19	1.24	.93

CAL YR 1986 TOTAL 365469 MEAN 1001 MAX 6230 MIN 110 AC-FT 724900 CFSM 1.12 IN. 15.2
WTR YR 1987 TOTAL 285411 MEAN 782 MAX 5270 MIN 214 AC-FT 566100 CFSM .87 IN. 11.9

NISHNABOTNA RIVER BASIN

06810000 NISHNABOTNA RIVER ABOVE HAMBURG, IA
(National stream-quality accounting network station)

LOCATION.--Lat 40°37'57", long 95°37'32", in SW1/4 SE1/4 sec.11, T.67 N., R.42 W., Fremont County, Hydrologic Unit 10240004, on left bank 1.7 mi downstream from confluence of East Nishnabotna and West Nishnabotna Rivers, 2 mi northeast of Hamburg, and at mile 13.8.

DRAINAGE AREA.--2,806 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1922 to September 1923, October 1928 to current year. Monthly discharge only for some periods published in WSP 1310.

REVISED RECORDS.--WSP 1240: 1923, 1929-37, 1938-40 (M), 1943 (M). WSP 1440: Drainage area. WDR IA-74-1: 1973.

GAGE.--Water-stage recorder. Datum of gage is 894.17 ft above NGVD. See WSP 1730 for history of changes prior to Nov. 16, 1950.

REMARKS.--Estimated daily discharges: Nov. 13-18, Dec. 8-18, and Jan. 16 to Feb. 4. Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers rain-gage and satellite data collection platform at station.

AVERAGE DISCHARGE.--60 years (water years 1923, 1929-87), 1,129 ft³/s, 5.46 in/yr, 818,000 acre-ft/yr; median of yearly mean discharges, 960 ft³/s, 4.6 in/yr, 696,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 55,500 ft³/s June 24, 1947, gage height, 26.03 ft, from flood-mark, present site and datum; maximum gage height, 28.14 ft May 27, 1987; minimum daily discharge, 4.5 ft³/s Aug. 30, 1934.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 9,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 12	1300	24,500	25.95	Aug. 8	2200	15,700	22.88
May 27	1300	*31,400	*28.14	Aug. 27	0315	22,600	25.35
July 9	1600	18,000	23.78	Sept. 16	1045	14,600	22.42
July 13	0615	12,100	21.30				

Minimum discharge, 987 ft³/s Feb. 27.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3700	3170	2270	1720	1400	1340	2430	2300	11000	1910	1420	3270
2	3270	3250	2410	1700	1490	1260	2840	2250	9360	1850	1380	3020
3	3490	3200	2220	1670	1380	1180	2960	2260	6720	1810	1350	2820
4	3880	3030	2090	1670	1300	1120	2910	2460	5750	1770	1360	2650
5	4030	2910	1980	1660	1190	1110	2910	2440	4950	1770	1340	2560
6	3300	2830	1950	1660	1170	1100	3000	2310	4350	1800	1310	2640
7	2800	2760	2180	1650	1160	1100	3090	2190	3960	2010	1370	2600
8	2570	2770	2500	1640	1150	1090	3070	2130	3650	2680	7920	2620
9	2430	2850	2310	1650	1130	1060	2890	2080	3580	10400	9520	2420
10	2300	2890	2100	1640	1100	1030	2720	2020	3340	9140	3540	2460
11	7980	2650	2120	1590	1110	1010	2580	1970	3220	5810	2460	2300
12	23300	2530	2020	1570	1120	1000	2470	1970	3430	5270	2090	2180
13	14800	2400	1990	1640	1100	1010	2440	1920	3580	9570	2470	2060
14	8320	2400	2030	1670	1100	1020	3340	1870	2910	4100	2170	1990
15	6200	2400	2100	1630	1100	1030	4590	1820	2680	3200	2440	2460
16	5250	2300	2180	1500	1080	1020	4850	1770	2560	3320	1980	11200
17	4700	2300	2100	1400	1040	1060	4310	1740	3360	2850	2450	7150
18	4280	2300	2010	1370	1020	1370	3830	1730	2770	3530	2230	4890
19	3980	2260	1990	1300	1040	1670	3530	1890	3000	3570	1930	3500
20	3720	2270	1980	1310	1040	1790	3300	5870	2590	2680	2030	3010
21	3560	2250	1950	1330	1040	1750	3110	5050	2500	2270	1840	2750
22	3440	2210	1910	1300	1030	1680	2970	3290	2370	2070	1720	2540
23	3420	2280	1890	1280	1020	1640	2970	2610	2420	1960	1620	2390
24	3780	2330	1890	1270	1020	1670	2900	2330	2350	1880	1550	2300
25	4610	2240	1870	1260	1010	1820	2770	4000	2950	1780	9990	2240
26	4300	2170	1820	1260	1000	2000	2670	19500	2840	1730	19200	2140
27	4010	2120	1790	1270	1000	1940	2580	28700	2400	1770	21100	2080
28	3720	2070	1770	1300	1080	1910	2470	23500	2060	1650	11100	2010
29	3500	2050	1770	1310	---	1970	2410	17600	2140	1590	5700	2560
30	3310	2080	1750	1320	---	1710	2370	14000	2080	1520	4400	2060
31	3170	---	1730	1360	---	1810	---	12200	---	1470	3690	---
TOTAL	155120	75270	62670	45900	31420	43270	91280	177770	110870	98730	134670	90870
MEAN	5004	2509	2022	1481	1122	1396	3043	5735	3696	3185	4344	3029
MAX	23300	3250	2500	1720	1490	2000	4850	28700	11000	10400	21100	11200
MIN	2300	2050	1730	1260	1000	1000	2370	1730	2060	1470	1310	1990
AC-FT	307700	149300	124300	91040	62320	85830	181100	352600	219900	195800	267100	180200
CFSM	1.78	.89	.72	.53	.40	.50	1.08	2.04	1.32	1.14	1.55	1.08
IN.	2.06	.99	.83	.61	.42	.57	1.21	2.36	1.47	1.31	1.79	1.20

CAL YR 1986	TOTAL	943069	MEAN	2620	MAX	23300	MIN	280	AC-FT	1871000	CFSM	.93	IN.	12.5
WTR YR 1987	TOTAL	1117840	MEAN	3063	MAX	28700	MIN	1000	AC-FT	2217000	CFSM	1.09	IN.	14.8

NISHNABOTNA RIVER BASIN

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06810000 NISHNABOTNA RIVER ABOVE HAMBURG, IA--Continued
(National stream-quality accounting network station)

WATER-QUALITY RECORDS

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

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: April 1979 to September 1981.

WATER TEMPERATURES: April 1979 to September 1981.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 815 microsiemens Sept. 16,18, 19, 28,30, 1979; minimum daily, 155 microsiemens, July 20, 1981.

WATER TEMPERATURES: Maximum daily, 32.0°C July 14, 1980; minimum daily 0.0°C, on many days during winter period.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	TEMPER- ATURE AIR (DEG C) (00020)	TUR- BID- ITY (NTU) (00076)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED SATUR- ATION (00301)	BARO- METRIC PRES- SURE (MM HG) (00025)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML.) (31625)
NOV 25...	1200	2220	610	8.11	2.5	16.5	58	13.2	101	734	3100
FEB 23...	1130	1020	529	8.27	3.5	12.5	1.5	13.1	102	737	1600
MAY 20...	1030	5150	268	7.19	19.5	25.0	360	5.6	64	733	80000
AUG 19...	0945	1880	460	7.14	23.0	25.5	250	7.3	88	741	30000

DATE	STREP- TOCOCCEI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	HARD- NESS NONCARB WH WAT TOT FLD MG/L AS CACO3 (00902)	HARD- NESS (MG/L AS CACO3) (00900)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM AD- SORP- TION RATIO (00931)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	ALKA- LITY WH WAT TOTAL FIELD MG/L AS CACO3 (00410)	BICAR- BONATE WH WAT TOTAL FIELD MG/L AS HCO3 (00440)
NOV 25...	5400	48	280	74	23	10	7	0.3	2.1	232	280
FEB 23...	470	46	280	74	23	11	8	0.3	1.5	234	290
MAY 20...	160000	22	120	33	9.5	20	26	0.8	3.8	100	120
AUG 19...	10000	50	230	64	18	9.1	8	0.3	4.1	184	230

DATE	CAR- BONATE WH WAT TOTAL FIELD MG/L AS CO3 (00445)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N) (00605)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)
NOV 25...	0	34	11	0.30	17	336	310	0.46	2010	0.87	7.00
FEB 23...	0	38	14	0.30	14	404	320	0.55	1110	0.65	5.90
MAY 20...	0	16	7.2	0.40	12	208	160	0.28	2890	21	4.10
AUG 19...	0	26	14	0.40	17	290	260	0.39	1470	2.3	5.40

NISHNABOTNA RIVER BASIN

06810000 NISHNABOTNA RIVER ABOVE HAMBURG, IA--Continued

WATER-QUALITY RECORDS

DATE	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P) (00671)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS, TOTAL (MG/L AS P) (00665)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (MG/L) (80154)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
NOV 25...	<0.010	0.030	0.030	0.90	0.080	0.100	0.160	455	2730	73
FEB 23...	0.020	0.050	0.050	0.70	0.050	0.070	0.090	96	264	81
MAY 20...	0.070	0.450	0.470	21	0.070	0.100	4.20	6480	90100	97
AUG 19...	0.010	0.020	0.010	2.3	0.190	0.210	0.810	1330	6750	91

DATE	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	ALUM- INUM, DIS- SOLVED (UG/L AS AL) (01106)	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)
NOV 25...	2	<10	140	<0.5	2	<1	<3	3	18	<5
FEB 23...	2	10	140	<0.5	<1	<1	<3	1	4	<5
MAY 20...	2	260	86	<2	<3	<1	<20	7	220	<5
AUG 19...	4	<10	160	<0.5	<1	1	<3	3	22	<5

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)
NOV 25...	16	25	0.1	<10	3	3	<1	250	<6	20
FEB 23...	14	38	0.2	<10	3	3	1	250	<6	5
MAY 20...	<12	120	<0.1	<30	3	1	<1	140	<18	34
AUG 19...	5	<10	<0.1	<10	3	2	<1	210	<6	17

TARKIO RIVER BASIN

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06811840 TARKIO RIVER AT STANTON, IA

LOCATION.--Lat 40°58'52", long 95°06'32", in NW1/4 SW1/4 sec.4, T.71 N., R.37 W., Montgomery County, Hydrologic Unit 10240005, on right bank 10 ft downstream from bridge on county highway H42, 0.1 mi downstream from Little Tarkio Creek, and 0.5 mi west of Stanton.

DRAINAGE AREA.--49.3 mi².

PERIOD OF RECORD.--October 1957 to current year. Annual maximum, water years 1952-57.

REVISED RECORDS.--WSP 1919: 1960 (M).

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,104.67 ft above NGVD.

REMARKS.--Estimated daily discharges: Nov. 10, 11, 14, Jan. 15-18, 24-27, and Feb. 24. Records good except those for estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--30 years, 29.9 ft³/s, 8.24 in/yr, 21,660 acre-ft/yr; median of yearly mean discharges, 27 ft³/s, 7.4 in/yr, 19,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,500 ft³/s June 9, 1967, gage height, 28.56 ft, from rating curve extended above 1,600 ft³/s on basis of slope-area measurement of peak flow; no flow at times most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,500 ft³/s, and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 11	1000	1,510	12.89	Aug. 25	1015	9,750	19.63
May 26	1215	*10,100	*19.86	Aug. 25	2130	2,380	14.04
May 26	1930	6,470	17.29	Aug. 26	0630	6,490	17.31
July 9	1015	3,910	15.41	Sept. 16	0230	2,930	14.57
July 12	0500	1,830	13.41				

Minimum discharge, 4.8 ft³/s Feb. 16, result of freezeup

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	76	65	38	23	16	59	108	21	109	22	19	47
2	77	60	39	23	15	37	97	20	102	21	18	41
3	81	56	35	23	12	30	84	20	83	20	20	38
4	135	51	30	24	12	27	80	20	74	19	20	36
5	74	49	29	25	13	26	83	21	68	19	18	49
6	58	47	32	25	13	24	76	19	61	19	17	38
7	51	45	80	23	13	22	64	17	56	17	22	33
8	43	55	81	23	12	20	54	15	52	20	265	30
9	40	42	62	24	12	18	47	14	53	1050	34	31
10	38	38	47	18	12	18	42	13	51	229	24	40
11	705	36	46	21	11	20	40	12	51	78	20	31
12	234	35	39	22	11	20	36	13	45	342	18	30
13	148	34	34	21	12	20	39	12	43	75	21	29
14	117	35	37	23	13	20	287	11	40	60	20	27
15	97	37	36	18	11	18	149	10	37	90	20	258
16	86	38	38	15	11	17	106	10	58	49	16	811
17	75	37	38	17	11	20	80	9.6	44	47	14	138
18	68	35	37	16	11	102	63	9.2	102	139	15	95
19	63	34	36	15	9.4	57	54	14	42	49	14	77
20	59	37	33	14	8.8	43	45	32	37	40	15	66
21	56	35	32	17	10	41	40	66	35	37	13	57
22	58	36	32	12	10	34	43	27	32	34	10	52
23	71	32	32	11	9.0	34	40	23	31	32	11	49
24	84	30	31	10	9.7	38	35	22	40	29	11	45
25	92	31	29	10	9.8	40	31	47	39	28	2820	43
26	82	28	27	10	11	35	29	3640	27	28	1480	42
27	70	28	27	12	13	34	24	454	26	26	154	39
28	62	28	26	14	44	35	24	185	25	25	98	40
29	55	29	26	18	---	18	23	132	26	23	74	38
30	54	29	24	15	---	55	22	99	23	21	60	36
31	52	---	25	15	---	67	---	409	---	20	51	---
TOTAL	3061	1172	1158	557	355.7	1049	1945	5416.8	1512	2708	5412	2386
MEAN	98.7	39.1	37.4	18.0	12.7	33.8	64.8	175	50.4	87.4	175	79.5
MAX	705	65	81	25	44	102	287	3640	109	1050	2820	811
MIN	38	28	24	10	8.8	17	22	9.2	23	17	10	27
AC-FT	6070	2320	2300	1100	706	2080	3860	10740	3000	5370	10730	4730
CFSM	2.00	.79	.76	.36	.26	.69	1.32	3.54	1.02	1.77	3.54	1.61
IN.	2.31	.88	.87	.42	.27	.79	1.47	4.09	1.14	2.04	4.08	1.80

CAL YR 1986 TOTAL 18002.4 MEAN 49.3 MAX 973 MIN 3.1 AC-FT 35710 CFSM 1.00 IN. 13.6
WTR YR 1987 TOTAL 26732.5 MEAN 73.2 MAX 3640 MIN 8.8 AC-FT 53020 CFSM 1.49 IN. 20.2

06813500 MISSOURI RIVER AT RULO. NE

LOCATION.--Lat 40°03'13", long 95°25'19", in NW1/4 NW1/4 sec.17, T.1 N., R.18 E., Richardson County, Hydrologic Unit 10240005, on right bank at downstream side of bridge on U. S. Highway 159 at Rulo, 3.2 mi upstream from Big Nemaha River, and at mile 498.0.

DRAINAGE AREA.--414,900 mi², approximately. The 3,959 mi² in Great Divide basin are not included.

PERIOD OF RECORD.--October 1949 to current year in reports of U.S. Geological Survey. Gage-height record collected at site 80 ft upstream January 1886 to December 1899 published in reports of Missouri River Commission September 1929 to September 1950 in files of Kansas City office of U.S. Army Corps of Engineers.

GAGE.--Water-stage recorder. Datum of gage is 837.23 ft above NGVD. Oct. 1949 to Sept. 12, 1950, nonrecording gage at site 80 ft upstream and Sept. 13, 1950 to Apr. 19, 1983, recording gage on downstream end of middle pier and pier, all at same datum.

REMARKS.--Estimated daily discharges: Jan. 18-20, 22-31, Mar. 26-31, Apr. 6, 7, 12, 13, 21-23 and Aug. 12-17. Records good except those for estimated daily discharges, which are poor. Flow regulated by upstream main-stem reservoirs. U. S. Army Corps of Engineers satellite data collection platform at station.

AVERAGE DISCHARGE.--38 years, 41,740 ft³/s, 30,241,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 358,000 ft³/s Apr. 22, 1952, gage height, 25.60 ft; minimum daily discharge, 4,420 ft³/s Jan. 13, 1957; minimum gage height, 0.65 ft Jan. 7, 1971, result of freezeup.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in 1881 reached a stage of 22.9 ft, from floodmark, discharge not determined.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 146,000 ft³/s Mar. 25, gage height, 20.97 ft; maximum gage height 22.93 ft, May 28, (backwater from Big Nemaha River); minimum daily discharge, 35,200 ft³/s Jan. 26; minimum gage height 8.22 ft. Jan. 21.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	80300	66900	64200	46800	38500	40100	87000	50800	70600	44700	41200	47800
2	79000	67400	68100	48100	38700	39900	92000	50300	65300	42300	39700	45900
3	77900	67200	66400	47900	39000	39200	100000	53400	71800	41500	38500	44300
4	75200	66700	63500	47100	39400	39200	96500	53500	61900	41600	38300	43300
5	74900	65800	60300	47500	39100	38800	92000	55800	56800	41900	38300	42700
6	70200	65500	58400	47300	38800	38500	89000	56300	55800	41900	37500	43000
7	67900	65500	59400	46900	39100	39300	85400	56600	51100	44700	38100	43200
8	65200	65900	64800	47800	38700	39000	81500	53300	49900	60100	46700	45400
9	63000	68200	62700	46800	38500	39200	77300	51900	54200	69300	63700	43800
10	61600	67900	59600	46800	38500	39500	73300	50000	58500	69800	50500	49000
11	74300	67000	56900	46400	37800	38900	70200	50000	52200	60400	45600	46800
12	128000	65400	55000	45800	38100	38700	69000	49200	50400	61200	43000	44200
13	127000	61700	55100	45100	38300	38000	69000	48600	54800	68200	46000	42100
14	105000	58900	55200	46500	38300	37900	82600	48400	54500	59600	47000	41700
15	85300	58200	53800	44300	38100	37600	108000	47800	51400	53400	44000	44200
16	76400	58200	55100	41800	38000	37700	92300	47900	51000	50200	41000	73900
17	72700	59200	59700	40700	38200	38300	81700	46800	49700	48800	42700	62700
18	71800	60000	58200	38200	37800	45600	76400	46500	50900	47400	44500	58400
19	71300	63800	57600	37000	37600	66300	73600	46800	62100	49300	41500	55000
20	72200	65700	55200	36000	36400	67800	71200	53600	58300	46900	45100	53600
21	72900	65900	50400	36000	36200	59700	69000	57300	52500	47300	43400	50900
22	72600	65700	46800	36200	36400	63600	67000	54600	52000	47000	41000	48600
23	72100	64400	46400	36000	36300	87300	64000	51500	51000	45900	39800	47300
24	73900	65000	47800	36200	36300	104000	61400	49300	49300	46400	38600	45900
25	78100	66000	47700	36000	36500	140000	57600	57300	49400	45400	42500	45400
26	81000	65200	48600	35200	36500	129000	54100	67400	54500	46500	104000	45400
27	79400	64700	47800	35300	36700	112000	53500	122000	50000	48100	100000	44200
28	74200	64300	46200	35500	37300	100000	52400	132000	47100	46100	77900	43000
29	70700	63900	46700	35800	---	95000	52100	107000	48200	44800	61400	43500
30	69300	63100	47900	36400	---	90000	50700	83800	49000	43900	54500	43000
31	67400	---	46900	37000	---	88000	---	72700	---	42100	50800	---
TOTAL	2410800	1933300	1712400	1290400	1059100	1888100	2249800	1872400	1634200	1546700	1526800	1428200
MEAN	77770	64440	55240	41630	37820	60910	74990	60400	54470	49890	49250	47610
MAX	128000	68200	68100	48100	39400	140000	108000	132000	71800	69800	104000	73900
MIN	61600	58200	46200	35200	36200	37600	50700	46500	47100	41500	37500	41700
AC-FT	4782000	3835000	3397000	2560000	2101000	3745000	4462000	3714000	3241000	3068000	3028000	2833000
CAL YR 1986	TOTAL 21053100		MEAN 57680		MAX 128000		MIN 23500		AC-FT 41760000			
WTR YR 1987	TOTAL 20552200		MEAN 56310		MAX 140000		MIN 35200		AC-FT 40770000			

NODAWAY RIVER BASIN

221

06817000 NODAWAY RIVER AT CLARINDA, IA

LOCATION.--Lat 40°44'19", long 95°00'47", in SW1/4 NE1/4 sec.32, T.69 N., R.36 W., Page County, Hydrologic Unit 10240009, near left abutment on downstream side of bridge on State Highway 2 (city route), 0.5 mi downstream from North Branch, 1.2 mi east of city square of Clarinda, and 7.5 mi upstream from East Nodaway River.

DRAINAGE AREA.--762 mi².

WATER DISCHARGE RECORDS

PERIOD OF RECORD.--May 1918 to July 1925, May 1936 to current year. Monthly discharge only for some periods, published in WSP 1310.

REVISED RECORDS.--WSP 1240: 1918-20 (M), 1921, 1922-25 (M), 1936-38, 1942, 1943-45 (M), 1948. WSP 1440: Drainage area. WSP 1710: 1958, 1959 (P).

GAGE.--Water-stage recorder. Datum of gage is 960.36 ft above NGVD. Prior to July 5, 1925, and May 28, 1936, to Mar. 26, 1957 nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Nov. 11-17, Dec. 5, 9-14, Dec. 23 to Feb. 1, Feb. 9-11 and Mar. 30. Records good except those for estimated daily discharges, which are poor. Clarinda municipal water supply is taken from Nodaway River, 500 ft upstream from station. Average daily pumpage was 1.39 ft³/s. U.S. National Weather Service gage-height telemeter at station.

COOPERATION.--Average pumpage provided by City of Clarinda water works.

AVERAGE DISCHARGE.--57 years (1918-24, 1936-87), 356 ft³/s, 6.34 in/yr, 257,900 acre-ft/yr; median of yearly mean discharges, 280 ft³, 5.0 in/yr, 203,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 31,100 ft³/s June 13, 1947, gage-height, 25.3 ft, from floodmark, from rating curve extended above 15,000 ft³/s on basis of an overflow profile and extended channel rating; minimum daily discharge, 1.0 ft³/s Sept. 5, 9, 12, 14, 1918, Dec. 9, 27-31 1923.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in August 1903 reached a stage of 25.4 ft, from floodmarks, discharge not determined.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 5,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 11	1915	12,200	10.20	July 10	2200	10,000	8.93
Apr. 15	0200	6,320	7.68	July 12	1030	12,700	10.48
May 26	1500	*27,800	*17.87	Aug. 25	1700	26,500	17.29
May 31	1745	5,290	7.28	Aug. 26	1615	27,700	17.81
July 9	1215	23,800	16.04				

Minimum discharge, 90 ft³/s Feb. 18.

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

MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2050	967	451	200	210	397	961	482	1850	238	257	872
2	1240	988	508	175	263	372	1050	475	1260	224	243	760
3	1470	783	451	170	221	292	886	480	1000	217	233	677
4	1680	711	379	170	204	269	777	497	806	216	230	613
5	1790	645	300	165	201	253	767	471	697	198	224	566
6	1120	614	377	165	192	246	753	452	630	198	218	586
7	914	592	559	165	191	234	703	433	578	297	222	579
8	805	644	900	165	193	223	626	410	534	327	2360	535
9	714	629	723	155	170	207	579	392	608	9680	1680	486
10	655	537	370	155	155	191	547	376	531	6160	562	546
11	4440	350	420	155	170	179	514	367	514	4410	421	518
12	6580	300	400	170	182	183	490	371	488	6820	360	449
13	2150	200	370	225	168	182	476	351	446	2990	456	414
14	1590	250	430	280	167	187	1620	336	406	1250	612	393
15	1300	350	460	200	170	197	3780	326	369	1100	594	413
16	1130	540	428	170	153	191	1610	310	341	1010	487	1460
17	1010	500	426	150	135	200	1320	304	357	707	400	1900
18	898	475	419	150	137	546	1110	300	505	635	344	825
19	814	451	395	150	146	1040	957	832	428	832	377	612
20	752	445	387	150	163	699	833	1530	357	618	349	529
21	705	435	368	145	149	601	731	915	347	526	323	476
22	673	431	347	140	143	560	680	547	330	476	293	432
23	944	454	330	130	142	517	695	459	309	439	267	406
24	2040	427	315	130	137	512	662	432	298	403	255	389
25	1550	400	300	130	138	626	612	726	412	374	11900	370
26	1400	396	295	130	133	646	587	11700	412	351	22200	348
27	1200	379	280	140	140	567	559	9810	306	332	8630	335
28	987	367	265	150	182	558	524	3840	279	315	2290	566
29	857	363	250	155	---	577	507	2180	278	298	1540	610
30	761	359	230	165	---	500	500	1560	255	287	1210	375
31	715	---	240	180	---	690	---	3310	---	272	1020	---
TOTAL	44934	14982	12373	5080	4755	12642	26416	44974	15931	42200	60557	18040
MEAN	1449	499	399	164	170	408	881	1451	531	1361	1953	601
MAX	6580	988	900	280	263	1040	3780	11700	1850	9680	22200	1900
MIN	655	200	230	130	133	179	476	300	255	198	218	335
AC-FT	89130	29720	24540	10080	9430	25080	52400	89210	31600	83700	120100	35780
CFSM	1.90	.66	.52	.22	.22	.54	1.16	1.90	.70	1.79	2.56	.79
IN.	2.19	.73	.60	.25	.23	.62	1.29	2.20	.78	2.06	2.96	.88

CAL YR 1986 TOTAL 300824 MEAN 824 MAX 12900 MIN 62 AC-FT 596700 CFSM 1.08 IN. 14.7
WTR YR 1987 TOTAL 302884 MEAN 830 MAX 22200 MIN 130 AC-FT 600800 CFSM 1.09 IN. 14.8

NODAWAY RIVER BASIN

06817000 NODAWAY RIVER AT CLARINDA, IA--Continued

WATER-QUALITY RECORDS

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

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1975 to current year.

WATER TEMPERATURES: October 1975 to September 1978, October 1979 to current year.

SUSPENDED-SEDIMENT DISCHARGE: October 1975 to current year.

REMARKS.--Records of specific conductance are obtained from suspended-sediment samples at time of analysis. Suspended-sediment samples at normal flows and winter period are collected downstream from dam, 300 ft upstream from gage. Samples at higher stages are collected from bridge at gage. Random water temperatures are on file for the 1979 water year.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 600 microsiemens Aug. 22, 1982; minimum daily, 130 microsiemens June 15, 1976.

WATER TEMPERATURES: Maximum daily, 30.5°C Aug. 23, 1978; minimum daily, 0.0°C on many days during winter period.

SEDIMENT CONCENTRATIONS: Maximum daily mean, 23,800 mg/L Apr. 17, 1978; minimum daily mean, 3 mg/L Dec. 1, 1986.

SEDIMENT LOADS: Maximum daily, 1,500,000 tons June 16, 1982; minimum daily, 0.23 ton Dec. 14, 1977.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 465 microsiemens Jan. 21; minimum daily, 170 microsiemens July 9.

WATER TEMPERATURE: Maximum daily, 28.0°C July 28, Aug. 1, 2, 10.

SEDIMENT CONCENTRATIONS: Maximum daily mean, 10,600 mg/L April 15, July 10; minimum daily mean, 11 mg/L Jan. 17.

SEDIMENT LOADS: Maximum daily, 640,000 tons Aug. 26; minimum daily, 4.5 ton Jan. 17.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	380	360	380	415	360	320	340	400	280	440	400	360
2	390	340	360	410	360	340	330	400	345	440	400	---
3	360	360	360	415	370	350	340	395	370	430	---	370
4	335	375	380	---	380	360	340	390	380	420	400	380
5	300	380	390	415	375	380	360	395	400	440	400	380
6	350	380	390	400	380	370	360	400	400	430	400	380
7	380	380	375	400	350	360	360	400	400	410	400	---
8	380	380	305	405	350	350	360	410	400	320	260	370
9	390	365	320	405	370	360	360	---	390	170	200	380
10	390	375	360	410	380	340	360	410	360	180	240	---
11	380	380	400	410	380	360	380	415	395	200	300	380
12	220	380	400	420	380	350	380	400	400	220	350	---
13	290	400	420	420	380	350	380	410	400	190	360	420
14	340	420	400	410	380	350	350	400	400	300	240	410
15	360	400	390	390	380	340	280	420	405	340	290	410
16	360	380	380	410	380	340	305	410	405	290	350	340
17	380	380	370	440	390	360	340	415	380	350	340	245
18	380	380	400	400	400	320	340	410	400	370	370	300
19	380	380	380	420	380	280	360	415	360	360	380	345
20	380	370	400	440	380	310	360	240	400	340	---	365
21	380	380	410	465	380	360	370	200	400	370	370	370
22	380	380	400	440	380	370	370	320	405	---	380	380
23	380	380	400	400	370	390	375	380	415	400	400	395
24	310	380	400	420	360	380	375	400	460	400	400	395
25	300	380	405	395	370	380	390	390	420	400	400	385
26	320	380	400	420	350	360	400	320	360	400	160	---
27	350	385	415	440	350	380	400	220	400	400	160	380
28	360	380	410	400	340	390	400	290	420	400	260	380
29	370	380	405	400	---	370	400	315	420	400	320	240
30	370	380	420	380	---	370	400	350	440	400	340	340
31	375	---	420	380	---	370	---	350	---	400	340	---

NODAWAY RIVER BASIN

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06817000 NODAWAY RIVER AT CLARINDA, IA--Continued

WATER-QUALITY RECORDS

TEMPERATURE, WATER, DEGREES CENTIGRADE, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15.0	15.0	7.0	---	---	---	7.0	18.0	21.0	26.0	28.0	19.0
2	14.0	15.0	5.0	---	---	---	8.0	20.0	22.0	24.0	28.0	---
3	18.0	16.0	6.0	---	---	---	6.0	21.0	18.0	24.0	---	20.0
4	15.0	12.0	5.0	---	---	---	7.0	15.0	19.0	24.0	25.0	20.0
5	15.0	---	5.0	---	---	---	7.0	17.0	20.0	23.0	23.0	21.0
6	14.0	12.0	4.0	---	---	---	9.0	17.0	20.0	24.0	24.0	19.0
7	14.0	11.0	5.0	---	---	---	9.0	17.0	20.0	25.0	21.0	---
8	16.0	10.0	---	---	---	---	9.0	17.0	22.0	22.0	26.0	19.0
9	17.0	9.0	---	---	---	---	11.0	---	24.0	---	27.0	19.0
10	---	7.0	---	---	---	---	11.0	19.0	21.0	26.0	28.0	---
11	17.0	6.0	3.0	---	---	---	12.0	20.0	22.0	26.0	24.0	19.0
12	17.0	6.0	---	---	---	---	11.0	18.0	23.0	26.0	26.0	---
13	13.0	3.0	3.0	---	---	---	13.0	19.0	23.0	26.0	24.0	18.0
14	15.0	0	---	---	---	---	12.0	19.0	25.0	26.0	23.0	21.0
15	---	3.0	---	---	---	---	13.0	19.0	26.0	26.0	24.0	---
16	12.0	3.0	1.5	---	---	---	---	18.0	26.0	23.0	27.0	---
17	---	3.0	---	---	---	---	---	19.0	26.0	25.0	25.0	19.0
18	---	3.0	---	---	---	---	16.0	21.0	25.0	24.0	24.0	19.0
19	---	5.0	---	---	---	---	16.0	---	23.0	26.0	---	19.0
20	---	5.0	---	---	---	---	---	21.0	22.0	27.0	---	19.0
21	11.0	5.0	---	---	---	---	15.0	21.0	24.0	26.0	24.0	15.0
22	14.0	6.0	---	---	---	---	13.0	16.0	26.0	---	24.0	15.0
23	---	5.0	---	---	---	---	12.0	14.0	25.0	25.0	20.0	16.0
24	15.0	6.0	---	---	---	10.0	14.0	18.0	---	26.0	20.0	17.0
25	15.0	7.0	---	---	---	10.0	14.0	17.0	---	26.0	21.0	18.0
26	14.0	6.0	---	---	---	11.0	15.0	19.0	25.0	26.0	17.0	---
27	---	5.0	---	---	---	---	15.0	21.0	25.0	27.0	22.0	18.0
28	13.0	4.0	---	---	---	10.0	15.0	18.0	25.0	28.0	21.0	21.0
29	14.0	6.0	---	---	---	5.0	17.0	19.0	25.0	26.0	18.0	15.0
30	---	8.0	---	---	---	3.0	16.0	20.0	26.0	27.0	20.0	14.0
31	15.0	---	---	---	---	5.0	---	20.0	---	27.0	19.0	---

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

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	2760	15300	415	1080	229	279	130	70	60	34	1110	1190
2	1230	4120	364	971	280	384	82	39	102	72	519	521
3	1900	7540	215	455	150	183	69	32	115	69	220	173
4	1830	8300	191	367	110	113	74	34	74	41	135	98
5	1900	9180	172	300	145	117	82	37	58	31	116	79
6	710	2150	162	269	148	151	87	39	44	23	107	71
7	460	1140	160	256	400	604	85	38	44	23	93	59
8	360	782	230	400	1060	2580	77	34	65	34	86	52
9	305	588	219	372	460	898	66	28	35	16	79	44
10	280	495	150	217	160	160	31	13	22	9.2	52	27
11	3260	84200	139	131	110	125	22	9.2	36	17	44	21
12	5380	113000	139	113	92	99	54	25	44	22	46	23
13	1980	11500	69	37	74	74	105	64	25	11	46	23
14	1000	4290	45	30	70	81	139	105	23	10	46	23
15	690	2420	115	109	166	206	87	47	26	12	65	35
16	520	1590	204	297	184	213	43	20	22	9.1	35	18
17	420	1150	271	366	162	186	11	4.5	40	15	45	24
18	355	861	190	244	165	187	20	8.1	36	13	1640	3240
19	310	681	170	207	147	157	32	13	28	11	3750	10700
20	280	569	140	168	134	140	23	9.3	29	13	1410	2660
21	255	485	135	159	116	115	29	11	19	7.6	625	1010
22	250	454	140	163	120	112	33	12	18	6.9	445	673
23	850	2170	190	233	120	107	27	9.5	16	6.1	330	461
24	2170	12000	150	173	108	92	24	8.4	17	6.3	305	422
25	1250	5230	118	127	92	75	34	12	16	6.0	620	1050
26	710	2680	121	129	83	66	20	7.0	16	5.7	800	1400
27	490	1590	103	105	70	53	21	7.9	16	6.0	375	574
28	350	933	99	98	96	69	22	8.9	168	83	320	482
29	289	669	99	97	77	52	25	10	---	---	410	639
30	240	493	98	95	43	27	37	16	---	---	265	358
31	218	421	---	---	55	36	45	22	---	---	835	1560
TOTAL	---	296981	---	7768	---	7741	---	793.8	---	612.9	---	27710

NODAWAY RIVER BASIN

06817000 NODAWAY RIVER AT CLANRINDA, IA--Continued

WATER-QUALITY RECORDS

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

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)
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	1660	4310	153	199	3380	16900	88	57	39	27	412	970
2	1740	4930	141	181	1250	4250	61	37	55	36	368	755
3	1140	2730	148	192	760	2050	59	35	70	44	281	514
4	725	1520	256	344	545	1190	50	29	72	45	241	399
5	625	1290	199	253	435	819	44	24	61	37	212	324
6	590	1200	129	157	365	621	68	36	50	29	228	361
7	580	1100	101	118	330	515	610	489	48	29	248	388
8	410	693	90	100	285	411	850	750	5070	49800	252	364
9	320	500	75	79	400	657	7550	257000	4050	24300	141	185
10	275	406	66	67	335	480	5800	96500	795	1210	230	339
11	230	319	66	65	298	414	6000	71400	335	381	178	249
12	180	238	69	69	275	362	10600	257000	210	204	131	159
13	165	212	61	58	255	307	4570	45100	1070	1320	119	133
14	3540	30100	51	46	215	236	1220	4120	1950	3220	109	116
15	10600	122000	50	44	203	202	1420	4600	950	1520	109	122
16	3700	16100	40	33	203	187	1600	4770	495	651	3160	15600
17	1800	6420	46	38	390	376	540	1030	332	359	3230	19500
18	1220	3660	43	35	577	1340	460	789	211	196	782	1740
19	850	2200	1710	14700	722	924	955	2150	259	264	373	616
20	640	1440	7090	33200	255	246	510	851	262	247	258	369
21	562	1110	4910	13200	195	183	261	371	179	156	216	278
22	439	806	1230	1820	185	165	211	271	131	104	183	213
23	380	713	305	378	165	138	176	209	111	80	171	187
24	345	617	210	245	175	141	135	147	101	70	160	168
25	300	496	2070	5000	658	732	75	76	1520	48800	145	145
26	271	430	10200	506000	858	954	40	38	10200	640000	124	117
27	258	389	8380	247000	360	297	28	25	5900	137000	105	95
28	212	300	3250	33700	180	136	29	25	2150	13300	890	2600
29	185	253	2900	17100	200	150	33	27	1160	4820	1360	2670
30	171	231	1240	5220	195	134	35	27	705	2300	265	268
31	---	---	6780	79000	---	---	37	27	645	1780	---	---
TOTAL	---	206713	---	958641	---	35517	---	748010	---	932329	---	49944

TOTAL LOAD FOR YEAR: 3272760.7 TONS.

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	TEMPER- ATURE WATER (DEG C) (00010)	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	SEDI- MENT, SUS- PENDE (MG/L) (80154)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY) (80155)	SED. SUSP. FALL DIAM. % FINER THAN .002 MM (70337)	SED. SUSP. FALL DIAM. % FINER THAN .004 MM (70338)
OCT							
12...	0800	--	7530	6210	126000	26	31
13...	0730	13.0	22100	2150	128000	28	34
NOV							
14...	1045	0.0	236	42	27	--	--
DEC							
16...	1650	1.5	438	177	209	--	--
FEB							
06...	1200	2.5	196	90	48	--	--
APR							
15...	0730	13.0	5220	13200	186000	31	36
23...	0925	10.0	677	464	848	41	49
MAY							
20...	0730	21.0	1750	8060	38100	36	45
JUN							
03...	1000	17.5	1010	861	2350	40	46
JUL							
09...	1415	22.0	21100	7990	455000	44	48
10...	0730	22.0	2910	4510	35400	43	48
17...	1040	25.5	702	623	1180	35	37

NODAWAY RIVER BASIN

225

06817000 NODAWAY RIVER AT CLARINDA, IA--Continued

WATER-QUALITY RECORDS

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)	SED. SUSP. FALL DIAM. % FINER THAN .062 MM (70331)
OCT							
12...	36	50	92	97	100	--	--
13...	41	55	94	99	100	--	--
NOV							
14...	--	--	--	--	--	--	96
DEC							
16...	--	--	--	--	--	--	96
FEB							
06...	--	--	--	--	--	--	97
APR							
15...	44	58	96	98	100	--	--
23...	53	64	91	93	100	--	--
MAY							
20...	50	66	--	--	--	--	99
JUN							
03...	50	59	94	96	100	--	--
JUL							
09...	55	63	97	99	100	--	--
10...	57	64	96	98	99	100	--
17...	42	49	60	69	94	100	--

PARTICLE-SIZE DISTRIBUTION OF SURFACE BED MATERIAL, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	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)	BED MAT. SIEVE DIAM. % FINER THAN 8.00 MM (80171)	BED MAT. SIEVE DIAM. % FINER THAN 16.0 MM (80172)
NOV												
14...	1045	236	3	--	0	6	53	86	94	98	100	--
DEC												
16...	1645	438	3	0	1	6	62	87	96	99	100	--
FEB												
06...	1200	196	3	1	2	16	62	82	90	94	98	100
MAR												
20...	0945	715	3	0	1	9	55	87	96	99	100	--
APR												
23...	0900	677	3	0	1	24	75	95	98	100	--	--
JUN												
03...	0900	1010	3	--	0	15	83	99	100	--	--	--
JUL												
09...	1430	21100	3	1	3	19	69	91	94	96	98	100
10...	0745	2910	3	1	1	15	67	87	90	92	95	100
17...	0915	702	3	0	1	18	83	97	99	100	--	--
AUG												
28...	0945	2390	3	--	0	4	79	99	100	--	--	--

PLATTE RIVER BASIN

06818750 PLATTE RIVER NEAR DIAGONAL, IA

LOCATION.--Lat 40°46'02", long 94°24'46", in NE1/4 NW1/4 sec.22, T.69 N., R.31 W., Ringgold County, Hydrologic Unit 10240012, on left bank at downstream side of bridge on county highway, 2.2 mi upstream from Turkey Creek, 4.6 mi southwest of Diagonal, and 4.9 mi downstream from Gard Creek.

DRAINAGE AREA.--217 mi².

PERIOD OF RECORD.--April 1968 to current year.

REVISED RECORDS.--WSP 2119: 1969 (P).

GAGE.--Water-stage recorder. Datum of gage is 1,095.27 ft above NGVD.

REMARKS.--Estimated daily discharges: Nov. 11 - 18, Dec. 5, 10 - 14, 20, Dec. 27 to Jan. 13, Jan. 15 to Feb. 10, Feb. 17 - 19 and 22. Records good except those for estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--19 years, 139 ft³/s, 8.70 in/yr, 100,700 acre-ft/yr; median of yearly mean discharges, 120 ft³/s, 7.5 in/yr, 86,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,580 ft³/s Aug. 27, 1987, gage height, 23.67 ft; minimum daily discharge, 0.21 ft³/s Jan. 14, 15, 1969.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 1967 reached a stage of 23.16 ft, from floodmark by local resident, discharge, 6,360 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 26	2400	3,910	17.77	July 12	1800	6,160	21.19
July 9	1115	4,820	18.76	Aug. 27	1145	*8,580	*23.67

Minimum discharge, 5.1 ft³/s Aug. 6, 7, 24, 25.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	429	337	136	35	45	209	215	60	1200	21	8.6	194
2	500	300	197	32	40	175	166	58	521	20	7.6	160
3	786	199	142	30	35	152	128	77	422	19	8.1	133
4	398	165	93	30	30	113	114	134	224	17	8.8	116
5	269	144	50	30	32	106	112	93	173	16	6.7	103
6	183	132	90	30	36	100	112	74	148	16	5.5	97
7	149	122	170	30	40	92	106	65	129	16	5.2	90
8	131	139	475	30	44	84	104	55	114	55	1180	81
9	115	113	392	30	34	83	102	49	121	2890	258	70
10	107	99	100	28	32	67	102	44	123	1460	69	97
11	920	100	130	28	38	57	93	41	113	818	33	109
12	1600	70	100	45	35	53	89	36	103	4690	21	65
13	414	60	80	45	34	52	85	31	95	1840	74	50
14	249	85	95	83	37	53	924	30	83	346	89	48
15	182	120	104	60	40	57	948	26	74	287	367	53
16	150	100	100	40	28	56	457	23	66	169	136	204
17	132	85	100	35	26	58	314	22	59	107	53	290
18	117	80	94	31	26	564	237	23	120	431	30	147
19	108	77	86	29	25	386	191	127	128	331	21	97
20	103	113	82	29	27	204	157	319	83	128	16	75
21	96	98	77	28	25	166	136	121	72	86	15	61
22	91	107	76	26	24	139	116	67	55	66	10	49
23	301	103	77	25	24	131	110	47	45	49	7.2	47
24	844	85	75	23	25	144	101	48	40	38	5.3	48
25	468	80	68	22	23	246	91	76	50	29	2320	45
26	518	80	58	22	23	178	89	1450	60	24	7340	44
27	273	76	52	24	26	140	81	1910	32	19	7830	43
28	204	65	48	27	44	132	78	849	26	16	1410	64
29	165	65	44	40	---	229	66	634	28	14	583	71
30	143	64	40	45	---	167	69	372	26	12	378	40
31	134	---	45	52	---	165	---	531	---	11	272	---
TOTAL	10279	3463	3476	1064	898	4558	5693	7492	4533	14041	22568.0	2791
MEAN	332	115	112	34.3	32.1	147	190	242	151	453	728	93.0
MAX	1600	337	475	83	45	564	948	1910	1200	4690	7830	290
MIN	91	60	40	22	23	52	66	22	26	11	5.2	40
AC-FT	20390	6870	6890	2110	1780	9040	11290	14860	8990	27850	44760	5540
CFSM	1.53	.53	.52	.16	.15	.68	.87	1.11	.70	2.09	3.35	.43
IN.	1.76	.59	.60	.18	.15	.78	.98	1.28	.78	2.41	3.87	.48

CAL YR 1986 TOTAL 81898.7 MEAN 224 MAX 4750 MIN 6.0 AC-FT 162400 CFSM 1.03 IN. 14.0
WTR YR 1987 TOTAL 80856.0 MEAN 222 MAX 7830 MIN 5.2 AC-FT 160400 CFSM 1.02 IN. 13.9

PLATTE RIVER BASIN

227

06819185 EAST FORK ONE HUNDRED AND TWO RIVER AT BEDFORD, IA

LOCATION.--Lat 40°39'38", long 94°42'59", in NE1/4 sec.35, T.68 N., R.34 W., Taylor County, Hydrologic Unit 10240013, on left bank at downstream side of bridge of county highway N44, 0.1 mi south of Bedford, 0.4 mi upstream from concrete stabilization dam, and 3.0 mi upstream from Daugherty creek.

DRAINAGE AREA.--85.4 mi².

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

GAGE.--Water-stage recorder. Datum of gage is 1,069.16 ft above NGVD.

REMARKS.--Estimated daily discharges: Dec. 4, 5, 10-16, Dec. 24 to Jan. 13, Jan. 16-29, Feb. 9, 17-23, Mar. 30, 31, Apr. 3-17, May 7-18, June 23 to July 9 and July 24 to Aug. 7. Records fair except those for estimated daily discharges, which are poor. Slight regulation at low flow by low dam used for water supply in Bedford. U.S. National Weather Service gage-height telemeter at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,570 ft³/s July 14, 1986, gage height 23.47 ft.; minimum daily discharge, 0.29 ft³/s Oct. 17, 1984.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 2	1915	2,380	16.88	July 9	unknown	4,530	19.97
Oct. 11	2100	2,410	16.93	July 12	0715	*5,660	*21.07
Mar. 18	1115	2,200	17.16	Aug. 8	1115	2,670	17.82
May 20	0015	3,370	18.70	Aug. 25	1600	2,650	18.15
May 26	1415	5,010	20.45	Aug. 26	1115	3,170	18.87

Minimum daily discharge, 1.8 ft³/s Aug. 7.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	216	199	438	16	24	232	104	15	270	8.0	3.0	25
2	673	168	276	14	23	155	90	16	91	7.2	2.7	21
3	463	90	127	13	17	103	76	34	87	6.7	3.0	15
4	219	71	60	13	14	78	60	36	56	6.0	3.5	12
5	109	60	35	13	13	70	56	28	49	5.6	2.3	8.3
6	74	53	53	13	16	62	52	24	40	5.8	1.9	9.9
7	61	48	250	13	25	57	49	22	33	6.2	1.8	8.7
8	51	65	469	12	30	56	46	20	30	70	1010	7.5
9	46	42	170	12	13	49	44	19	320	1300	105	7.7
10	43	37	40	12	15	41	41	17	55	541	44	48
11	1080	32	50	13	18	45	38	15	49	153	32	24
12	618	29	40	15	17	45	36	16	44	2320	26	11
13	148	16	28	30	15	44	33	13	38	211	87	7.6
14	95	23	34	45	26	44	550	13	32	84	69	6.7
15	72	31	35	32	27	53	275	11	29	62	351	8.1
16	58	34	38	12	14	51	190	10	29	45	78	59
17	52	35	42	10	12	66	110	9.6	29	35	52	42
18	46	35	40	9.0	12	982	57	9.6	33	352	41	21
19	42	32	35	8.4	13	232	47	164	47	86	30	13
20	39	66	35	8.0	14	130	44	617	33	46	29	9.0
21	36	40	33	9.0	16	103	39	112	25	33	23	7.8
22	39	45	33	8.0	14	93	34	37	23	28	14	6.9
23	50	41	33	7.8	13	72	36	21	28	19	10	6.5
24	117	28	32	7.4	15	84	27	29	18	12	10	7.2
25	99	31	28	6.8	14	123	23	89	22	9.2	810	6.5
26	134	30	23	7.2	17	90	24	1900	27	6.7	1900	6.1
27	72	22	20	8.0	22	81	22	1140	18	5.7	369	6.0
28	57	26	18	10	70	83	21	400	11	5.0	114	6.4
29	47	27	16	15	---	123	22	257	13	4.5	68	5.3
30	42	25	15	22	---	70	20	115	9.8	4.2	49	4.3
31	41	---	19	18	---	80	---	345	---	3.6	36	---
TOTAL	4939	1481	2565	432.6	539	3597	2266	5554.2	1588.8	5481.4	5375.2	427.5
MEAN	159	49.4	82.7	14.0	19.2	116	75.5	179	53.0	177	173	14.2
MAX	1080	199	469	45	70	982	550	1800	320	2320	1900	59
MIN	36	16	15	6.8	12	41	20	9.6	9.8	3.6	1.8	4.3
AC-FT	9800	2940	5090	858	1070	7130	4490	11020	3150	10870	10660	848
CFSM	1.87	.58	.97	.16	.23	1.36	.88	2.10	.62	2.07	2.03	.17
IN.	2.15	.65	1.12	.19	.23	1.57	.99	2.42	.69	2.39	2.34	.19

CAL YR 1986	TOTAL	48618.9	MEAN	133	MAX	4240	MIN	3.1	AC-FT	96440	CFSM	1.56	IN.	21.2
WTR YR 1987	TOTAL	34246.6	MEAN	93.8	MAX	2320	MIN	1.8	AC-FT	67930	CFSM	1.10	IN.	14.9

GRAND RIVER BASIN

06897950 ELK CREEK NEAR DECATUR CITY, IA
(Hydrologic bench-mark station)

LOCATION.--Lat 40°43'18", long 93°56'12", near SE corner sec.34, T.69 N., R.27 W., Decatur County, Hydrologic Unit 10280102, at right downstream corner of bridge on county highway, 1,000 ft downstream from West Elk Creek, 5.2 mi upstream from mouth, and 5.7 mi southwest of Decatur City.

DRAINAGE AREA.--52.5 mi².

WATER DISCHARGE RECORDS

PERIOD OF RECORD--October 1967 to current year.

GAGE.--Water-stage recorder. Datum of gage is 924.70 ft above NGVD. Oct. 1, 1967, to Sept. 30, 1974, at datum 10.00 ft higher.

REMARKS.--Estimated daily discharges: Nov. 10-12, Dec. 5, 10-17, 19-20, Dec. 23 to Feb. 2, Feb. 10-13 and 19-25. Records good except those for estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--20 years, 32.4 ft³/s, 8.38 in/yr, 23,470 acre-ft/yr; median of yearly mean discharges, 28 ft³/s, 7.2 in/yr, 20,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,400 ft³/s June 2, 1980, gage height, 28.22 ft, from rating curve extended above 5,300 ft³/s on basis of step-backwater computation; no flow at times most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 14, 1967, reached a stage of 18.35 ft, datum in use prior to Oct. 1, 1974, discharge, 17,800 ft³/s, estimated from rating curve extended above 5,300 ft³/s on basis of step-backwater computation. Flood of Aug. 6, 1959, reached a stage between 20.5 and 22.5 ft, datum in use prior to Oct. 1, 1974, 300 ft downstream, from information by assistant county engineer, discharge not determined.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 11	2230	3,440	19.01	July 8	1530	2,250	16.88
Oct. 24	1030	1,470	15.18	July 9	0930	6,180	22.92
Oct. 25	2345	524	12.94	July 10	1515	1,630	15.57
Mar. 18	1015	1,290	14.79	July 12	0815	5,700	22.30
Mar. 28	2315	731	13.48	Aug. 8	1015	545	13.00
Apr. 14	1415	731	13.47	Aug. 13	0630	538	12.98
May 3	1330	735	13.46	Aug. 15	0245	3,810	19.59
May 29	0800	1,970	16.34	Aug. 26	0915	3,090	18.42
July 7	unknown	*9,340	*25.96				

Minimum discharge, 0.07 ft³/s, Aug. 5, 6.

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

DAY	MEAN VALUES											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	87	21	90	9.0	20	208	40	9.6	43	3.2	.38	12
2	42	25	102	7.5	17	113	31	9.0	33	2.6	.32	9.9
3	45	18	60	7.0	15	55	27	255	23	2.3	.43	7.9
4	40	14	31	7.0	12	31	23	68	16	2.2	.27	7.3
5	23	13	15	7.0	11	23	21	35	14	2.6	.13	6.2
6	16	11	29	7.0	12	18	19	25	11	2.1	.11	6.8
7	13	10	69	7.0	14	16	18	20	9.8	2150	.17	7.0
8	10	13	159	7.0	12	13	16	17	8.2	945	162	5.8
9	9.4	9.0	66	7.0	7.9	11	14	15	10	1970	13	4.6
10	8.5	7.5	42	6.8	8.6	9.7	13	13	10	716	2.8	4.6
11	538	6.0	24	6.8	9.4	9.5	12	11	11	145	1.7	4.1
12	345	7.0	19	7.5	8.2	8.5	11	9.7	8.6	1340	1.4	3.6
13	40	7.3	17	10	7.8	8.4	14	8.8	6.4	142	113	3.4
14	24	7.4	20	15	9.9	8.0	348	8.3	5.1	52	22	3.5
15	16	9.3	22	10	8.5	17	258	7.0	4.5	40	915	6.1
16	14	9.8	25	9.0	5.9	13	83	6.7	6.2	26	49	47
17	11	9.0	27	8.0	6.7	11	49	6.1	8.9	17	19	19
18	8.8	7.7	26	7.0	7.5	563	36	11	29	13	12	7.5
19	8.1	7.1	24	7.0	6.4	157	29	22	21	10	7.5	4.9
20	7.1	17	22	6.8	6.2	67	24	51	52	7.1	6.0	4.0
21	6.5	10	20	6.6	6.0	51	22	18	22	5.5	4.5	3.5
22	6.8	10	19	6.2	5.6	40	21	11	13	4.7	2.7	3.1
23	7.5	10	17	5.8	5.6	35	21	8.8	15	3.4	2.0	3.1
24	450	7.3	16	5.6	5.6	124	17	14	9.3	2.6	1.6	3.1
25	132	8.1	15	5.4	5.4	93	16	13	9.4	2.0	372	2.8
26	150	7.2	14	5.4	6.2	53	14	9.5	6.3	1.6	1690	2.5
27	35	6.0	12	5.8	7.4	42	12	104	4.9	1.2	142	2.4
28	24	6.5	11	7.0	71	122	11	76	4.2	.94	45	2.1
29	17	6.0	10	8.0	---	248	11	526	5.1	.74	27	2.0
30	15	5.9	9.5	12	---	68	9.8	82	4.3	.58	20	1.8
31	13	---	11	15	---	47	---	38	---	.50	15	---
TOTAL	2162.7	306.1	1043.5	242.2	318.8	2283.1	1240.8	1508.5	424.2	7611.85	3648.01	201.6
MEAN	69.8	10.2	33.7	7.81	11.4	73.6	41.4	48.7	14.1	246	118	6.72
MAX	538	25	159	15	71	563	348	526	52	2150	1690	47
MIN	6.5	5.9	9.5	5.4	5.4	8.0	9.8	6.1	4.2	.50	.11	1.8
AC-FT	4290	607	2070	480	632	4530	2460	2990	841	15100	7240	400
CFSM	1.33	.19	.64	.15	.22	1.40	.79	.83	.27	4.68	2.24	.13
IN.	1.53	.22	.74	.17	.23	1.62	.88	1.07	.30	5.39	2.58	.14

CAL YR 1986 TOTAL 18727.60 MEAN 51.3 MAX 1500 MIN .11 AC-FT 37150 CFSM .98 IN. 13.3
WTR YR 1987 TOTAL 20991.26 MEAN 57.5 MAX 2150 MIN .11 AC-FT 41640 CFSM 1.10 IN. 14.9

GRAND RIVER BASIN

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06897950 ELK CREEK NEAR DECATUR CITY, IA--Continued
(Hydrologic bench-mark station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1968 to current year.

REMARKS.--Miscellaneous biological data collected September 1970 to September 1972 are available in the Iowa City district office.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	TEMPER- ATURE AIR (DEG C) (00020)	TUR- BID- ITY (NTU) (00076)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	BARO- METRIC PRES- SURE (MM HG) (00025)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)
NOV 26...	0915	7.8	481	8.17	1.5	4.5	2.0	13.4	99	739	340
FEB 24...	0930	4.0	504	8.41	1.0	6.0	4.0	13.7	99	742	100
MAY 19...	1030	16	382	7.63	20.5	27.0	55	7.9	92	732	220000
JUL 08...	1145	2090	145	8.16	21.5	27.5	930	--	--	--	--
AUG 18...	1515	12	465	7.53	28.5	27.5	10	7.5	100	738	1100

DATE	STREP- TOCOCCHI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	HARD- NESS NONCARB WH WAT TOT FLD MG/L AS CACO3 (00902)	HARD- NESS (MG/L AS CACO3) (00900)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM AD- SORP- TION RATIO (00931)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	ALKA- LINITY WH WAT TOTAL FIELD MG/L AS CACO3 (00410)	BICAR- BONATE WH WAT TOTAL FIELD MG/L AS HCO3 (00440)
NOV 26...	1000	35	250	74	16	11	9	0.3	2.3	216	260
FEB 24...	180	38	250	72	17	11	9	0.3	1.8	212	260
MAY 19...	70000	23	180	53	12	10	10	0.3	5.0	159	200
JUL 08...	--	7	66	20	3.8	3.7	10	0.2	3.2	59	72
AUG 18...	1900	27	240	73	14	8.4	7	0.2	4.9	213	260

DATE	CAR- BONATE WH WAT TOTAL FIELD MG/L AS CO3 (00445)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N) (00605)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)
NOV 26...	0	54	7.7	0.20	11	295	310	0.40	6.2	0.39	0.310
FEB 24...	0	60	7.9	0.20	8.5	311	310	0.42	3.4	1.7	0.140
MAY 19...	0	40	7.5	0.30	9.5	238	230	0.32	10	1.8	1.20
JUL 08...	0	22	3.8	0.30	9.8	102	100	0.14	576	2.0	0.400
AUG 18...	0	36	<0.10	0.30	15	283	--	--	--	0.88	0.290

GRAND RIVER BASIN

06897950 ELK CREEK NEAR DECATUR CITY, IA--Continued

WATER-QUALITY RECORDS

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P) (00671)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS, TOTAL (MG/L AS P) (00665)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (MG/L) (80154)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. Z FINER THAN .062 MM (70331)
NOV 26...	<0.010	0.010	0.010	0.40	0.010	0.020	0.030	20	0.42	88
FEB 24...	<0.010	0.020	0.030	1.7	<0.010	<0.010	0.010	30	0.32	65
MAY 19...	0.080	0.190	0.250	2.1	0.040	0.070	0.270	195	8.2	100
JUL 08...	0.010	0.060	0.100	2.1	0.050	0.130	0.480	--	--	--
AUG 18...	<0.010	0.020	0.020	0.90	0.060	0.080	0.160	63	2.0	97

DATE	ARSENIC DIS- SOLVED (UG/L AS BA) (01000)	ALUM- INUM, DIS- SOLVED (UG/L AS AL) (01106)	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)
NOV 26...	<1	<10	110	<0.5	<1	<1	<3	2	7	<5
FEB 24...	<1	<10	98	<0.5	<1	<1	<3	22	13	<5
MAY 19...	1	<10	92	<0.5	<1	<1	<3	4	56	<5
JUL 08...	1	180	41	<0.5	<1	<1	<3	5	230	<5
AUG 18...	2	<10	130	<0.5	<1	<1	<3	5	4	<5

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)
NOV 26...	12	180	<0.1	<10	3	<1	<1	240	<6	6
FEB 24...	11	200	<0.1	<10	3	<1	1	250	<6	27
MAY 19...	11	20	<0.1	<10	<1	<1	<1	190	<6	7
JUL 08...	8	18	<0.1	<10	5	<1	<1	73	<6	4
AUG 18...	4	110	0.2	<10	5	<1	<1	240	<6	7

DATE	GROSS ALPHA, DIS- SOLVED (UG/L AS U-NAT) (80030)	GROSS ALPHA, SUSP. TOTAL (UG/L AS U-NAT) (80040)	GROSS BETA, DIS- SOLVED (PCI/L AS CS-137) (03515)	GROSS BETA, DIS- SOLVED (PCI/L AS SR/ YT-90) (80050)	GROSS BETA, SUSP. TOTAL (PCI/L AS CS-137) (03516)	GROSS BETA, SUSP. TOTAL (PCI/L AS SR/ YT-90) (80060)	URANIUM DIS- SOLVED, EXTRAC- TION (UG/L) (80020)
MAY 19...	3.2	<0.4	7.0	5.1	0.9	0.9	1.7

GRAND RIVER BASIN

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06898000 THOMPSON RIVER AT DAVIS CITY, IA

LOCATION.--Lat 40°38'25", Long 93°48'29", in SE1/4 SE1/4 sec.35, T.68 N., R.26 W., Decatur County, Hydrologic Unit 10280102, on right bank 15 ft downstream from bridge on U.S. Highway 69 at Davis City, 2.6 mi upstream from Dickersons Branch, and 5.2 mi upstream from Iowa-Missouri State line.

DRAINAGE AREA.--701 mi².

PERIOD OF RECORD.--May 1918 to July 1925, July 1941 to current year. Monthly discharge only for some periods, published in WSP 1310. Prior to October 1918, published as "Grand River".

REVISED RECORDS.--WSP 1240: 1918, 1920-21 (M), 1922-24, 1925 (M), 1946-47 (M). WSP 1440: Drainage area. WSP 1710: 1957.

GAGE.--Water-stage recorder. Datum of gage is 874.04 ft above NGVD. May 14, 1918, to July 2, 1925, July 14, 1941, to Feb. 24, 1942, nonrecording gage, and Feb. 25, 1942, to Feb. 8, 1967, water-stage recorder at same site at datum 2.00 ft higher.

REMARKS.--Estimated daily discharges: Oct. 12-29, Nov. 13-14, Dec. 4-13, Dec. 28 to Jan. 12, Jan. 15 to Feb. 1 and May 11-19. Records good except those for estimated daily discharges, which are poor. U.S. National Weather Service gage-height telemeter at station.

AVERAGE DISCHARGE.--52 years (water years 1919-24, 1942-87), 383 ft³/s, 7.42 in/yr, 277,500 acre-ft/yr; median of yearly mean discharges, 340 ft³/s, 6.6 in/yr 246,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 24,300 ft³/s June 10, 1974, gage height, 19.43 ft, from rating curve extended above 17,000 ft³/s on basis of velocity-area study; minimum daily discharge, 0.1 ft³/s June 25, 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Aug. 8, 1885, reached a stage of 22.8 ft, datum in use prior to Feb. 9, 1967, from floodmark, discharge, 30,000 ft³/s, from rating curve extended as explained above.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 12	0300	5,250	7.50	July 9	1715	12,100	12.10
Apr. 15	0745	5,040	7.35	July 12	1600	13,300	12.96
June 1	2200	5,240	7.49	Aug. 15	0900	5,140	7.42
July 7	1900	8,650	9.72	Aug. 28	0300	*14,600	*13.81
July 8	1830	8,380	9.55				

Minimum daily discharge, 62 ft³/s Jan. 27, 28.

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

MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2040	489	355	120	125	1050	735	226	3400	110	183	754
2	1210	845	617	110	150	1200	753	221	3240	94	172	587
3	1110	815	527	110	175	1050	645	1110	1700	83	163	477
4	1090	585	250	110	166	677	508	1820	841	79	154	394
5	882	496	200	105	161	513	432	951	567	74	148	341
6	953	442	230	100	146	423	394	581	454	68	158	304
7	624	410	300	100	153	377	364	448	376	4250	148	274
8	497	401	500	100	180	339	337	396	317	8860	808	254
9	414	403	900	95	167	305	311	364	282	9920	1510	235
10	361	367	400	95	130	269	294	347	445	9770	620	216
11	780	315	300	110	131	252	274	320	323	11100	376	199
12	4480	281	230	130	135	244	256	300	289	12400	274	192
13	2570	165	200	173	133	239	256	250	265	8640	1410	195
14	1180	180	303	230	133	242	1280	200	224	2070	752	174
15	791	219	300	160	133	282	4560	160	193	1130	3530	170
16	626	299	332	100	123	332	3010	140	171	962	1060	335
17	502	321	341	80	99	295	1300	135	160	726	836	611
18	431	316	338	80	84	2070	911	150	452	582	451	866
19	381	284	290	80	92	3400	694	400	563	523	339	439
20	345	301	276	80	105	1320	562	1310	508	524	289	299
21	319	342	280	78	120	760	516	1330	2390	488	268	246
22	307	323	260	76	116	559	442	610	539	402	247	215
23	308	339	222	74	110	452	402	284	339	359	230	193
24	1100	332	228	70	102	566	388	227	216	326	213	178
25	2210	279	220	66	101	1350	353	230	187	300	399	166
26	2510	261	180	66	103	922	313	253	155	277	8640	156
27	1550	241	151	62	106	619	286	948	261	254	13000	145
28	1200	222	130	62	149	531	258	1930	195	235	14000	134
29	1020	219	125	70	---	2080	242	2540	139	220	11200	126
30	640	215	120	80	---	1190	229	2930	121	207	7200	120
31	492	---	140	105	---	728	---	927	---	194	1140	---
TOTAL	32923	10707	9245	3077	3628	24636	21305	22038	19312	73227	69918	8995
MEAN	1062	357	298	99.3	130	795	710	711	644	2362	2255	300
MAX	4480	845	900	230	180	3400	4560	2930	3400	12400	14000	866
MIN	307	165	120	62	84	239	229	135	121	68	148	120
AC-FT	65300	21240	18340	6100	7200	48870	42260	43710	38310	145200	138700	17840
CFSM	1.52	.51	.43	.14	.18	1.13	1.01	1.01	.92	3.37	3.22	.43
IN.	1.75	.57	.49	.16	.19	1.31	1.13	1.17	1.02	3.89	3.71	.48

CAL YR 1986 TOTAL 230687 MEAN 632 MAX 7610 MIN 42 AC-FT 457600 CFSM .90 IN. 12.2
WTR YR 1987 TOTAL 299011 MEAN 819 MAX 14000 MIN 62 AC-FT 593100 CFSM 1.17 IN. 15.9

GRAND RIVER BASIN

06898400 WELDON RIVER NEAR LEON, IA

LOCATION--Lat 40°41'45, long 93°38'07", in NE1/4 NE1/4 sec.17, T.68 N., R.24 W., Decatur County, Hydrologic Unit 10280102, on left bank 10 ft downstream from bridge on county highway A, 200 ft upstream from unnamed creek, 1.3 mi downstream from Brush Creek, and 6.5 mi southeast of post office at Leon.

DRAINAGE AREA.--104 mi².

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

GAGE.--Water-stage recorder. Datum of gage is 906.26 ft above NGVD.

REMARKS.--Estimated daily discharges: Oct. 1, 7-29, Nov. 11-18, Dec. 5, 11-14, Dec. 23 to Jan.13, Jan. 16 to Feb. 4, Feb. 17-18 and 23. Records good except those for estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--29 years, 71.9 ft³/s, 9.39 in/yr, 52,090 acre-ft/yr; median of yearly mean discharges, 63 ft³/s, 8.2 in/yr, 45,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 48,600 ft³/s Aug. 6, 1959, gage height, 25.27 ft, from rating curve extended above 5,600 ft³/s on basis of contracted-opening and flow-over-embankment measurement at gage height 25.27 ft; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Stage and discharge of the flood of Aug. 6, 1959 are the greatest since at least 1919.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Aug. 15	0300	*6,020	*17.09	No other peak greater than base discharge.			

Minimum daily discharge, 0.3 cfs Aug. 6-7.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	125	56	52	17	26	366	72	21	63	10	.59	8.4
2	81	62	109	15	20	294	58	18	26	9.5	.60	7.2
3	360	43	53	15	17	324	49	1000	20	9.4	.94	6.4
4	142	34	25	15	15	131	44	319	13	8.7	.73	5.6
5	83	31	15	15	15	81	41	70	9.8	17	.44	5.2
6	44	29	26	15	18	57	39	40	9.1	11	.30	4.8
7	41	27	127	14	23	47	36	32	8.3	11	.30	4.3
8	37	62	344	14	25	41	33	26	7.8	246	212	3.8
9	33	41	141	14	21	37	30	23	7.9	473	93	3.3
10	80	30	59	13	15	33	28	21	7.9	152	12	3.2
11	800	24	38	13	17	31	27	19	8.2	84	7.2	2.9
12	500	21	33	15	16	31	26	17	7.7	1460	5.9	2.6
13	200	16	30	22	14	31	35	15	7.4	129	496	2.4
14	100	23	35	42	17	29	709	14	7.0	44	323	2.4
15	70	35	65	29	16	66	676	12	6.8	32	1700	4.4
16	60	27	73	18	14	57	149	11	6.6	16	79	107
17	50	20	66	16	13	42	72	10	7.9	9.9	18	417
18	40	18	43	15	13	424	55	11	46	6.7	9.9	39
19	33	17	36	14	12	216	47	13	154	5.6	6.8	21
20	30	31	37	14	12	84	43	43	80	4.4	5.1	12
21	30	26	32	13	12	71	323	13	51	3.3	3.7	9.0
22	33	26	31	12	11	63	84	9.8	97	2.8	2.6	7.6
23	300	25	28	12	12	59	66	9.1	29	2.3	2.1	6.4
24	600	20	24	11	11	573	53	11	16	2.0	1.8	6.4
25	280	18	21	10	11	263	40	14	189	1.7	446	5.7
26	300	18	19	10	11	90	36	28	30	1.5	3290	5.5
27	100	15	18	11	13	70	29	74	16	1.3	542	4.9
28	50	15	17	13	96	121	24	35	12	1.1	88	3.9
29	30	15	16	18	---	594	23	18	12	.91	35	3.8
30	26	15	15	21	---	110	27	13	11	.88	18	2.9
31	30	---	19	29	---	80	---	10	---	.72	12	---
TOTAL	4688	840	1647	505	516	4516	2974	1969.9	967.4	2757.71	7413.00	719.0
MEAN	151	28.0	53.1	16.3	18.4	146	99.1	63.5	32.2	89.0	239	24.0
MAX	800	62	344	42	96	594	709	1000	189	1460	3290	417
MIN	26	15	15	10	11	29	23	9.1	6.6	.72	.30	2.4
AC-FT	9300	1670	3270	1000	1020	8960	5900	3910	1920	5470	14700	1430
CFSM	1.45	.27	.51	.16	.18	1.40	.95	.61	.31	.86	2.30	.23
IN.	1.68	.30	.59	.18	.18	1.62	1.06	.70	.35	.99	2.65	.26

CAL YR 1986	TOTAL 38640.43	MEAN 106	MAX 3500	MIN 1.0	AC-FT 76640	CFSM 1.02	IN. 13.8
WTR YR 1987	TOTAL 29512.87	MEAN 80.9	MAX 3290	MIN .30	AC-FT 58540	CFSM .78	IN. 10.6

CHARITON RIVER BASIN

233

06903400 CHARITON RIVER NEAR CHARITON, IA

LOCATION.--Lat 40°57'12", long 93°15'37", in SW1/4 NE1/4 sec.15, T.71 N., R.21 W., Lucas County, Hydrologic Unit 10280201, on right bank 15 ft downstream from bridge on county highway S43, 0.4 mi downstream from Wolf Creek and 5.0 mi southeast of Chariton.

DRAINAGE AREA.--182 mi².

PERIOD OF RECORD.--October 1965 to current year. Occasional low-flow measurements, water years 1958-60, 1962, 1964.

GAGE.--Water-stage recorder. Datum of gage is 917.90 ft above NGVD (U.S. Army Corps of Engineers bench mark).

REMARKS.--Estimated daily discharges: Nov. 13-18, Dec. 10-18 and Jan. 16 to Feb. 5. Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers data collection platform at station.

AVERAGE DISCHARGE.--22 years, 121 ft³/s, 9.03 in/yr, 87,660 acre-ft/yr; median of yearly mean discharges, 100 ft³/s, 7.5 in/yr, 72,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,600 ft³/s July 4, 1981, gage height, 23.14 ft; no flow Aug. 1, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in March 1960 reached a stage of about 23 ft, discharge, about 15,000 ft³/s and flood of June 5, 1947 reached a stage of 21.65 ft, from floodmark, discharge, 11,000 ft³/s. A discharge of 0.08 ft³/s was measured on Oct. 30, 1963.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,600 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 12	1230	2,250	16.95	July 12	1600	1,780	16.30
Apr. 15	0245	2,020	16.55	Aug. 26	2015	*6,720	*19.62
May 4	0200	1,700	16.14	Sept. 17	1300	1,970	16.60

Minimum daily discharge, 1.1 ft³/s Aug. 5, 6, 7.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1250	64	30	23	13	371	98	23	176	22	1.4	67
2	1210	82	46	24	14	496	74	22	211	12	1.4	45
3	877	73	56	21	16	606	58	646	121	7.2	1.2	36
4	336	68	64	21	18	429	49	1290	57	5.3	1.2	30
5	210	59	52	20	20	212	43	861	32	3.9	1.1	25
6	128	50	42	22	22	120	40	287	20	2.9	1.1	24
7	80	43	76	22	26	84	37	75	14	69	1.1	23
8	56	59	318	20	31	64	34	50	8.8	135	11	51
9	45	50	393	21	25	52	31	39	6.8	748	41	28
10	40	44	120	25	28	43	29	32	5.5	851	64	21
11	258	45	70	23	27	39	27	26	4.6	893	31	19
12	2050	37	40	22	24	36	26	22	4.2	1530	16	18
13	1220	27	33	25	21	35	26	19	3.7	992	521	17
14	1110	21	30	35	22	34	752	17	3.2	716	1310	18
15	291	20	28	34	22	39	1610	15	3.0	844	993	587
16	90	21	30	25	20	55	1110	13	2.3	149	709	518
17	64	23	33	19	17	44	508	12	2.0	60	459	1770
18	51	26	36	16	17	139	120	12	2.3	34	115	727
19	43	30	34	14	15	416	75	12	2.4	24	43	489
20	39	36	35	13	15	218	54	12	216	16	29	113
21	35	40	33	12	14	111	234	25	127	11	36	55
22	33	43	31	11	15	75	232	14	561	8.4	30	38
23	42	49	31	10	14	59	123	8.6	220	6.8	22	30
24	149	50	32	9.6	13	307	89	8.1	83	5.2	15	26
25	449	44	29	9.3	14	539	60	9.5	80	3.9	543	21
26	1120	41	27	9.3	14	260	46	12	191	3.2	4890	18
27	725	37	31	9.4	13	126	36	108	86	2.6	4180	15
28	316	32	25	9.6	26	93	29	40	31	2.2	2770	13
29	112	31	23	10	---	392	25	35	19	1.7	1800	12
30	74	30	23	11	---	377	24	25	44	1.6	405	12
31	57	---	24	12	---	170	---	20	---	1.4	122	---
TOTAL	12560	1275	1875	558.2	536	6041	5699	3790.2	2337.8	7162.3	19163.5	4866
MEAN	405	42.5	60.5	18.0	19.1	195	190	122	77.9	231	618	162
MAX	2050	82	393	35	31	606	1610	1290	561	1530	4890	1770
MIN	33	20	23	9.3	13	34	24	8.1	2.0	1.4	1.1	12
AC-FT	24910	2530	3720	1110	1060	11980	11300	7520	4640	14210	38010	9650
CFSM	2.23	.23	.33	.10	.11	1.07	1.04	.67	.43	1.27	3.40	.89
IN.	2.57	.26	.38	.11	.11	1.23	1.16	.77	.48	1.46	3.92	.99

CAL YR 1986 TOTAL 75885.0 MEAN 208 MAX 3020 MIN .49 AC-FT 150500 CFSM 1.14 IN. 15.5
WTR YR 1987 TOTAL 65863.9 MEAN 180 MAX 4890 MIN 1.1 AC-FT 130600 CFSM .99 IN. 13.5

CHARITON RIVER BASIN

06903700 SOUTH FORK CHARITON RIVER NEAR PROMISE CITY, IA

LOCATION.--Lat 40°48'02", long 93°11'32", in SW1/4 SW1/4 sec. 5, T.69 N., R.20 W., Wayne County, Hydrologic Unit 10280201, on right bank 20 ft downstream from bridge on county highway S50, 1.3 mi downstream from Jordan Creek and 4.3 mi northwest of Promise City.

DRAINAGE AREA.--168 mi².

PERIOD OF RECORD.--October 1967 to current year. Occasional low-flow measurements, water years 1958-66, published as "near Bethlehem". Monthly discharge measurements for March 1965 to September 1967 available in files of Iowa City district office.

GAGE.--Water-stage recorder. Datum of gage is 913.70 ft above NGVD (U.S. Army Corps of Engineers bench mark).

REMARKS.--Estimated daily discharges: Nov. 13-18, 22-25, Dec. 5, 11-20, Dec. 31 to Jan. 3, Jan. 16 to Feb. 2, Feb. 2, Feb. 8-11, 16-19, Mar. 26 to Apr. 2, Apr. 4, 6-10 and 12. Records good except those for estimated daily discharges, which are poor. U.S. Army Corps of Engineers satellite data collection platform at station.

AVERAGE DISCHARGE.--20 years, 119 ft³/s, 9.62 in/yr, 86,220 acre-ft/yr; median of yearly mean discharges, 110 ft³/s, 8.9 in/yr, 79,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 28,000 ft³/s July 4, 1981, gage height, 29.95 ft; no flow July 6, 7, 21-24, 28-31, and Aug. 1, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Sept. 21, 1965, reached a stage of 25.5 ft, from floodmarks, discharge, about 18,000 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 3	0730	2,570	15.12	Aug. 15	1415	2,570	15.17
Oct. 12	0400	3,880	17.85	Aug. 26	1415	*4,490	*18.45
May 3	1615	2,130	13.61	Sept. 17	0515	2,550	15.24
July 12	1445	2,500	14.89				

Minimum discharge, 3.1 ft³/s June 16, 17.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	370	55	29	24	18	787	68	19	65	15	6.0	26
2	146	66	59	29	21	492	58	17	27	11	7.3	22
3	2130	57	53	27	28	342	45	1010	26	9.3	8.7	19
4	538	48	36	25	21	130	43	1170	15	8.3	10	17
5	163	42	25	26	20	94	40	216	10	7.7	10	16
6	84	41	30	27	24	71	38	97	8.1	8.5	11	18
7	56	38	78	26	33	61	38	66	6.6	93	13	20
8	42	73	355	23	26	52	37	49	5.3	430	64	361
9	38	61	210	28	20	46	35	40	5.8	1070	62	58
10	34	42	97	28	16	39	34	34	6.2	675	23	28
11	370	37	56	38	20	35	34	26	6.0	263	16	22
12	2500	28	43	32	25	34	33	22	5.6	1530	12	16
13	303	23	33	38	18	34	32	20	4.8	435	546	14
14	129	19	36	43	21	33	767	19	4.5	117	627	14
15	83	18	42	38	20	63	869	18	4.1	217	1690	238
16	64	18	45	27	16	95	267	15	3.5	78	287	452
17	58	19	41	23	12	61	114	14	4.6	34	90	1540
18	46	21	40	18	16	413	72	15	7.5	24	57	161
19	40	24	46	16	12	604	50	14	45	19	43	78
20	38	34	41	14	8.8	154	39	52	657	17	43	49
21	38	37	38	13	9.1	95	181	208	355	16	141	38
22	33	46	36	12	8.3	71	118	56	189	13	60	31
23	35	60	42	11	8.0	52	71	25	75	11	43	25
24	114	45	39	11	7.3	683	56	20	32	10	35	21
25	127	39	37	10	8.9	380	39	19	33	9.0	473	19
26	691	36	35	9.8	11	220	31	35	27	7.8	3340	15
27	212	34	39	10	12	130	25	271	21	7.1	847	14
28	93	32	37	11	103	80	19	81	18	7.4	171	13
29	69	28	34	12	---	500	19	70	12	6.5	93	13
30	54	28	33	14	---	126	22	41	16	6.2	58	11
31	47	---	30	16	---	80	---	32	---	6.1	35	---
TOTAL	8745	1149	1795	679.8	563.4	6057	3294	3791	1695.6	5161.9	8922.0	3369
MEAN	282	38.3	57.9	21.9	20.1	195	110	122	56.5	167	288	112
MAX	2500	73	355	43	103	787	869	1170	657	1530	3340	1540
MIN	33	18	25	9.8	7.3	33	19	14	3.5	6.1	6.0	11
AC-FT	17350	2280	3560	1350	1120	12010	6530	7520	3360	10240	17700	6680
CFSM	1.68	.23	.34	.13	.12	1.16	.65	.73	.34	.99	1.71	.67
IN.	1.94	.25	.40	.15	.12	1.34	.73	.84	.38	1.14	1.98	.75

CAL YR 1986 TOTAL 58760.2 MEAN 161 MAX 7250 MIN 1.1 AC-FT 116600 CFSM .96 IN. 13.0
WTR YR 1987 TOTAL 45222.6 MEAN 124 MAX 3340 MIN 3.5 AC-FT 89700 CFSM .74 IN. 10.0

CHARITON RIVER BASIN

235

06903880 RATHBUN LAKE NEAR RATHBUN, IA

LOCATION.--Lat 40°49'30", long 92°53'33", in NW1/4 NE1/4 sec.35, T.70 N., R.18 W., Appanoose County, Hydrologic Unit 10280201, at control tower of Rathbun Dam, 1.8 mi north of Rathbun and 3.9 mi upstream from Walnut Creek and at mile 142.3.

DRAINAGE AREA.--549 mi².

PERIOD OF RECORD.--October 1969 to current year.

GAGE.--Water-stage recorder. Datum of gage is at NGVD.

REMARKS.--Reservoir is formed by earthfill dam completed in 1969. Storage began in November 1969. Release is controlled by two hydraulically controlled slide gates, 6 ft wide and 12 ft high, into forechamber of an 11-ft diameter horseshoe conduit through the dam. No dead storage. Maximum design discharge through gates is 5,000 ft³/s. Uncontrolled notch spillway is concrete overflow section 500 ft in length, located about 3,000 ft west of the right abutment of the dam and provides emergency discharge into the adjacent drainage area of Little Walnut Creek. Uncontrolled notch spillway is at elevation 926 ft, contents 545,621 acre-ft, surface area, 20,974 acres. Conservation pool level is at elevation 904.0 ft, contents 199,830 acre-ft, surface area, 10,989 acres. Reservoir is used for flood control, low-flow augmentation, conservation and recreation.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum daily contents, 514,000 acre-ft July 22, 23, 1982; maximum elevation, 924.46 ft July 22, 1982; minimum daily contents, 100 acre-ft Oct. 1-15, Nov. 17-21, 1969; minimum elevation, 855.40 ft Oct. 6-10, 1969.

EXTREMES FOR CURRENT YEAR.--Maximum daily contents, 311,000 acre-ft Oct. 15-16; maximum elevation 912.76 ft Oct. 15; minimum daily contents, 200,000 acre-ft Jan. 5-9, Mar. 13-15, Apr. 10-13, June 10-11, 13-20; minimum elevation, 904.00 ft June 18-20.

Capacity table (elevation, in feet, and contents, in acre-feet)

860	150	880	31,900	905	211,000
862	226	885	52,700	910	272,600
865	950	890	80,300	915	345,000
870	5,870	895	115,600	920	428,900
875	17,000	900	158,800	925	524,900

RESERVOIR STORAGE (AC-FT), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
OBSERVATION AT 08:00

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	280000	303000	259000	205000	201000	207000	213000	208000	205000	205000	207000	254000
2	284000	302000	257000	203000	201000	210000	212000	207000	205000	205000	206000	253000
3	293000	300000	256000	201000	202000	213000	210000	207000	205000	205000	205000	251000
4	302000	299000	253000	201000	202000	214000	209000	213000	204000	205000	204000	249000
5	304000	297000	250000	200000	202000	214000	208000	219000	203000	206000	204000	248000
6	305000	296000	248000	200000	202000	213000	206000	221000	203000	205000	203000	247000
7	305000	294000	247000	200000	202000	211000	205000	221000	202000	206000	202000	245000
8	304000	294000	246000	200000	202000	209000	203000	220000	201000	207000	203000	244000
9	302000	293000	246000	200000	202000	207000	202000	218000	201000	208000	204000	243000
10	300000	290000	245000	201000	202000	205000	200000	217000	200000	211000	203000	242000
11	299000	289000	243000	201000	202000	203000	200000	215000	200000	214000	203000	240000
12	301000	288000	243000	201000	203000	201000	200000	213000	201000	218000	202000	239000
13	307000	286000	243000	201000	203000	200000	200000	212000	200000	223000	203000	237000
14	310000	284000	242000	201000	203000	200000	201000	211000	200000	227000	204000	235000
15	311000	283000	241000	201000	202000	200000	206000	209000	200000	229000	208000	237000
16	311000	281000	239000	201000	203000	201000	212000	207000	200000	229000	212000	239000
17	309000	280000	237000	201000	203000	201000	216000	205000	200000	229000	215000	243000
18	308000	279000	235000	201000	203000	202000	218000	204000	200000	228000	216000	249000
19	306000	276000	232000	201000	203000	205000	217000	203000	200000	227000	216000	252000
20	305000	276000	230000	201000	203000	207000	216000	203000	200000	226000	215000	252000
21	304000	274000	228000	201000	203000	207000	215000	203000	201000	224000	214000	251000
22	302000	272000	226000	202000	203000	207000	214000	204000	203000	223000	214000	250000
23	301000	272000	224000	201000	203000	205000	214000	203000	204000	221000	213000	248000
24	300000	270000	222000	201000	203000	205000	212000	203000	205000	219000	212000	247000
25	299000	268000	220000	201000	203000	207000	211000	202000	206000	217000	211000	245000
26	301000	267000	218000	201000	203000	209000	210000	202000	205000	216000	216000	243000
27	304000	265000	215000	201000	203000	209000	209000	204000	206000	214000	227000	242000
28	307000	264000	213000	201000	203000	207000	209000	205000	205000	212000	241000	240000
29	307000	262000	211000	201000	---	209000	209000	205000	205000	211000	249000	239000
30	306000	260000	209000	201000	---	212000	208000	205000	205000	209000	253000	237000
31	304000	---	207000	201000	---	213000	---	204000	---	208000	255000	---
MEAN	302600	282100	235000	201100	202500	206900	208800	208800	202500	215700	214200	244700
MAX	311000	303000	259000	205000	203000	214000	218000	221000	206000	229000	255000	254000
MIN	280000	260000	207000	200000	201000	200000	200000	202000	200000	205000	202000	235000

CAL YR 1986 MEAN 244100 MAX 314000 MIN 188000
WTR YR 1987 MEAN 227200 MAX 311000 MIN 200000

CHARITON RIVER BASIN

06903900 CHARITON RIVER NEAR RATHBUN, IA

LOCATION.--Lat 40°49'22", long 92°53'22", in SE1/4 NE1/4 sec.35, T.70 N., R.18 W., Appanoose County, Hydrologic Unit 10280201, on left bank 600 ft downstream from outlet of Rathbun Dam, 1.8 mi north of Rathbun and 3.7 mi upstream from Walnut Creek and at mile 142.1.

DRAINAGE AREA.--549 mi².

PERIOD OF RECORD.--October 1956 to current year. Monthly discharge only for some periods, published in WSP 1730.

REVISED RECORDS.--WSP 1560: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 847.92 ft above NGVD. Prior to Nov. 16, 1960, nonrecording gage and Nov. 17, 1960, to Sept. 30, 1969, recording gage, at site 3.1 mi downstream at datum 4.65 ft lower.

REMARKS.--Estimated daily discharges: Oct. 1-4, Jan. 16, 20, 22 and Apr. 14-16. Records good except those for estimated daily discharges, which are fair. U.S. Army Corps of Engineers gage-height telemeter at station. Flow regulated by Rathbun Reservoir (station 06903880) since Nov. 21, 1969. Records of discharge include diversion of:

Date	Discharge (ft ³ /s)	Date	Discharge (ft ³ /s)
Oct. 1 - Nov. 12	14	June 12 - July 31	8
Nov. 13 - June 10	8	Aug. 1	10
June 11	9	Aug. 2 - Sept. 30	11

The diversion goes from the reservoir through fish ponds on left bank downstream from dam. Diverted flow returns to stream 0.1 mi downstream from gage. Rathbun Regional Water Association permit No. 3663 allows withdrawal from Rathbun Dam discharge immediately downstream from gage for maximum rate of 4,200 gpm (9.36 ft³/s) and maximum quantity of 638 million gallons per year (1,955 acre-ft).

AVERAGE DISCHARGE.--31 years, 350 ft³/s, 8.66 in/yr, (unadjusted) 253,600 acre-ft/yr; median of yearly mean discharges, 280 ft³/s, 6.9 in/yr, 203,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 21,800 ft³/s Mar. 31, 1960, gage height, 25.3 ft from flood-mark, site and datum then in use; no flow Oct. 26, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,310 ft³/s Dec. 8-9, gage height, 11.77 ft; minimum daily discharge, 23 ft³/s May 20, 21 and June 17.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	31	860	1060	1220	29	33	864	439	411	26	415	703
2	31	858	1200	911	28	29	862	853	383	26	415	800
3	31	865	1200	467	28	222	859	243	401	26	300	799
4	31	853	1230	452	28	922	858	29	402	26	220	800
5	41	850	1250	223	28	1160	857	325	402	26	219	802
6	305	854	1250	31	28	1160	857	828	401	25	219	804
7	658	853	1070	30	27	1160	857	827	402	26	171	803
8	779	857	1100	30	28	1160	855	822	202	28	73	804
9	869	859	1250	30	28	1150	854	822	25	26	29	802
10	866	851	1250	29	29	1150	855	821	25	26	121	801
11	867	850	685	30	28	1150	49	820	26	26	217	801
12	874	847	195	29	28	619	29	815	25	26	218	797
13	876	840	363	30	29	31	27	815	25	25	93	797
14	875	840	760	30	29	32	25	815	24	26	28	786
15	873	839	1200	29	29	35	25	813	25	343	29	122
16	873	839	1200	29	29	32	25	811	24	613	124	139
17	874	837	1210	29	29	33	255	809	23	613	218	228
18	870	837	1210	29	29	42	650	680	27	612	219	287
19	869	836	1210	29	29	36	804	25	25	721	326	423
20	871	836	1210	29	29	362	804	23	24	808	410	646
21	872	835	1210	29	29	830	801	23	24	806	412	811
22	876	835	1210	30	29	827	800	97	24	805	412	810
23	876	833	1200	30	29	826	800	207	24	803	411	808
24	875	833	1200	32	28	679	799	208	24	801	411	809
25	881	833	1220	31	28	440	799	209	24	797	235	808
26	443	864	1230	30	28	638	798	137	24	796	34	810
27	30	889	1220	29	28	1000	396	32	25	795	30	813
28	470	889	1220	29	31	1090	26	24	26	793	207	814
29	866	887	1220	29	---	291	26	242	26	792	416	815
30	863	885	1220	28	---	30	26	409	26	605	419	815
31	861	---	1220	29	---	432	---	409	---	414	525	---
TOTAL	20277	25544	34473	4042	799	17601	16542	14432	3549	12281	7576	21057
MEAN	654	851	1112	130	28.5	568	551	466	118	396	244	702
MAX	881	889	1250	1220	31	1160	864	853	411	808	525	815
MIN	30	833	195	28	27	29	25	23	23	25	28	122
AC-FT	40220	50670	68380	8020	1580	34910	32810	28630	7040	24360	15030	41770
CAL YR 1986	TOTAL 241219	MEAN 661	MAX 1260	MIN 11	AC-FT 478500							
WTR YR 1987	TOTAL 178173	MEAN 488	MAX 1250	MIN 23	AC-FT 353400							

CHARITON RIVER BASIN

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06904010 CHARITON RIVER NEAR MOULTON, IA

LOCATION.--Lat 40°41'30", long 92°46'15", in SE1/4 NE1/4 sec.14, T.68N., R.17W., Appanoose County, Hydrologic Unit 10280201, on right bank 6 ft downstream from bridge on county highway J45, 0.7 mi downstream from Hickory Creek, 5.0 mi west of Moulton, 8.0 mi upstream from Iowa-Missouri border, 20.8 mi downstream from Rathbun Dam, and at mile 121.5.

DRAINAGE AREA.--740 mi².

PERIOD OF RECORD--August 1979 to current year

GAGE--Water stage recorder. Datum of gage is 800.00 ft above NGVD (U.S. Army Corps of Engineers bench mark).

REMARKS.--Estimated daily discharges: Nov. 22-23 and Apr. 14. Records good except those for estimated daily discharges, which are poor. Flow regulated by Rathbun Reservoir (station 06903880) 20.8 mi upstream. U.S. Army Corps of Engineers rain-gage, gage-height telemeters and satellite data collection platform at station.

AVERAGE DISCHARGE.--8 years, 655 ft³/s, 12.0 in/yr, 474,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,200 ft³/s July 16, 1982, gage height, 36.83 ft; minimum daily discharge, 19 ft³/s Oct. 26, 1979.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1947 reached a stage of about 45 ft, discharge unknown, from information by U.S. Army Corps of Engineers.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,300 ft³/s Oct. 3, gage height, 31.45 ft; minimum daily discharge, 31 ft³/s June 16, 17.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2330	933	941	1190	60	642	899	64	433	34	396	627
2	1520	937	1280	1160	60	716	946	778	405	33	394	819
3	3600	937	1300	540	60	339	924	981	415	32	383	837
4	2860	934	1280	437	56	670	909	677	392	33	239	837
5	861	930	1300	420	56	1260	901	287	378	37	221	835
6	262	924	1290	137	59	1280	897	750	373	40	219	838
7	632	922	1280	75	63	1260	891	879	370	47	218	839
8	726	923	1120	69	65	1250	887	862	356	88	174	852
9	884	1020	1500	68	62	1240	882	852	100	109	108	835
10	882	959	1340	67	62	1220	790	845	39	75	63	831
11	877	913	1180	67	66	1220	152	840	37	53	180	829
12	932	898	236	73	65	1140	78	834	36	133	222	823
13	952	883	393	70	62	229	93	827	35	327	230	821
14	979	879	567	75	63	75	550	829	33	140	89	823
15	915	882	1160	78	62	199	2850	824	32	118	86	1590
16	887	884	1210	68	57	347	999	820	31	604	133	455
17	874	884	1210	89	52	179	278	818	31	609	239	549
18	864	882	1210	69	53	704	547	820	39	589	240	514
19	858	880	1200	66	52	1130	868	368	65	598	239	474
20	854	886	1200	70	51	395	864	56	42	774	391	497
21	852	881	1200	71	53	855	850	46	47	786	415	820
22	850	880	1190	63	52	922	863	45	52	784	415	836
23	848	874	1190	67	51	898	858	148	48	783	413	830
24	847	865	1190	69	50	1060	842	207	41	783	413	825
25	942	862	1190	63	47	1230	827	208	51	785	430	821
26	2320	855	1210	64	47	768	817	211	46	783	378	817
27	881	901	1210	65	47	958	759	973	38	783	439	817
28	314	904	1210	65	62	1300	152	217	35	783	201	831
29	916	903	1210	63	---	2030	64	120	33	782	396	817
30	958	902	1200	60	---	771	59	374	34	761	445	806
31	941	---	1190	60	---	263	---	396	---	435	455	---
TOTAL	34218	27117	35387	5598	1595	26550	22296	16956	4067	12721	8864	23745
MEAN	1104	904	1142	181	57.0	856	743	547	136	410	286	791
MAX	3600	1020	1500	1190	66	2030	2850	981	433	786	455	1590
MIN	262	855	236	60	47	75	59	45	31	32	63	455
AC-FT	67870	53790	70190	11100	3160	52660	44220	33630	8070	25230	17580	47100

CAL YR 1986 TOTAL 317317 MEAN 869 MAX 5480 MIN 30 AC-FT 629400
WTR YR 1987 TOTAL 219114 MEAN 600 MAX 3600 MIN 31 AC-FT 434600

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Crest-stage partial-record stations

The following table contains annual maximum discharge for crest-stage stations. A crest-stage is a device which will register the peak stage occurring between inspections of the gage. A stage-discharge relation for each gage is developed from discharge measurements made by indirect measurements of peak flow or by current meter. The date of the maximum discharge is not always certain but is usually determined by comparison with nearby continuous-record stations, weather records, or local inquiry. Only the maximum discharge for each water year is given. Information on some lower floods may have been obtained, but is not published herein. The years given in the period of record represent water years up to the current year for which the annual maximum has been determined.

Annual maximum discharge at crest-stage partial-record stations during water year 1987

Station no.	Station name	Location	Drainage area (mi ²)	Period of record	Date	Annual maximum Gage height (feet)	Dis-charge (ft ³ /s)
Upper Iowa River Basin							
05387500	Upper Iowa River at Decorah, Ia.	Lat 43°18'19", long 91°47'48", in NE1/4 sec. 16, T.98N., R.8 W., Winneshiek County, on right bank 1,200 ft upstream from bridge on U.S. Highway 52 (city route) in Decorah.	511	1951-	10-13-86	9.50	6,430
05388310	Waterloo Creek near Dorchester, Ia.	Lat 43°27'04", long 91°30'18", in NW1/4 sec.25, T.100 N., R.6 W., Allamakee County, on State Highway 76, 1.4 mi south of Dorchester.	43.6	1966-	10-14-86	700.15	1,800
Wexford Creek Basin							
05388400	Wexford Creek near Harpers Ferry, Ia.	Lat 43°16'22", long 91°08'00", in SE1/4 sec.25, T.98 N., R.3 W., Allamakee County, at bridge, 5 mi north of Harpers Ferry on county highway X52.	11.9	1953-	07-24-87	6.89	1,650
Turkey River Basin							
05411530	North Branch Turkey River near Cresco, Ia.	Lat 43°22'15", long 92°12'49", in NW1/4 sec.25, T.99 N., R.12 W., Howard County, at bridge on state highway 9, 5 mi west of Cresco.	19.5	1966-	10-12-86	90.06	550
05411700	Crane Creek near Lourdes, Ia.	Lat 43°14'57", long 92°18'32", in SE1/4 NW1/4 sec.6, T.97 N., R.12 W., Howard County, at bridge on State Highway 272, 1 mi southwest of Lourdes.	75.8	1951-	10-12-86	11.97	4,400
Little Maquoketa River Basin							
05414350	Little Maquoketa River near Graf, Ia.	Lat 42°30'09", long 90°51'50", in SE1/4 sec.20, T.89 N., R.1 E., Dubuque County, at bridge on county highway, 300 ft downstream from Illinois Central railroad bridge, 0.5 mi northeast of Graf.	39.6	1951-	c09-21-86 1987	12.33 (a)	4,000 <1,150
05414400	Middle Fork Little Maquoketa River near Rickardsville, Ia.	Lat 42°33'38", long 90°51'35", in SE1/4 sec.32, T.90 N., R.1 E., Dubuque County, at bridge on county highway, 2 mi southeast of Rickardsville.	30.2	1951-	c09-21-86 1987	16.50 (a)	1,220 <180
05414450	North Fork Little Maquoketa River near Rickardsville, Ia.	Lat 42°35'09", long 90°51'20", near NW corner sec.28, T.90 N., R.1 E., Dubuque County, at bridge on county highway, 1 mi northeast of Rickardsville.	21.6	1951-	c09-21-86 1987	8.17 (a)	1,350 <290
05414500	Little Maquoketa River near Durango, Ia.	Lat 42°33'18", long 90°44'46", in NW1/4 NE1/4 sec. 5, T.89 N., R.2 E., Dubuque County, on left bank 10 ft (3 m) upstream from bridge on county highway, 300 ft (91 m) upstream from Cloie Branch, 1.7 mi (2.7 km) east of Durango, 5.6 mi (9.0 km) northwest of court house at Dubuque and 6.4 mi (10.3 km) upstream from mouth.	130	1934-	c09-21-86 1987	8.17 (*)	1,350 <290
05414600	Little Maquoketa River tributary at Dubuque, Ia.	Lat 42°32'33", long 90°41'38", near NW corner sec.11, T.89 N., R.2 E., Dubuque County at bridge on State Highway 386, near north city limits of Dubuque.	1.54	1951-	1987	(a)	(+)

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

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Annual maximum discharge at crest-stage partial-record stations during water year 1987--Continued

Station no.	Station name	Location	Drainage area (mi ²)	Period of record	Date	Annual maximum Gage height (feet)	Dis-charge (ft ³ /s)
Maquoketa River Basin							
05417530	Plum Creek at Earlville, Ia.	Lat 42°28'13", long 91°14'53", in NE1/4 sec.1, T.88 N., R.4 W., Delaware County, at bridge on U.S. Highway 20, 1.5 mi southeast of Earlville.	41.1	1966-	1987	(a)	<490
05417590	Kitty Creek near Langworthy, Ia.	Lat 42°12'04", long 91°12'27", in NW1/4 sec.4, T.85 N., R.3 W., Jones County, at bridge on U.S. Highway 151, 1 mi north-east of Langworthy.	14.4	1966-	1987	(a)	<430
Wapsipinicon River Basin							
05420600	Little Wapsipinicon River tributary near Riceville, Ia.	Lat 43°21'31", long 92°29'08", near S1/4 corner sec.27, T.99 N., R.14 W., Howard County, at culvert on county highway, 3.5 mi east of Riceville.	0.90	1953-	10-12-86	3.21	28
05420620	Little Wapsipinicon River near Acme, Ia.	Lat 43°19'37", long 92°29'07", near N1/4 corner sec.10, T.98 N., R.14 W., Howard County, at bridge on county highway, 1 mi north of Acme.	7.76	1953-	10-12-86	5.88	480
05420640	Little Wapsipinicon River at Elma, Ia.	Lat 43°14'30", long 92°27'04", in NW1/4 sec.12, T.97 N., R.14 W., Howard County, at bridge on county highway B17, near west city limits of Elma.	37.3	1953-	10-12-86	10.77	2,250
05420650	Little Wapsipinicon River near New Hampton, Ia.	Lat 43°03'58", long 92°23'38", in NW1/4 sec.9, T.95 N., R.13 W., Chickasaw County, at bridge on U.S. Highway 18, 4 mi west of New Hampton.	95.0	1966-	10-12-86	87.61	3,400
05420690	East Fork Wapsipinicon River near New Hampton, Ia.	Lat 43°05'11", long 92°18'22", in SE1/4 sec.31, T.96 N., R.12 W., Chickasaw County, at bridge on U.S. Highway 63, 2 mi north of New Hampton.	30.3	1966-	1987	(a)	<480
05420850	Little Wapsipinicon River near Oran, Ia.	Lat 42°42'53", long 92°02'29", near NW corner sec.9, T.91 N., R.10 W., Fayette County at bridge on State Highway 3, 2 mi northeast of Oran.	94.1	1966-	08-21-87	86.22	780
05420855	Buck Creek near Oran, Ia.	Lat 42°42'53", long 92°07'33", in NE1/4 sec.10, T.91 N., R.11 W., Bremer County, at bridge on State Highway 3, 2.5 mi northwest of Oran.	37.9	1966-	08-21-87	86.51	210
05421100	Pine Creek tributary near Winthrop, Ia.	Lat 42°29'17", long 91°47'10", in SW1/4 sec.27, T.89 N., R.8 W., Buchanan County, at culvert on county highway, 2.5 mi northwest of Winthrop.	0.334	1953-	08-21-87	5.60	110
05421200	Pine Creek near Winthrop, Ia.	Lat 42°28'11", long 91°47'01", in SW1/4 sec.34, T.89 N., R.8 W., Buchanan County, at railroad bridge, 500 ft upstream from U.S. Highway 20, and 2.5 mi north-west of Winthrop.	28.3	1950-	08-21-87	11.81	495
05421300	Pine Creek tributary No. 2 at Winthrop, Ia.	Lat 42°28'06", long 91°44'33", at N1/4 corner sec.2, T.88 N., R.8 W., Buchanan County, at culvert on U.S. Highway 20, near west city limits of Winthrop.	0.704	1953-	08-21-87	6.90	140
05421550	Buffalo Creek above Winthrop, Ia.	Lat 42°29'51", long 91°43'42", near NE corner sec.25, T.89 N., R.8 W., Buchanan County, at bridge on county highway W45, 1.5 mi northeast of Winthrop.	68.2	1957-	1987	(a)	(+)
05421600	Buffalo Creek near Winthrop, Ia.	Lat 42°28'07", long 91°43'04" in NE1/4 sec.1, T.88 N., R.8 W., Buchanan County, at bridge on U.S. Highway 20, 1 mi east of Winthrop.	71.4	1953-	1987	(a)	(+)
05421890	Silver Creek at Welton, Ia.	Lat 41°54'54", long 90°36'00", in NW1/4 sec.15, T.82 N., R.3 E., Clinton County, at bridge on U.S. Highway 61, at north edge of Welton.	9.03	1966-	1987	(a)	(+)

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Annual maximum discharge at crest-stage partial-record stations during water year 1987--Continued

Station no.	Station name	Location	Drainage area (mi ²)	Period of record	Date	Annual maximum Gage height (feet)	Dis-charge (ft ³ /s)
Iowa River Basin							
05448400	Westmain drainage ditch 1 & 2 near Britt, Ia.	Lat 43°06'09", long 93°47'04", in SW1/4 sec.27, T.96 N., R.25 W., Hancock County, at bridge on U.S. Highway 18, near east city limits of Britt.	21.2	1966-	1987	(a)	<53
05448600	East Branch Iowa River above Hayfield, Ia.	Lat 43°09'21", long 93°41'21", near S1/4 corner sec.4, T.96 N., R.24 W., Hancock County, at bridge on county highway, 1.5 mi southeast of Hayfield.	2.23	1953-	1987	(a)	(+)
05448700	East Branch Iowa River near Hayfield, Ia.	Lat 43°10'50", long 93°39'20", in NW1/4 sec.35, T.97 N., R.24 W., Hancock County, at bridge on county highway B20, 2 mi east of Hayfield.	7.94	1952-	1987	(a)	(+)
05448800	East Branch Iowa River near Garner, Ia.	Lat 43°06'17", long 93°37'20", near center sec.25, T.96 N., R.24 W., Hancock County, at bridge on U.S. Highway 18, 1.2 mi west of Garner.	45.1	1952-	10-12-86	6.58	105
05448900	East Branch Iowa River tributary near Garner, Ia.	Lat 43°06'18", long 93°39'29", near E1/4 corner sec.27, T.96 N., R.24 W., Hancock County, at culvert on U.S. Highway 18, 2.1 mi west of Garner.	5.98	1952-	1987	(a)	(+)
05451955	Stein Creek near Clutier, Ia.	Lat 42°04'46", long 92°18'00", in NE1/4 sec.24, T.84 N., R.13 W., Tama County, at bridge on State Highway 318, 5 mi east of Clutier.	23.4	1971-	08-26-87	72.50	730
05453200	Price Creek at Amana, Ia.	Lat 41°48'18", long 91°52'23", in SE1/4 sec.22, T.81 N., R.9 W., Iowa County, at bridge on State Highway 149, near north edge of Amana.	29.1	1966-	1987	(a)	(+)
05453600	Rapid Creek below Morse, Ia.	Lat 41°43'45", long 91°25'38", near NE corner sec.21, T.80 N., R.5 W., Johnson County, at bridge on county highway, 1.5 mi southeast of Morse.	8.12	1951-	06-21-87	25.99	3,000
05453750	Rapid Creek south-west of Morse, Ia.	Lat 41°43'23", long 91°26'16", in W1/2 sec. 21, T.80 N., R.5 W., Johnson County, at bridge on county highway, 2 mi southwest of Morse.	15.2	1951-	06-21-87	28.47	2,800
05453850	Rapid Creek tributary No. 3 near Oasis, Ia.	Lat 41°42'33", long 91°27'14", near center sec. 29, T.80 N., R.5 W., Johnson County, at bridge on county highway, 3.5 mi west of Oasis.	1.62	1951-	1987	(a)	(+)
05453900	Rapid Creek tributary near Oasis, Ia.	Lat 41°41'14", long 91°26'37", near SW corner sec.33, T.80 N., R.5 W., Johnson County, at bridge on county highway X16, 3 mi southwest of Oasis.	0.97	1951-	1987	(a)	(+)
05453950	Rapid Creek tributary near Iowa City, Ia.	Lat 41°41'56", long 91°28'39", in NW1/4 sec.31, T.80 N., R.5 W., Johnson County, at bridge on county highway, 4 mi north-east of Iowa City.	3.43	1951-	1987	(a)	(+)
05455140	North English River near Montezuma, Ia.	Lat 41°38'45", long 92°34'20", in SW1/4 sec.14, T.79 N., R.15 W., Poweshiek County, at bridge on county highway, 5.0 mi northwest of Montezuma.	31.0	1972-	08-26-87	21.85	1,000
05455200	North English River near Guernsey, Ia.	Lat 41°38'47", long 92°23'47", near SW corner sec.17, T.79 N., R.13 W., Poweshiek County, at bridge on county highway V21, 2.2 mi west of Guernsey.	68.7	1953-	1987	(a)	(+)
05455210	North English River at Guernsey, Ia.	Lat 41°38'42", long 92°21'28", at NW corner sec.22, T.79 N., R.13 W., Poweshiek County at bridge on State Highway 21, 1 mi southwest of Guernsey.	81.5	1960, 1966-	08-26-87	81.86	2,150

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

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Annual maximum discharge at crest-stage partial-record stations during water year 1987--Continued

Station no.	Station name	Location	Drainage area (mi ²)	Period of record	Date	Annual maximum Gage height (feet)	Dis-charge (ft ³ /s)
Iowa River Basin--Continued							
05455230	Deep River at Deep River, Ia.	Lat 41°35'29", long 92°21'18", in SW1/4 sec.3, T.78 N., R.13 W., Poweshiek County, at bridge on State Highway 21, 1 mi northeast of Deep River.	30.5	1960, 1966-	08-26-87	78.80	<420
05455300	South English River near Barnes City, Ia.	Lat 41°31'26", long 92°27'56", near NW corner sec.34, T.78 N., R.14 W., Poweshiek County, at bridge on county highway, 1 mi north of Barnes City.	11.5	1953-	08-26-87	11.16	470
05455550	Bulgers run near Riverside, Ia.	Lat 41°29'02", long 91°37'36", in SE1/4 sec.11, T.77 N., R.7 W., Washington County, at bridge on State Highway 22, 2.5 mi west of Riverside.	6.31	1965-	05-20-87	86.23	(+)
05457440	Deer Creek near Carpenter, Ia.	Lat 43°24'54", long 92°59'05", at NW corner sec.9, T.99 N., R.18 W., Mitchell County, at bridge on State Highway 105, 1.5 mi east of Carpenter.	91.6	1966-	10-12-86	80.91	1,850
05458560	Beaverdam Creek near Sheffield, Ia.	Lat 42°56'11", long 93°12'09", at NW corner sec.27, T.94 N., R.20 W., Cerro Gordo County, at bridge on U.S. Highway 65, 3 mi north of Sheffield.	123	1966-	1987	(a)	<650
05459010	Elk Creek at Kensett, Ia.	Lat 43°22'18", long 93°12'37", in NE1/4 sec.28, T.99 N., R.20 W., Worth County, at bridge on U.S. Highway 65, 1 mi north of Kensett.	58.1	1966-	1987	(a)	<180
05459490	Spring Creek near Mason City, Ia.	Lat 43°12'48", long 93°12'38", in SE1/4 sec.16, T.97 N., R.20 W., Cerro Gordo County, at bridge on U.S. Highway 65, 4 mi north of Mason City.	29.3	1966-	10-12-86	86.07	670
05460100	Willow Creek near Mason City, Ia.	Lat 43°08'55", long 93°16'07", near center sec.12, T.96 N., R.21 W., Cerro Gordo County, at bridge on U.S. Highway 18, 3.5 mi west of Mason City.	78.6	1966-	1987	(a)	145
05462750	Beaver Creek tributary near Aplington, Ia.	Lat 42°34'40", long 92°50'49", in NW1/4 sec.27, T.90 N., R.17 W., Butler County, at bridge on U.S. Highway 20, 2 mi east of Aplington.	11.6	1966-	10-12-86	93.44	970
05463090	Black Hawk Creek at Grundy Center, Ia.	Lat 42°22'10", long 92°46'05", in NW1/4 sec.7, T.87 N., R.16 W., Grundy County, at bridge on State Highway 14, at north edge of Grundy Center.	56.9	1966-	1987	(a)	<78
05464145	Twelve Mile Creek near Traer, Ia.	Lat 42°13'50", long 92°27'56", in SE1/4 sec.27, T.86 N., R.14 W., Tama County, at bridge on U.S. Highway 63, 2.5 mi north of Traer.	43.8	1966-	08-26-87	87.49	1,800
05464310	Pratt Creek near Garrison, Ia.	Lat 42°10'53", long 92°11'10", in SE1/4 sec.12, T.85 N., R.12 W., Benton County, at bridge on U.S. Highway 218, 3.5 mi northwest of Garrison.	23.4	1966-	1987	(a)	<740
05464318	East Blue Creek at Center Point, Ia.	Lat 42°12'44", long 91°47'21", in SW1/4 sec.33, T.86 N., R.8 W., Linn County, at bridge on State Highway 150, 1.5 mi north of Center Point.	17.6	1966-	1987	78.61	(+)
05464560	Prairie Creek at Blairstown, Ia.	Lat 41°54'42", long 92°05'03", in SW1/4 sec.13, T.82 N., R.11 W., Benton County, at bridge on State Highway 82, at north edge of Blairstown.	87.0	1966-	08-26-87	81.45	1,650
05464880	Otter Creek at Wilton, Ia.	Lat 41°36'17", long 91°02'08", in NE1/4 sec.35, T.79 N., R.2 W., Cedar County, at bridge on State Highway 38, 1.5 mi northwest of Wilton.	10.7	1966-	1987	(a)	<200
05465150	North Fork Long Creek at Ainsworth, Ia.	Lat 41°16'51", long 91°32'16", in SW1/4 sec.22, T.75 N., R.6 W., Washington County, at bridge on U.S. Highway 218, 1 mi southeast of Ainsworth.	30.2	1951, 1965-	03-16-87	89.11	(+)

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Annual maximum discharge at crest-stage partial-record stations during water year 1987--Continued

Station no.	Station name	Location	Drainage area (mi ²)	Period of record	Date	Annual maximum Gage height (feet)	Dis-charge (ft ³ /s)
Skunk River Basin							
05469860	Mud Lake drainage ditch 71 in Jewell, Ia.	Lat 42°18'52", long 93°38'23", in SW1/4 sec.27, T.87 N., R.24 W., Hamilton County, at bridge on U.S. Highway 69, in Jewell.	65.4	1966-	07-12-87	86.56	790
05469990	Keigley Branch near Story City, Ia.	Lat 42°09'01", long 93°37'13", in NW1/4 sec.26, T.85 N., R.24 W., Story County, at bridge on U.S. Highway 69, 3 mi south of Story City.	31.0	1966-	07-12-87	87.35	290
05472090	North Skunk River near Baxter, Ia.	Lat 41°49'13", long 93°03'41", in NE1/4 sec.21, T.81 N., R.19 W., Jasper County, at bridge on State Highway 223, 4.5 mi east of Baxter.	52.2	1966-	08-26-87	78.31	(+)
05472290	Sugar Creek near Searsboro, Ia.	Lat 41°34'26", long 92°44'20", at E1/4 corner sec.7, T.78 N., R.16 W., Poweshiek County, at bridge on State Highway 225, 1.8 mi west of Searsboro.	52.7	1966-	08-26-87	92.13	2,600
05472390	Middle Creek near Lacey, Ia.	Lat 41°25'17", long 92°39'04", near N1/4 corner sec.1, T.76 N., R.16 W., Mahaska County, at bridge on U.S. Highway 63, 1.5 mi northwest of Lacey.	23.0	1966-	08-26-87	87.19	1,300
05472445	Rock Creek at Sigourney, Ia.	Lat 41°20'12", long 92°13'20", in NE1/4 sec.3, T.75 N., R.12 W., Keokuk County, at bridge on State Highway 92, near west edge of Sigourney.	26.3	1966-	04-15-87	87.70	260
05473300	Cedar Creek near Batavia, Ia.	Lat 41°00'34", long 92°07'06", in SW1/4 sec.27, T.72 N., R.11 W., Jefferson County, at bridge on U.S. Highway 34, 2.5 mi northeast of Batavia.	252	1966-	c09-30-86 04-15-87	80.91 80.78	4,400 4,600
Des Moines River Basin							
05480930	White Fox Creek at Clarion, Ia.	Lat 42°43'55", long 93°42'26", in NW1/4 sec.5, T.91 N., R.24 W., Wright County, at bridge on State Highway 3, 1.5 mi east of Clarion.	13.3	1966-	10-12-86	90.60	420
05481510	Bluff Creek at Pilot Mound, Ia.	Lat 42°09'59", long 94°01'15", in NW 1/4 sec.20, T.85 N., R.27 W., Boone County, at bridge on State Highway 329, at northwest edge of Pilot Mound.	23.5	1966-	10-11-86	85.50	370
05481680	Beaver Creek at Beaver, Ia.	Lat 42°02'04", long 94°08'46", in NE1/4 sec.6, T.83 N., R.28 W., Boone County, at bridge on U.S. Highway 30, at southwest edge of Beaver.	38.5	1966-	04-15-87	86.02	273
05481690	West Beaver Creek at Grand Junction, Ia.	Lat 42°01'56", long 94°12'38", in NE1/4 sec.3, T.83 N., R.29 W., Greene County, at bridge on U.S. Highway 30, near east edge of Grand Junction.	12.6	1966-	1987	(*)	(+)
05482600	Hardin Creek at Farnhamville, Ia.	Lat 42°16'01", long 94°25'10", near NE corner sec.14, T.86 N., R.31 W., Calhoun County, at bridge on State Highway 175, near west city limits of Farnhamville.	43.7	1952-	10-11-86	9.17	450
05482800	Happy Run at Churdan, Ia.	Lat 42°10'16", long 94°29'39", in SW1/4 sec.17, T.85 N., R.31 W., Greene County, at bridge on county highway, 1 mi northwest of Churdan.	7.58	1952-	1987	(a)	(+)
05482900	Hardin Creek near Farlin, Ia.	Lat 42°05'34", long 94°25'39", near N1/4 corner sec.14, T.84 N., R.31 W., Greene County, at bridge on county highway, 1.5 mi northeast of Farlin.	101	1951-	10-12-86	11.29	1,450
05483318	Brushy Fork Creek near Templeton, Ia.	Lat 41°56'45", long 94°52'45", in NW1/4 sec.1, T.82 N., R.35 W., Carroll County, at bridge on U.S. Highway 71, 4 mi northeast of Templeton.	45.0	1966-	1987	(a)	(+)
05483349	Middle Raccoon River tributary at Carroll, Ia.	Lat 42°02'30", long 94°52'43", in NW1/4 sec.36, T.84 N., R.35 W., Carroll County, at bridge on U.S. Highway 71, 1.5 mi south of Carroll.	6.58	1966-	1987	(*)	(+)
05487350	South Otter Creek tributary near Woodburn, Ia.	Lat 41°02'48", long 93°35'26" near SW corner sec.11, T.72 N., R.24 W., Clarke County, at bridge on county highway, 2 mi north of Wood.	0.71	1955-	1987	(*)	(+)

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

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Annual maximum discharge at crest-stage partial-record stations during water year 1987--Continued

Station no.	Station name	Location	Drainage area (mi ²)	Period of record	Date	Annual maximum Gage height (feet)	Dis-charge (ft ³ /s)
Des Moines River Basin--Continued							
05487800	White Breast Creek at Lucas, Ia.	Lat 41°01'24", long 93°27'56", in NE1/4 sec.23, T.72 N., R.23 W., Lucas County, at bridge on U.S. Highway 65, near south city limits of Lucas.	128	1953-	08-26-87	17.52	11,500
05488620	Coal Creek near Albia, Ia.	Lat 41°01'02", long 92°50'46", in SW1/4 sec.20, T.72 N., R.17 W., Monroe County, at bridge on U.S. Highway 34, 2 mi southwest of Albia.	13.5	1966-	07-12-87	79.89	870
05489150	Little Muchakinoch Creek at Oskaloosa, Ia.	Lat 41°15'58", long 92°38'33", in SE1/4 sec.25, T.75 N., R.16 W., Mahaska County, at bridge on State Highway 137, at south edge of Oskaloosa.	9.12	1966-	08-26-87	87.25	620
05489350	South Avery Creek near Blakesburg, Ia.	Lat 41°00'59", long 92°37'32", in SE1/4 sec.19, T.72 N., R.15 W., Wapello County, at bridge on U.S. Highway 34, 3.5 mi north of Blakesburg.	33.1	1965-	05-31-87	84.98	5,500
05489490	Bear Creek at Ottumwa, Ia.	Lat 41°00'43", long 92°27'54", in NW1/4 sec.27, T.72 N., R.14 W., Wapello County, at bridge on U.S. Highway 34, near west edge of Ottumwa.	22.9	1965-	05-31-87	84.63	1,020
Fox River Basin							
05494110	South Fox Creek near West Grove, Ia.	Lat 40°43'31", long 92°36'16", in SE1/4 sec.32, T.69 N., R.15 W., Davis County, at bridge on State Highway 2, 2.4 mi west of West Grove.	12.2	1965-	10-03-86	81.08	(+)
Big Sioux River Basin							
06483410	Otter Creek north of Sibley, Ia.	Lat 43°27'41", long 95°44'29", at NE corner sec.25, T.100 N., R.42 W., Osceola County, at bridge on county highway L40, 4 mi north of Sibley.	11.9	1952-	09-19-87	6.21	150
06483430	Otter Creek at Sibley, Ia.	Lat 43°24'14", long 95°46'10", near N1/4 corner sec.14, T.99 N., R.42 W., Osceola County, at bridge on county highway A22, 1 mi northwest of Sibley.	29.9	1952-	09-19-87	7.26	200
06483440	Dawson Creek near Sibley, Ia.	Lat 43°23'23", long 95°42'53", near NW corner sec.20, T.99 N., R.41 W., Osceola County, at culvert on county highway A30, 2 mi southeast of Sibley.	4.35	1952-	09-19-87	5.85	(+)
06483460	Otter Creek near Ashton, Ia.	Lat 43°20'07", long 95°45'43", in SE1/4 sec.2, T.98 N., R.42 W., Osceola County, at bridge on county highway L36, 2 mi northeast of Ashton.	88.0	1952-	09-19-87	8.82	740
06483495	Burr Oak Creek near Perkins, Ia.	Lat 43°14'43", long 96°10'38", in SE1/4 sec.5, T.97 N., R.45 W., Sioux County, at bridge on U.S. Highway 75, 4 mi north of Perkins.	30.9	1966-	1987	(a)	(+)
Perry Creek Basin							
06599800	Perry Creek near Merrill, Ia.	Lat 42°43'16", long 96°20'33", in NW1/4 sec.12, T.91 N., R.47 W., Plymouth County, at bridge on county highway C44, 5 mi west of Merrill.	8.17	1953-	05-25-87	6.29	(+)
06599950	Perry Creek near Hinton, Ia.	Lat 42°37'57", long 96°22'13", in NE1/4 sec.15, T.90 N., R.47 W., Plymouth County, at bridge on county highway, 4 mi west of Hinton.	30.8	1953-	1987	(*)	(+)
Floyd River Basin							
06600030	Little Floyd River near Sanborn, Ia.	Lat 43°11'10", long 95°43'30", in NE1/4 sec.31, T.97 N., R.41 W., O'Brien County, at bridge on U.S. Highway 18, 3.5 mi west of Sanborn.	8.44	1966-	1987	(a)	(+)
Monona-Harrison Ditch Basin							
06601480	Big Whiskey Slough near Remsen, Ia.	Lat 42°48'28", long 95°53'21", in NW1/4 sec.11, T.92 N., R.43 W., Plymouth County, at bridge on State Highway 3, 4.2 mi east of Remsen.	12.9	1966-	1987	(a)	(+)

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Annual maximum discharge at crest-stage partial-record stations during water year 1987--Continued

Station no.	Station name	Location	Drainage area (mi ²)	Period of record	Date	Annual maximum Gage height (feet)	Dis-charge (ft ³ /s)
Monona-Harrison Ditch Basin--Continued							
06602190	Elliott Creek at Lawton, Ia.	Lat 42°28'30", long 96°11'22", in NW1/4 sec.3, T.88 N., R.46 W., Woodbury County, at bridge on U.S. Highway 20, at west edge of Lawton.	34.8	1966-	1987	(a)	(+)
Little Sioux River Basin							
06604510	Ocheyedan River near Ocheyedan, Ia.	Lat 43°25'58", long 95°36'41", in NE1/4 sec.6, T.99 N., R.40 W., Osceola County, at bridge on State Highway 9, 4 mi northwest of Ocheyedan.	73.5	1966-	1987	(d)	(+)
06605340	Prairie Creek near Spencer, Ia.	Lat 43°05'16", long 95°09'40", in SE1/4 sec.36, T.96 N., R.37 W., Clay County, at bridge on U.S. Highway 71, 4 mi south of Spencer.	22.3	1966-	1987	(a)	<160
06605750	Willow Creek near Cornell, Ia.	Lat 42°58'21", long 95°09'40", in SE1/4 sec.12, T.94 N., R.37 W., Clay County, at bridge on U.S. Highway 71, 2 mi northwest of Cornell.	78.6	1966-	1987	(a)	<340
06605890	Waterman Creek at Hartley, Ia.	Lat 43°11'06", long 95°30'43", in NE1/4 sec.36, T.97 N., R.40 W., O'Brien County, at bridge on U.S. Highway 18, 1.8 mi west of Hartley.	28.7	1966-	09-18-87	89.68	(+)
06606790	Maple Creek near Alta, Ia.	Lat 42°44'56", long 95°22'16", in NE1/4 sec.31, T.92 N., R.38 W., Buena Vista County, at bridge on State Highway 3, 6 mi northwest of Alta.	15.5	1966-	1987	(a)	<32
Soldier River Basin							
06608450	Jordan Creek at Moorhead, Ia.	Lat 41°54'59", long 95°51'33", in NW1/4 sec.16, T.82 N., R.43 W., Monona County, at bridge on State Highway 183, at southwest corner of Moorhead.	30.1	1966-	1987	(a)	(+)
Boyer River Basin							
06609560	Willow Creek near Soldier, Ia.	Lat 41°55'17", long 95°42'05", near S1/4 corner sec.11, T.82 N., R.42 W., Monona County, at bridge on State Highway 37, 6 mi southeast of Soldier.	29.1	1966-	07-12-87	81.10	4,440
Mosquito Creek Basin							
06610510	Moser Creek near Earling, Ia.	Lat 41°46'35", long 95°26'55", in NE1/4 sec.1, T.80 N., R.40 W., Shelby County, at bridge on State Highway 37, 1.5 mi west of Earling.	21.6	1966-	05-26-87	79.95	(+)
06610600	Mosquito Creek at Neola, Ia.	Lat 41°26'36", long 95°36'42", in NE1/4 sec.25, T.77 N., R.42 W., Pottawattamie County, at bridge on county highway, 0.5 mi south of Neola. Prior to 04-19-63, gage located 0.9 miles upstream D.A. 128 mi ² .	131	1952-	05-26-87	22.00	6,400
Nishnabotna River Basin							
06807418	Graybill Creek near Carson, Ia.	Lat 41°13'57", long 95°22'51", in NW1/4 sec.7, T.74 N., R.39 W., Pottawattamie County, at bridge on State Highway 92, 2 mi east of Carson.	45.9	1966-	08-08-87	76.12	(+)
06807470	Indian Creek near Emerson, Ia.	Lat 41°01'50", long 95°22'51", in NW1/4 sec.19, T.72 N., R.39 W., Montgomery County, at bridge on U.S. Highway 34, 1 mi east of Emerson.	37.3	1966-	05-26-87	91.78	9,600
06807720	Middle Silver Creek near Avoca, Ia.	Lat 41°28'33", long 95°28'06", near N1/4 corner sec.17, T.77 N., R.40 W., Pottawattamie County, at bridge on State Highway 83, 7 mi west of Avoca.	3.21	1955-	1987	(a)	(+)

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

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Annual maximum discharge at crest-stage partial-record stations during water year 1987--Continued

Station no.	Station name	Location	Drainage area (mi ²)	Period of record	Annual maximum Date	Gage height (feet)	Dis-charge (ft ³ /s)
Nishnabotna River Basin--Continued							
06807760	Middle Silver Creek near Oakland, Ia.	Lat 41°19'28", long 95°33'19", near E1/4 corner sec. 4, T.75., R.41 W., Pottawattamie County, at bridge on county highway, 8.5 mi northwest of Oakland.	25.7	1953-	08-08-87	12.52	(+)
06807780	Middle Silver Creek at Treynor, Ia.	Lat 41°14'37", long 95°36'53", near NE corner sec. 1, T.74 N., R.42 W., Pottawattamie County, at bridge on county highway L55, 1 mi north of Treynor.	42.7	1953-	08-08-87	14.06	(+)
06808880	Bluegrass Creek at Audubon, Ia.	Lat 41°42'46", long 94°55'43", in NW1/4 sec.28, T.80 N., R.35 W., Audubon County, at bridge on U.S. Highway 71, near south edge of Audubon.	15.4	1966-	1987	(a)	(+)
Tarkio River Basin							
06811760	Tarkio River near Elliot, Ia.	Lat 41°06'06", long 95°06'09", near NE corner sec.28, T.73 N., R.37 W., Montgomery County, at bridge on county highway, 4.5 mi southeast of Elliot.	10.7	1952-	05-26-87	12.26	3,210
06811800	East Tarkio Creek near Stanton, Ia.	Lat 41°04'48", long 95°05'34", in W1/2 sec. 34, T.73 N., R.37 W., Montgomery County, at bridge on county highway H24, 7 mi north of Stanton.	4.66	1952-	05-26-87	12.94	3,600
06811820	Tarkio River tributary near Stanton, Ia.	Lat 41°02'38", long 95°05'55", near NE corner sec.16, T.72 N., R.37 W., Montgomery County, at box culvert on county highway H63, 4 mi north of Stanton.	0.67	1952-	05-26-87	-0.69	398
06811875	Snake Creek near Yorktown, Ia.	Lat 40°44'33", long 95°07'46", in NW1/4 sec.32, T.69 N., R.37 W., Page County, at bridge on State Highway 2, 1.5 mi northeast of Yorktown.	9.10	1966-	07-09-87	95.24	3,080
Nodaway River Basin							
06816290	West Nodaway River at Massena, Ia.	Lat 41°14'44", long 94°45'27", in E1/2 sec.33, T.75 N., R.34 W., Cass County, at bridge on State Highway 148, at southeast corner of Massena.	23.4	1966-	07-09-87	74.70	(+)
Platte River Basin							
06818598	Platte River near Stringtown, Ia.	Lat 40°58'44", long 94°29'39", in SE1/4 sec.2, T.71 N., R.32 W., Adams County, at bridge on U.S. Highway 34, 3.8 mi east of Stringtown.	51.7	1966-	08-26-87	91.93	2,770
06819110	Middle Branch 102 River near Gravity, Ia.	Lat 40°49'40", long 94°44'18", in SE1/4 sec.27, T.70 N., R.34 W., Taylor County, at bridge on State Highway 148, 4.8 mi north of Gravity.	33.5	1966-	07-12-87	78.91	(+)
Chariton River Basin							
06903980	Chariton River near Udell, Ia.	Lat 40°46'53", long 92°50'12", in NE1/4 sec.17, T.69 N., R.17 W., Appanoose County, at bridge on county highway, 5.0 mi west of Udell.	631	1972-	10-03-86	51.97	2,300-
06903990	Cooper Creek at Centerville, Ia.	Lat 40°45'02", long 92°51'36", in NW1/4 sec.30, T.69 N., R.17 W., Appanoose County, at bridge on State Highway 5, at north edge of Centerville.	47.8	1966-	1987	(a)	<370

+ Discharge not determined.

a Peak stage did not reach bottom of gage.

b Ice affected.

c Revised.

d Gage destroyed.

* Not determined.

Discharge measurements in the following table were made at special study and miscellaneous sites throughout the state.

Stream	Tributary	Location	Drainage area (mi ²)	Measurements	
				Date	Discharge (ft ³ /s)
Des Moines River Basin					
Middle Raccoon River	Raccoon River	NW1/4 sec.2, T.81 N., R.33 W., Guthrie County, at bridge on State Highway 141, at Coon Rapids.	224	07-23-79	2,140
				03-20-80	74.9
				06-29-81	1,500
				06-29-81	1,680
				06-29-81	1,870
				06-30-86	4,600
Boyer River Basin					
Boyer River (06609400)	Missouri River	Lat 42°00'08", long 95°23'07", in NE1/4 sec.16, T.83 N., R.39 W., Crawford County, at bridge on county road, 2.0 mi southwest of Denison.	517	10-06-82	361
				09-27-83	152
				11-02-83	200
				08-20-84	239
				11-14-84	167
				03-20-85	149
				04-30-85	506
				06-11-85	306
				07-23-85	111
				09-03-85	86.0
				10-16-85	97.8
				07-31-86	200
				09-05-86	125
				03-17-87	190
				09-08-87	275
Nishnabotna River Basin					
Unnamed Trib.	West Nishnabotna River	SE1/4 sec.6, T.72 N., R.40 W., Mills County, at bridge on county road M16, 2.5 mi north of Hastings.	1.13	05-26-87	483
East Nishnabotna River	Nishnabotna River	NE1/4 sec.36, T.71 N., R.39 W., Montgomery County, at bridge on county road H54, 1/2 mi west of Coburg.	e950	03-06-87	348
East Nishnabotna River	Nishnabotna River	SW1/4 sec.27, T.70 N., R.39 W., Page County, at bridge on county road, 1/2 mi west of Essex.	976	03-06-87	363
East Nishnabotna River	Nishnabotna River	SE1/4 sec.7, T.69 N., R.39 W., Page County, at bridge on county road, 1 1/2 mi north of Shenandoah.	e1,010	11-10-86	1,078
				03-06-87	372
East Nishnabotna River	Nishnabotna River	NW1/4 sec.24, T.69 N., R.40 W., Fremont County, at bridge on county road J32, 1 mi west of Shenandoah.	e1,030	11-10-86	1,100
				03-06-87	437
East Nishnabotna River	Nishnabotna River	SE1/4 sec.30, T.69 N., R.40 W., Fremont County, at bridge on county road M16, 1 1/2 mi north of Farragut.	e1,070	03-06-87	449
East Nishnabotna River	Nishnabotna River	SW1/4 sec.20, T.68 N., R.41 W., Fremont County, at bridge on county road J46, 1/4 mi west of Riverton.	e1,125	03-06-87	458
West Nishnabotna River	Nishnabotna River	NW1/4 sec.2, T.71 N., R.41 W., Mills County, at bridge on county road, 3 mi east of Malvern.	967	11-10-86	1,100
				03-06-87	372
West Nishnabotna River	Nishnabotna River	NW1/4 sec.15, T.71 N., R.41 W., Mills County, at bridge on county road L68, 2 mi south- east of Malvern.	e1,120	11-10-86	1,380
				03-06-87	358

Nishnabotna River Basin--Continued

West Nishnabotna River	Nishnabotna River	NW1/4 sec.32, T.70 N., R.41 W., Fremont County, at bridge on county road J22, 3 1/2 mi southwest of Randolph.	e1,350	11-10-86 03-06-87	1,370 551
West Nishnabotna River	Nishnabotna River	SW1/4 sec.5, T.69 N., R.41 W., Fremont County, at bridge on county road J26, 5 mi southwest of Randolph.	e1,520	11-10-86 03-06-87	1,470 539
West Nishnabotna River	Nishnabotna River	SW1/4 sec.29, T.69 N., R.41 W., Fremont County, at bridge on State Highway 2, 2 mi east of Sidney.	e1,590	11-10-86 03-06-87	1,570 621
West Nishnabotna River	Nishnabotna River	NW1/4 sec.30, T.68 N., R.41 W., Fremont County, at bridge on county road J46, 2 mi west of Riverton.	e1,635	03/06/87	718

e approximately

MISCELLANEOUS WATER-QUALITY DATA

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)
05388250 UPPER IOWA R NR DORCHESTER IA (LAT 43 25 16N LONG 091 30 31W)									
OCT 1986					APR 1987				
31...	1145	886	10.0	572	09...	1515	577	14.5	500
DEC					JUN				
11...	0915	--	0.0	545	03...	1415	362	21.5	495
FEB 1987					JUL				
22...	1655	156	1.0	620	10...	1023	325	25.0	490
MAR					AUG				
10...	1245	815	4.0	515	21...	0925	295	22.0	480
05389500 MISSISSIPPI RIVER AT MCGREGOR, IOWA (LAT 43 01 29N LONG 091 10 21W)									
APR 1987					AUG 1987				
15...	1530	34800	13.0	380	20...	1405	26100	26.0	360
MAY									
28...	1630	33400	22.5	400					
05411600 TURKEY RIVER AT SPILLVILLE, IOWA (LAT 43 12 28N LONG 091 56 56W)									
OCT 1986					APR 1987				
31...	1620	197	11.0	540	10...	0820	126	11.0	500
DEC					JUN				
11...	1630	--	0.5	620	04...	0910	78	16.0	515
JAN 1987					JUL				
23...	0920	--	0.0	625	10...	1340	38	30.0	515
FEB					10...	1342	38	30.0	515
18...	1315	70	0.0	500	AUG				
MAR					21...	1250	60	25.0	455
10...	0954	186	1.0	435					
10...	0955	186	1.0	435					
05412060 SILVER CREEK AT LUANA (LAT 43 01 19N LONG 091 29 21W)									
OCT 1986					APR 1987				
30...	1625	1.1	12.0	700	16...	1310	1.7	18.0	715
DEC					MAY				
10...	1200	0.75	1.0	800	29...	1012	1.6	18.0	725
JAN 1987					JUL				
22...	1000	0.78	0.0	750	08...	1445	0.68	27.0	745
MAR					AUG				
11...	1130	2.2	5.0	720	19...	1530	2.9	21.0	720
05412070 UNNAMED TRIBUTARY AT LUANA (LAT 43 02 24N LONG 091 28 07W)									
FEB 1987					MAY 1987				
11...	1000	0.40	5.0	700	29...	0905	0.06	17.0	755
MAR					JUL				
02...	1155	0.44	6.0	645	08...	1320	0.01	28.0	755
APR					AUG				
16...	1148	0.18	16.0	685	19...	1640	0.31	21.0	760
05412100 ROBERTS C AB ST. OLAF, IOWA (LAT 42 55 49N LONG 091 23 03W)									
OCT 1986					MAY 1987				
30...	1430	13	12.0	610	19...	1110	19	19.0	575
DEC					27...	0930	13	21.0	660
10...	0920	--	0.0	650	JUL				
MAR 1987					08...	1205	4.0	28.0	570
11...	1400	21	5.0	665	AUG				
APR					19...	1313	43	22.0	690
16...	1010	22	14.0	685					

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)
05412500 TURKEY RIVER AT GARBER, IOWA (LAT 42 44 24N LONG 091 15 42W)									
OCT 1986					MAY 1987				
30...	1155	1270	11.0	568	26...	1550	958	17.0	615
JAN 1987					26...	1552	958	17.0	615
21...	1255	--	0.5	655	JUL				
FEB					08...	0935	395	23.0	495
18...	0800	603	0.0	500	08...	0937	395	23.0	495
MAR					AUG				
11...	1705	1280	5.0	455	19...	1055	910	20.0	530
APR									
14...	1555	1090	11.0	555					
05418450 NF MAQUOKETA R AT FULTON IA (LAT 42 08 42N LONG 090 40 55W)									
OCT 1986					JUN 1987				
28...	1600	869	13.0	570	01...	1555	427	25.0	535
FEB 1987					JUL				
21...	0930	--	0.0	690	07...	1217	257	24.0	605
MAR					AUG				
20...	1000	285	7.0	610	18...	1324	223	24.0	580
APR									
18...	1025	347	11.0	625					
05418500 MAQUOKETA RIVER NEAR MAQUOKETA, IOWA (LAT 42 05 05N LONG 090 38 04W)									
OCT 1986					JUN 1987				
28...	1140	3150	12.0	527	02...	1215	1770	22.0	415
DEC					JUL				
09...	1155	1450	3.0	540	07...	0925	607	23.0	530
MAR 1987					AUG				
20...	1315	962	8.0	600	18...	1035	607	22.0	445
APR									
07...	1600	1080	14.0	575					
05420500 MISSISSIPPI RIVER AT CLINTON, IOWA (LAT 41 46 53N LONG 090 15 04W)									
NOV 1986					MAY 1987				
18...	1200	58000	2.5	408	26...	0930	40600	18.0	410
MAR 1987					AUG				
12...	1100	48300	5.0	348	25...	1130	35000	22.5	342
05420560 WAPSIPINICON RIVER NEAR ELMA, IOWA (LAT 43 14 34N LONG 092 31 48W)									
OCT 1986					JUN 1987				
28...	1135	69	11.5	590	29...	1450	10	23.0	610
FEB 1987					AUG				
05...	0900	16	1.0	440	19...	1040	8.5	22.0	380
APR					SEP				
07...	1305	68	12.0	490	22...	1020	13	15.0	400
MAY									
19...	1055	22	23.0	550					
05421000 WAPSIPINICON R AT INDEPENDENCE, IOWA (LAT 42 27 49N LONG 091 53 42W)									
NOV 1986					APR 1987				
03...	1120	768	9.0	409	17...	1330	904	12.0	490
DEC					JUN				
12...	1305	381	0.5	595	04...	1320	370	23.0	480
FEB 1987					JUL				
23...	1325	146	0.0	530	14...	1200	182	25.0	365
MAR					AUG				
09...	1245	1730	6.0	440	24...	1145	1160	19.0	425

MISCELLANEOUS WATER-QUALITY DATA

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)
05422000 WAPSIPINICON RIVER NEAR DE WITT, IOWA (LAT 41 46 01N LONG 090 32 05W)									
OCT 1986					APR 1987				
27...	1715	4450	13.0	470	13...	1600	1760	12.0	455
DEC					JUN				
08...	1405	2140	3.0	395	01...	1220	1500	25.0	435
FEB 1987					JUL				
20...	1510	807	0.0	580	06...	1335	505	28.0	305
MAR					AUG				
20...	1645	1690	9.0	505	17...	1445	416	30.0	320
05422470 CROW C AT BETTENDORF IA (LAT 41 33 03N LONG 090 27 15W)									
OCT 1986					MAY 1987				
27...	1015	45	12.0	640	21...	1045	63	19.0	450
DEC					JUL				
08...	1015	30	4.0	575	06...	0955	1.8	24.0	620
FEB 1987					AUG				
17...	1000	7.4	0.5	755	17...	1040	7.1	25.0	520
MAR					26...	1130	346	16.0	215
19...	1030	7.5	7.0	715					
APR									
13...	1115	11	10.0	695					
05449000 EAST BRANCH IOWA RIVER NEAR KLEMME, IOWA (LAT 43 00 31N LONG 093 37 42W)									
OCT 1986					APR 1987				
27...	1040	110	11.5	790	06...	1310	115	10.5	740
JAN 1987					MAY				
12...	1017	--	0.0	665	18...	1130	31	22.0	750
FEB					JUN				
09...	1145	28	0.0	750	24...	1345	12	23.0	560
23...	1125	18	3.0	620					
05449500 IOWA RIVER NEAR ROWAN, IOWA (LAT 42 45 36N LONG 093 37 23W)									
OCT 1986					MAY 1987				
16...	1025	1440	14.0	650	18...	0940	109	22.0	600
JAN 1987					JUN				
12...	0835	--	0.0	440	24...	1025	51	22.0	550
FEB					SEP				
09...	1020	69	0.0	660	23...	1325	41	15.0	570
23...	0945	84	3.0	720					
APR									
06...	1030	346	9.0	560					
05451500 IOWA RIVER AT MARSHALLTOWN, IOWA (LAT 42 03 57N LONG 092 54 27W)									
NOV 1986					JUL 1987				
24...	1410	857	1.5	568	23...	1025	528	26.0	620
JAN 1987									
08...	1225	569	1.5	575					
05451700 TIMBER CREEK NEAR MARSHALLTOWN, IOWA (LAT 42 00 25N LONG 092 51 15W)									
OCT 1986					APR 1987				
17...	1415	214	12.5	552	21...	1120	148	13.0	540
NOV					JUN				
25...	0815	84	2.0	565	09...	1030	59	25.0	560
JAN 1987									
08...	0945	55	1.5	573					

MISCELLANEOUS WATER-QUALITY DATA

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DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)
05451900 RICHLAND CREEK NEAR HAVEN, IOWA (LAT 41 53 58N LONG 092 28 27W)									
OCT 1986					MAY 1987				
21...	1645	64	16.0	513	11...	1515	37	22.0	580
NOV					JUN				
25...	1045	43	3.5	592	15...	1230	22	25.0	535
JAN 1987					AUG				
08...	1345	26	3.0	495	03...	1500	6.1	27.0	464
FEB					SEP				
17...	1130	14	0.5	506	10...	1400	14	17.0	538
05452000 SALT CREEK NR ELBERON, IOWA (LAT 41 57 51N LONG 092 18 47W)									
OCT 1986					MAY 1987				
21...	1000	154	15.0	580	11...	1345	120	20.0	680
NOV					JUN				
24...	1200	137	1.5	578	15...	0945	69	25.0	608
JAN 1987					AUG				
08...	1515	101	2.5	571	03...	1245	25	27.0	562
FEB					SEP				
17...	1000	53	0.5	587	10...	1145	97	18.0	635
05452200 WALNUT CREEK NEAR HARTWICK, IOWA (LAT 41 50 06N LONG 092 23 10W)									
OCT 1986					MAY 1987				
20...	1450	90	16.0	474	12...	1045	36	16.0	526
NOV					JUN				
25...	1215	63	5.0	480	15...	1500	24	31.0	535
JAN 1987					AUG				
09...	1400	39	0.0	649	04...	0930	6.1	23.0	478
FEB					SEP				
17...	1300	13	0.5	490	11...	0945	15	18.0	532
05453000 BIG BEAR CREEK AT LADORA, IOWA (LAT 41 44 58N LONG 092 10 55W)									
OCT 1986					MAY 1987				
20...	1215	230	14.0	492	12...	1330	90	20.0	562
NOV					JUN				
25...	1345	165	5.0	478	16...	1230	49	27.0	615
JAN 1987					AUG				
09...	1215	64	0.5	494	04...	1115	16	24.0	566
FEB					SEP				
17...	1430	45	1.5	541	11...	1200	45	18.0	625
APR									
01...	1150	309	6.0	480					
05453100 IOWA RIVER NEAR MARENGO, IOWA (LAT 41 48 41N LONG 092 03 42W)									
OCT 1986					MAY 1987				
20...	1100	6110	13.0	607	13...	1300	1530	20.0	548
NOV					JUN				
24...	0945	2080	2.0	595	16...	1400	1400	26.0	630
FEB 1987					AUG				
20...	1015	938	1.5	622	04...	1330	378	28.0	486
APR					SEP				
01...	0935	3250	5.0	575	11...	1430	1480	18.0	670

MISCELLANEOUS WATER-QUALITY DATA

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)
05454000 RAPID CREEK NEAR IOWA CITY, IOWA (LAT 41 41 19N LONG 091 29 15W)									
OCT 1986					MAY 1987				
03...	1315	43	19.0	490	06...	1100	13	14.0	550
NOV					JUN				
05...	1345	23	10.0	580	04...	1100	8.5	16.0	600
DEC					JUL				
30...	1200	9.7	3.0	570	01...	1400	9.9	24.0	530
FEB 1987					AUG				
03...	1240	8.0	1.0	660	04...	1220	--	27.0	490
MAR					SEP				
04...	1445	12	7.0	0	03...	1100	3.1	16.0	490
APR					29...	1400	3.6	17.0	580
01...	1015	42	6.0	540					
05454300 CLEAR CREEK NR CORALVILLE, IOWA (LAT 41 40 36N LONG 091 35 55W)									
OCT 1986					JUN 1987				
07...	1130	119	14.0	555	10...	1530	23	19.0	605
NOV					JUL				
05...	1315	99	10.0	532	01...	1510	22	28.0	590
DEC					AUG				
04...	1025	99	2.0	440	03...	1155	4.3	28.0	645
11...	1355	94	0.0	564	31...	1350	30	21.0	310
15...	1635	104	0.0	533					
29...	1511	53	3.0	490					
05454500 IOWA RIVER AT IOWA CITY, IOWA (LAT 41 39 24N LONG 091 32 27W)									
NOV 1986					APR 1987				
06...	1500	4630	11.0	572	07...	1215	3280	10.0	550
DEC					28...	1525	2880	14.0	500
04...	1415	5030	2.0	500	JUN				
30...	1145	1720	2.5	580	11...	1400	1190	24.0	595
FEB 1987					JUL				
04...	1430	1170	2.0	700	01...	1145	879	27.0	545
MAR					AUG				
02...	1245	1140	2.5	500	04...	1115	486	30.0	500
					SEP				
					01...	1152	4560	20.0	360
05455000 RALSTON CREEK AT IOWA CITY, IOWA (LAT 41 39 50N LONG 091 30 48W)									
OCT 1986					MAY 1987				
01...	1430	14	16.0	405	05...	1450	1.0	17.0	670
NOV					JUN				
07...	1410	1.8	12.0	670	03...	1000	1.0	16.0	720
DEC					JUL				
04...	1130	2.0	3.5	660	02...	1100	0.42	22.0	0
30...	1530	2.4	3.0	660	SEP				
FEB 1987					01...	1110	0.30	16.0	0
02...	1400	0.97	2.0	640	29...	1055	0.22	15.0	660
MAR									
04...	1035	1.4	4.5	670					
31...	1000	3.8	3.0	620					

MISCELLANEOUS WATER-QUALITY DATA

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DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)
05455010 SOUTH BRANCH RALSTON CREEK AT IOWA CITY, IOWA (LAT 41 39 05N LONG 091 30 27W)									
OCT 1986					MAR 1987				
08...	1247	2.2	16.0	700	02...	0910	1.7	1.0	595
NOV					APR				
05...	1520	1.9	11.0	650	06...	1400	2.1	20.0	280
DEC					JUN				
03...	1100	2.3	4.0	560	10...	0943	0.21	17.0	645
29...	0935	1.0	3.0	660					
FEB 1987									
03...	0930	0.70	1.0	720					
05455100 OLD MANS CR NR IOWA CITY, IOWA (LAT 41 36 25N LONG 091 36 40W)									
OCT 1986					MAR 1987				
07...	1500	243	15.0	510	06...	1035	111	7.0	490
NOV					APR				
05...	1025	197	9.0	490	06...	1110	163	19.0	390
DEC					28...	0940	117	12.0	450
03...	1510	214	4.0	470	JUN				
29...	1150	90	3.0	495	10...	1300	69	18.0	475
FEB 1987					JUL				
04...	1220	60	2.0	500	02...	1125	61	23.0	515
05455500 ENGLISH RIVER AT KALONA, IOWA (LAT 41 27 59N LONG 091 42 56W)									
DEC 1986					JUN 1987				
15...	1415	430	0.5	456	11...	1435	168	22.0	490
FEB 1987					JUL				
02...	1430	153	1.0	430	23...	0900	71	27.0	455
MAR					SEP				
19...	1020	529	6.0	600	03...	1245	141	19.0	413
APR									
27...	1515	327	18.0	451					
05455700 IOWA RIVER NEAR LONE TREE, IOWA (LAT 41 25 15N LONG 091 28 25W)									
NOV 1986					APR 1987				
10...	1525	5290	7.5	528	30...	1150	3600	16.0	556
DEC					JUL				
15...	1000	2180	0.5	567	24...	0920	846	28.0	458
FEB 1987					SEP				
12...	0915	2170	3.0	580	04...	1025	5090	22.0	374
MAR									
19...	1300	4190	6.5	500					
05457700 CEDAR RIVER AT CHARLES CITY, IOWA (LAT 43 03 45N LONG 092 40 23W)									
OCT 1986					MAY 1987				
28...	0730	948	11.0	520	18...	1820	246	23.0	580
JAN 1987					JUN				
13...	0800	367	1.0	610	29...	1815	220	23.0	550
FEB					SEP				
23...	1615	288	3.0	590	22...	0850	250	15.0	550
APR									
07...	1855	0.0	11.0	500					

MISCELLANEOUS WATER-QUALITY DATA

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05458500 CEDAR RIVER AT JANESVILLE, IOWA (LAT 42 38 54N LONG 092 27 54W)									
JAN 1987					JUN 1987				
14...	1400	672	0.0	600	30...	1430	358	23.0	610
FEB					AUG				
04...	1330	495	1.5	610	11...	1815	362	27.0	480
24...	1520	578	4.0	720	SEP				
APR					24...	1125	394	17.0	540
08...	1425	926	12.0	610					
MAY									
21...	0810	545	22.5	460					
05458900 WEST FORK CEDAR RIVER AT FINCHFORD, IOWA (LAT 42 37 50N LONG 092 32 24W)									
OCT 1986					MAY 1987				
29...	1025	701	11.0	600	20...	1740	299	26.0	520
JAN 1987					JUN				
14...	1220	308	0.0	460	30...	1300	168	23.0	580
FEB					AUG				
24...	1405	267	5.0	610	11...	1600	159	27.5	520
APR					SEP				
08...	1140	545	13.0	640	23...	1130	245	17.0	650
05459500 WINNEBAGO RIVER AT MASON CITY, IOWA (LAT 43 09 54N LONG 093 11 33W)									
OCT 1986					MAY 1987				
27...	1415	413	12.0	640	18...	1520	90	21.0	560
JAN 1987					JUN				
12...	1233	0.0	0.0	460	29...	1215	35	23.0	560
FEB					SEP				
23...	1400	109	3.0	740	21...	1510	45	17.0	760
APR									
06...	1900	0.0	10.0	550					
05462000 SHELL ROCK RIVER AT SHELL ROCK, IOWA (LAT 42 39 10N LONG 092 35 46W)									
OCT 1986					MAY 1987				
28...	1620	1470	11.5	570	21...	1025	487	23.0	520
JAN 1987					JUN				
14...	1030	578	1.0	600	30...	1120	357	21.5	540
FEB					AUG				
24...	1225	460	5.0	680	11...	1340	325	27.5	580
APR									
08...	0905	867	13.0	620					
05463000 BEAVER CREEK AT NEW HARTFORD, IOWA (LAT 42 30 50N LONG 092 37 55W)									
OCT 1986					JUN 1987				
29...	1230	292	11.5	560	25...	1220	76	22.0	590
JAN 1987					AUG				
13...	1240	141	1.0	450	11...	1100	428	24.0	760
FEB					SEP				
25...	1000	154	3.0	600	23...	1000	55	15.5	640
APR									
09...	1205	252	13.0	670					

MISCELLANEOUS WATER-QUALITY DATA

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DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)
05463500 BLACK HAWK CREEK AT HUDSON, IOWA (LAT 42 24 28N LONG 092 27 47W)									
OCT 1986					MAY 1987				
29...	1430	178	11.0	610	20...	1340	143	20.0	690
JAN 1987					JUL				
13...	1420	116	1.0	460	01...	0845	58	23.0	580
FEB					AUG				
04...	0830	162	1.0	450	12...	0920	67	26.0	590
25...	0825	116	4.0	590	SEP				
APR					23...	0755	176	13.0	600
09...	0920	263	9.0	540					
05464000 CEDAR RIVER AT WATERLOO, IOWA (LAT 42 29 44N LONG 092 20 03W)									
OCT 1986					MAY 1987				
29...	0900	4950	11.0	520	08...	0930	2490	17.0	483
DEC					JUL				
17...	1030	2690	0.0	630	09...	1130	1370	25.0	372
FEB 1987					AUG				
24...	1215	1950	2.0	550	31...	1130	1190	20.0	500
05464500 CEDAR RIVER AT CEDAR RAPIDS, IOWA (LAT 41 58 14N LONG 091 40 01W)									
NOV 1986					MAY 1987				
25...	1220	2830	0.5	632	27...	1400	3880	21.0	455
26...	1100	4460	3.0	655	JUN				
DEC					25...	1010	2280	28.0	375
22...	1300	2900	1.5	608	JUL				
FEB 1987					28...	1300	944	29.0	410
23...	1300	2560	5.0	559	AUG				
MAR					28...	1050	7320	18.0	435
25...	1130	4700	10.0	543					
05465000 CEDAR RIVER NEAR CONESVILLE, IOWA (LAT 41 24 36N LONG 091 17 06W)									
NOV 1986					APR 1987				
13...	1020	5500	0.0	585	30...	1545	5480	20.0	421
DEC					JUN				
15...	1110	--	0.5	653	12...	1430	2710	29.0	395
FEB 1987					JUL				
11...	1450	4450	3.0	545	24...	1155	2240	27.0	357
MAR					SEP				
23...	1225	5980	11.0	530	04...	1245	3930	22.0	418
05465500 IOWA RIVER AT WAPELLO, IOWA (LAT 41 10 48N LONG 091 10 57W)									
OCT 1986					MAY 1987				
07...	1415	12500	16.0	495	05...	1100	7660	16.0	498
29...	1030	19300	13.0	512	JUL				
DEC					10...	1015	3070	28.0	430
15...	1315	5400	1.0	592	AUG				
MAR 1987					24...	1130	5600	22.0	410
10...	1030	8530	6.0	501					
05470000 SOUTH SKUNK RIVER NEAR AMES, IOWA (LAT 42 04 05N LONG 093 37 02W)									
NOV 1986					AUG 1987				
25...	1010	187	3.0	730	06...	1050	50	24.0	690
MAY 1987					SEP				
01...	1200	198	17.5	750	17...	1245	255	20.0	760
JUN									
09...	1615	134	26.0	690					

MISCELLANEOUS WATER-QUALITY DATA

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)
05470500 SQUAW CREEK AT AMES, IOWA (LAT 42 01 21N LONG 093 37 45W)									
OCT 1986					MAY 1987				
02...	1300	243	17.0	700	01...	1030	140	16.5	620
NOV					AUG				
25...	1220	138	4.5	760	04...	1340	22	27.0	650
MAR 1987					SEP				
20...	0810	262	9.0	540	17...	1145	135	20.0	570
05471050 S SKUNK R AT COLFAX, IOWA (LAT 41 40 55N LONG 093 14 47W)									
OCT 1986					MAY 1987				
17...	0910	1930	12.0	640	15...	1030	428	20.0	450
NOV					JUN				
15...	1010	647	1.0	525	25...	1025	262	27.0	600
JAN 1987					AUG				
09...	0910	329	1.0	610	05...	1430	175	28.0	650
FEB					SEP				
20...	0910	240	1.5	600	17...	1120	826	19.0	410
APR									
01...	1430	845	2.0	530					
05471200 INDIAN CREEK NEAR MINGO, IOWA (LAT 41 48 17N LONG 093 18 26W)									
OCT 1986					MAY 1987				
17...	1105	654	12.0	680	15...	0840	111	20.0	250
NOV					JUN				
15...	1140	228	1.0	700	24...	1430	81	28.0	650
JAN 1987					AUG				
09...	1045	95	1.0	650	05...	1225	35	26.0	300
FEB									
20...	1105	69	1.0	700					
05471500 SOUTH SKUNK RIVER NEAR OSKALOOSA, IOWA (LAT 41 21 19N LONG 092 39 31W)									
OCT 1986					MAR 1987				
14...	1155	7220	10.0	470	30...	1205	1780	3.0	600
NOV					MAY				
19...	1010	1190	3.5	560	11...	1325	1140	18.0	460
JAN 1987					JUN				
06...	0955	734	3.0	440	22...	1010	594	23.0	400
FEB					AUG				
17...	1020	421	0.5	550	06...	1205	307	28.0	550
05472500 NORTH SKUNK RIVER NEAR SIGOURNEY, IOWA (LAT 41 18 03N LONG 092 12 16W)									
NOV 1986					MAR 1987				
10...	1115	560	6.5	298	16...	1010	381	2.5	590
DEC					APR				
18...	1245	557	0.0	272	27...	1100	351	17.0	487
FEB 1987					JUN				
09...	1015	184	0.0	325	11...	1035	227	22.0	510
05473400 CEDAR CR NR OAKLAND MILLS, IOWA (LAT 40 55 00N LONG 091 40 00W)									
NOV 1986					APR 1987				
05...	1110	240	8.5	494	29...	1230	130	19.0	513
FEB 1987					JUN				
11...	1300	81	2.0	535	10...	1330	89	21.0	250
MAR					SEP				
18...	1245	152	6.0	530	02...	1425	20	20.0	410

MISCELLANEOUS WATER-QUALITY DATA

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DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)
05474000 SKUNK RIVER AT AUGUSTA, IOWA (LAT 40 45 13N LONG 091 16 40W)									
OCT 1986					MAY 1987				
07...	1735	10200	17.0	480	04...	1130	2310	16.0	597
28...	1030	16300	12.0	316	JUL				
DEC					08...	1030	666	27.0	440
04...	0815	2780	1.5	598	AUG				
15...	1000	4500	0.0	605	28...	1130	6760	18.0	515
FEB 1987									
25...	1115	893	4.0	580					
05476500 DES MOINES RIVER AT ESTHERVILLE, IOWA (LAT 43 23 51N LONG 094 50 38W)									
OCT 1986					JUN 1987				
14...	1345	1860	8.5	800	23...	1035	227	28.0	830
FEB 1987					AUG				
05...	1340	130	1.5	1080	03...	1245	310	27.0	950
MAR					SEP				
31...	1200	1860	1.0	830	16...	1430	130	19.0	740
MAY									
12...	1015	376	18.5	760					
05476750 DES MOINES RIVER AT HUMBOLDT, IOWA (LAT 42 43 12N LONG 094 13 06W)									
JAN 1987					JUN 1987				
02...	0945	583	0.0	650	29...	1205	406	26.5	790
MAR					SEP				
05...	1050	377	7.5	800	22...	1300	340	17.0	750
05479000 EAST FORK DES MOINES RIVER AT DAKOTA CITY, IOWA (LAT 42 43 26N LONG 094 11 30)									
OCT 1986					MAY 1987				
22...	0930	1300	13.0	780	11...	1030	486	19.5	725
NOV					JUN				
28...	1030	579	2.0	840	29...	0930	137	28.0	760
MAR 1987					SEP				
05...	1310	163	7.5	720	22...	1045	156	13.5	725
30...	1500	664	0.0	830					

MISCELLANEOUS WATER-QUALITY DATA

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)
05481000 BOONE RIVER NEAR WEBSTER CITY, IOWA (LAT 42 26 01N LONG 093 48 12W)									
OCT 1986					APR 1987				
02...	1030	1370	19.0	790	24...	1145	807	14.0	580
NOV					JUN				
21...	1205	312	0.0	600	05...	1140	323	23.0	740
FEB 1987					AUG				
10...	0950	154	1.0	710	06...	1315	47	29.0	580
MAR					SEP				
20...	1045	592	9.0	760	02...	1500	102	25.0	750
05481300 DES MOINES RIVER NR STRATFORD, IOWA (LAT 42 15 04N LONG 093 59 52W)									
APR 1987					JUL 1987				
23...	1005	5370	12.0	780	20...	1045	4830	30.0	875
JUN									
16...	1040	1290	26.0	825					
05481650 DES MOINES RIVER NEAR SAYLORVILLE, IOWA (LAT 41 40 50N LONG 093 40 07W)									
NOV 1986					APR 1987				
24...	1250	6900	5.0	675	28...	0830	4600	16.0	650
FEB 1987					JUL				
02...	1540	998	7.0	800	22...	1225	3940	26.0	700
MAR									
25...	1015	2700	9.0	770					
05481950 BEAVER CREEK NEAR GRIMES, IOWA (LAT 41 41 18N LONG 093 44 08W)									
OCT 1986					JUN 1987				
07...	1245	516	19.0	795	08...	1825	204	25.5	750
NOV					JUL				
24...	1050	289	3.0	725	22...	1030	122	23.0	610
MAR 1987					SEP				
19...	0900	176	9.0	620	16...	1225	396	21.0	850
APR									
28...	1235	247	16.0	790					
05482170 BIG CEDAR CREEK NEAR VARINA, IOWA (LAT 42 41 16N LONG 094 47 52W)									
OCT 1986					JUN 1987				
14...	1015	272	7.0	680	22...	1000	24	28.5	720
NOV					AUG				
24...	1025	41	4.0	720	05...	0950	8.5	20.5	810
FEB 1987					SEP				
06...	1310	13	2.0	830	16...	1100	135	18.0	840
MAY									
11...	1430	38	22.0	725					
05482300 N RACCOON R NR SAC CITY IOWA (LAT 42 20 28N LONG 094 59 05W)									
OCT 1986					JUN 1987				
15...	1615	1990	8.0	690	23...	1800	228	28.0	760
NOV					AUG				
25...	1500	505	5.0	710	07...	1445	185	24.0	740
FEB 1987									
11...	1430	165	5.0	700					

MISCELLANEOUS WATER-QUALITY DATA

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DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)
05482500 NORTH RACCOON RIVER NEAR JEFFERSON, IOWA (LAT 41 59 17N LONG 094 22 36W)									
OCT 1986					MAY 1987				
16...	1245	5520	10.0	690	14...	0915	806	20.5	760
NOV					JUL				
26...	1200	1320	5.0	760	24...	1025	618	28.5	750
FEB 1987					AUG				
10...	1415	349	3.5	660	07...	1200	388	22.5	740
APR					SEP				
02...	1345	1880	0.0	740	21...	1100	1980	19.0	780
05483000 EAST FORK HARDIN CREEK NR. CHURDAN, IOWA (LAT 42 06 27N LONG 094 22 12W)									
JAN 1987					JUN 1987				
06...	1410	7.0	0.0	880	24...	1510	4.0	27.0	700
MAR					AUG				
06...	0915	15	6.0	730	07...	0900	1.0	22.0	800
APR					SEP				
02...	1545	22	0.0	700	21...	1425	26	14.5	780
15...	1100	95	7.5	750					
MAY									
14...	1145	9.6	20.0	640					
05483450 M RACCOON R NR BAYARD, IOWA (LAT 41 47 00N LONG 094 30 00W)									
FEB 1987					JUN 1987				
02...	0935	151	3.0	630	08...	1050	208	24.0	650
MAR					JUL				
18...	1005	167	5.0	600	22...	1410	152	27.5	750
APR					SEP				
27...	1115	312	17.0	560	10...	1020	225	19.0	700
05483600 MIDDLE RACCOON RIVER AT PANORA, IOWA (LAT 41 41 14N LONG 094 22 15W)									
DEC 1986					AUG 1987				
22...	1115	214	3.0	690	04...	1035	65	26.0	460
APR 1987									
27...	1420	352	18.0	660					
05484000 SOUTH RACCOON RIVER AT REDFIELD, IOWA (LAT 41 34 48N LONG 094 10 58W)									
NOV 1986					JUL 1987				
17...	1105	467	2.0	470	22...	1120	327	27.5	390
DEC					SEP				
22...	1325	477	3.5	600	10...	1355	560	19.0	570
MAR 1987									
18...	1410	447	5.0	540					
05484500 RACCOON RIVER AT VAN METER, IOWA (LAT 41 32 02N LONG 093 56 59W)									
OCT 1986					MAY 1987				
06...	1515	5450	17.0	520	07...	1000	2680	18.0	688
DEC					JUL				
16...	1030	1820	1.0	776	07...	1200	790	25.0	483
FEB 1987					AUG				
26...	1100	809	5.0	665	27...	1100	790	17.0	495
APR									
08...	1200	4530	0.0	610					

MISCELLANEOUS WATER-QUALITY DATA

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)
05484800 WALNUT CREEK AT DES MOINES, IOWA (LAT 41 35 14N LONG 093 42 11W)									
OCT 1986					MAY 1987				
16...	0840	119	9.5	700	14...	0800	54	20.0	450
NOV					AUG				
16...	1010	54	2.0	890	04...	1555	12	26.0	310
JAN 1987					SEP				
08...	0905	23	1.0	660	16...	0850	104	19.0	300
FEB									
19...	0930	8.3	0.5	730					
05485500 DES MOINES R. BL RACCOON R. AT DES MOINES, IOWA (LAT 41 34 30N LONG 093 35 48)									
APR 1987					AUG 1987				
20...	1315	19000	19.0	600	05...	0910	1950	27.0	500
MAY									
14...	1010	4630	20.0	520					
05485640 FOURMILE CREEK AT DES MOINES, IOWA (LAT 41 36 50N LONG 093 32 43W)									
OCT 1986					MAY 1987				
16...	1230	18	13.0	730	14...	1130	85	21.0	310
NOV					JUN				
16...	0815	73	2.0	700	24...	1215	26	28.0	850
JAN 1987					AUG				
08...	1110	33	2.0	750	05...	1005	9.0	25.0	310
FEB					SEP				
19...	1020	27	0.5	820	16...	1230	120	20.0	290
APR									
01...	1200	133	5.0	500					
05486000 NORTH RIVER NEAR NORWALK, IOWA (LAT 41 27 25N LONG 093 39 10W)									
OCT 1986					JUN 1987				
16...	1040	434	9.5	430	23...	1520	164	28.0	500
NOV					AUG				
20...	1530	227	1.0	420	04...	1410	27	26.0	530
JAN 1987					SEP				
07...	1410	95	2.0	420	15...	1520	111	20.0	330
FEB									
18...	1210	35	0.5	500					
05486490 MIDDLE RIVER NEAR INDIANOLA, IOWA (LAT 41 25 27N LONG 093 35 09W)									
OCT 1986					MAR 1987				
15...	1550	676	9.5	420	31...	1550	674	2.0	510
NOV					AUG				
20...	1335	284	2.0	490	04...	1240	69	25.0	450
JAN 1987					SEP				
07...	1200	126	2.0	450	15...	1340	336	20.0	490
FEB									
18...	1045	49	0.5	510					
05487470 SOUTH RIVER NEAR ACKWORTH, IOWA (LAT 41 20 14N LONG 093 29 10W)									
OCT 1986					MAY 1987				
15...	1235	297	7.0	400	13...	1130	127	20.0	350
NOV					JUN				
20...	1140	203	1.0	420	23...	1130	334	28.0	290
JAN 1987					AUG				
12...	1245	117	0.5	490	04...	1200	31	25.0	480
FEB					SEP				
18...	0955	--	0.0	510	15...	1100	713	20.0	570
MAR									
31...	1305	862	2.5	420					

MISCELLANEOUS WATER-QUALITY DATA

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DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)
05487500 DES MOINES RIVER NR RUNNELLS, IOWA (LAT 41 29 19N LONG 093 20 17W)									
APR 1987					AUG 1987				
02...	1100	10700	3.0	450	06...	0945	1710	28.0	590
23...	1145	13700	16.0	630					
05487980 WHITE BREAST CREEK NEAR DALLAS, IOWA (LAT 41 14 41N LONG 093 16 08W)									
OCT 1986					MAY 1987				
15...	1040	316	7.5	410	13...	0845	65	20.0	480
NOV					JUN				
20...	0925	111	1.5	470	23...	0915	528	27.0	550
JAN 1987					AUG				
07...	0830	65	1.0	480	04...	0900	15	25.0	490
FEB					SEP				
18...	0840	13	0.5	520	15...	0840	621	19.0	510
MAR									
31...	1030	487	2.0	510					
05488200 ENGLISH CR NR KNOXVILLE, IOWA (LAT 41 16 00N LONG 093 05 00W)									
OCT 1986					MAY 1987				
14...	1740	79	9.5	400	12...	1415	13	20.0	410
NOV					JUN				
19...	1815	24	2.0	490	22...	1540	4.7	27.0	500
JAN 1987					AUG				
06...	1535	20	1.0	525	03...	1455	0.09	29.0	460
FEB					SEP				
17...	1605	17	0.5	520	14...	1500	2.1	20.0	250
MAR									
31...	0855	116	2.0	490					
05488500 DES MOINES RIVER NEAR TRACY, IOWA (LAT 41 16 53N LONG 092 51 34W)									
OCT 1986					MAR 1987				
14...	1315	5650	14.0	540	30...	1500	12500	2.0	550
NOV					JUN				
19...	1245	19200	3.5	600	22...	1100	3260	28.0	350
FEB 1987					AUG				
17...	1120	2440	3.0	630	03...	1220	2670	28.0	530
05489000 CEDAR CREEK NEAR BUSSEY, IOWA (LAT 41 13 09N LONG 092 54 38W)									
OCT 1986					MAY 1987				
14...	1545	362	10.0	360	12...	1250	59	20.0	300
NOV					JUN				
19...	1425	109	2.5	530	22...	1410	46	28.0	510
JAN 1987					AUG				
06...	1410	82	3.0	550	03...	1420	41	29.0	550
FEB					SEP				
17...	1445	36	0.5	600	14...	1340	21	19.0	320
MAR									
30...	1650	601	2.5	435					
05490500 DES MOINES RIVER AT KEOSAUQUA, IOWA (LAT 40 43 40N LONG 091 57 34W)									
NOV 1986					APR 1987				
05...	1445	19600	9.0	576	29...	1015	10800	17.0	662
DEC					JUN				
16...	1310	3530	0.5	725	10...	1025	6520	0.0	350
FEB 1987					JUL				
11...	0905	3050	2.0	750	22...	0800	7560	28.0	502
MAR					SEP				
18...	1010	4990	6.0	600	02...	0945	18700	20.0	288

MISCELLANEOUS WATER-QUALITY DATA

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06483500 ROCK RIVER NEAR ROCK VALLEY, IOWA (LAT 43 12 52N LONG 096 17 39W)									
NOV 1986					JUN 1987				
04...	1045	572	5.0	760	09...	1345	429	19.0	810
FEB 1987					JUL				
03...	1400	269	0.0	810	16...	1030	877	23.5	720
MAR					AUG				
10...	1000	321	0.5	810	26...	1455	104	16.5	690
APR									
29...	1210	628	16.5	810					
06486000 MISSOURI RIVER AT SIOUX CITY, IOWA (LAT 42 29 10N LONG 096 24 47W)									
OCT 1986					MAY 1987				
03...	1140	50200	17.0	700	03...	0930	35000	14.5	820
03...	1145	50200	17.0	700	07...	0900	33800	17.0	800
06...	1145	44200	17.0	710	12...	1345	32900	18.0	840
09...	1430	42700	16.0	780	15...	0905	32100	18.5	820
14...	1230	42700	11.5	790	19...	1100	32100	19.5	800
17...	1205	43700	0.0	790	22...	1050	31900	15.0	760
22...	1135	50300	10.0	700	26...	1200	33400	16.0	780
24...	1245	51700	14.0	780	29...	1030	24400	18.0	830
28...	1150	46700	14.0	760	JUN				
31...	1300	44200	14.0	740	02...	0840	25100	18.0	840
NOV					05...	0945	26600	20.0	800
03...	1130	45900	12.0	775	08...	1315	31000	22.5	875
06...	1035	43700	9.0	760	11...	0740	31700	20.5	800
12...	1230	44400	2.0	650	16...	1115	30600	24.0	820
14...	1040	44000	1.0	680	19...	0730	31200	25.0	750
18...	1300	46700	1.5	810	23...	0720	30800	26.5	795
20...	1115	48700	0.5	800	26...	1145	31600	23.5	830
25...	1300	44700	4.0	775	30...	0910	30900	24.0	765
28...	0940	48700	4.0	805	JUL				
DEC					02...	0820	31500	23.5	795
02...	1300	46800	4.0	800	07...	0830	31500	25.0	830
09...	1515	37400	0.0	850	11...	0905	30700	25.0	840
18...	1415	38200	0.5	810	14...	0710	31500	23.0	840
23...	1330	34400	1.0	800	17...	0635	30800	25.0	810
29...	1130	30200	0.0	820	21...	0830	31500	26.0	760
JAN 1987					24...	0810	31600	26.5	800
05...	1040	30900	0.5	780	27...	1140	30800	27.0	850
28...	1315	24800	0.5	800	30...	0815	31800	27.5	560
FEB					AUG				
02...	1300	24300	2.0	805	04...	1200	31100	25.5	760
12...	1230	24400	3.0	850	07...	0820	32600	25.0	760
19...	1145	24100	1.5	775	11...	0840	31300	25.0	795
25...	1000	23600	2.5	750	14...	1015	31700	24.0	760
MAR					18...	0925	31000	24.0	750
02...	1300	25200	3.5	740	21...	1000	30600	23.5	795
11...	0815	24400	4.0	770	25...	0930	31600	20.0	780
18...	1345	25100	3.5	725	28...	0705	30100	20.0	800
31...	1015	45500	4.0	750	31...	0810	30100	19.0	750
APR					SEP				
03...	1145	40900	4.5	730	03...	0700	30700	21.0	840
07...	1000	38300	7.0	850	08...	1030	31100	22.0	830
10...	1230	40500	10.0	810	10...	0925	30800	20.5	810
14...	1045	41200	9.0	830	15...	0945	30600	20.0	800
17...	1230	40000	11.5	825	18...	1115	31500	17.5	850
21...	1245	34400	11.0	800	22...	0750	32500	17.0	750
24...	1150	31600	14.0	830	25...	1000	31400	18.0	770
27...	1540	31300	16.0	830	29...	0740	31300	17.0	770
30...	1000	33900	16.5	825					

MISCELLANEOUS WATER-QUALITY DATA

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DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)
06600000 PERRY CREEK AT 38TH STREET, SIOUX CITY, IOWA (LAT 42 32 05N LONG 096 24 35W)									
NOV 1986					JUN 1987				
03...	1345	21	10.0	540	10...	1445	25	19.0	760
DEC					JUL				
16...	1525	17	0.0	805	17...	1040	14	23.5	760
FEB 1987					AUG				
02...	1015	16	1.0	775	27...	1600	11	16.5	850
MAR					SEP				
09...	1145	13	2.0	810	29...	1420	8.2	16.0	780
APR									
30...	0845	19	12.0	815					
06600100 FLOYD RIVER AT ALTON, IOWA (LAT 42 58 55N LONG 096 00 03W)									
NOV 1986					JUN 1987				
05...	1200	98	5.0	900	09...	1000	107	19.0	920
FEB 1987					JUL				
04...	1215	38	0.5	830	15...	1135	99	21.0	860
MAR					AUG				
10...	1530	58	2.0	950	26...	1105	70	15.0	905
APR									
28...	1600	122	15.5	870					
06600300 WEST BRANCH FLOYD RIVER NEAR STRUBLE, IOWA (LAT 42 55 15N LONG 096 10 30W)									
NOV 1986					JUN 1987				
04...	0945	48	5.0	1080	09...	0800	73	17.0	1050
FEB 1987					JUL				
03...	1115	21	0.0	990	15...	0900	46	19.0	1030
MAR					AUG				
09...	1430	28	3.0	1000	26...	0915	24	14.5	1060
APR									
28...	1330	79	16.0	1040					
06600500 FLOYD RIVER AT JAMES, IOWA (LAT 42 34 36N LONG 096 18 43W)									
NOV 1986					JUN 1987				
03...	1600	311	8.0	950	10...	1110	395	19.0	940
FEB 1987					JUL				
02...	1515	211	0.0	830	14...	1235	388	22.5	875
MAR					AUG				
09...	1630	188	4.0	950	25...	1220	209	16.0	890
24...	1500	2620	6.5	690	SEP				
APR					29...	1150	212	16.5	920
29...	1520	422	20.0	920					

MISCELLANEOUS WATER-QUALITY DATA

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)
06601200 MISSOURI RIVER AT DECATUR, NEBRASKA (LAT 42 00 26N LONG 096 14 29W)									
OCT 1986					JUN 1987				
08...	1230	43500	16.0	810	02...	1700	28000	23.0	880
15...	1245	44100	11.5	800	08...	1215	32200	23.0	910
23...	1255	51600	14.0	760	17...	1845	31700	25.5	750
29...	1330	45600	14.0	775	23...	1415	31500	27.5	
NOV					JUL				
05...	1230	45800	10.0	780	01...	1410	31000	25.0	845
12...	1500	46200	2.0	675	07...	1400	31600	26.0	850
19...	1240	48300	1.5	790	14...	1245	31700	24.0	750
26...	1145	45700	3.0	700	21...	1300	31500	27.0	750
DEC					28...	1230	31200	29.0	850
02...	1730	49000	4.5	810	AUG				
MAR 1987					04...	1500	30800	27.0	795
24...	1145	35700	6.5	775	14...	0745	31100	24.0	760
31...	1440	48400	4.0	840	19...	1030	31500	24.0	800
APR					25...	1340	32000	20.0	750
07...	1500	39600	9.0	950	SEP				
22...	1315	36400	12.0	865	01...	1200	30400	20.0	790
28...	1315	32300	17.0	840	08...	1710	31500	23.0	790
MAY					15...	1615	31300	21.0	810
05...	1645	34900	15.5	820	24...	1430	31200	19.5	790
12...	2000	33300	19.5	800	30...	1320	32100	18.0	775
19...	1300	32600	21.0	800					
28...	1830	29100	18.0	825					
06602020 WEST FORK DITCH AT HORNICK, IOWA (LAT 42 13 37N LONG 096 04 40W)									
OCT 1986					APR 1987				
07...	1645	141	16.0	830	29...	1800	192	20.5	750
NOV					JUN				
14...	1100	113	3.0	800	16...	1530	126	27.0	800
DEC					JUL				
29...	1715	116	0.0	790	28...	1615	143	31.0	780
FEB 1987					SEP				
04...	1515	80	2.0	715	09...	1115	71	16.0	750
MAR									
18...	1645	109	4.5	760					
24...	1230	1290	7.5	620					
06602400 MONONA-BARRISON DITCH NEAR TURIN, IOWA (LAT 41 57 52N LONG 095 59 30W)									
OCT 1986					APR 1987				
08...	1230	283	14.5	840	30...	1045	332	17.0	760
NOV					JUN				
17...	1655	236	0.5	790	18...	1200	240	25.0	790
DEC					JUL				
30...	1500	170	0.5	610	29...	1145	243	27.0	740
FEB 1987					SEP				
06...	1220	175	6.0	800	09...	1400	154	16.0	730
MAR									
19...	1200	263	5.5	760					
06605000 OCHEYEDAN R NR SPENCER, IOWA (LAT 43 07 44N LONG 095 12 37W)									
OCT 1986					JUN 1987				
14...	1800	460	7.0	680	23...	0815	85	27.5	710
FEB 1987					AUG				
06...	0825	56	2.0	820	06...	0810	128	22.0	775
MAR					SEP				
31...	1630	715	1.0	800	17...	1400	2100	19.5	760
MAY									
12...	1415	133	21.0	725					

MISCELLANEOUS WATER-QUALITY DATA

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DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)
06605850 L SIOUX R AT LINN GROVE, IOWA (LAT 42 53 24N LONG 095 14 30W)									
OCT 1986					JUN 1987				
15...	1115	2330	7.0	750	22...	1625	297	27.5	780
FEB 1987					AUG				
06...	1000	255	2.0	855	06...	1005	654	27.0	750
APR					SEP				
01...	0930	2950	1.0	820	17...	1000	1610	20.5	760
MAY									
12...	1630	478	20.5	580					
06606600 LITTLE SIOUX RIVER AT CORRECTIONVILLE, IOWA (LAT 42 28 20N LONG 095 47 49W)									
OCT 1986					JUN 1987				
02...	1300	1660	17.5	750	11...	1500	1010	23.5	755
NOV					JUL				
05...	1645	1250	7.0	800	08...	1440	744	26.0	620
FEB 1987					AUG				
05...	1115	505	0.5	765	24...	1500	806	20.0	690
MAR					SEP				
11...	1620	676	5.0	750	30...	1010	1270	17.0	765
APR									
28...	1000	1500	16.0	750					
06607200 MAPLE RIVER AT MAPLETON, IOWA (LAT 42 09 28N LONG 095 48 27W)									
OCT 1986					FEB 1987				
07...	1230	351	15.0	710	05...	1400	201	0.5	690
NOV					19...	0945	150	0.0	760
18...	1310	331	0.0	730	MAR				
DEC					18...	1300	258	3.5	520
04...	1045	251	0.0	740	APR				
11...	1140	96	0.0	850	29...	1200	493	18.0	610
30...	1050	185	0.0	850	JUN				
JAN 1987					17...	1300	379	24.5	730
09...	1400	217	0.5	690	JUL				
20...	1345	158	0.0	800	28...	1245	709	28.0	700
29...	1115	170	0.0	740	SEP				
					10...	1030	327	14.0	750
06607500 LITTLE SIOUX RIVER NR. TURIN, IOWA (LAT 41 57 52N LONG 095 58 21W)									
OCT 1986					JUN 1987				
08...	1625	2960	14.5	770	18...	1600	1260	28.5	730
FEB 1987					JUL				
12...	1510	907	4.0	730	29...	1700	3120	31.0	700
MAR					SEP				
19...	1700	1170	7.5	730	10...	1430	925	18.0	710
APR									
30...	1345	2080	18.0	700					
06608500 SOLDIER RIVER AT PISGAH, IOWA (LAT 41 49 52N LONG 095 55 50W)									
OCT 1986					APR 1987				
09...	1150	119	13.0	710	30...	1915	242	19.0	660
DEC					JUN				
31...	1030	115	0.0	760	19...	1145	231	23.0	690
FEB 1987					JUL				
06...	1410	124	3.0	680	30...	1145	201	27.5	700
MAR					SEP				
20...	1345	153	12.0	700	10...	1630	233	16.0	720

MISCELLANEOUS WATER-QUALITY DATA

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)
06609500 BOYER RIVER AT LOGAN, IOWA (LAT 41 38 33N LONG 095 46 57W)									
OCT 1986					APR 1987				
09...	1620	330	15.0	780	28...	1415	729	18.0	760
DEC					JUN				
31...	1430	330	1.0	570	22...	1215	475	26.0	700
FEB 1987					SEP				
06...	1710	307	4.5	740	16...	1300	1060	19.0	610
MAR									
20...	1530	470	12.0	700					
06610000 MISSOURI RIVER AT OMAHA, NEBRASKA (LAT 41 15 32N LONG 095 55 20W)									
OCT 1986					MAY 1987				
02...	1100	60900	18.0	700	06...	1120	40300	15.0	800
08...	1350	48500	16.0	790	11...	1230	38200	19.5	830
14...	1145	54600	11.0	750	15...	1125	38300	19.5	800
17...	1155	52700	11.0	720	18...	1225	39000	21.5	805
20...	1330	52900	13.0	800	21...	1300	37300	20.5	740
23...	1400	59600	16.5	775	29...	1400	39100	19.0	925
27...	1430	56100	13.5	780	JUN				
NOV					01...	1400	35300	23.0	840
03...	1250	52200	10.5	780	04...	1430	34300	21.0	800
06...	1400	53800	10.0	700	10...	1045	35600	23.0	770
14...	1700	50500	1.0	710	15...	1250	37200	26.0	795
17...	1545	50400	4.5	790	18...	1300	37400	26.5	830
21...	1030	54900	2.5	820	22...	1230	37800	26.5	765
24...	1400	52300	4.0	800	25...	1230	39700	26.5	755
DEC					29...	1140	36800	24.5	770
05...	1630	50100	2.0	780	JUL				
08...	1310	44300	2.0	800	02...	1140	35500	25.0	820
17...	1330	45100	1.0	860	06...	1145	37000	25.0	780
24...	1400	36700	1.5	850	10...	1300	40000	26.0	750
31...	1215	36500	1.0	840	13...	1150	46700	0.0	735
JAN 1987					17...	1100	40100	25.0	840
06...	1130	37200	0.5	810	20...	1210	41600	26.0	740
13...	1230	37800	1.5	830	24...	1115	42000	27.0	800
29...	1225	28900	1.0	800	29...	1100	36000	29.0	775
FEB					AUG				
05...	1145	28500	3.0	760	03...	1215	37000	29.5	795
11...	1100	26500	3.5	780	06...	1145	37100	26.0	775
19...	1250	28400	2.0	770	10...	1200	38600	27.0	810
25...	1230	27300	3.5	700	13...	0930	38900	26.0	760
MAR					17...	1400	41200	26.0	760
04...	1130	28000	4.5	750	20...	1125	36600	23.5	780
11...	1130	27400	5.0	730	23...	1215	35600	24.0	780
19...	1200	29000	5.0	800	SEP				
25...	1230	50700	7.0	550	02...	0915	34200	21.0	795
31...	1545	61000	3.5	825	08...	1110	36000	22.5	750
APR					11...	1445	35200	21.0	750
03...	1230	59000	5.0	825	14...	1115	33700	20.5	810
06...	1245	51300	7.0	820	17...	1110	35700	20.5	805
10...	1320	48700	11.0	900	21...	1030	39500	18.0	725
13...	1340	51300	10.0	850	24...	1300	39500	19.0	715
16...	1230	53000	11.0	800	28...	1015	36800	20.0	770
20...	1330	48000	15.5	825					
23...	1210	43300	12.0	850					
27...	1140	40700	16.5	805					
30...	1130	38600	17.0	825					

MISCELLANEOUS WATER-QUALITY DATA

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DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)
06807000 MISSOURI RIVER AT NEBRASKA CITY, NEBR. (LAT 40 40 55N LONG 095 50 48W)									
OCT 1986					APR 1987				
01...	1215	73700	18.5	750	22...	1430	61300	14.5	800
01...	1230	73700	18.5	750	27...	1400	51500	18.0	800
07...	1245	66700	16.0	720	30...	1305	47500	18.0	840
10...	1430	58000	16.5	760	MAY				
22...	1315	62600	14.5	780	05...	1525	53000	17.0	790
29...	1230	64900	14.0	790	11...	1645	51000	21.0	800
NOV					14...	1500	46200	21.0	800
04...	1350	64000	10.0	760	JUN				
07...	1230	58500	10.0	750	03...	0930	56000	23.0	695
17...	1150	57200	2.0	730	09...	1100	46800	23.5	780
20...	1405	66800	2.0	760	12...	0930	45400	23.0	800
DEC					16...	1315	46300	28.5	800
05...	1230	59500	2.5	795	25...	1300	45000	26.5	710
18...	1245	54200	0.5	890	JUL				
22...	1710	45300	0.5	810	01...	1415	39900	25.0	775
29...	1330	45300	1.0	790	06...	1400	39100	26.5	800
JAN 1987					10...	1400	43200	26.0	755
06...	1600	45200	1.5	775	15...	1050	43100	24.0	725
13...	1230	44800	0.0	810	20...	0950	42200	28.0	770
29...	1430	34800	1.0	840	23...	1300	42900	28.0	740
FEB					28...	1030	42300	28.5	750
05...	1325	37000	3.5	775	AUG				
10...	1345	38000	4.0	810	03...	1020	--	29.0	775
17...	1315	38300	3.0	725	06...	1000	35600	28.0	800
26...	1145	35700	4.5	800	12...	0945	38500	26.0	750
MAR					17...	0945	40900	27.0	780
04...	1300	37600	6.0	740	21...	1215	38700	25.0	760
09...	1330	35300	3.0	750	28...	1445	51700	19.0	650
18...	1300	38700	6.0	740	SEP				
26...	1630	115000	7.0	550	01...	1030	41300	21.5	755
31...	1115	84500	3.0	700	04...	1010	39000	22.0	745
APR					10...	0830	40800	21.0	725
03...	1145	98900	4.5	725	14...	0930	39000	21.0	790
08...	1300	77700	9.5	740	17...	1615	45000	21.0	830
17...	1315	70600	13.0	750	23...	1215	44300	18.0	730
					29...	1315	41200	20.0	740
06807410 WEST NISHNABOTNA RIVER AT HANCOCK, IOWA (LAT 41 23 24N LONG 095 22 17W)									
DEC 1986					JUN 1987				
15...	1215	424	0.5	610	03...	1530	573	20.0	580
FEB 1987					JUL				
04...	1545	252	3.0	620	08...	1245	498	22.5	345
APR					AUG				
16...	1130	919	10.0	580	21...	1135	392	22.0	550
06808500 WEST NISHNABOTNA RIVER AT RANDOLPH, IOWA (LAT 40 52 23N LONG 095 34 48W)									
NOV 1986					APR 1987				
10...	1100	1420	5.0	570	14...	1330	1560	9.0	550
DEC					JUN				
18...	1300	920	4.0	625	01...	1745	2660	22.0	540
FEB 1987					JUL				
04...	1220	568	2.0	520	13...	1400	2520	21.5	330
MAR					AUG				
09...	1515	493	6.0	640	18...	1040	1280	22.0	480
06809210 EAST NISHNABOTNA RIVER NEAR ATLANTIC, IOWA (LAT 41 20 47N LONG 095 04 31W)									
NOV 1986					APR 1987				
13...	1700	345	0.0	570	16...	1415	875	12.0	490
DEC					JUN				
16...	1550	290	2.0	510	03...	1415	400	18.0	450
JAN 1987					JUL				
29...	1400	172	0.5	520	08...	1540	277	24.5	400
MAR					AUG				
11...	1150	148	6.0	540	21...	0930	232	21.0	500

MISCELLANEOUS WATER-QUALITY DATA

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06809500 EAST NISHNABOTNA RIVER NEAR RED OAK, IOWA (LAT 41 00 41N LONG 095 14 07W)									
OCT 1986					APR 1987				
02...	1200	1320	17.0	420	15...	1200	1950	9.0	420
NOV					JUN				
14...	1215	423	0.0	540	04...	1215	924	20.0	480
DEC					JUL				
17...	1445	585	2.5	480	15...	1330	1130	23.0	425
FEB 1987					AUG				
04...	1315	338	3.0	490	18...	1315	453	24.0	480
MAR									
10...	1130	294	4.0	490					
06810000 NISHNABOTNA RIVER ABOVE HAMBURG, IOWA (LAT 40 37 57N LONG 095 37 32W)									
OCT 1986					MAY 1987				
23...	1245	3390	14.0	520	20...	1030	5150	19.5	268
NOV					27...	1425	31100	17.5	125
24...	1335	2350	3.5	540	28...	1530	22800	19.0	230
25...	1200	2220	2.5	610	29...	1800	16600	21.0	300
DEC					JUN				
22...	1245	1820	2.5	530	02...	1415	10100	20.5	340
JAN 1987					26...	1240	2600	23.5	410
22...	1230	1070	0.0	540	JUL				
FEB					23...	0930	1940	27.0	520
23...	1130	1020	3.5	529	AUG				
MAR					19...	0945	1880	23.0	460
24...	1310	1650	11.0	580	19...	1100	1880	23.0	460
APR					SEP				
22...	1130	2860	13.5	490	23...	1300	2430	16.0	540
06811840 TARKIO RIVER AT STANTON, IOWA (LAT 40 58 52N LONG 095 06 32W)									
OCT 1986					JUN 1987				
02...	1410	56	16.5	442	04...	1455	78	18.0	500
DEC					JUL				
17...	1105	38	3.0	440	09...	1445	321	23.0	230
FEB 1987					AUG				
02...	1705	16	2.0	300	18...	1635	16	24.0	450
MAR					25...	1305	2140	15.0	175
10...	1335	21	2.0	430					
APR									
16...	1620	102	16.0	460					

MISCELLANEOUS WATER-QUALITY DATA

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DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)
06813500 MISSOURI RIVER AT RULO, NEBRASKA (LAT 40 03 14N LONG 095 25 12W)									
OCT 1986					APR 1987				
07...	1235	67800	18.0	750	16...	1415	91200	10.5	690
07...	1245	67800	18.0	750	23...	1445	63600	15.5	820
15...	1215	85100	10.0	730	29...	1045	52300	18.0	800
22...	1310	72900	14.0	740	MAY				
28...	1330	74200	15.0	800	07...	1230	57100	17.0	790
NOV					15...	1300	47800	21.5	775
04...	1150	66900	11.0	750	22...	1400	54200	20.5	740
10...	1150	68200	9.0	700	28...	1630	127000	18.0	445
18...	1215	59500	2.0	700	JUN				
25...	1005	--	4.5	720	04...	1415	61100	22.5	650
DEC					12...	1200	50600	24.0	760
05...	1345	60200	3.0	800	17...	1305	49900	28.5	752
17...	1340	60200	0.0	805	24...	1520	49400	27.0	765
30...	1045	48300	1.5	800	JUL				
JAN 1987					02...	1200	41900	25.0	790
06...	1300	47300	1.5	805	08...	1440	58000	25.0	700
13...	1300	44900	0.5	780	16...	1200	49700	25.0	730
FEB					22...	2015	45200	27.0	700
09...	1345	36600	4.0	770	30...	1300	44100	29.0	875
18...	1340	37600	3.5	740	AUG				
23...	1430	36500	4.0	740	05...	1400	38100	29.0	750
MAR					20...	1130	45200	25.0	800
10...	1315	38100	5.5	760	26...	1350	108000	17.0	365
20...	1310	67000	7.5	650	27...	1515	99600	17.0	475
27...	1030	112000	7.0	580	SEP				
APR					03...	1150	44300	20.0	750
01...	1400	87100	3.5	700	09...	1315	43700	22.0	740
09...	1515	76400	11.0	770	18...	1300	59400	20.5	730
					24...	1400	45900	19.0	760
06817000 NODAWAY RIVER AT CLARINDA, IOWA (LAT 40 44 19N LONG 095 00 47W)									
NOV 1986					JUN 1987				
14...	1050	236	0.0	480	03...	1050	1010	17.5	380
DEC					JUL				
16...	1640	438	1.5	445	09...	1455	21100	22.0	155
FEB 1987					10...	0845	2910	21.5	175
06...	1145	196	2.5	425	17...	1040	702	25.5	370
MAR					AUG				
20...	0945	715	9.0	360	25...	1800	27600	16.0	125
APR					27...	1900	4420	17.5	240
23...	0840	677	10.0	400	28...	1100	2390	16.5	375
06818750 PLATTE RIVER NEAR DIAGONAL, IOWA (LAT 40 46 02N LONG 094 24 46W)									
NOV 1986					MAR 1987				
13...	1155	35	0.0	470	18...	1355	853	5.5	265
DEC					APR				
04...	1035	76	0.0	600	21...	1230	139	14.5	375
10...	1130	104	0.0	360	JUN				
16...	1135	101	0.5	400	02...	1640	596	20.0	310
JAN 1987					JUL				
02...	1145	32	0.0	460	09...	1830	3430	21.5	155
12...	1345	55	2.0	420	15...	1420	320	21.5	260
22...	1210	26	0.0	480	AUG				
FEB					26...	1815	7790	16.5	115
02...	1350	41	1.5	480	27...	1415	8630	17.0	140
13...	1300	34	5.0	550	SEP				
24...	1315	26	5.5	450	29...	1540	56	18.0	315

MISCELLANEOUS WATER-QUALITY DATA

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)
06819185 EAST FORK 102 RIVER AT BEDFORD, IOWA (LAT 40 39 40N LONG 094 42 58W)									
NOV 1986					MAY 1987				
13...	1415	23	1.0	445	27...	1310	1190	17.0	210
DEC					JUN				
16...	1435	37	0.5	405	02...	1900	80	21.0	315
FEB 1987					JUL				
06...	0840	14	1.0	390	16...	1635	43	26.5	325
MAR					AUG				
19...	1730	180	9.5	215	26...	1450	2810	17.5	155
APR					SEP				
22...	1615	34	13.5	390	29...	1305	5.3	20.0	375
06897950 ELK CREEK NEAR DECATUR CITY, IOWA (LAT 40 43 18N LONG 093 56 19W)									
NOV 1986					MAY 1987				
13...	0915	7.6	0.0	525	19...	1030	16	20.5	382
26...	0915	7.8	1.5	481	JUN				
DEC					01...	1850	30	26.5	400
16...	0930	25	0.0	480	JUL				
FEB 1987					07...	1450	4250	21.5	105
05...	1505	12	1.0	490	08...	1145	2090	21.5	145
24...	0930	4.0	1.0	504	15...	1745	37	27.0	450
MAR					AUG				
18...	1715	781	7.0	225	18...	1515	12	28.5	465
APR					18...	1735	12	18.0	465
21...	1520	22	14.5	490	27...	1645	89	18.0	335
06898000 THOMPSON RIVER AT DAVIS CITY, IOWA (LAT 40 38 25N LONG 093 48 29W)									
OCT 1986					JUN 1987				
01...	1250	2150	17.5	300	02...	1115	3640	21.0	205
NOV					JUL				
12...	1732	290	0.0	390	07...	1940	8750	21.0	135
DEC					16...	1025	978	22.5	365
15...	1635	327	0.0	405	AUG				
FEB 1987					27...	1100	12900	17.0	140
05...	0920	166	0.0	455	SEP				
MAR					30...	1000	122	15.5	490
19...	1045	3660	6.5	240					
APR									
22...	0940	462	14.5	455					
06898400 WELDON RIVER NEAR LEON, IOWA (LAT 40 41 45N LONG 093 38 07W)									
OCT 1986					JUN 1987				
01...	1600	139	16.5	315	02...	1330	24	22.0	350
NOV					JUL				
12...	1540	19	0.0	505	16...	1200	17	26.0	395
FEB 1987					AUG				
05...	1215	15	0.5	480	27...	1315	258	17.5	255
MAR					SEP				
19...	1330	173	9.5	325	30...	1340	2.8	18.5	495
APR									
22...	1210	75	11.5	360					

MISCELLANEOUS WATER-QUALITY DATA

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DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)
06903400 CHARITON RIVER NEAR CHARITON, IOWA (LAT 40 57 12N LONG 093 15 37W)									
NOV 1986					JUN 1987				
07...	0945	44	8.5	414	08...	1500	8.9	22.0	500
FEB 1987					JUL				
09...	1545	31	0.0	550	20...	1345	16	30.0	285
MAR					AUG				
17...	0845	46	5.0	500	27...	1105	4870	18.0	1080
APR									
27...	1530	35	16.0	392					
06903700 SOUTH FORK CHARITON RIVER NEAR PROMISE CITY, IOW (LAT 40 48 02N LONG 093 11 32)									
NOV 1986					APR 1987				
06...	1555	39	9.0	446	28...	0825	20	13.0	458
DEC					JUL				
17...	0930	--	0.5	500	21...	0800	16	26.0	398
FEB 1987									
10...	0950	10	0.0	550					
06903900 CHARITON RIVER NEAR RATHBUN, IOWA (LAT 40 49 22N LONG 092 53 22W)									
NOV 1986					JUN 1987				
06...	1015	808	11.0	207	09...	1105	18	21.0	210
FEB 1987					JUL				
10...	1110	21	4.0	320	21...	1125	812	25.5	267
MAR					AUG				
17...	1330	25	5.0	220	31...	1015	598	23.0	264
APR									
28...	1130	17	15.0	265					
06904010 CHARITON R NR MOULTON, IOWA (LAT 40 41 30N LONG 092 46 15W)									
NOV 1986					APR 1987				
06...	0810	921	10.0	230	28...	1550	91	17.0	362
DEC					JUN				
16...	1530	1190	2.0	232	09...	1325	71	21.0	300
FEB 1987					JUL				
10...	1450	66	4.0	550	21...	1410	788	26.0	275

GROUND-WATER LEVELS

BENTON COUNTY

415211092164101. Local number, 82-12-31 DAAD1.

LOCATION.--Lat 41°52'11", long 92°16'41", Hydrologic Unit 07080208, approximately 0.6 mi north of the Iowa River, west side of Iowa Highways 21 and 212, approximately 1.2 mi south of the Town of Belle Plaine. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.

AQUIFER.--Iowa River Alluvial Aquifer: in sand and gravel of Holocene age.

WELL CHARACTERISTICS.--Drilled observation water-table well, diameter 2 in., depth 26 ft, cased to 23 ft, screen 23 to 26 ft.

INSTRUMENTATION.--Monthly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 770 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 3 ft above land-surface datum.

REMARKS.--Well IRA-16A.

PERIOD OF RECORD.--October 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.52 ft below land-surface datum, May 28, 1986; lowest measured, 6.97 ft below land-surface datum, Sep. 2, 1985.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 30	2.40	JAN 23	4.29	MAY 1	3.14	JUL 30	5.74
DEC 1	3.82	FEB 23	4.54	21	3.63	AUG 27	1.01
29	3.44	MAR 26	2.72	JUN 30	5.30	SEP 28	3.80

415211092164102. Local number, 82-12-31 DAAD2.

LOCATION.--Lat 41°52'11", long 92°16'41", Hydrologic Unit 07080208, approximately 0.6 mi north of the Iowa River, west side of Iowa Highways 21 and 212, approximately 1.2 mi south of the Town of Belle Plaine. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.

AQUIFER.--Iowa River Alluvial Aquifer: in sand and gravel of Holocene age.

WELL CHARACTERISTICS.--Drilled observation water-table well, diameter 2 in., depth 15 ft, cased to 12 ft, slotted 12 to 15 ft.

INSTRUMENTATION.--Monthly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 770 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.92 ft above land-surface datum.

REMARKS.--Well IRA-16B.

PERIOD OF RECORD.--October 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.48 ft below land-surface datum, May 28, 1986; lowest measured, 6.97 ft below land-surface datum, Sep. 2, 1985.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 29	2.41	JAN 23	4.32	MAY 1	3.17	JUL 30	5.74
DEC 1	3.84	FEB 23	4.57	21	3.66	AUG 27	1.03
29	3.44	MAR 26	2.75	JUN 30	5.32	SEP 28	3.83

420319091540102. Local number, 84-9-28 DBCC2.

LOCATION.--Lat 42°03'19", long 91°54'01", Hydrologic Unit 07080205, approximately 3 mi south and 1.5 mi west of the Town of Shellsburg. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.

AQUIFER.--Silurian-Devonian: in limestone of Devonian age and dolomite of Silurian age.

WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 7 in., to 173 ft, 5 in. to 590 ft, depth 590 ft, cased to 260 ft, open hole 265 to 590 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 915 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.10 ft above land-surface datum.

REMARKS.--Parker's Grove Cemetery well. Cement plug 260 to 265 ft. 59.7 ft of open Devonian rock reported to yield little, if any, water.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 150.73 ft below land-surface datum, Apr. 14, 1975; lowest measured, 166.92 ft below land-surface datum, Aug. 9, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 1	157.38	MAR 25	157.57	JUN 9	158.39	AUG 10	160.31

GROUND-WATER LEVELS

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BENTON COUNTY

420731092083801. Local number, 85-11-33 CCBC1.

LOCATION.--Lat 42°07'31", long 92°08'38", Hydrologic Unit 07080205, approximately 1 mi south of the Town of Garrison, just east of County Road V-56. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.

AQUIFER.--Cedar Valley: in limestone of Devonian age.

WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 0.75 in., depth 237 ft, cased 170 ft, slotted below cement plug, open hole 170 to 237 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 912 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of 6 in. casing, 2.20 ft above land-surface datum.

REMARKS.--Garrison 170 well. 3 ft cement plugs from 97 to 100 ft and 237 to 240 ft.

PERIOD OF RECORD.--June 1977 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 60.18 ft below land-surface datum, Apr. 19, 1983; lowest measured, 64.80 ft below land-surface datum, Jan. 29, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 1	62.08	MAR 25	62.02	JUN 15	62.84	SEP 10	61.98

420731092083802. Local number, 85-11-33 CCBC2.

LOCATION.--Lat 42°07'31", long 92°08'38", Hydrologic Unit 07080205, approximately 1 mi south of the Town of Garrison, just east of County Road V-56. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.

AQUIFER.--Silurian-Devonian: in limestone of Devonian age and dolomite of Silurian age.

WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 0.75 in., depth 538 ft, cased to 340 ft, open hole 340 to 538 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 912 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of 6 in. casing, 2.20 ft above land-surface datum.

REMARKS.--Garrison 340 well. 106 ft of open Devonian rock reported to yield little, if any, water. 3 ft cement plug 237 to 240 ft.

PERIOD OF RECORD.--October 1975, June 1977 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 88.00 ft below land-surface datum, Oct. 17, 1975; lowest measured, 104.94 ft below land-surface datum, Aug. 21, 1985.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 1	95.81	MAR 25	93.89	JUN 15	93.62	SEP 10	93.00

e Estimated.

420731092083803. Local number, 85-11-33 CCBC3.

LOCATION.--Lat 42°07'31", long 92°08'38", Hydrologic Unit 07080205, approximately 1 mi south of the Town of Garrison, just east of County Road V-56. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.

AQUIFER.--Cedar Valley: in limestone of Devonian age.

WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 6 in., depth 97 ft, cased to 90 ft, open hole 90 to 97 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 912 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of 6 in. casing, 2.20 ft above land-surface datum.

REMARKS.--Garrison 109 well. 3 ft cement plug 97 to 100 ft.

PERIOD OF RECORD.--June 1977 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 60.63 ft below land-surface datum, Mar. 23, 1979; lowest measured, 64.86 ft below land-surface datum, Jun. 29, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 1	62.15	MAR 25	62.04	JUN 15	62.87	SEP 10	62.02

GROUND-WATER LEVELS

BENTON COUNTY

421326091522701. Local number, 86-9-34 AAAD1.

LOCATION.--Lat 42°13'28", long 91°52'19", Hydrologic Unit 07080205, next to the water tower in the Town of Urbana. Owner: Town of Urbana.

AQUIFER.--Silurian-Devonian and Ordovician: open from limestone of Devonian age into limestone and dolomite of the Platteville formation of Ordovician age.

WELL CHARACTERISTICS.--Drilled unused artesian water well, diameter 8 in., depth 1,033 ft, cased to 142 ft, open hole 142 to 1,033 ft.

INSTRUMENTATION.--Monthly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 940 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Nipple on plate welded to casing, 3.15 ft above land-surface datum.

REMARKS.--None.

PERIOD OF RECORD.--September 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 141.37 ft below land-surface datum, Dec. 17, 1986; lowest measured, 148.25 ft below land-surface datum, Sep. 23, 1985.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 22	142.97	JAN 22	141.58	APR 22	142.85	JUL 20	144.60
NOV 21	141.77	FEB 24	142.57	MAY 28	143.73	AUG 21	145.22
DEC 17	141.37	MAR 20	142.82	JUL 9	143.57	SEP 21	144.80

BUENA VISTA COUNTY

423618095194511. Local number, 90-38-16 DDDD11.

LOCATION.--Lat 42°36'18", long 95°19'45", Hydrologic Unit 10230005, north of County Highway C-65, 2 mi east of the Village of Hanover. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.

AQUIFER.--Dakota: in sandstone of Early Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 497 ft, cased to 497 ft, perforated 346.5 to 349.5 ft.

INSTRUMENTATION.--Quarterly measurement with electric line by USGS personnel.

DATUM.--Elevation of land-surface datum is 1,365 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 3.50 ft above land-surface datum.

REMARKS.--Well D-25.

PERIOD OF RECORD.--April 1980 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 187.32 ft below land-surface datum, Jun. 23, 1987; lowest measured, 189.53 ft below land-surface datum, Dec. 6, 1983.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 25	187.51	JUN 23	187.32	SEP 17	187.48

424023095571401. Local number, 91-35-26 BCCC1.

LOCATION.--Lat 42°40'23", long 95°57'14", Hydrologic Unit 07100006, approximately 2.7 mi west and 0.5 mi north of the Village of Varina. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.

AQUIFER.--Dakota: in sandstone of Early Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 357 ft, cased to 357 ft, perforated 338 to 347 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape or electric line by USGS personnel.

DATUM.--Elevation of land-surface datum is 1,291 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.00 ft above land-surface datum.

REMARKS.--Well D-24. Paleozoic rock at 347 ft.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 18.40 ft below land-surface datum, Jan. 7, 1980; lowest measured, 52.45 ft below land-surface datum, Sep. 16, 1987.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 24	49.29	JAN 2	49.72	JUN 22	51.56	SEP 16	52.45

GROUND-WATER LEVELS

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BUENA VISTA COUNTY

425233094545001. Local number, 93-35-13 ADAA1.

LOCATION.--Lat 42°52'33", long 94°54'50", Hydrologic Unit 07100006, south of the Chicago, Rock Island and Pacific Railroad track, approximately 3.5 mi east and 0.75 mi north of the Town of Marathon. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.

AQUIFER.--Dakota; in sandstone of Early Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 1.50 in., depth 381 ft, cased to 381 ft, perforated 350 to 360 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape or electric line by USGS personnel.

DATUM.--Elevation of land-surface datum is 1,330 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 3.00 ft above land-surface datum.

REMARKS.--Well D-36.

PERIOD OF RECORD.--February 1980 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 131.65 ft below land-surface datum, May 6, 1985; lowest measured, 133.67 ft below land-surface datum, Sept. 11, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 24	132.46	JAN 5	132.38	MAY 26	132.00	SEP 16	132.15

CALHOUN COUNTY

422846094375601. Local number, 89-32-33 CABC1.

LOCATION.--Lat 42°28'46", long 94°37'56", Hydrologic Unit 07100006, west edge of the picnic area on the east side of North Twin Lake, approximately 5 mi north of Rockwell City. Owner: Iowa State Conservation Commission.

AQUIFER.--Glacial drift; in material of Pleistocene age.

WELL CHARACTERISTICS.--Drilled unused water-table well, diameter 8 in., depth 53 ft, lined with tile.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 1,222 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Hole in concrete platform, 0.50 ft above land-surface datum.

REMARKS.--1948 to 1955 records published in Geological Survey Water-Supply Papers. Well 33Fl. A public-supply well prior to 1978. Well destroyed December 1987.

PERIOD OF RECORD.--October 1948 to June 1959, December 1961 to August 1966, July 1968 to November 1971, October 1973 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.82 ft below land-surface datum, May 9, 1984; lowest measured, 32.12 ft below land-surface datum, Aug. 8, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 21	11.86	JAN 20	13.07	JUN 22	26.07	SEP 16	31.47

CARROLL COUNTY

420335094521501. Local number, 84-35-25 BDAD1.

LOCATION.--Lat 42°03'35", long 94°52'15", Hydrologic Unit 07100007, near the city water plant, Carroll. Owner: City of Carroll.

AQUIFER.--Dakota; in sandstone of Early Cretaceous age.

WELL CHARACTERISTICS.--Drilled unused artesian water well, diameter 8 in., depth 120 ft, cased to 100 ft, open hole 100 to 120 ft.

INSTRUMENTATION.--Intermittent measurement reported by personnel from the City of Carroll.

DATUM.--Elevation of land-surface datum is 1,275 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 4.00 ft above land-surface datum.

REMARKS.--City test No. 1.

PERIOD OF RECORD.--September 1939 to December 1949, May 1952 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 34.55 ft below land-surface datum, Sep. 8, 1945; lowest measured, 85.50 ft below land-surface datum, Jul. 15, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 22	56.08	MAR 12	55.33	MAY 12	65.02	JUN 16	72.24
DEC 17	52.85	APR 6	56.45	14	65.98	JUL 22	66.09
JAN 17	52.92	16	55.52	18	68.85	AUG 6	70.41
FEB 10	52.93	28	60.12	JUN 1	58.86	11	65.37
26	54.02	MAY 5	62.02	9	65.64	SEP 3	61.54
MAR 3	54.88						

GROUND-WATER LEVELS

CARROLL COUNTY

421058094582701. Local number, 85-35-7 CCCC1.

LOCATION.--Lat 42°10'58", long 94°58'27", Hydrologic Unit 07100006, approximately 1 block north of Iowa Highway 217, next to the town maintenance building, Breda. Owner: Town of Breda.

AQUIFER.--Dakota: in sandstone of Early Cretaceous age.

WELL CHARACTERISTICS.--Drilled municipal artesian water well, diameter 10 in., depth 340 ft, cased to 320 ft, screen 320 to 340 ft.

INSTRUMENTATION.--Quarterly measurement with chalked taped by USGS personnel.

DATUM.--Elevation of land-surface datum is 1,362 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Vent pipe, 1.60 ft above land-surface datum.

REMARKS.--Town well No. 3. Water levels affected by pumping. Original depth 349 ft. 1942 to 1955 records published in Geological Survey Water-Supply Papers.

PERIOD OF RECORD.--March 1942 to August 1966, March 1968 to November 1971, June 1975 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 187.70 ft below land-surface datum, Mar. 25, 1948; lowest measured, 250.40 ft below land-surface datum, May 24, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 24	204.09	JAN 15	198.08	JUN 24	202.13	SEP 18	201.03

CERRO GORDO COUNTY

430806093164501. Local number, 96-21-13 BCCB1.

LOCATION.--Lat 43°08'06", long 93°16'45", Hydrologic Unit 07080203, south of the County Home, just north of Iowa Highway 106, east of the City of Clear Lake. Owner: Mason City and Clear Lake Railroad.

AQUIFER.--Cedar Valley: in limestone of Devonian age.

WELL CHARACTERISTICS.--Drilled unused artesian water well, diameter 5 in., depth 198 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape or electric line by USGS personnel.

DATUM.--Elevation of land-surface datum is 1,165 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of well curb, 1.30 ft above land-surface datum.

REMARKS.--Casing information not available.

PERIOD OF RECORD.--November 1940 to August 1971, March 1973 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 1.73 ft below land-surface datum, Jan. 28, 1951; lowest measured, 17.26 ft below land-surface datum, Nov. 18, 1955.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 25	7.16	JAN 12	6.03	JUN 29	6.71	SEP 21	7.04

430658093281001. Local number, 96-22-20 CADC1.

LOCATION.--Lat 43°06'58", long 93°28'10", Hydrologic Unit 07080203, east of County Road S-14 in Ventura Heights. Owner: W. Baine and H. Elder.

AQUIFER.--Glacial drift: in material of Pleistocene age.

WELL CHARACTERISTICS.--Drilled unused artesian water well, diameter 5 in., depth 126 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape or electric line by USGS personnel.

DATUM.--Elevation of land-surface datum is 1,249 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Hole in side of casing, 0.87 ft above land-surface datum.

REMARKS.--Casing information not available. Formerly Boy Scouts of America.

PERIOD OF RECORD.--July 1940 to August 1971, March 1973 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 29.65 ft below land-surface datum, Mar. 25, 1942; lowest measured, 52.99 ft below land-surface datum, Jun. 29, 1987.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 25	45.39	JAN 12	43.72	JUN 29	52.99	SEP 21	46.86

GROUND-WATER LEVELS

277

CHEROKEE COUNTY

423833095365701. Local number, 90-40-6 BDCD1.

LOCATION.--Lat 42°38'33", long 95°36'57", Hydrologic Unit 10230003, approximately 3.1 mi east of U.S. Highway 59 and 0.55 mi north of Iowa Highway 31 along the Illinois Central Railroad track. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.

AQUIFER.--Dakota: in sandstone of Early Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 1.25 in., depth 253 ft, cased to 252 ft, sandpoint 252 to 253 ft.

INSTRUMENTATION.--Quarterly measurements with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 1,182 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 3.93 ft above land-surface datum.

REMARKS.--Well D-6.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 28.38 ft below land-surface datum, Aug. 27, 1983; lowest measured, 37.22 ft below land-surface datum, Sept. 10, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 6	31.56	JAN 13	32.54	APR 14	32.67	JUL 8	32.86

424348095231601. Local number, 91-39-1 ADAD1.

LOCATION.--Lat 42°43'48", long 95°23'16", Hydrologic Unit 10230005, approximately 2 mi east and 0.5 mi north of the Town of Aurelia at the Larson Lake County Park. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.

AQUIFER.--Cambrian-Ordovician: in dolomite of Ordovician age and sandstone of Cambrian age.

WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 6 in. to 236 ft, 5 in. to 486 ft, 2 in. to 1,545 ft, depth 1,545 ft, cased to 1,126 ft, open hole 1,126 to 1,545 ft.

INSTRUMENTATION.--Quarterly measurement with electric line by USGS personnel.

DATUM.--Elevation of land-surface datum is 1,370 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 3.20 ft above land-surface datum.

REMARKS.--Well D-28.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 189.65 ft below land-surface datum, Dec. 19, 1984; lowest measured, 194.47 ft below land-surface datum, May 5, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 25	191.97	JAN 6	191.77	JUN 22	191.83	SEP 17	192.04

424348095231602. Local number, 91-39-1 ADAD2.

LOCATION.--Lat 42°43'48", long 95°23'16", Hydrologic Unit 10230005, approximately 2 mi east and 0.5 mi north of the Town of Aurelia at the Larson Lake County Park. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.

AQUIFER.--Dakota: in sandstone of Early Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 4 in., depth 340 ft, cased to 340 ft, perforated 235 to 240 ft.

INSTRUMENTATION.--Quarterly measurement with electric line by USGS personnel.

DATUM.--Elevation of land-surface datum is 1,370 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 3.30 ft above land-surface datum.

REMARKS.--Well D-29.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 188.84 ft below land-surface datum, Jun. 9, 1986; lowest measured, 194.15 ft below land-surface datum, Aug. 24, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 25	189.15	JAN 6	188.90	JUN 22	189.12	SEP 17	189.10

GROUND-WATER LEVELS

CHEROKEE COUNTY

424132095480211. Local number, 91-42-16 DDDD11.

LOCATION.--Lat 42°41'32", long 95°48'02", Hydrologic Unit 10230004, approximately 2 mi north of the Village of Fielding at the junction of County Roads L-36 and C-44. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.

AQUIFER.--Dakota: in sandstone of Early Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 390 ft, cased to 390 perforated 386 to 390 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 1,320 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.50 ft above land-surface datum.

REMARKS.--Well D-11.

PERIOD OF RECORD.--March 1980 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 152.75 ft below land-surface datum, June 27, 1984; lowest measured, 155.50 ft below land-surface datum, Dec. 15, 1980.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 6	153.40	JAN 13	153.12	APR 14	153.14	JUL 8	153.56

424802095331201. Local number, 92-40-10 BDDD1.

LOCATION.--Lat 42°48'02", long 95°33'12", Hydrologic Unit 10230003, west of U.S. Highway 59, approximately 2.5 mi north of the City of Cherokee. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.

AQUIFER.--Dakota: in sandstone of Early Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2.50 in., depth 300 ft, cased to 300 ft, perforated 114 to 118 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 1,210 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.30 ft above land-surface datum.

REMARKS.--Well D-5.

PERIOD OF RECORD.--April 1980 to October 1980, May 1982 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 26.05 ft below land-surface datum, Jun. 27, 1984; lowest measured, 29.19 ft below land-surface datum, May 5, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 6	26.98	JAN 13	26.93	APR 14	26.61	JUL 8	26.99

CLAYTON COUNTY

424023091291201. Local number, 91-5-30 BBBB1.

LOCATION.--Lat 42°40'23", long 91°29'12", Hydrologic Unit 07060006, 5 mi northwest of the City of Edgewood, or 2 mi northwest of the junction of Iowa Highways 3 and 13 east of Strawberry Point. Owner: Harold Knight.

AQUIFER.--Glacial drift: in material of Pleistocene age.

WELL CHARACTERISTICS.--Dug unused water-table well, diameter 36 in., depth 36 ft.

INSTRUMENTATION.--Intermittent measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 1,233 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Hole in pump base at land-surface datum.

REMARKS.--Casing information not available.

PERIOD OF RECORD.--June 1957 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 14.06 ft below land-surface datum, Mar. 26, 1986; lowest measured, 30.68 ft below land-surface datum, Jan. 12, 1959.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 30	18.63	FEB 17	20.98	APR 14	20.56	JUL 7	20.97
DEC 9	20.15	MAR 12	21.06	MAY 26	19.86	AUG 18	15.45
JAN 21	21.37						

GROUND-WATER LEVELS

279

CLAYTON COUNTY

424057091320001. Local number, 91-6-22 ACAC1.

LOCATION.--Lat 42°40'57", long 91°32'00", Hydrologic Unit 07060006, southeast corner of the junction of Iowa Highways 3 and 13, Strawberry Point. Owner: City of Strawberry Point.

AQUIFER.--Silurian and Ordovician: in dolomite of Silurian age and Upper Ordovician age.

WELL CHARACTERISTICS.--Drilled unused artesian water well, diameter 16 in., 0-130 ft, 12 in. 130-161 ft, depth 492 ft, cased to 161 ft with a 10 in. liner 229-370 ft, open hole 161 to 229 ft and 370 to 492 ft.

INSTRUMENTATION.--Water-level recorder.

DATUM.--Elevation of land-surface datum is 1,219 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of recorder platform, 2.10 ft above land-surface datum.

REMARKS.--City well No. 2.

PERIOD OF RECORD.--March 1963 to current year.

REVISED RECORDS.--WDR IA-84-1.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 114.38 ft below land-surface datum, May 9, 1973; lowest recorded, 133.18 ft below land-surface datum, Feb. 4, 1968.

WATER LEVEL, IN FEET, BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
NOON VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	124.51	124.46	125.05	125.32	126.38	125.62	125.14	125.50	127.00	126.80	127.36	126.47
10	124.57	124.99	125.13	125.42	125.90	125.60	124.75	125.36	126.78	126.88	127.25	126.75
15	124.56	124.53	125.13	125.94	125.88	125.32	124.88	125.95	126.93	127.00	126.87	126.95
20	-----	124.77	125.39	125.71	125.95	125.29	124.45	126.08	126.55	127.08	127.12	126.88
25	124.54	124.93	125.10	126.00	125.82	124.85	125.06	126.17	126.45	127.20	126.74	126.97
DOM	124.50	125.12	125.23	125.92	125.31	124.97	125.23	126.69	126.77	127.23	126.65	126.99
WTR YEAR	1987	HIGHEST	124.03	OCT 7, 1986	LOWEST	127.58	AUG 7, 1987					

430156091182901. Local number, 95-4-22 BCBD1.

LOCATION.--Lat 43°01'56", long 91°18'29", Hydrologic Unit 07060001, approximately 2 mi north of the junction of U.S. Highway 18 and U.S. Highway 52-Iowa Highway 13, near Spook Cave. Owner: Gerald Mielke.

AQUIFER.--St. Peter: in sandstone of Middle Ordovician age.

WELL CHARACTERISTICS.--Drilled unused artesian water well, diameter 6 in., depth 49 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 940 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.00 ft above land-surface datum.

REMARKS.--Casing information not available. Water level for Mar. 7, 1984, 22.51 ft.

PERIOD OF RECORD.--October 1957 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 13.98 ft below land-surface datum, Dec. 7, 1983; lowest measured, 27.88 ft below land-surface datum, Mar. 4, 1968.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 10	23.26	MAR 11	22.25	APR 16	22.56	JUL 8	23.64

425940091194701. Local number, 95-4-32 DDDD1.

LOCATION.--Lat 42°59'40", long 91°19'47", Hydrologic Unit 07060004, 1 mi west of the junction of U.S. Highway 52 and Iowa Highway 13, or northeast of the Town of Farmersburg. Owner: Milton and Willis Meier.

AQUIFER.--St. Peter: in sandstone of Middle Ordovician age.

WELL CHARACTERISTICS.--Drilled stock artesian water well, diameter 6 in., depth 380 ft (reported).

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 1,090 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Plug in pump base, 1.00 ft above land-surface datum.

REMARKS.--Casing information not available. Water level form Mar. 7, 1984, 78.10 ft.

PERIOD OF RECORD.--October 1957 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 74.08 ft below land-surface datum, July 10, 1984; lowest measured, 126.56 ft below land-surface datum, Jan. 13, 1969.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 10	86.19	MAR 11	87.58	APR 16	87.50	JUL 8	95.62

GROUND-WATER LEVELS

CRAWFORD COUNTY

421031095225611. Local number, 85-39-16 ADDD11.

LOCATION.--Lat 42°10'31", long 95°22'56", Hydrologic Unit 10230007, approximately 2.5 mi east and 0.5 mi north of the Town of Schleswig. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.

AQUIFER.--Mississippian: in limestone of Mississippian age.

WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 561 ft, cased to 561 ft, perforated 543 to 561 ft.

INSTRUMENTATION.--Quarterly measurement with electric line by USGS personnel.

DATUM.--Elevation of land-surface datum is 1,370 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 3.14 ft above land-surface datum.

REMARKS.--Well WC-7B. Water level for Jan. 8, 1985, 307.26 ft.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 305.58 ft below land-surface datum, Feb. 8, 1983; lowest measured, 307.64 ft below land-surface datum, Oct. 4, 1983.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	306.54	JAN 14	307.16	APR 16	306.86	JUL 9	307.26

DELAWARE COUNTY

422029091144302. Local number, 87-3-18 CBCD2.

LOCATION.--Lat 42°20'37", long 91°14'47", Hydrologic Unit 07060006, behind the municipal utilities building in downtown Hopkinton. Owner: Town of Hopkinton.

AQUIFER.--Silurian: in dolomite of Silurian age.

WELL CHARACTERISTICS.--Drilled unused artesian water well, diameter 8 in., depth 86 ft.

INSTRUMENTATION.--Weekly measurement with chalked tape by observer. Monthly measurements beginning July 1987.

DATUM.--Elevation of land-surface datum is 863 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Nipple welded to plate on top of casing, 2.46 ft above land-surface datum.

REMARKS.--Casing information not available. Water levels affected by pumping of a nearby well.

PERIOD OF RECORD.--December 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 16.65 ft below land-surface datum, Nov. 6, 1986; lowest measured, 24.18 ft below land-surface datum, Jul. 15, 1987.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 3	18.37	JAN 3	18.20	APR 4	20.54	JUL 15	24.18
10	17.18	10	18.50	11	20.80	AUG 19	21.94
17	17.14	17	18.70	18	20.70	SEP 28	19.78
24	17.13	24	19.30	25	20.27		
31	17.25	FEB 3	19.45	MAY 2	20.52		
NOV 6	16.65	7	19.75	9	21.20		
14	16.80	14	19.91	16	21.31		
21	17.15	21	20.33	23	21.16		
28	17.59	28	22.25	30	21.21		
DEC 6	17.52	MAR 7	20.45	JUN 6	21.31		
13	17.88	14	20.70	13	21.14		
20	18.10	21	20.95	20	21.13		
27	18.03	28	21.00	27	21.19		

DES MOINES COUNTY

404844091142701. Local number, 69-3-6 AABA1.

LOCATION.--Lat 40°48'44", long 91°14'27", Hydrologic Unit 07080104, at the Iowa Army Ammunition Plant, near the Town of Middleton. Owner: Iowa Ordnance Plant.

AQUIFER.--St. Peter: in sandstone of Middle Ordovician age.

WELL CHARACTERISTICS.--Drilled unused artesian water well, diameter 16 in., depth 1,209 ft, cased to 855 ft, open hole 855 to 1,209 ft.

INSTRUMENTATION.--Intermittent measurement with chalked tape by observer.

DATUM.--Elevation of land-surface datum is 717 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of platform, 1.61 ft above land-surface datum.

REMARKS.--Plant well No. 3.

PERIOD OF RECORD.--March 1950 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 105.97 ft below land-surface datum, May 11, 1987; lowest measured, 201.75 ft below land-surface datum, Aug. 15, 1978.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 5	111.07	FEB 20	111.79	MAY 11	105.97	JUL 4	106.50
NOV 1	110.99	MAR 8	112.10	JUN 6	106.81	SEP 12	106.36
JAN 17	111.25						

GROUND-WATER LEVELS

281

DES MOINES COUNTY

404753091142501. Local number, 69-3-6 DDCD1.

LOCATION.--Lat 40°47'53", long 91°14'25", Hydrologic Unit 07080104, at the Iowa Army Ammunition Plant, near the Town of Middleton. Owner: Iowa Ordnance Plant.

AQUIFER.--Cedar Valley and Mississippian: in limestone of Devonian and Mississippian age.

WELL CHARACTERISTICS.--Drilled unused artesian water well, diameter 19 in., depth 675 ft, cased to 75 ft, open hole 75 to 675 ft.

INSTRUMENTATION.--Intermittent measurement with chalked tape by observer.

DATUM.--Elevation of land-surface datum is 699 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of platform, 1.91 ft above land-surface datum.

REMARKS.--Plant well No. 2.

PERIOD OF RECORD.--March 1950 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 74.46 ft below land-surface datum, Apr. 18, 1975; lowest measured, 83.19 ft below land-surface datum, Apr. 26, 1950.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 5	80.05	FEB 20	79.75	MAY 11	79.42	JUL 4	79.57
NOV 1	79.99	MAR 8	79.93	JUN 6	79.69	SEP 12	79.20
JAN 17	80.09						

EMMET COUNTY

432927094345501. Local number, 100-32-11 DDDD1.

LOCATION.--Lat 43°29'27", long 94°34'55", Hydrologic Unit 07100003, at Okamanpedan Lake Reserve State Park, north of the Town of Dolliver. Owner: State of Iowa.

AQUIFER.--Dakota: in sandstone of Early Cretaceous age.

WELL CHARACTERISTICS.--Drilled public-supply artesian water well, diameter 6 in., depth 277 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 1,233 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Plug in pump base, 0.61 ft above land-surface datum.

REMARKS.--Casing information not available.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 59.60 ft below land-surface datum, Dec. 19, 1946; lowest measured, 77.86 ft below land-surface datum, Aug. 27, 1979.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 24	67.66	JAN 5	69.57	JUN 23	72.96	SEP 16	73.01

GREENE COUNTY

415449094161501. Local number, 82-29-18 CAAA1.

LOCATION.--Lat 41°54'49", long 94°16'15", Hydrologic Unit 07100006, approximately 0.5 mi south and 4 mi east of the Village of Cooper and just south of County Road E-57. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.

AQUIFER.--Pennsylvanian: in sandstone of Pennsylvanian age.

WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 101 ft, cased to 100 ft, perforated 89 to 100 ft, open hole 100 to 101 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 960 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.00 ft above land-surface datum.

REMARKS.--Well WC-116.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.41 ft above land-surface datum, Jul. 5, 1983; lowest measured, 5.57 ft below land-surface datum, Jan. 7, 1986.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	2.43	JAN 14	2.46	APR 16	2.22	JUL 9	3.19

GROUND-WATER LEVELS

GREENE COUNTY

415449094173201. Local number, 82-30-13 CABA1.

LOCATION.--Lat 41°54'49", long 94°17'32", Hydrologic Unit 07100006, approximately 0.5 mi south and 3 mi east of the Village of Cooper and just south of County Road E-57. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.

AQUIFER.--Pennsylvanian and Mississippian: in sandstone of Pennsylvanian age and limestone of Mississippian age.

WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 230 ft, cased to 230 ft, perforated 209 to 230 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape or electric line by USGS personnel.

DATUM.--Elevation of land-surface datum is 1,035 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.45 ft above land-surface datum.

REMARKS.--Well WC-118. Original depth 245 ft, casing plugged at 230 ft. Water level for Jan. 8, 1985, 70.61 ft.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 66.79 ft below land-surface datum, Jul. 5, 1983; lowest measured, 72.59 below land-surface datum, Jan. 7, 1986.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	69.95	JAN 14	69.82	APR 16	69.62	JUL 9	70.57

GRUNDY COUNTY

422605092560001. Local number, 88-18-15 DBBB1.

LOCATION.--Lat 42°26'05", long 92°56'00", Hydrologic Unit 07080205, west of the corner of Monroe and 4th Streets and west of the high school, Wellsburg. Owner: City of Wellsburg.

AQUIFER.--Devonian: in limestone and dolomite of Upper Devonian age.

WELL CHARACTERISTICS.--Drilled public-emergency-supply artesian water well, diameter 12 in., depth 280 ft, cased to 128 ft, open hole 128 to 280 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 1,060 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Edge of vent pipe, 1.25 ft above land-surface datum.

REMARKS.--None.

PERIOD OF RECORD.--September 1960 to August 1971, May 1973 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 32.78 ft below land-surface datum, Jun. 18, 1987; lowest measured, 96.81 ft below land-surface datum, Sep. 27, 1960.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 29	33.88	JAN 13	34.06	JUN 18	32.78

HARRISON COUNTY

413838095462001. Local number, 79-42-19 AADB1.

LOCATION.--Lat 41°38'38", long 95°46'20", Hydrologic Unit 10230007, approximately 0.5 mi east of the Town of Logan, north of U.S. Highway 30. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.

AQUIFER.--Mississippian: in dolomite of Mississippian age.

WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 628 ft, cased to 628 ft, perforated 588 to 628 ft.

INSTRUMENTATION.--Intermittent measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 1,045 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 4.40 ft above land-surface datum.

REMARKS.--Well WC-22.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.33 ft above land-surface datum, Jun. 9, 1987; lowest measured, 16.37 ft below land-surface datum, Jun. 3, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 14	2.77	FEB 25	2.45	APR 28	2.37	JUN 9	+0.33
JAN 2	2.49	MAR 18	2.05	MAY 12	2.22	JUL 27	+0.09

HARRISON COUNTY

414955096000601. Local number, 81-44-18 AADA1.

LOCATION.--Lat 41°49'55", long 96°00'06", Hydrologic Unit 10230003, approximately 1.8 mi northeast of the Town of Little Sioux, just west of Iowa Highway 301. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.

AQUIFER.--Pennsylvanian: in sandstone of Pennsylvanian age.

WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 126 ft, cased to 126 ft, perforated 108 to 126 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 1,075 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.80 ft above land-surface datum.

REMARKS.--Well WC-23. Original depth 209 ft, casing plugged at 126 ft.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 52.33 ft below land-surface datum, Jul. 12, 1984; lowest measured, 64.07 ft below land-surface datum, Jan. 15, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 8	59.48	JAN 12	61.16	APR 13	58.40	JUL 6	60.29

HENRY COUNTY

405741091334501. Local number, 71-6-9 CBCA1.

LOCATION.--Lat 40°57'41", long 91°33'45", Hydrologic Unit 07080107, at Saunders Park in the southwest part of Mount Pleasant. Owner: City of Mount Pleasant.

AQUIFER.--Jordan: in strata of Cambrian and Ordovician age.

WELL CHARACTERISTICS.--Drilled municipal artesian water well, diameter 16 to 6 in., depth 1,896 ft, cased to 1,689 ft, open hole 1,689 to 1,896 ft.

INSTRUMENTATION.--Quarterly measurement with airline by USGS personnel.

DATUM.--Elevation of land-surface datum is 670 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.32 ft below land-surface datum.

REMARKS.--City well No. 3. Water levels affected by pumping. Well deepened from 1,802 to 1,896 ft in 1955. Records for 1945 to 1958, and 1961 to September 1985 are available in the files of the Iowa District Office.

PERIOD OF RECORD.--September 1945 to February 1958 and November 1961 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 71.60 ft below land-surface datum, Dec. 31, 1945; lowest measured (pumping), 259.32 ft below land-surface datum, Jan. 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 5	177.32	FEB 25	191.32	JUN 15	168.32	SEP 2	154.32

405810091330502. Local number, 71-6-9 ABAC2.

LOCATION.--Lat 40°58'10", long 91°33'05", Hydrologic Unit 07080107, in the city water plant on Adams Street, Mount Pleasant. Owner: City of Mount Pleasant.

AQUIFER.--Jordan: in strata of Cambrian and Ordovician age.

WELL CHARACTERISTICS.--Drilled municipal artesian water well, diameter 20 to 19 in., depth 1,860 ft, cased to 623 ft, open hole 623 to 1,860 ft.

INSTRUMENTATION.--Quarterly measurement with airline by USGS personnel.

DATUM.--Elevation of land-surface datum is 725 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Hole in pump base, 2.25 ft above land-surface datum.

REMARKS.--City well No. 4. Water levels affected by pumping.

PERIOD OF RECORD.--April 1946 to December 1950, January 1953 to March 1957 and May 1959 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 132.00 ft below land-surface datum, May 5, 1946; lowest measured, nonpumping, 208.25 ft below land-surface datum, Feb. 25, 1987.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 5	191.25	FEB 25	208.25	JUN 15	p230.25	SEP 2	206.25

p Well being pumped.

GROUND-WATER LEVELS

HENRY COUNTY

410852091394301. Local number, 73-7-9 AABD1.

LOCATION.--Lat 41°08'48", long 91°39'48", Hydrologic Unit 07080107, north of Main Street near the water tower, Wayland. Owner: Town of Wayland.

AQUIFER.--Glacial drift: in material of Pleistocene age.

WELL CHARACTERISTICS.--Dug unused water-table well, diameter 4 ft, depth 52 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 735 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of cement cover, 0.21 ft above land-surface datum.

REMARKS.--Casing information not available.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.30 ft below land-surface datum, Sep. 1, 1965; lowest measured, 14.69 ft below land-surface datum, Feb. 15, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 19	9.46	MAR 9	9.35	JUN 15	11.19	SEP 2	9.89

IDA COUNTY

422215095390811. Local number, 87-41-5 CCCC11.

LOCATION.--Lat 42°22'15", long 95°39'08", Hydrologic Unit 10230005, approximately 0.75 mi east and 6.5 mi south of the Village of Cushing. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.

AQUIFER.--Dakota: in sandstone of Early Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 490 ft, cased to 490 ft, perforated 301 to 305 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 1,344 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.72 ft above land-surface datum.

REMARKS.--Well D-10. Original depth, 510 ft, cemented back to 490 ft.

PERIOD OF RECORD.--June 1980 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 202.55 ft below land-surface datum, Jun. 4, 1980; lowest measured, 206.50 ft below land-surface datum, May 7, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 6	204.06	JAN 18	203.93	APR 14	203.87	JUL 8	204.07

423107095383201. Local number, 89-41-13 CCCC1.

LOCATION.--Lat 42°31'07", long 95°38'32", Hydrologic Unit 10230003, at a roadside park on County Road D-15, approximately 1.5 mi east and 3.5 mi north of the Village of Cushing. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.

AQUIFER.--Mississippian: in limestone of Mississippian age.

WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 469 ft, cased to 465 ft, sand point 465 to 468 ft, open hole 468 to 469 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 1,320 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.50 ft above land-surface datum.

REMARKS.--Well D-9.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 186.45 ft below land-surface datum, Jul. 27, 1983; lowest measured, 207.14 ft below land-surface datum, Apr. 8, 1980.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 6	188.87	JAN 18	189.03	APR 14	189.18	JUL 8	188.96

GROUND-WATER LEVELS

285

IOWA COUNTY

414709091515801. Local number, 81-9-35 BCAA1.

LOCATION.--Lat 41°47'09", long 91°51'58", Hydrologic Unit 07080208, approximately 400 ft northwest of the Iowa River, east of Iowa Highway 149, and approximately 1.1 mi south of the Village of Amana.

Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.

AQUIFER.--Iowa River Alluvial Aquifer: in sand and gravel of Holocene age.

WELL CHARACTERISTICS.--Drilled observation water-table well, diameter 10 in, depth 27 ft, cased to 18 ft, screen 18 to 27 ft.

INSTRUMENTATION.--Water-level recorder.

DATUM.--Elevation of land-surface datum is 710 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 4 ft above land-surface datum.

REMARKS.--Well IRA-24.

PERIOD OF RECORD.--December 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 2.90 ft below land-surface datum, Feb. 24, 1985; lowest recorded, 11.28 ft below land-surface datum, Sep. 12, 1985.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
NOON VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	4.90	6.00	6.70	7.72	8.50	8.45	6.66	7.25	8.48	9.45	10.24	6.57
10	5.64	6.37	6.67	7.91	8.47	8.23	6.75	7.64	8.74	9.58	10.36	7.35
15	5.10	6.70	6.92	8.05	8.55	7.99	6.36	8.05	8.92	9.70	10.45	7.77
20	4.57	6.88	6.78	8.16	8.63	7.49	6.25	8.26	9.05	9.70	10.55	7.72
25	5.21	6.70	7.13	8.30	8.72	7.23	6.41	8.26	---	9.85	10.55	8.07
EOM	5.57	6.94	7.43	8.43	8.69	6.51	---	8.30	9.30	10.06	4.71	8.31

WTR YEAR 1987 HIGHEST 4.24 OCT 3, 1986 LOWEST 10.58 AUG 24 and 25, 1987

414930092093801. Local number, 81-11-17 CBBC1.

LOCATION.--Lat 41°49'30", long 92°09'38", Hydrologic Unit 07080208, approximately 2.2 mi east of the Village of Koszta and 0.5 mi south of the Iowa River. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.

AQUIFER.--Iowa River Alluvial Aquifer: in sand and gravel of Holocene age.

WELL CHARACTERISTICS.--Drilled observation water-table well, diameter 2 in., depth 30 ft, cased to 27 ft, screen 27 to 30 ft.

INSTRUMENTATION.--Monthly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 745 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.60 ft above land-surface datum.

REMARKS.--Well IRA-6. Replaces well IRA 10-B. Records for 1984 to July 1986 are available in the files of the Iowa District Office.

PERIOD OF RECORD.--October 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.64 ft below land-surface datum, May 28, 1986; lowest measured, 9.26 ft below land-surface datum, Sep. 2, 1986.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
JUL 30	7.38	AUG 27	5.88	SEP 28	6.43

414816092053401. Local number, 81-11-23 DCCC1.

LOCATION.--Lat 41°48'16", long 92°05'34", Hydrologic Unit 07080208, approximately 0.75 mi west of the Town of Marengo, 0.5 mi north of Iowa Highway 212 and 0.5 mi south of the Iowa River. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.

AQUIFER.--Iowa River Alluvial Aquifer: in sand and gravel of Holocene age.

WELL CHARACTERISTICS.--Drilled observation water-table well, diameter 2 in., depth 31 ft, cased to 28 ft, screen 28 to 31 ft.

INSTRUMENTATION.--Monthly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 745 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.30 ft above land-surface datum.

REMARKS.--Well IRA-4A. Replaces well IRA-10A. Records for 1984 to July 1986 are available in the files of the Iowa District Office.

PERIOD OF RECORD.--October 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 1.65 ft below land-surface datum, May 28, 1986; lowest measured, 8.23 ft below land-surface datum, Sep. 2, 1985.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
JUL 30	6.17	AUG 27	4.50	SEP 28	5.69

GROUND-WATER LEVELS

IOWA COUNTY

415104092131101. Local number, 81-12-2 CCBB1.

LOCATION.--Lat 41°51'04", long 92°13'11", Hydrological Unit 07080208, approximately 0.6 mi north of the Iowa River, approximately 1.7 mi north and 1 mi west of the Village of Koszta. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.

AQUIFER.--Iowa River Alluvial Aquifer: in sand and gravel of Holocene age.

WELL CHARACTERISTICS.--Drilled observation water-table well, diameter 2 in, depth 34 ft, cased to 34 ft, screen 31 to 34 ft.

INSTRUMENTATION.--Monthly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 755 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.80 ft above land-surface datum.

REMARKS.--Well IRA-10A. No longer able to measure after January 1987.

PERIOD OF RECORD.--October 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.48 ft below land-surface datum, May 28, 1986; lowest measured, 9.65 ft below land-surface datum, Oct. 4, 1985.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 30	4.42	DEC 1	5.18

415104092131102. Local number, 81-12-2 CCBB2.

LOCATION.--Lat 41°51'04", long 92°13'11", Hydrologic Unit 07080208, approximately 0.6 mi north of the Iowa River, approximately 1.7 mi north and 1 mi west of the Village of Koszta. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.

AQUIFER.--Iowa River Alluvial Aquifer: in sand and gravel of Holocene age.

WELL CHARACTERISTICS.--Drilled observation water-table well, diameter 2 in, depth 17.5 ft, cased to 15.2 ft, slotted 15.2 to 17.5 ft.

INSTRUMENTATION.--Monthly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 755 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.31 ft above land-surface datum.

REMARKS.--Well IRA-10B. No longer able to measure after January 1987.

PERIOD OF RECORD.--October 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.42 ft below land-surface datum, May 28, 1986; lowest measured, 9.69 ft below land-surface datum, Sep. 2, 1985.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 30	4.35	DEC 1	5.29

415125092164201. Local number, 81-12-6 ADDA1.

LOCATION.--Lat 41°51'25", long 92°16'42", Hydrologic Unit 07080208, approximately 800 ft south of the Iowa River, west side of Iowa Highways 21 and 212, approximately 2 mi south of the Town of Belle Plaine. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.

AQUIFER.--Iowa River Alluvial Aquifer: in sand and gravel of Holocene age.

WELL CHARACTERISTICS.--Drilled observation water-table well, diameter 2 in, depth 36 ft, cased to 33 ft, screen 33 to 36 ft.

INSTRUMENTATION.--Monthly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 765 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.60 ft above land-surface datum.

REMARKS.--Well IRA-14.

PERIOD OF RECORD.--October 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.35 ft below land-surface datum, May 28, 1986; lowest measured, 12.68 ft below land-surface datum, Sep. 2, 1985.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 30	5.87	JAN 23	9.47	MAY 1	8.06	JUL 30	11.29
DEC 1	8.31	FEB 23	10.49	21	9.21	AUG 27	4.39
29	9.24	MAR 26	8.07	JUN 30	10.83	SEP 28	10.44

GROUND-WATER LEVELS

287

JACKSON COUNTY

420842090165701. Local number, 85-6E-29 ACAD1.

LOCATION.--Lat 42°08'42", long 90°16'57", Hydrologic Unit 07060005, 1 mi east of U.S. Highway 52, 2 mi southeast of the Village of Green Island beside the Chicago, Milwaukee, St. Paul and Pacific Railroad tracks in the Upper Mississippi River Wildlife and Fish Refuge. Owner: U.S. Geological Survey.

AQUIFER.--Mt. Simon: in sandstone of Early Cambrian age.

WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in. depth 1,804 ft, cased to 1,705 ft, screened 1,705 to 1,725 ft, open hole 1,725 to 1,804 ft.

INSTRUMENTATION.--Monthly measurement with engineers rule by USGS personnel.

DATUM.--Elevation of land-surface datum is 610 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Mark on angle iron attached to well house, 6.05 ft above land-surface datum.

REMARKS.--Flowing well.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 10.23 ft above land-surface datum, Sep. 11, 1987; lowest measured, 7.67 ft above land-surface datum, Sep. 6, 1984.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 28	+9.71	FEB 17	+9.60	MAY 21	+10.17	AUG 17	+10.06
DEC 8	+9.67	MAR 19	+9.74	JUN 15	+10.13	SEP 11	+10.23
JAN 20	+9.59	APR 13	+10.03	JUL 6	+10.03		

420842090165703. Local number, 85-6E-29 ACAD3.

LOCATION.--Lat 42°08'42", long 90°16'57", Hydrologic Unit 07060005, 1 mi east of U.S. Highway 52, 2 mi southeast of the Village of Green Island beside the Chicago, Milwaukee, St. Paul and Pacific Railroad tracks in the Upper Mississippi River Wildlife and Fish Refuge. Owner: U.S. Geological Survey.

AQUIFER.--St. Peter and Prairie du Chien: in sandstone and dolomite of Middle and Early Ordovician age.

WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 910 ft, cased to 604.2 ft, screened 604.2 to 624.2 ft, open hole 624.2 to 910 ft.

INSTRUMENTATION.--Monthly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 610 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.00 ft above land-surface datum.

REMARKS.--None.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.19 ft below land-surface datum, Jan. 8, 1986; lowest measured 9.90 ft below land-surface datum, Aug. 31, 1983.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 28	5.87	FEB 17	6.22	MAY 21	5.99	AUG 17	7.11
DEC 8	6.16	MAR 19	6.25	JUN 15	6.21	SEP 11	6.93
JAN 20	6.13	APR 13	5.97	JUL 6	6.63		

420842090165704. Local number, 85-6E-29 ACAD4.

LOCATION.--Lat 42°08'42", long 90°16'57", Hydrologic Unit 07060005, 1 mi east of U.S. Highway 52, 2 mi southeast of the Village of Green Island beside the Chicago, Milwaukee, St. Paul and Pacific Railroad tracks in the Upper Mississippi River Wildlife and Fish Refuge. Owner: U.S. Geological Survey.

AQUIFER.--Galena: in dolomite of Ordovician age.

WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 400 ft, cased to 299.6 ft, screened 299.6 to 319.6 ft, open hole 319.6 to 400 ft.

INSTRUMENTATION.--Monthly measurements with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 610 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.00 ft above land-surface datum.

REMARKS.--None.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 11.40 ft below land-surface datum May 15, 1986; lowest measured, 17.75 ft below land-surface datum, Jul. 6, 1987.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 28	12.34	FEB 17	16.53	MAY 21	16.41	AUG 17	17.16
DEC 8	15.59	MAR 19	16.17	JUN 15	17.22	SEP 11	16.99
JAN 20	16.17	APR 13	16.06	JUL 6	17.75		

GROUND-WATER LEVELS

JASPER COUNTY

414205092592001. Local number, 80-18-31 ABBB1.

LOCATION.--Lat 41°42'05", long 92°59'20", Hydrologic Unit 07080105, approximately 3 mi east of the City of Newton just south of U.S. Highway 6. Owner: P.W. Beukema.

AQUIFER.--Glacial drift: in material of Pleistocene age.

WELL CHARACTERISTICS.--Dug stock water-table well, diameter 36 in., depth 37 ft, cribbed with brick.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 940 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of cement platform, 0.70 ft above land-surface datum.

REMARKS.--None.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.67 ft below land-surface datum, Jun. 10, 1947; lowest measured, 27.15 ft below land-surface datum, Dec. 18, 1948.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	4.36	APR 2	4.80	JUL 2	6.32	SEP 16	4.30
JAN 9	5.91						

414147093035401. Local number, 80-19-33 ACAC1.

LOCATION.--Lat 41°41'47", long 93°03'54", Hydrologic Unit 07080105, 231 West 10th Street, Newton. Owner: John Coppess.

AQUIFER.--Jordan: in strata of Cambrian and Ordovician age.

WELL CHARACTERISTICS.--Drilled unused private artesian water well, diameter 12 to 6 in., depth 2,567 ft, cased to 1,750 ft, open hole 1,750 to 2,567 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 915 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Plug in cement well cover, 0.50 ft above land-surface datum.

REMARKS.--461 ft of the Prairie du Chien formation of Ordovician age, 262 ft of the St. Lawrence formation of Cambrian age, and 94 ft of Franconia sandstone of Cambrian age open.

PERIOD OF RECORD.--September 1963 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 98.43 ft below land-surface datum, Jun. 14, 1966; lowest measured, 271.19 ft below land-surface datum, Sep. 16, 1987.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	258.73	APR 2	258.40	JUL 2	262.25	SEP 16	271.19
JAN 9	258.15						

JOHNSON COUNTY

414107091322901. Local number, 79-6-4 AAAA1.

LOCATION.--Lat 41°41'07", long 91°32'29", Hydrologic Unit 07080209, at Forest View Trailer Court, northern edge of Iowa City. Owner: Forest View Trailer Court.

AQUIFER.--Silurian: in limestone of Silurian age.

WELL CHARACTERISTICS.--Drilled unused artesian water well, diameter 6 in., depth 280 ft, cased to 96 ft, open hole 96 to 280 ft.

INSTRUMENTATION.--Monthly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 735 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Nipple on plate welded to top of casing, 1.62 ft above land-surface datum.

REMARKS.--Water levels affected by wells in the area pumping in late spring, summer, and early fall. Water-level recorder removed October 1986.

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

REVISED RECORDS.--WDR IA-84-1.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 96.93 ft below land-surface datum, Mar. 23, 1979; lowest recorded, 146.01 ft below land-surface datum, Jul. 17, 1971.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 6	124.63	JAN 6	106.87	APR 3	104.98	JUL 6	132.96
NOV 6	119.10	FEB 6	106.75	MAY 6	119.34	AUG 5	136.90
DEC 5	108.86	MAR 9	105.00	JUN 5	126.98	SEP 4	131.25

GROUND-WATER LEVELS

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JOHNSON COUNTY

413925091324001. Local number, 79-6-9 DDBC1.

LOCATION.--Lat 41°39'34", long 91°32'42", Hydrologic Unit 07080209, at the Quadrangle Dormitory, University of Iowa, Iowa City. Owner: University of Iowa.

AQUIFER.--Silurian: in dolomite of Silurian age.

WELL CHARACTERISTICS.--Drilled unused artesian water well, diameter 12 in., depth 430.5 ft, cased to 225 ft, open hole 225 to 430.5 ft.

INSTRUMENTATION.--Monthly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 714 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Nipple welded to plate on top of casing, 1.81 ft above land-surface datum.

REMARKS.--Water levels affected by nearby wells pumping in late spring, summer, and early fall.

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

REVISED RECORDS.--WDR IA-84-1.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 75.02 ft below land-surface datum, Mar. 15, 1979; lowest measured, 165.93 ft below land-surface datum, Jul. 13, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE		WATER LEVEL	DATE		WATER LEVEL	DATE		WATER LEVEL
OCT	6	141.48	JAN	6	87.82	APR	3	80.97
NOV	6	120.14	FEB	6	88.15	MAY	6	122.54
DEC	5	92.81	MAR	9	82.03	JUN	5	141.58
						JUL	6	148.43
						AUG	5	154.01
						SEP	4	150.09

413955091320303. Local number, 79-6-10 BDBC3.

LOCATION.--Lat 41°39'58", long 91°32'06", Hydrologic Unit 07080209, at the Currier Hall Dormitory, University of Iowa, Iowa City. Owner: University of Iowa.

AQUIFER.--Silurian-Devonian: in dolomite of Devonian age and Silurian age.

WELL CHARACTERISTICS.--Drilled unused artesian water well, diameter 12 in., depth 425 ft, cased to 160 ft, open hole 160 to 425 ft.

INSTRUMENTATION.--Monthly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 707 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Nipple welded to plate on top of casing, 7.94 ft below land-surface datum.

REMARKS.--Water levels affected by nearby wells pumping in late spring, summer, and early fall.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 62.12 ft below land-surface datum, Apr. 23, 1973; lowest measured, 163.16 ft below land-surface datum, Jul. 14, 1978.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE		WATER LEVEL	DATE		WATER LEVEL	DATE		WATER LEVEL
OCT	6	146.81	JAN	6	73.06	APR	3	70.94
NOV	6	103.80	FEB	6	73.24	MAY	6	137.61
DEC	5	76.83	MAR	9	71.65	JUN	22	156.88
						JUL	6	158.69
						AUG	5	161.60
						SEP	4	160.71

413844091323201. Local number, 79-6-16 DDAD1.

LOCATION.--Lat 41°38'44", long 91°32'32", Hydrologic Unit 07080209, 1223 South Riverside Drive, Iowa City. Owner: Iowa City Community School District.

AQUIFER.--Silurian-Devonian: in limestone and dolomite of Devonian age and dolomite of Silurian age.

WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 6 in., depth 363 ft, cased to 66.5 ft, open hole 66.5 to 363 ft.

INSTRUMENTATION.--Monthly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 652 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Nipple welded to plate on top of casing, 2.12 ft above land-surface datum.

REMARKS.--Warehouse well. Water levels affected by wells in the area pumping in late spring, summer, and early fall. Main water, 214 to 215 ft, in the Silurian.

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

REVISED RECORDS.--WDR IA-84-1.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 9.96 ft below land-surface datum, Apr. 11, 1979; lowest measured, 32.94 ft below land-surface datum, Jul. 15, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE		WATER LEVEL	DATE		WATER LEVEL	DATE		WATER LEVEL
OCT	6	24.64	JAN	6	12.17	APR	3	11.65
NOV	6	22.28	FEB	6	12.38	MAY	6	16.41
DEC	5	14.98	MAR	9	12.02	JUN	5	25.28
						JUL	6	27.87
						AUG	5	30.52
						SEP	4	29.56

GROUND-WATER LEVELS

JOHNSON COUNTY

414458091260201. Local number, 80-5-9 DBBC1.

LOCATION.--Lat 41°44'58", long 91°26'02", Hydrologic Unit 07080209, in the southeast corner of the T junction of County Roads F8W and F36 in the Village of Morse. Owner: Mrs. Frank Miller.

AQUIFER.--Glacial drift: in material of Pleistocene age.

WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1.25 in., depth 15 ft, cased to 13 ft, sand point 13 to 15 ft.

INSTRUMENTATION.--Monthly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 762 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Nipple welded to casing, 2.72 ft above land-surface datum.

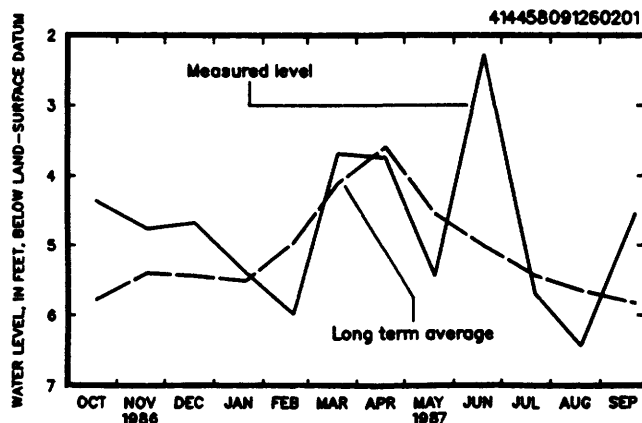
REMARKS.--Records for 1950 to September 1985 are available in the files of the Iowa District Office.

PERIOD OF RECORD.--August 1950 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.60 ft above land-surface datum, Mar. 14, 1953; lowest measured, 9.22 ft below land-surface datum, Sep. 8, 1955.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 22	4.36	JAN 22	5.39	APR 22	3.74	JUL 20	5.69
NOV 21	4.76	FEB 23	5.98	MAY 22	5.44	AUG 21	6.43
DEC 22	4.67	MAR 20	3.68	JUN 22	2.28	SEP 21	4.55



414315091252001. Local number, 80-5-22 CBCB1.

LOCATION.--Lat 41°43'15", long 91°25'20", Hydrologic Unit 07080209, along the Chicago, Rock Island and Pacific Railroad track, southeast of the overpass on Rapid Creek Road over the track, approximately 5.5 mi northeast of the junction of Interstate 80 and Iowa Highway 1. Owner: Chicago, Rock Island and Pacific Railroad Co.

AQUIFER.--Glacial drift: in material of Pleistocene age.

WELL CHARACTERISTICS.--Drilled unused water-table well, diameter 2.25 in., depth 20 ft, cased to 18 ft, screened 18 to 20 ft.

INSTRUMENTATION.--Monthly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 753 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Nipple welded to casing, 4.47 ft above land-surface datum.

REMARKS.--At the site of the former Elmira depot.

PERIOD OF RECORD.--October 1941 to September 1956, January 1958 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.78 ft below land-surface datum, Sep. 20, 1977; lowest measured, dry, Dec. 2-31, 1955 and Nov. 8 - Dec. 31, 1964.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 22	9.91	JAN 22	9.86	APR 22	9.71	JUL 20	13.17
NOV 21	9.80	FEB 23	10.06	MAY 22	9.76	AUG 21	13.62
DEC 22	9.77	MAR 20	10.13	JUN 22	13.21	SEP 21	13.68

GROUND-WATER LEVELS

291

JOHNSON COUNTY

414315091252002. Local number, 80-5-22 CBCB2.

LOCATION.--Lat 41°43'15", long 91°25'20", Hydrologic Unit 07080209, along the Chicago, Rock Island and Pacific Railroad track, southeast of the overpass on Rapid Creek Road over the track, approximately 5.5 mi northeast of the junction of Interstate 80 and Iowa Highway 1. Owner: Chicago, Rock Island and Pacific Railroad Co.

AQUIFER.--Cedar Valley: in limestone of Devonian age.

WELL CHARACTERISTICS.--Drilled unused artesian water well, diameter 5 in., depth 82 ft.

INSTRUMENTATION.--Monthly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 753 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Nipple welded to plate on top of casing, 4.01 ft above land-surface datum.

REMARKS.--Casing information not available. At the site of the former Elmira depot.

PERIOD OF RECORD.--December 1941 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 8.15 ft below land-surface datum, Apr. 21, 1952; lowest measured, 21.05 ft below land-surface datum, Sep. 26, 1957.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 22	14.91	JAN 22	15.37	APR 22	14.31	JUL 20	16.49
NOV 21	15.11	FEB 23	15.95	MAY 22	15.51	AUG 21	17.60
DEC 22	14.93	MAR 20	14.62	JUN 22	14.54	SEP 21	16.66

414853091425101. Local number, 81-7-19 ECBB1.

LOCATION.--Lat 41°48'53", long 91°42'51", Hydrologic Unit 07080208, approximately 0.75 mi west and 2.25 mi south of the Town of Swisher. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.

AQUIFER.--Silurian-Devonian: in dolomite of Silurian age and limestone of Devonian age.

WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 6 in., depth 535 ft, cased to 130 ft, open hole 130 to 535 ft.

INSTRUMENTATION.--Water-level recorder.

DATUM.--Elevation of land-surface datum is 745 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 3.50 ft above land-surface datum.

REMARKS.--Plum Creek well.

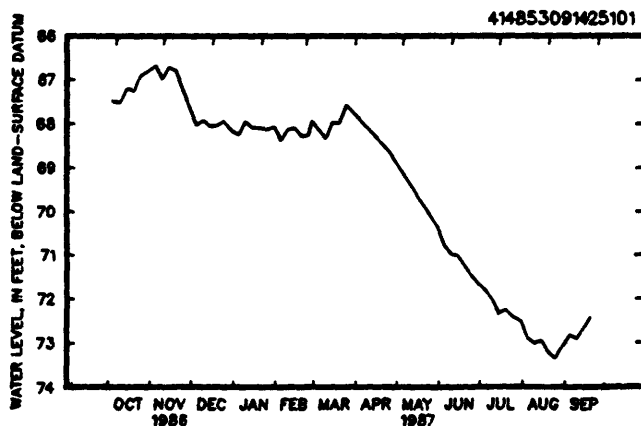
PERIOD OF RECORD.--November 1976 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 64.46 ft below land-surface datum, May 31, 1983; lowest recorded, 74.85 ft below land-surface datum, Oct. 9, 1985.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
NOON VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	67.48	66.67	68.03	68.25	68.38	68.15	-----	-----	70.78	e71.80	72.89	72.83
10	67.52	66.98	67.93	67.95	68.13	68.33	-----	-----	70.98	e72.00	73.01	72.91
15	67.20	66.72	68.05	68.09	68.09	67.97	-----	-----	71.01	72.33	72.96	72.69
20	67.26	66.79	68.04	68.10	68.28	67.99	-----	-----	71.26	72.25	e73.20	72.44
25	66.91	67.22	67.95	68.13	68.26	67.57	68.61	-----	71.47	e72.40	73.35	-----
EOB	66.80	67.62	68.16	68.07	67.94	-----	-----	70.35	71.66	72.51	73.06	-----
WTR YEAR 1987	HIGHEST			66.37	NOV 8, 1986			LOWEST	73.45	AUG 24, 1987		

e Estimated.



GROUND-WATER LEVELS

JONES COUNTY

415808091160501. Local number, 83-4-25 CBBB1.

LOCATION.--Lat 41°58'08", long 91°16'05", Hydrologic Unit 07080103, 4 mi north of the Town of Mechanicsville and 1 mi west of County Road X-40. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.

AQUIFER.--Silurian: in dolomite of Silurian age.

WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 6 in. to 41 ft, 5 in. to 517 ft, depth 517 ft, cased to 41 ft, open hole 41 to 517 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 807 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Nipple welded to plate on top of casing, 2.16 ft above land-surface datum.

REMARKS.--White Oak Creek well.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 1.24 ft below land-surface datum, Apr. 3, 1979; lowest measured, 5.49 ft below land-surface datum, Jun. 29, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 1	1.99	MAR 20	3.28	JUN 9	2.58	AUG 10	4.34

LEE COUNTY

403630091240801. Local number, 67-5-14 BAAD1.

LOCATION.--Lat 40°36'30", long 91°24'08", Hydrologic Unit 07080104, approximately 1 mi east of U.S. Highway 61 and 0.5 mi north of the Atchison, Topeka, and Santa Fe railroad tracks, approximately 1.4 mi west and 1.1 mi south of the City of Fort Madison. Owner: U.S. Geological Survey.

AQUIFER.--Alluvial: in sand and gravel of Holocene age.

WELL CHARACTERISTICS.--Driven observation water-table well, diameter 1.25 in., depth 12 ft, cased to 10 ft, sand point 10 to 12 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 530 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Nipple welded to casing, 3.55 ft above land-surface datum.

REMARKS.--Records for 1950 to 1981 and September 1985 are available in the files of the Iowa District Office.

PERIOD OF RECORD.--June 1950 to September 1981, September 1985 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 1.29 ft below land-surface datum, Nov. 19, 1986; lowest measured, 9.70 ft below land-surface datum, Jan. 29, 1953.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 19	1.29	MAR 19	2.39	JUN 25	2.71	JUL 14	5.22

LINN COUNTY

415534091251502. Local number, 82-5-10 CBAA2.

LOCATION.--Lat 41°55'26", long 91°25'11", Hydrologic Unit 07080206, next to the water tower, north of Main Street, 3 blocks west of Iowa Highway 1 in Mt. Vernon. Owner: City of Mt. Vernon.

AQUIFER.--Jordan: in strata of Cambrian and Ordovician age.

WELL CHARACTERISTICS.--Drilled unused municipal artesian water well, diameter 12 to 8 in., depth 1,557 ft, cased to 1,054 ft, open hole 1,054 to 1,557 ft.

INSTRUMENTATION.--Monthly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 895 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Nipple on plate welded to casing, 1.59 ft above land-surface datum.

REMARKS.--None.

PERIOD OF RECORD.--March 1987 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 332.46 ft below land-surface datum, Mar. 24, 1987; lowest measured, 333.84 ft below land-surface datum, Sep. 21, 1987.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
MAR 4	333.33	APR 22	332.71	JUN 22	332.96	AUG 21	333.27
MAR 24	332.46	MAY 22	332.68	JUL 20	333.41	SEP 21	333.84

GROUND-WATER LEVELS

293

LINN COUNTY

415422091422601. Local number, 82-7-18 CDGD1.

LOCATION.--Lat 41°54'22", long 91°42'26", Hydrologic Unit 07080205, on 76th Avenue SW, approximately 1.5 mi west of U.S. Highway 218, Cedar Rapids. Owner: Lester Petrak.

AQUIFER.--Glacial drift: in material of Pleistocene age.

WELL CHARACTERISTICS.--Dug unused water-table well, diameter 4 ft, depth 14 ft, cribbed with brick.

INSTRUMENTATION.--Water-level recorder.

DATUM.--Elevation of land-surface datum is 835 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Base of recorder shelter, 0.25 ft above land-surface datum.

REMARKS.--None.

PERIOD OF RECORD.--July 1959 to current year.

REVISED RECORDS.--WDR IA-84-1.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 1.09 ft below land-surface datum, Aug. 4, 1968; lowest recorded, 11.75 ft below land-surface datum, Feb. 8, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
NOON VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	4.53	4.93	4.82	5.68	6.60	6.75	4.72	5.21	5.56	7.14	8.50	6.82
10	4.81	5.12	4.92	5.83	6.70	6.14	4.90	5.32	5.84	7.32	8.53	7.20
15	4.94	5.18	5.10	5.99	6.86	5.85	4.67	5.57	6.14	7.43	8.72	7.50
20	5.00	5.32	5.27	6.07	7.02	4.35	4.79	5.67	6.42	7.61	8.88	7.40
25	5.09	5.13	5.34	6.22	7.16	4.63	4.95	5.27	6.66	7.86	9.02	7.58
EOB	4.70	5.22	5.50	6.40	7.19	4.18	5.07	5.40	6.89	8.20	6.50	7.78

WTR YEAR 1987 HIGHEST 3.54 OCT 1, 1986 LOWEST 9.05 AUG 25, 1987

e Estimated.

415509091461801. Local number, 82-8-20 ACBB1.

LOCATION.--Lat 41°55'09", long 91°46'18", Hydrologic Unit 070802005, approximately 1.5 mi southwest of the Town of Fairfax, just northwest of Iowa Highway 149. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.

AQUIFER.--Silurian-Devonian: in limestone of Devonian age and dolomite of Silurian age.

WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 5 in., depth 569 ft, cased to 100.5 ft, open hole 100.5 to 569 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 842 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Nipple welded to plate on top of casing, 2.39 ft above land-surface datum.

REMARKS.--Rock Pile well.

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

REVISED RECORDS.--WDR IA-84-1.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 96.70 ft below land-surface datum, Jun. 21, 1974; lowest measured, 108.37 ft below land-surface datum, Jul. 22 and 23, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 1	100.54	MAR 24	100.44	JUN 9	101.76	AUG 10	103.09

415834091351601. Local number, 83-6-30 ABBA1.

LOCATION.--Lat 41°58'34", long 91°35'16", Hydrologic Unit 07080206, approximately 200 ft west of 5201 Mount Vernon Road SE, Cedar Rapids. Owner: B.L. Anderson.

AQUIFER.--Silurian-Devonian: in limestone of Devonian age and dolomite of Silurian age.

WELL CHARACTERISTICS.--Drilled unused artesian water well, diameter 6 in., depth 76.5 ft.

INSTRUMENTATION.--Monthly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 755 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Hole in pump base, 0.50 ft above land-surface datum.

REMARKS.--Katz well. Casing information not available. Devonian rock reported to yield little, if any, water. Records for 1940 to September 1985 are available in the files of the Iowa District Office.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 41.93 ft below land-surface datum, Apr. 25, 1973; lowest measured, 53.90 ft below land-surface datum, Dec. 21, 1970.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 22	47.34	JAN 22	48.52	APR 22	48.28	JUL 20	51.00
NOV 21	47.76	FEB 23	49.13	MAY 22	48.72	AUG 21	49.89
DEC 22	47.99	MAR 20	49.10	JUN 22	49.09	SEP 21	49.57

GROUND-WATER LEVELS

LINN COUNTY

415816N091393401. Local number, 83-7-28 ADDA1.

LOCATION.--Lat 41°58'16", long 91°39'34", Hydrologic Unit 07080205, 320 11th Avenue SE, Cedar Rapids.

Owner: Robert Chadima.

AQUIFER.--Silurian: in limestone of Silurian age.

WELL CHARACTERISTICS.--Drilled unused artesian water well, diameter 10 in., depth 420 ft, cased to 75 ft, open hole 75 to 420 ft.

INSTRUMENTATION.--Water-level recorder.

DATUM.--Elevation of land-surface datum is 735 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of recorder platform, 2.95 ft below land-surface datum.

REMARKS.--Formerly The Kacena Co., Inc.

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

REVISED RECORDS.--WDR IA-84-1.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 51.10 ft below land-surface datum, Feb. 25, 1963; lowest recorded, 101.40 ft below land-surface datum, Jul. 27, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

NOON VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	95.67	94.58	91.70	88.97	88.59	87.77	87.73	89.81	90.95	91.82	92.47	93.08
10	95.77	94.83	91.05	88.64	88.03	87.90	87.75	89.56	91.15	92.02	92.61	92.84
15	95.69	93.70	90.58	88.85	87.95	87.46	87.92	90.33	91.24	92.20	92.99	92.55
20	95.43	93.05	90.37	88.42	88.12	87.90	88.43	89.93	91.34	92.45	93.00	92.40
25	95.07	92.45	89.75	88.43	87.97	87.38	89.05	90.08	91.61	92.38	93.33	92.48
EOB	95.03	91.93	89.32	87.95	87.25	87.60	89.42	90.38	91.97	92.42	93.30	92.17

WTR YEAR 1987 HIGHEST 86.78 MAR 1, 1987 LOWEST 95.90 OCT 9, 1986

415725091410101. Local number, 83-7-32 ACDC1.

LOCATION.--Lat 41°57'25", long 91°41'01", Hydrologic Unit 07080205, northwest corner of 22nd Avenue SW and 11th Street SW, Cedar Rapids. Owner: Floyd Fetter.

AQUIFER.--Silurian: in limestone of Silurian age.

WELL CHARACTERISTICS.--Drilled unused artesian water well, diameter 5 in., depth 282 ft.

INSTRUMENTATION.--Monthly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 805 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Plug in well cover at land-surface datum.

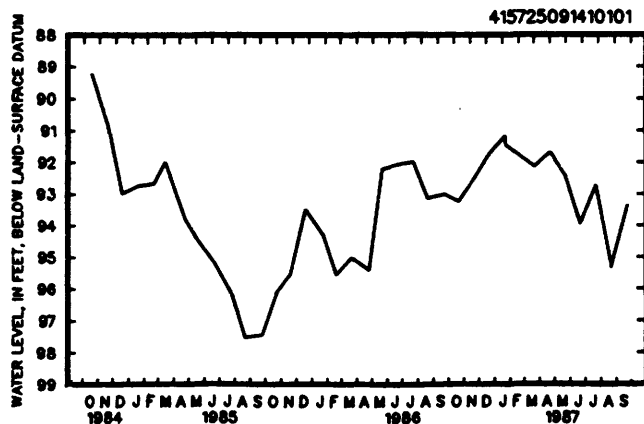
REMARKS.--Casing information not available.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 75.80 ft below land-surface datum, Jan. 26, 1942; lowest measured, 107.00 ft below land-surface datum, Sept. 16, 1976.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 22	93.23	JAN 22	91.17	APR 22	91.68	JUL 20	92.73
NOV 21	92.52	FEB 23	91.44	MAY 22	92.45	AUG 21	95.32
DEC 22	91.74	MAR 20	92.13	JUN 22	93.95	SEP 21	93.37



GROUND-WATER LEVELS

295

LINN COUNTY

420526091370701. Local number, 84-7-13 BCB1.

LOCATION.--Lat 42°05'26", long 91°37'07", Hydrologic Unit 07080206, approximately 0.25 mi south of the junction of County Roads W-58 and E-34, on the east side of the road, or approximately 3.75 mi north of the City of Marion. Owner: U.S. Geological Survey.

AQUIFER.--Glacial drift: in material of Pleistocene age.

WELL CHARACTERISTICS.--Drilled observation water-table well, diameter 1.25 in., depth 17 ft, cased to 15 ft, screened 15 to 17 ft.

INSTRUMENTATION.--Monthly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 882 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Nipple welded to casing, 1.24 ft above land-surface datum.

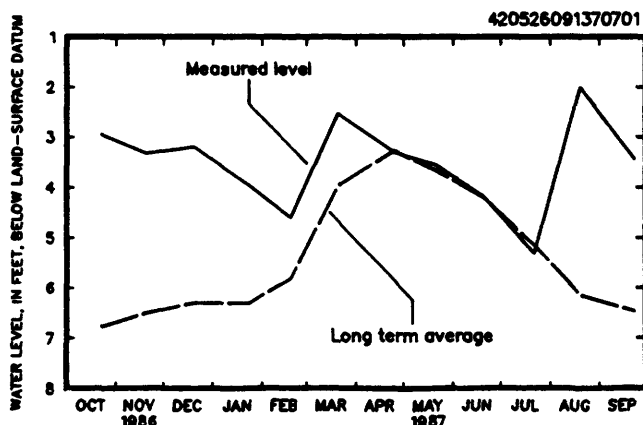
REMARKS.--None.

PERIOD OF RECORD.--September 1948 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.93 ft below land-surface datum, May 18, 1982; lowest measured, 15.19 ft below land-surface datum, Jan. 20, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 22	2.95	JAN 22	3.96	APR 22	3.30	JUL 20	5.32
NOV 21	3.32	FEB 23	4.60	MAY 22	3.55	AUG 21	2.01
DEC 22	3.19	MAR 20	2.53	JUN 22	4.17	SEP 21	3.44



421149091403301. Local number, 85-7-4 CCCC1.

LOCATION.--Lat 42°11'49", long 91°40'33", Hydrologic Unit 07080205, approximately 5 mi east of the Town of Center Point, north side of County Road E-16. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.

AQUIFER.--Silurian-Devonian: in dolomite of Silurian age and limestone of Devonian age.

WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 6 in., depth 435 ft, cased to 41 ft, 5 in. liner 129 to 147 ft, open hole 41 to 129 ft and 147 to 435 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 912 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Nipple welded to plate on top of casing, 1.21 ft above land-surface datum.

REMARKS.--Alice well.

PERIOD OF RECORD.--July 1973 to current year.

REVISED RECORDS.--WDR IA-84-1.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 17.06 ft below land-surface datum, Jun. 10, 1974; lowest measured, 32.87 ft below land-surface datum, Mar. 23, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 1	24.82	MAR 20	26.97	JUN 9	26.08	AUG 10	28.53

431812096302701. Local number. 98-48-16 DDAD1.

AQUIFER.--Dakota: in sandstone of Early Cretaceous age.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.

REMARKS.--Well D-20. Sioux quartzite from 353 to 358 ft.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 91.89 ft below land-surface datum, Jul. 8, 1986; lowest measured, 97.56 ft below land-surface datum, Dec. 9, 1982.

DATE			WATER LEVEL			DATE			WATER LEVEL		
OCT	9	93.06	JAN	13	93.48	APR	14	93.73	JUL	7	94.50

AQUIFER.--Glacial drift: in material of Pleistocene age.

REMARKS. --None.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.41 ft above land-surface datum, May 9, 1979; lowest measured, 9.74 ft below land-surface datum, Oct. 24, 1940.

DATE		WATER LEVEL	DATE		WATER LEVEL	DATE		WATER LEVEL	DATE		WATER LEVEL
OCT	9	0.19	JAN	13	0.82	APR	14	0.83	JUL	7	0.61

AQUIFER.--Dakota: in sandstone of Early Cretaceous age

INSTRUMENTATION.--Intermittent measurement with chalked tape by USGS personnel.

REMARKS.--City test well No. 3.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 100.08 ft below land-surface datum, Jul. 27, 1964; lowest measured, 114.60 ft below land-surface datum, May 7, 1985.

DATE		WATER LEVEL	DATE		WATER LEVEL	DATE		WATER LEVEL	DATE		WATER LEVEL
DEC	15	112.58	MAR	10	113.04	JUN	10	113.02	SEP	30	113.59
FEB	3	112.84	APR	29	112.77	JUL	15	113.19			



GROUND-WATER LEVELS

297

LYON COUNTY

432601096335511. Local number, 100-48-31 CCCC11. LOCATION.--Lat 43°26'01", long 96°33'55", Hydrologic Unit 10170203, 0.5 mi west and 2.5 mi south of the Village of Granite. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey. AQUIFER.--Dakota: in sandstone of Early Cretaceous age. WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 657 ft, cased to 657 ft, perforated 450 to 455 ft and 630 to 650 ft. INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. DATUM.--Elevation of land-surface datum is 1,417 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing at land-surface datum. REMARKS.--Well D-19. PERIOD OF RECORD.--December 1978 to December 1980, May 1982 to current year. EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 152.17 ft below land-surface datum, Oct. 9, 1986; lowest measured, 157.53 ft below land-surface datum, Aug. 12, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 9	152.17	JAN 13	153.03	APR 14	153.01	JUL 7	153.75

MADISON COUNTY

411727093483001. Local number, 75-26-23 AAAC1. LOCATION.--Lat 41°17'27", long 93°48'30", Hydrologic Unit 07100008, near the shelter house in the city park, St. Charles. Owner: City of St. Charles. AQUIFER.--Mississippian: in limestone of Mississippian age. WELL CHARACTERISTICS.--Drilled unused artesian water well, diameter 10 in., depth 1,058 ft, cased to 657 ft, open hole 657 to 1,058 ft. INSTRUMENTATION.--Intermittent measurement with chalked tape by USGS personnel. DATUM.--Elevation of land-surface datum is 1,067 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Plug in well cover, 1.20 ft above land-surface datum. REMARKS.--City well No. 1. PERIOD OF RECORD.--November 1962 to current year. EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 261.62 ft below land-surface datum, Nov. 20, 1962; lowest measured, 275.80 ft below land-surface datum, Mar. 31, 1987.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

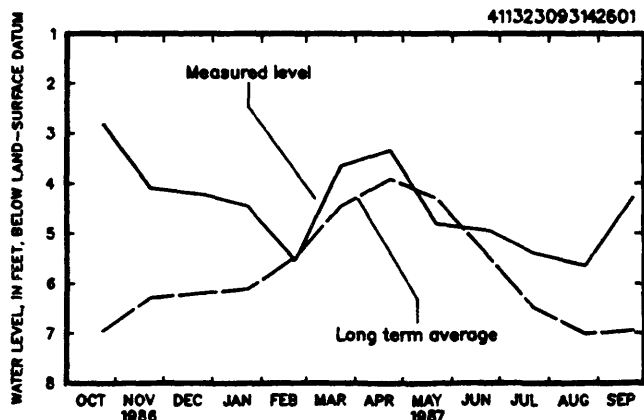
DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 15	273.02	MAR 31	275.80

MARION COUNTY

411323093142601. Local number, 74-21-11 BBCE1. LOCATION.--Lat 41°13'23", long 93°14'26", Hydrologic Unit 07100008, north of the water tower in the town square, Melcher. Owner: Town of Melcher. AQUIFER.--Glacial drift: in material of Pleistocene age. WELL CHARACTERISTICS.--Drilled unused water-table well, diameter 18 in., depth 12.2 ft, lined with tile. INSTRUMENTATION.--Twice a month measurement with chalked tape by observer. DATUM.--Elevation of land-surface datum is 948 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of tile casing at land-surface datum. REMARKS.--Town well No. 2. Depth formerly 25 ft, re-measured in 1981. PERIOD OF RECORD.--March 1950 to current year. EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.30 ft below land-surface datum, May 23, 1966; lowest measured, 16.27 ft below land-surface datum, Oct. 22, 1953.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 13	2.52	JAN 6	4.75	APR 6	3.58	JUL 13	4.37
24	2.82	16	4.45	21	3.34	22	5.40
NOV 10	3.68	FEB 11	5.31	MAY 9	4.09	AUG 15	5.29
22	4.09	23	5.55	22	4.81	24	5.66
DEC 10	4.15	MAR 5	5.25	JUN 16	5.70	SEP 12	5.13
22	4.22	20	3.65	25	4.94	22	4.28



GROUND-WATER LEVELS

MARION COUNTY

411329093142902. Local number, 74-21-11 DBBB2.

1A

LOCATION.--Lat 41°13'29", long 93°14'29", Hydrologic Unit 07100008, southeast corner of the T junction of North B Street and Main Street, Melcher. Owner: Town of Melcher.

AQUIFER.--Glacial drift: in sand and gravel of Pleistocene age.

WELL CHARACTERISTICS.--Drilled unused artesian water well, diameter 6 in., depth 119 ft, cased to 76 ft, open hole 76 to 119 ft.

INSTRUMENTATION.--Twice a month measurement with chalked tape by observer.

DATUM.--Elevation of land-surface datum is 943 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Nipple welded to plate on top of casing, 1.82 ft above land-surface datum.

REMARKS.--Sand and gravel 103 to 117 ft. Pennsylvanian shale 117 to 119 ft. Records for 1945 to 1955 and 1976 to September 1985 are available in the files of the Iowa District Office. Town well No. 3. Well 11K1.

PERIOD OF RECORD.--July 1945 to December 1955, October 1976 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 13.43 ft below land-surface datum, May 21, 1986; lowest measured (nearby well pumping), 108.85 ft below land-surface datum, Dec. 4, 6-7, 1949.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 13	14.43	JAN 6	20.01	APR 6	16.91	JUL 13	17.13
24	15.49	16	20.13	21	16.86	22	19.83
NOV 10	15.61	FEB 11	19.83	MAY 9	17.23	AUG 15	18.06
22	18.43	23	21.13	22	19.79	24	20.61
DEC 10	18.57	MAR 5	18.93	JUN 16	20.48	SEP 12	19.28
22	18.73	20	16.93	25	17.85	22	17.78

411328093143503. Local number, 74-21-11 CAAD3.

LOCATION.--Lat 41°13'28", long 93°14'35", Hydrologic Unit 07100008, northeast corner of the junction of West 1st Street and North A Street, Melcher. Owner: Town of Melcher.

AQUIFER.--Glacial drift: in sand of Pleistocene age.

WELL CHARACTERISTICS.--Drilled unused artesian water well, diameter 1.25 in., depth 96.5 ft, cased to 80 ft, screen 80 to 82 ft, open hole 82 to 96.5 ft.

INSTRUMENTATION.--Twice a month measurement with chalked tape by observer.

DATUM.--Elevation of land-surface datum is 944 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Nipple welded to casing, 0.51 ft above land-surface datum.

REMARKS.--Town well No. 5. Well 11L1. Records for 1956 to September 1985 are available in the files of the Iowa District Office.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 10.55 ft below land-surface datum, May 21, 1986; lowest measured (nearby well pumping), 55.22 ft below land-surface datum, Jan. 26, 1956.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 13	10.75	JAN 6	11.15	APR 6	11.05	JUL 13	11.45
24	10.71	16	11.35	21	10.76	22	11.62
NOV 10	10.70	FEB 11	11.70	MAY 9	11.01	AUG 15	11.78
22	10.74	23	11.91	22	11.21	24	11.92
DEC 10	10.81	MAR 5	11.75	JUN 16	11.74	SEP 12	11.43
22	11.05	20	11.45	25	11.59	22	11.24

MARSHALL COUNTY

420355092534701. Local number, 84-18-24 CDCA1.

LOCATION.--Lat 42°03'55", long 92°53'47", Hydrologic Unit 07080208, east of Riverview Park and south of the sewage treatment plant, Marshalltown. Owner: City of Marshalltown.

AQUIFER.--Glacial drift: in sand and gravel of Pleistocene age.

WELL CHARACTERISTICS.--Drilled unused artesian water well, diameter 8 in., depth 200 ft, cased to 190 ft, screened 190 to 200 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape or electric line by USGS personnel.

DATUM.--Elevation of land-surface datum is 871 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing at land-surface datum.

REMARKS.--None.

PERIOD OF RECORD.--May 1949 to August 1971, March 1973 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.92 ft below land-surface datum, Jul. 13, 1951; lowest measured, 54.95 ft below land-surface datum, May 8, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 25	40.02	MAR 25	33.85	JUL 23	32.87	AUG 31	31.84

GROUND-WATER LEVELS

299

MONTGOMERY COUNTY

405841095012701. Local number, 71-36-6 DADA1.

LOCATION.--Lat 40°58'41", long 95°01'27", Hydrologic Unit 10240009, east of Viking Lake in Viking Lake State Park, or approximately 4 mi east of the town of Stanton and 0.25 mi south of U.S. Highway 34, Owner: State of Iowa.

AQUIFER.--Glacial drift: in material of Pleistocene age.

WELL CHARACTERISTICS.--Drilled observation water-table well, diameter 1.25 in., depth 38 ft, cased to 36 ft, screened 36 to 38 ft.

INSTRUMENTATION.--Intermittent measurement with chalked tape by USGS personnel or observer.

DATUM.--Elevation of land-surface datum is 1,081 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.95 ft above land-surface datum.

REMARKS.--None.

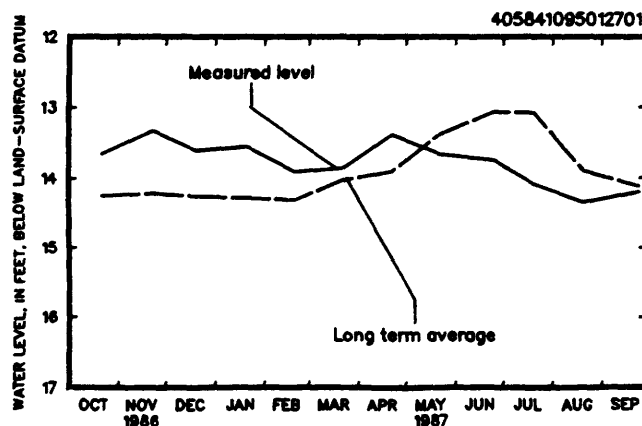
PERIOD OF RECORD.--April 1950 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.52 ft below land-surface datum, May 31, 1951; lowest measured (pumping), 30.99 ft below land-surface datum, Apr. 26, 1950.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 2	14.32	JAN 23	13.55	APR 15	13.58	JUL 9	13.70
22	13.65	FEB 4	13.88	22	13.39	22	14.09
NOV 12	13.53	20	13.91	MAY 21	13.66	AUG 18	14.38
23	13.33	MAR 18	14.14	JUN 4	13.51	20	14.35
DEC 15	13.47	23	13.86	25	13.75	SEP 20	14.20
22	13.16						

e Estimated



410057095075101. Local number, 72-37-29 BABA1.

LOCATION.--Lat 41°00'57", long 95°07'51", Hydrologic Unit 10240005, approximately 4.35 mi east of the City of Red Oak, just south of County Road H-34. Owner: John Ogden.

AQUIFER.--Glacial drift: in material of Pleistocene age.

WELL CHARACTERISTICS.--Bored observation water-table well, diameter 3 in., depth 40 ft, cased to 40 ft, perforated.

INSTRUMENTATION.--Intermittent measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 1,275 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.30 ft above land-surface datum.

REMARKS.--Interval of perforation not available. Records for 1937 to September 1985 are available in the files of the Iowa District Office.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.94 ft below land-surface datum, Jun. 20, 1984; lowest measured, dry, Jul. 8, 1963 and Feb. 3, 1964.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 2	12.04	FEB 4	12.93	APR 15	7.59	JUL 9	6.25
NOV 12	8.92	MAR 18	14.03	JUN 4	4.26	AUG 18	12.64
DEC 15	10.22						

GROUND-WATER LEVELS

MUSCATINE COUNTY

412120091080401. Local number, 76-2-30 CBAA1.

LOCATION.--Lat 41°21'20", long 91°08'04", Hydrologic Unit 07080101, west of the Town of Fruitland on an Iowa State University Agricultural Experiment Farm. Owner: U.S. Geological Survey.

AQUIFER.--Alluvial: in sand and gravel of Holocene age.

WELL CHARACTERISTICS.--Drilled observation water-table well, diameter 6 in., depth 27 ft, cased to 24 ft, screened 24 to 27 ft.

INSTRUMENTATION.--Water-level recorder.

DATUM.--Elevation of land-surface datum is 546 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Base of recorder shelter, 3.70 ft above land-surface datum.

REMARKS.--None.

PERIOD OF RECORD.--May 1966 to current year.

REVISED RECORDS.--WDR IA-84-1.

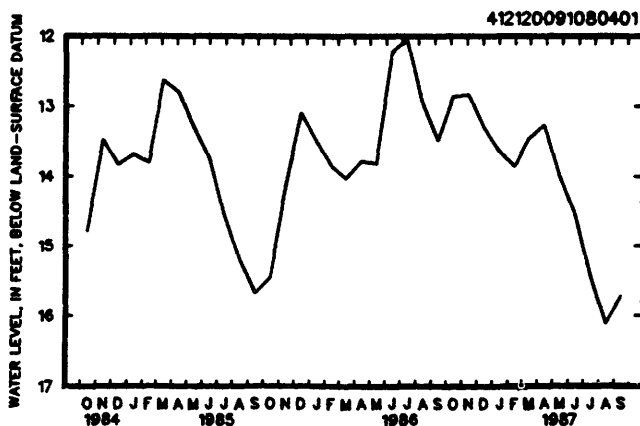
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 8.51 ft below land-surface datum, May 16, 1973; lowest recorded, 16.19 ft below land-surface datum, Aug. 24 and 25, 1987.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
NOON VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	13.19	12.84	13.16	13.55	13.79	-----	13.48	13.78	14.22	15.07	16.01	15.72
10	12.96	12.83	13.22	13.59	13.82	e13.40	13.33	13.86	14.38	15.27	16.10	15.74
15	12.87	12.84	13.30	13.64	13.86	13.47	13.27	13.99	14.54	15.42	16.12	15.73
20	12.86	12.92	13.35	13.68	e13.90	13.52	13.26	14.03	14.71	15.56	16.12	15.74
25	12.92	13.01	13.41	13.72	-----	13.65	13.22	14.04	14.84	15.73	16.19	15.80
EOM	12.90	13.09	13.49	13.75	-----	13.62	13.46	14.13	14.94	15.88	15.78	15.86

WTR YEAR 1987 HIGHEST 12.80 NOV 8, 1986 LOWEST 16.19 AUG 24 AND 25, 1987

e Estimated.



O'BRIEN COUNTY

425610095250611. Local number, 94-39-26 BADB11.

LOCATION.--Lat 42°56'10", long 95°25'06", Hydrologic Unit 10230003, near a dead-end road just south of the Little Sioux River, 0.9 mi north of Iowa Highway 10, approximately 5 mi southeast of the Town of Sutherland. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.

AQUIFER.--Dakota: in sandstone of Early Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2.50 in., depth 329 ft, cased to 329 ft, perforated 291 to 295 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape or electric line by USGS personnel.

DATUM.--Elevation of land-surface datum is 1,212 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing at land-surface datum.

REMARKS.--Well D-3.

PERIOD OF RECORD.--April 1980 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 35.25 ft below land-surface datum, Jun. 8, 1986 and Jan. 6, 1987; lowest measured, 36.85 ft below land-surface datum, Dec. 15, 1980.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 25	35.35	JAN 6	35.25	JUN 23	35.29	SEP 17	35.32

GROUND-WATER LEVELS

301

O'BRIEN COUNTY

425808095480311. Local number, 94-42-8 DDDD11.

LOCATION.--Lat 42°58'08", long 95°48'03", Hydrologic Unit 10230003, west of Iowa Highway 143, 1 mi west and 1 mi north of the Village of Germantown. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.

AQUIFER.--Dakota: in sandstone of Early Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 638 ft, cased to 638 ft, perforated 516 to 536 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 1,440 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 4.00 ft above land-surface datum.

REMARKS.--Well D-42.

PERIOD OF RECORD.--July 1980 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 215.09 ft below land-surface datum, May 6, 1982; lowest measured, 260.64 ft below land-surface datum, July 10, 1980.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 9	234.48	JAN 13	235.33	APR 14	236.13	JUL 8	236.81

430930095350401. Local number, 96-40-5 DDDA1.

LOCATION.--Lat 43°09'30", long 95°35'04", Hydrologic Unit 10230003, approximately 3 mi east of the Town of Sanborn and 2 mi south of U.S. Highway 18. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.

AQUIFER.--Dakota and Ordovician: in sandstone of Early Cretaceous age and sandy shale of Ordovician age. WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 701 ft, cased to 701 ft, perforated 661 to 701 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 1,560 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 4.00 ft above land-surface datum.

REMARKS.--Well D-41.

PERIOD OF RECORD.--June 1980 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 358.39 ft below land-surface datum, Jul. 8, 1986; lowest measured, 361.40 ft below land-surface datum, Jul. 16, 1980.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 9	360.75	JAN 13	359.48	APR 14	359.48	JUL 8	359.69

OSCEOLA COUNTY

431620095250501. Local number, 98-39-26 CDAD1.

LOCATION.--Lat 43°16'20", long 95°25'05", Hydrologic Unit 10230003, 3.5 mi south and 2.5 mi east of the Village of May City. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.

AQUIFER.--St. Peter: in sandstone of Middle Ordovician age.

WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 662 ft, cased to 662 ft, perforated 622 to 662 ft.

INSTRUMENTATION.--Intermittent measurement with chalked tape or electric line by USGS personnel or observer.

DATUM.--Elevation of land-surface datum is 1,402 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of low pipe, 1.47 ft above land-surface datum.

REMARKS.--Well D-38 Deep Hibbing.

PERIOD OF RECORD.--June 1980 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 197.68 ft below land-surface datum, May 8, 1984; lowest measured, 199.52 ft below land-surface datum, Aug. 5, 1980.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 15	198.08	MAY 8	197.94	SEP 16	197.91

OSCEOLA COUNTY

431620095250511. Local number, 98-39-26 CDAD11.

LOCATION.--Lat 43°16'20", long 95°25'05", Hydrologic Unit 10230003, 3.5 mi south and 2.5 mi east of the Village of May City. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.

AQUIFER.--Dakota: in sandstone of Early Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 345 ft, cased to 345 ft, perforated 335 to 345 ft.

INSTRUMENTATION.--Intermittent measurement with chalked tape or electric line by USGS personnel or observer.

DATUM.--Elevation of land-surface datum is 1,402 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of high pipe, 2.60 ft above land-surface datum.

REMARKS.--Well D-38 Shallow Hibbing.

PERIOD OF RECORD.--June 1980 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 192.20 ft below land-surface datum, Sep. 10, 1981; lowest measured, 194.11 ft below land-surface datum, Jul. 25, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 15	193.89	MAY 8	193.88	SEP 16	193.05

431613095251801. Local number, 98-39-26 CDC11.

LOCATION.--Lat 43°16'13", long 95°25'18", Hydrologic Unit 10230003, 3.5 mi south and 2.5 mi east of the Village of May City. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.

AQUIFER.--Dakota: in sandstone of Early Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 500 ft, cased to 500 ft, perforated 490 to 500 ft.

INSTRUMENTATION.--Intermittent measurement with chalked tape or electric line by USGS personnel or observer.

DATUM.--Elevation of land-surface datum is 1,398 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.70 ft above land-surface datum.

REMARKS.--Well D-39.

PERIOD OF RECORD.--June 1980 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 189.99 ft below land-surface datum, Jun. 17, 1980; lowest measured, 196.85 ft (nearby well pumping) below land-surface datum, Sep. 6, 1984.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 15	191.31	MAY 8	191.31	SEP 16	191.06

431620095482402. Local number, 98-42-33 AAB22.

LOCATION.--Lat 43°16'20", long 95°48'24", Hydrologic Unit 10170204, approximately 2.75 mi south of the Town of Ashton, west of Iowa Highway 60, near the Chicago and Northwestern Railroad tracks. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.

AQUIFER.--Dakota: in sandstone of Early Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 400 ft, cased to 400 ft, perforated 385 to 395 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 1,440 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.80 ft above land-surface datum.

REMARKS.--Well D-40.

PERIOD OF RECORD.--May 1980 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 195.87 ft below land-surface datum, June 1, 1983; lowest measured, 218.62 ft below land-surface datum, Jul. 8, 1987.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 9	215.19	JAN 13	216.45	APR 14	217.67	JUL 8	218.62

432828095283611. Local number, 100-39-17 DCCB11.

LOCATION.--Lat 43°28'28", long 95°28'36", Hydrologic Unit 10230003, approximately 2 mi west and 2 mi north of the Town of Harris, east of County Road M-12. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.

AQUIFER.--Dakota: in sandstone of Early Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 5 in. to 461 ft, 4 in. to 760 ft, depth 760 ft, cased to 760 ft, perforated 680 to 700 ft.

INSTRUMENTATION.--Quarterly measurement with electric line by USGS personnel.

DATUM.--Elevation of land-surface datum is 1,560 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 3.00 ft above land-surface datum.

REMARKS.--Well D-13.

PERIOD OF RECORD.--July 1980 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 341.80 ft below land-surface datum, Aug. 5, 1980; lowest measured, 343.70 ft below land-surface datum, Aug. 21, 1985.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 24	343.51	JAN 5	343.47	JUN 22	343.63	SEP 16	343.60

GROUND-WATER LEVELS

303

PAGE COUNTY

404257095150801. Local number, 68-38-7 CCAA1.

LOCATION.--Lat 40°42'57", long 95°15'08", Hydrologic Unit 10240005, approximately 2 mi south of the Village of Norwich and 1.5 mi west of County Road M-48. Owner: William Brayman.

AQUIFER.--Glacial drift: in material of Pleistocene age.

WELL CHARACTERISTICS.--Drilled unused water-table well, diameter 12 in., depth 44 ft, lined with tile.

INSTRUMENTATION.--Intermittent measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 1,087 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of pipe inserted through board cover, 1.00 ft above land-surface datum.

REMARKS.--None.

PERIOD OF RECORD.--May 1934 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.09 ft below land-surface datum, Mar. 26, 1946; lowest measured, 22.76 ft below land-surface datum, Jun. 23, 1947.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 14	11.66	FEB 6	13.08	APR 23	9.12	JUL 17	11.71
DEC 17	11.38	MAR 20	7.85	JUN 3	7.62	SEP 29	12.34

PLYMOUTH COUNTY

424850096074801. Local number, 92-45-2 CBCB1.

LOCATION.--Lat 42°48'50", long 96°07'48", Hydrologic Unit 10230002, approximately 3.8 mi west and 0.6 mi south of the Village of Oyens. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.

AQUIFER.--Cambrian-Ordovician: in dolomite of Cambrian and Ordovician age.

WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 5 in. to 161 ft, 4 in. to 598 2 in. to 1,340 ft, depth 1,340 ft, cased to 598 ft, open hole 598 to 1,340 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 1,245 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.80 ft above land-surface datum.

REMARKS.--Well D-21. Well deepened from 1,089 to 1,340 ft, May 1984. Penetrates the Precambrian.

PERIOD OF RECORD.--May 1979 to January 1981, May 1982 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 86.90 ft below land-surface datum, Apr. 14, 1987; lowest measured, 102.10 ft below land-surface datum, Aug. 6, 1980.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 9	92.41	JAN 13	90.58	APR 14	86.90	JUL 7	88.87

424833096324701. Local number, 92-48-6 DDDA1.

LOCATION.--Lat 42°48'33", long 96°32'47", Hydrologic Unit 10170203, just south of the curve on Iowa Highway 3, 1 mi south of the Town of Akron. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.

AQUIFER.--Dakota: in sandstone of Early Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 4 in. to 184 ft, 2 in. to 581 ft, depth 581 ft, cased to 576 ft, perforated 430 to 434 ft and 510 to 515 ft, open hole 576 to 581 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 1,282 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 4.80 ft above land-surface datum.

REMARKS.--Well D-35. 5 feet of Paleozoic rock open 576 to 581 ft.

PERIOD OF RECORD.--December 1979 to December 1980, May 1982 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 137.35 ft below land-surface datum, Apr. 22, 1987; lowest measured, 159.82 ft below land-surface datum, Aug. 6, 1980.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	137.75	JAN 23	137.59	APR 22	137.35	JUL 23	138.01

GROUND-WATER LEVELS

PLYMOUTH COUNTY

425249096125001. Local number, 93-46-12 DDDD1.

LOCATION.--Lat 42°52'49", long 96°12'50", Hydrologic Unit 10230002, 1 mi west and 1 mi south of the Village of Struble. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.

AQUIFER.--Dakota: in sandstone of Early Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2.50 in., depth 570 ft, cased to 570 ft, perforated 356 to 360 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 1,280 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of coupling, 4.80 ft above land-surface datum.

REMARKS.--Well D-2.

PERIOD OF RECORD.--March 1980 to December 1980, May 1982 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 117.78 ft below land-surface datum, Apr. 9, 1980; lowest measured, 122.00 ft below land-surface datum, Mar. 27, 1980.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 9	119.79	JAN 13	118.39	APR 14	118.46	JUL 7	120.21

POTTAWATTAMIE COUNTY

411246095502001. Local number, 74-43-18 BCCC1.

LOCATION.--Lat 41°12'46", long 95°50'20", Hydrologic Unit 10230006, approximately 0.4 mi east of Lake Manawa in Manawa State Park, 1.4 mi south of Interstate 80, south of the City of Council Bluffs. Owner: U.S. Geological Survey.

AQUIFER.--Alluvial: in sand and gravel of Holocene age.

WELL CHARACTERISTICS.--Bored observation water-table well, diameter 1.25 in., depth 16 ft, cased to 14 ft, sand point 14 to 16 ft.

INSTRUMENTATION.--Monthly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 975 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.25 ft above land-surface datum.

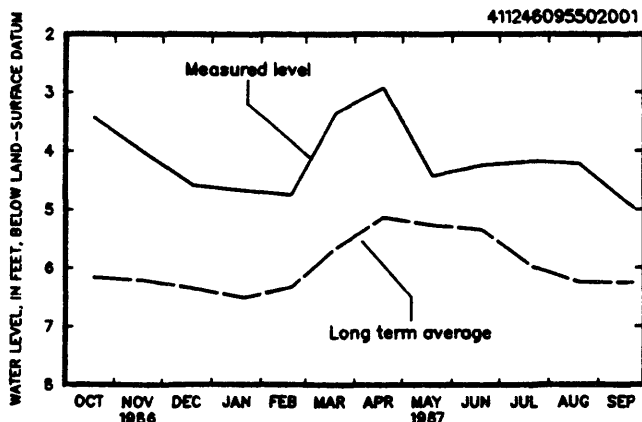
REMARKS.--Records from 1950 to September 1985 are available in the files of the Iowa District Office.

PERIOD OF RECORD.--November 1950 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.45 ft below land-surface datum, May 2, 1951; lowest measured, 11.86 ft below land-surface datum, Jun. 26, 1956.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 24	3.44	JAN 22	4.67	APR 23	2.93	JUL 24	4.18
NOV 24	4.04	FEB 24	4.75	MAY 21	4.43	AUG 21	4.22
DEC 22	4.58	MAR 24	3.36	JUN 26	4.25	SEP 29	4.97



GROUND-WATER LEVELS

305

SAC COUNTY

422500095084801. Local number, 88-37-22 CCCC1.

LOCATION.--Lat 42°25'00", long 95°08'48", Hydrologic Unit 10230007, approximately 3 mi south of the Town of Early or 0.5 mi south of the junction of U.S. Highways 20 and 71. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.

AQUIFER.--Dakota and Pennsylvanian: in sandstone of Early Cretaceous age and limestone of Pennsylvanian age.

WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 435 ft, cased to 435 ft, perforated 417 to 435 ft.

INSTRUMENTATION.--Quarterly measurement with electric line by USGS personnel.

DATUM.--Elevation of land-surface datum is 1,320 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.50 ft above land-surface datum.

REMARKS.--Well D-16.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 163.93 ft below land-surface datum, May 12, 1984; lowest measured, 165.40 ft below land-surface datum, Dec. 16, 1980.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 23	164.33	JAN 6	164.25	JUN 23	164.45	SEP 18	164.40

423013095175301. Local number, 88-38-26 ABAA1.

LOCATION.--Lat 42°30'13", long 95°17'53", Hydrologic Unit 10230005, northern part of the Town of Schaller. Owner: Town of Schaller.

AQUIFER.--Dakota: in sandstone of Early Cretaceous age.

WELL CHARACTERISTICS.--Drilled public-emergency-supply artesian water well, diameter 10 to 8 in., depth 352 ft, cased to 352 ft, perforated 304 to 352 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 1,376 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Edge of pump breather pipe, 1.80 ft above land-surface datum.

REMARKS.--None.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 210.04 ft below land-surface datum, Mar. 25, 1948; lowest non-pumping measured, 240.10 ft below land-surface datum, May 24, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 25	231.49	JAN 6	231.78	SEP 18	231.78

422850095171501. Local number, 88-38-36 CBCC1.

LOCATION.--Lat 42°28'50", long 95°17'15", Hydrologic Unit 10230005, just east of Iowa Highway 110, 0.75 mi south of the Town of Schaller and 0.25 mi north of U.S. Highway 20. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.

AQUIFER.--Dakota: in sandstone of Early Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 521 ft, cased to 512 ft, perforated 410 to 430 ft, open hole 512 to 521 ft.

INSTRUMENTATION.--Quarterly measurement with electric line by USGS personnel.

DATUM.--Elevation of land-surface datum is 1,445 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 4.00 ft above land-surface datum.

REMARKS.--Well D-17. 9 ft of Paleozoic rock open.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 288.05 ft below land-surface datum, Jun. 2, 1980; lowest measured, 291.80 ft below land-surface datum, Sep. 18, 1987.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 23	291.58	JAN 6	291.34	JUN 23	291.74	SEP 18	291.90

GROUND-WATER LEVELS

SCOTT COUNTY

413544090212901. Local number, 78-5E-3 AADA1.

LOCATION.--Lat 41°35'44", long 90°02'29", Hydrologic Unit 07080101, at the Bridgeview Elementary School, corner of 12th and Davenport Streets, LeClaire. Owner: City of LeClaire.

AQUIFER.--Jordan: in strata of Cambrian and Ordovician age.

WELL CHARACTERISTICS.--Drilled unused municipal artesian water well, diameter 16 to 12 in., depth 1,607 ft, cased to 1,128 ft, open hole 1,128 to 1,607 ft.

INSTRUMENTATION.--Monthly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 703 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Nipple on plate welded to casing, 2.11 ft above land-surface datum.

REMARKS.--Water-level recorder removed Dec. 4, 1984.

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

REVISED RECORDS.--WRD IA-84-1.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 247.46 ft below land-surface datum, Jul. 8, 1975; lowest recorded, 271.77 ft below land-surface datum, May 15, 1984.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 27	253.05	FEB 17	251.41	MAY 21	251.00	AUG 17	253.01
DEC 8	252.04	MAR 19	250.92	JUN 15	251.99	SEP 11	252.78
JAN 20	251.67	APR 13	250.55	JUL 6	252.35		

SIOUX COUNTY

430140095573101. Local number, 95-43-7 AAAA1.

LOCATION.--Lat 43°04'10", long 95°57'32", Hydrologic Unit 10230002, just south of County Road B-40, 1 mi east of the Village of Newkirk. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.

AQUIFER.--Dakota: in sandstone of Early Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 681 ft, cased to 681 ft, perforated 641 to 681 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 1,390 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 3.70 ft above land-surface datum.

REMARKS.--Well D-43. Paleozoic rock from 674 to 681 ft.

PERIOD OF RECORD.--July 1980 to December 1980, May 1982 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 214.77 ft below land-surface datum, Apr. 8, 1986; lowest measured, 217.23 ft below land-surface datum, July 9, 1985.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 9	216.23	JAN 13	215.79	APR 14	215.64	JUL 7	216.02

430913096033201. Local number, 96-44-8 ADA1.

LOCATION.--Lat 43°09'13", long 96°03'32", Hydrologic Unit 10230002, west side of County Road K-64, approximately 2.5 mi west of the Town of Boyden and approximately 2.2 mi south of U.S. Highway 18. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.

AQUIFER.--Dakota: in sandstone of Early Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 682 ft, cased to 682 ft, perforated 647 to 667 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 1,373 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 3.70 ft above land-surface datum.

REMARKS.--Well D-44. One ft of Paleozoic rock penetrated.

PERIOD OF RECORD.--August 1980 to December 1980, May 1982 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 187.85 ft below land-surface datum, Oct. 16, 1984; lowest measured, 194.19 ft below land-surface datum, Oct. 9, 1986.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 9	194.19	JAN 13	193.24	APR 14	193.15	JUL 7	193.60

GROUND-WATER LEVELS

307

STORY COUNTY

420130093362201. Local number, 83-24-2 DCAA1.

LOCATION.--Lat 42°01'30", long 93°36'22", Hydrologic Unit 07080105, just east of the water plant in Ames or southeast of the T junction of East 5th Street and Crawford Avenue. Owner: City of Ames.

AQUIFER.--Glacial drift: in sand and gravel of Pleistocene age.

WELL CHARACTERISTICS.--Drilled unused artesian water well, diameter 20 in., depth 110 ft.

INSTRUMENTATION.--Quarterly measurement with electric line by USGS personnel.

DATUM.--Elevation of land-surface datum is 925 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of recorder platform, 4.10 ft above land-surface datum.

REMARKS.--Casing information not available. Water levels affected by pumping of nearby wells. Records from 1947 to September 1985 are available in the files of the Iowa District Office. Well destroyed July 1987.

PERIOD OF RECORD.--November 1947 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 39.84 ft below land-surface datum, Jun. 3, 1951; lowest measured, 62.92 ft below land-surface datum, May 7, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 25	56.45	FEB 3	56.34

WASHINGTON COUNTY

411300091320701. Local number, 74-6-15 BDAC1.

LOCATION.--Lat 41°13'00", long 91°32'07", Hydrologic Unit 07080107, in the water treatment plant, beneath the water tower in Crawfordsville. Owner: Town of Crawfordsville.

AQUIFER.--Mississippian: in dolomite of Mississippian age.

WELL CHARACTERISTICS.--Drilled unused municipal artesian water well, diameter 6.5 in., depth 215 ft, cased to 132 ft, open hole 132 to 215 ft.

INSTRUMENTATION.--Monthly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 725 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Nipple on plate welded to casing, 1.10 ft above land-surface datum.

REMARKS.--Water level for Sep. 13, 1983, 72.69 ft below land-surface datum.

PERIOD OF RECORD.--September 1983, March 1987 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 69.23 ft below land-surface datum, Mar. 25, 1987; lowest measured, 72.72 ft below land-surface datum, Aug. 5 and Sep. 4, 1987.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
MAR 25	69.23	MAY 6	69.93	JUL 6	71.24	SEP 4	72.72
APR 3	69.48	JUN 4	70.87	AUG 5	72.72		

411244091323501. Local number, 74-6-15 CBDD1.

LOCATION.--Lat 41°12'44", long 91°32'19", Hydrologic Unit 07080107, just west of U.S. Highway 218, approximately 0.4 mi southeast of the water tower in Crawfordsville. Owner: Town of Crawfordsville.

AQUIFER.--Mississippian: in dolomite of Mississippian age.

WELL CHARACTERISTICS.--Drilled unused municipal artesian water well, diameter 8 in., depth 217 ft, cased to 142 ft, open hole 142 to 217 ft.

INSTRUMENTATION.--Monthly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 725 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Nipple on plate welded to casing, 1.67 ft above land-surface datum.

REMARKS.--Water level for Sep. 13, 1983, 75.46 ft below land-surface datum.

PERIOD OF RECORD.--September 1983, March 1987 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 71.62 ft below land-surface datum, Mar. 25, 1987; lowest measured, 75.46 ft below land-surface datum, Sep. 13, 1983.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
MAR 25	71.62	MAY 6	72.22	JUL 6	73.57	SEP 4	75.11
APR 3	71.91	JUN 4	73.20	AUG 5	74.98		

GROUND-WATER LEVELS

WASHINGTON COUNTY

421829091304701. Local number, 75-6-14 ABBB1.
 LOCATION.--Lat 42°18'29", long 91°30'47", Hydrologic Unit 07080209, 1 mi north and 1.5 mi east of the junction of U.S. Highway 218 and Iowa Highway 92. Owner: Mrs. David Armstrong.
 AQUIFER.--Glacial drift: in material of Pleistocene age.
 WELL CHARACTERISTICS.--Bored unused water-table well, diameter 12 in., depth 45 ft, lined with tile.
 INSTRUMENTATION.--Monthly measurement with chalked tape by USGS personnel.
 DATUM.--Elevation of land-surface datum is 745 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Nipple welded to barrel, 3.33 ft above land-surface datum.
 REMARKS.--None.
 PERIOD OF RECORD.--December 1983 to current year.
 EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 1.53 ft below land-surface datum, May 23, 1984; lowest measured, 9.77 ft below land-surface datum, Oct. 7, 1985.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

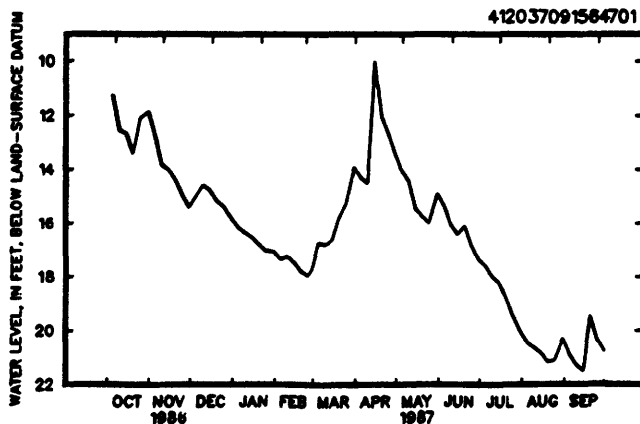
DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 6	2.42	JAN 6	4.42	APR 3	3.23	JUL 6	4.57
NOV 6	3.27	FEB 6	5.22	MAY 6	4.37	AUG 5	6.45
DEC 5	4.19	MAR 9	4.33	JUN 4	4.99	SEP 4	7.99

412037091564701. Local number, 76-9-31 CBBC1.
 LOCATION.--Lat 41°20'37", long 91°56'47", Hydrologic Unit 07080107, at Pepper Quarry on County Road V-15, 1 mi south of the City of Keota. Owner: River Products Co.
 AQUIFER.--Mississippian: in limestone of Mississippian age.
 WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 5 in., depth 136 ft, cased to 19 ft, open hole 19 to 136 ft.
 INSTRUMENTATION.--Water-level recorder.
 DATUM.--Elevation of land-surface datum is 745 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.88 ft above land-surface datum.
 REMARKS.--Water levels affected by quarrying operations.
 PERIOD OF RECORD.--August 1979 to current year.
 REVISED RECORDS.--WDR IA-84-1.
 EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 9.38 ft below land-surface datum, Mar. 4, 1985; lowest recorded, 24.06 ft below land-surface datum, Sep. 18, 1983.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
NOON VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	11.27	12.74	-----	16.15	17.35	16.76	14.32	14.05	15.36	17.60	20.46	20.93
10	12.55	13.83	14.59	16.36	17.25	16.82	14.52	14.44	16.07	18.00	20.64	21.30
15	12.69	14.02	14.77	16.53	17.48	16.64	10.01	15.45	16.43	18.24	20.85	21.51
20	13.41	14.41	15.15	16.79	17.81	15.81	12.03	15.76	16.12	18.77	21.18	19.48
25	12.10	14.96	15.36	17.03	17.97	15.30	12.66	15.99	16.83	19.41	21.12	20.33
EOM	11.87	15.42	15.81	17.07	17.75	13.92	13.40	14.91	17.36	20.05	20.33	20.76

WTR YEAR 1987 HIGHEST 10.01 APR 14 AND 15, 1987 LOWEST 21.52 SEP 15 AND 16, 1987



GROUND-WATER LEVELS

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WASHINGTON COUNTY

412750091495201. Local number, 77-9-24 AADA1.

LOCATION.--Lat 41°27'54", long 91°49'47", Hydrologic Unit 07080209, north of the city sewage treatment plant and west of First Avenue SE, Wellman. Owner: City of Wellman.

AQUIFER.--Mississippian: in dolomite of Mississippian age.

WELL CHARACTERISTICS.--Drilled unused artesian water well, diameter 8 in., depth 110 ft, cased to 47 ft, open hole 47 to 110 ft.

INSTRUMENTATION.--Monthly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 695 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Nipple on plate welded to casing, 1.87 ft above land-surface datum.

REMARKS.--City test well No. 1.

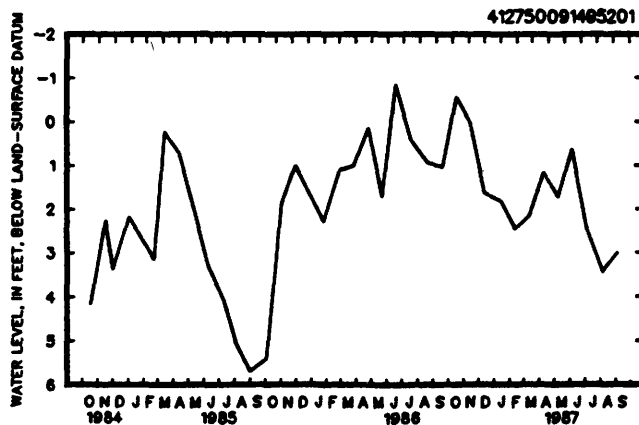
PERIOD OF RECORD.--May 1963 to October 1971, May 1973 to current year.

REVISED RECORDS.--WDR IA-84-1.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 1.35 ft above land-surface datum, Nov. 3, 1977, Mar. 28, 1979, and Apr. 13, 1983; lowest measured, 6.92 ft below land-surface datum, Nov. 1, 1964.

WATER LEVEL, IN FEET BELOW LAND SURFACE-DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 6	+0.56	JAN 6	1.82	APR 3	1.17	JUL 6	2.37
NOV 6	0.03	FEB 6	2.46	MAY 6	1.73	AUG 5	3.43
DEC 5	1.63	MAR 9	2.17	JUN 6	0.63	SEP 4	3.01



WEBSTER COUNTY

421550094041001. Local number, 86-28-14 ADAB1.

LOCATION.--Lat 42°15'50", long 94°04'10", Hydrologic Unit 07100004, in the town water plant, next to the water tower, Dayton. Owner: Town of Dayton.

AQUIFER.--Devonian and Mississippian: in limestone of Devonian and Mississippian age.

WELL CHARACTERISTICS.--Drilled municipal artesian water well, diameter 13 to 10 in., depth 1,240 ft, cased to 505 ft, 8 in. liner 770 to 966 ft, open hole 505 to 770 ft and 966 to 1,240 ft.

INSTRUMENTATION.--Quarterly measurement with airline by USGS personnel.

DATUM.--Elevation of land-surface datum is 1,121 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Pump base, 1.30 ft above land-surface datum.

REMARKS.--Town well No. 2. Water levels affected by pumping.

PERIOD OF RECORD.--September 1942 to December 1948, January 1952 to November 1971, March 1974 to current year.

REVISIONS.--WRD IA-85-1.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 69.93 ft below land-surface datum, Nov. 17, 1942; lowest measured, 153.20 ft below land-surface datum, Feb. 10, 1987.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL
FEB 10	153.20	AUG 31	126.20

GROUND-WATER LEVELS

WEBSTER COUNTY

421837094083601. Local number, 87-28-29 CCDD1.

LOCATION.--Lat 42°18'37", long 94°08'36", Hydrologic Unit 07100006, 3 mi north and 2 mi east of the Town of Harcourt. Owner: Ransom Helms.

AQUIFER.--Glacial drift: in material of Pleistocene age.

WELL CHARACTERISTICS.--Drilled unused water-table well, diameter 12 in., depth 42 ft, lined with tile.

INSTRUMENTATION.--Monthly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 1,165 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.75 ft above land-surface datum.

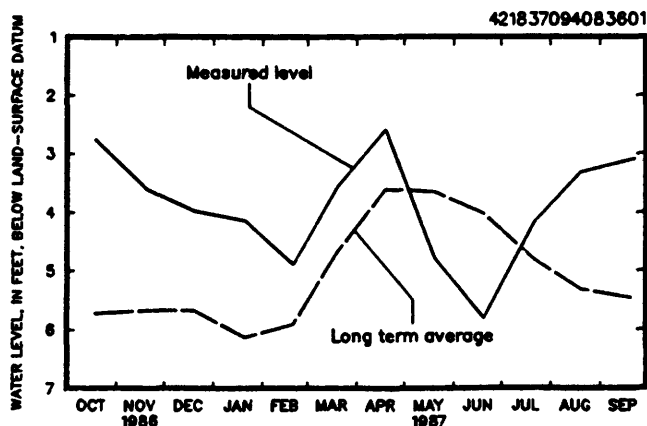
REMARKS.--None.

PERIOD OF RECORD.--October 1942 to June 1956, March 1958 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.05 ft below land-surface datum, Aug. 1, 1972; lowest measured, 13.62 ft below land-surface datum, Mar. 12, 1956.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 20	2.76	JAN 21	4.14	APR 20	2.59	JUL 21	4.16
NOV 21	3.60	FEB 20	4.89	MAY 20	4.79	AUG 21	3.32
DEC 23	3.97	MAR 21	3.56	JUN 22	5.81	SEP 21	3.09



423018094214701. Local number, 89-30-23 CCBB1.

LOCATION.--Lat 42°30'18", long 94°21'47", Hydrologic Unit 07100004, 75 ft west of the new school addition, Barnum. Owner: Johnson Township Consolidated School.

AQUIFER.--Dakota: in sandstone of Early Cretaceous age.

WELL CHARACTERISTICS.--Drilled unused artesian water well, diameter 4 in., reported depth 208 ft, cased to 208 ft, perforated 203-208 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 1,174 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing at land-surface datum.

REMARKS.--None.

PERIOD OF RECORD.--October 1942 to September 1945, May 1947 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 30.86 ft below land-surface datum, Jul. 2, 1945; lowest measured, 52.60 ft below land-surface datum, Feb. 26, 1980.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 24	41.49	JAN 20	41.13	JUN 22	41.57	SEP 16	41.69

WOODBURY COUNTY

422058095573701. Local number, 87-44-15 CBBB1.

LOCATION.--Lat 42°20'58", long 95°57'37", Hydrologic Unit 10230003, approximately 3.5 mi west and 5.5 mi north of the Village of Oto. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.

AQUIFER.--Dakota: in sandstone of Early Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 197 ft, cased to 197 ft, perforated 185 to 189 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 1,165 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.50 ft above land-surface datum.

REMARKS.--Well D-34.

PERIOD OF RECORD.--April 1980 to December 1980, May 1982 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 54.40 ft below land-surface datum, Oct. 7, 1985; lowest measured, 63.56 ft below land-surface datum, Nov. 2, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 8	55.93	JAN 12	56.08	APR 13	56.07	JUL 6	55.66

422830096000511. Local number, 88-44-6 BAAB11.

LOCATION.--Lat 42°28'30", long 96°00'05", Hydrologic Unit 10230004, approximately 3 mi east and 0.5 mi south of the Town of Merville. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.

AQUIFER.--Dakota: in sandstone of Early Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 337 ft, cased to 337 ft, perforated 332 to 337 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 1,340 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 3.50 ft above land-surface datum.

REMARKS.--Well D-33.

PERIOD OF RECORD.--October 1979 to December 1980, May 1982 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 199.09 ft below land-surface datum, Apr. 13, 1987; lowest measured, 202.90 ft below land-surface datum, Oct. 17, 1979.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 8	199.41	JAN 12	199.37	APR 13	199.09	JUL 8	199.31

423015096034601. Local number, 89-44-20 DCDC1.

LOCATION.--Lat 42°30'15", long 96°03'46", Hydrologic Unit 10230004, east of Iowa Highway 140, approximately 1 mi north of the Town of Merville. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.

AQUIFER.--Dakota: in sandstone of Early Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 221 ft, cased to 221 ft, perforated 206 to 221 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 1,160 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 4.00 ft above land-surface datum.

REMARKS.--Well D-32.

PERIOD OF RECORD.--October 1979 to December 1980, May 1982 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 22.64 ft below land-surface datum, Aug. 8, 1984; lowest measured, 26.65 ft below land-surface datum, Dec. 11, 1980.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 8	24.47	APR 13	23.86	MAY 13	24.26	JUL 8	24.41
JAN 12	24.70						

GROUND-WATER LEVELS

WOODBURY COUNTY

422910096135811. Local number, 89-46-36 BBDC11.

LOCATION.--Lat 42°29'10", long 96°13'58", Hydrologic Unit 10230004, approximately 0.75 mi northeast of the Eberly Cemetery or 2.5 mi west and 0.75 mi north of the Village of Lawton. Owner: Geological Survey Bureau, DNR and U.S. Geological Survey.

AQUIFER.--Dakota; in sandstone of Early Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation artesian water well, diameter 2 in., depth 500 ft, cased to 500 ft, perforated 358 to 362 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 1,268 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 3.00 ft above land-surface datum.

REMARKS.--Well D-30.

PERIOD OF RECORD.--April 1980 to December 1980, May 1982 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 128.32 ft below land-surface datum, Jul. 8, 1987; lowest measured, 135.35 ft below land-surface datum, Nov. 2, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 8	129.49	JAN 12	129.24	APR 13	128.47	JUL 8	128.32

GROUND-WATER-QUALITY DATA

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MAP STATION NUMBER	STATION NUMBER	LOCAL WELL NUMBER	DATE	LOCAL WELL NAME	COUNTY	SAMPLE DATE	SAMPLE TIME	GEO- LOGIC UNIT
1	411727094374001	07533W15DDBB	1976	Fontanelle 5	Adair	08-04-87	1220	111ALVM
2	412852094275101	07731W07CAAB	1977	Menlo 3	Adair	08-04-87	1100	111ALVM
3	424901095581701	09243W06BDCB	1977	Remsen 7	Adair	08-13-87	1530	217DKOT
4	405631094560802	07135W20AACA	1978	Nodaway 3	Adams	02-20-87	1415	112PLSC
5	414221094532202	08035W26DCBC	1977	Audubon 19	Audubon	02-26-87	1400	111ALVM
6	414330094524801	08035W23ADDD		Audubon 2	Audubon	02-26-87	1330	111ALVM
7	413537094532701	07835W04BCBD	1969	Exira 11	Audubon	02-26-87	1045	111ENRV
8	413743095041201	07936W29BBCA	1978	Kimballton 5	Audubon	02-26-87	1545	111ALVM
9	421016092015901	08510W17DBDC	1973	Vinton 4	Benton	03-23-87	1500	112PLSC
10	423112092213901	08913W15DABB	1937	Waterloo 10	Black Hawk	08-07-87	1200	111ALVM
11	423106092213101	08913W15DADA	1948	Waterloo 13	Black Hawk	08-07-87	1120	111ALVM
12	420447093560701	08427W13DDBC	1979	Boone 23	Boone	08-17-87	1315	111ALVM
13	420156093562402	08327W01ABCC	1985	Ogden 3A	Boone	08-17-87	1150	111ALVM
14	423902092272502	09114W35DA	1984	Janesville 3	Bremer	07-30-87	0730	350SLRN
15	424319092283401	09114W03CABB	1967	Waverly 5	Bremer	07-29-87	1430	340DVSL
16	422810092035201	08910W31DDCA	1976	Jesup 3	Buchanan	03-24-87	1200	340DVSL
17	425344095090401	09337W01DDDD	1977	Sioux Rapids 2	Buena Vista	08-18-87	1515	110QRNR
18	423803095143601	09037W05ADCD	1972	Storm Lake 11	Buena Vista	04-03-87	0945	112PLSC
19	425330092483701	09317W01DDDA	1960	Greene 2	Butler	08-07-87	--	344CDVL
20	415356094400601	08233W22ADDD	1978	Coon Rapids 1,6	Carroll	08-25-87	1330	112PLSC
21	415358094400201	08233W23BCCC	1978	Coon Rapids 2	Carroll	08-25-87	1350	112PLSC
22	420024094575906	08335W18BAAD	1985	Halbur 6	Carroll	08-26-87	1200	111ALVM
23	415430095041601	08236W17CCCA	1958	Manning 6	Carroll	08-25-87	1515	111ALVM
24	411622094520901	07535W27BBAB	1921	Cumberland 1	Cass	02-20-87	1000	112PLSC
25	411818095045801	07537W10DDBD	1916	Lewis 1	Cass	08-06-87	0945	112PLSC
26	412706095065501	07737W21CBDB	1959	Marne 3	Cass	08-06-87	1345	111HLCN
27	412400094532001	07635W09BB	1940	Wiota 1	Cass	08-06-87	1230	217DKOT
28	414026091210201	07904W06DDBA	1957	West Branch 2	Cedar	08-19-87	1110	355NIGR
29	424455095323701	09240W35BBBB	1951	Cherokee 4	Cherokee	04-03-87	1115	217DKOT
30	424414095332301	09240W34CDAC	1971	Cherokee 8	Cherokee	04-03-87	1150	112PLSC
31	423744095383501	09041W11ADAC	1930	Quimby 2	Cherokee	04-03-87	1340	112PLSC
32	424705092320803	09414W18DDAA	1957	Nashua 3	Chickasaw	08-06-87	1300	344CDVL
33	410038093361901	07224W27BDAC	1973	Woodburn 1	Clarke	10-21-86	1545	112PLSC
34	430922095193501	09638W03CCDD	1976	Everly 3	Clay	08-18-87	1345	111ALVM
35	430923095114501	09637W03DDCC	1971	Spencer 2	Clay	08-18-87	1230	112PLSC
36	430315091233001	09505W11DDAC	1922	Monona 1	Clayton	04-09-87	1200	360OVCB
37	424026091321502	09106W22CDDA	1957	Strawberry Point 4	Clayton	08-05-87	1400	358ALXD
38	414745090151001	08106E27BCAD	1971	Camanche 4	Clinton	03-25-87	1400	111ALVM
39	415752090485701	08301E26CBDD	1911	Lost Nation 1	Clinton	03-24-87	1700	350SLRN
40	415650095275603	08240W02ABDD	1965	Arion 2	Crawford	08-12-87	1030	111ALVM
41	420422095352001	08441W23CABB	1967	Charter Oak 6	Crawford	08-13-87	0945	111ALVM
42	420551095185801	08438W07CDBA	1977	Deloit 5	Crawford	08-12-87	0745	111ALVM
43	420131095221101	08339W03DCAC	1976	Denison 7	Crawford	08-11-87	1645	111ALVM
44	415533095291101	08240W10CBAC	1982	Dow City 3	Crawford	08-12-87	0945	112PLSC
45	421125095193101	08539W12ADDB	1977	Kiron 4	Crawford	08-11-87	1500	111ALVM
46	421140095190901	08539W12AADD	1985	Kiron 6	Crawford	08-11-87	1415	112PLSC
47	415313095134301	08238W26ADDA	1949	Manilla 3	Crawford	08-11-87	1000	111ALVM
48	420737095341501	08541W36CCAA	1971	Ricketts 4	Crawford	08-12-87	1400	112PLSC
49	420328095122401	08437W30CBBB	1960	Vail 2	Crawford	08-11-87	1130	111BRRV
50	415055094131202	08129W10BBBA	1969	Dawson 2	Dallas	08-04-87	0840	111ALVM
51	413303094001001	07827W18DBCB	1977	De Soto 3	Dallas	08-10-87	1600	111ALVM
52	413517094112801	07829W04ACDC	1975	Dexter 1	Dallas	08-11-87	0900	112PLSC
53	414538093491504	08026W12ABAB	1972	Granger 4	Dallas	08-11-87	1300	112PLSC
54	414947094055901	08128W15DBBD	1968	Perry 15	Dallas	08-11-87	1200	112PLSC
55	413515094114202	07829W04CAAA	1966	Redfield 2	Dallas	08-10-87	1500	112PLSC
56	413148093570901	07827W27BBCA	1968	Van Meter 2	Dallas	08-10-87	1200	111ALVM
57	422834091281601	08905W31DAAB	1970	Manchester 6	Delaware	07-28-87	1535	350SLRN

GROUND-WATER-QUALITY DATA

DATE	DEPTH OF WELL, TOTAL (FEET) (72008)	FLOW RATE (GPM) (00058)	PUMP OR FLOW PERIOD PRIOR TO SAM- PLING (MIN) (72004)	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH (STAND- ARD UNITS) (00400)	HARD- NESS (MG/L AS CACO3) (00900)	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)
08-04-87	39.00	125	15	12.0	460	7.20	190	54	14	8.6	3.3
08-04-87	25.00	6.0	20	12.0	510	7.50	210	68	10	16	0.50
08-13-87	417.00	400	20	13.5	1940	7.20	770	210	60	100	17
02-20-87	38.00	28	45	12.5	610	7.80	280	74	24	10	1.4
02-26-87	30.00	60	180	11.0	505	7.30	250	74	16	6.9	0.90
02-26-87	30.00	32	180	11.0	695	7.20	370	110	23	6.6	2.4
02-26-87	60.00	165	30	8.5	520	7.10	380	110	25	12	3.1
02-26-87	41.00	47	180	11.0	802	7.00	360	100	27	17	2.3
03-23-87	90.00	525	300	12.0	615	7.60	260	67	22	21	2.1
08-07-87	85.00	117000	10	20.5	540	7.90	250	66	21	5.8	2.0
08-07-87	82.00	119000	10	20.5	630	7.70	280	76	21	12	3.0
08-17-87	54.00	280	60	18.0	680	7.21	350	90	30	11	4.1
08-17-87	74.00	240	20	14.0	620	7.20	410	110	33	6.1	3.5
07-30-87	120.00	100	25	12.0	510	7.60	260	70	20	2.3	1.2
07-29-87	157.00	1400	15	12.0	610	7.40	280	76	23	7.6	1.8
03-24-87	400.00	400	60	11.0	475	7.55	250	64	21	4.4	1.0
08-18-87	40.00	180	60	12.0	920	7.21	440	120	35	13	3.8
04-03-87	108.00	500	30	12.0	870	7.20	420	110	36	23	4.5
08-07-87	120.00	58	10	15.5	450	7.80	230	67	15	1.3	1.9
08-25-87	85.00	400	10	13.0	530	6.92	290	77	24	6.1	4.2
08-25-87	87.00	400	15	12.0	560	6.80	290	77	24	6.1	4.3
08-26-87	40.00	5.0	60	13.0	925	6.90	430	120	32	22	3.2
08-25-87	50.00	80	15	12.0	860	6.77	460	130	34	20	2.9
02-20-87	156.00	30	30	13.0	300	7.20	160	46	12	7.2	1.6
08-06-87	56.00	110	30	12.0	721	6.50	340	80	33	11	2.5
08-06-87	43.00	3.0	30	11.0	1270	6.30	630	150	62	14	3.2
08-06-87	147.00	85	30	11.5	512	6.39	240	66	18	9.3	1.4
08-19-87	428.00	135	15	13.0	780	7.35	370	97	32	19	2.6
04-03-87	199.00	370	180	12.0	750	7.10	330	91	25	25	5.5
04-03-87	270.00	490	20	12.0	1170	7.20	560	150	44	50	7.1
04-03-87	175.00	100	30	12.0	700	7.10	290	80	21	13	4.3
08-06-87	153.00	425	10	16.0	655	7.39	310	84	25	12	2.0
10-21-86	33.00	--	15	12.5	635	6.70	290	88	16	12	1.4
08-18-87	16.00	225	20	15.0	890	7.12	410	110	34	13	5.4
08-18-87	39.00	130	30	11.0	580	7.08	280	76	22	2.3	3.6
04-09-87	814.00	--	--	--	400	--	250	58	25	<0.50	2.7
08-05-87	240.00	250	10	14.5	435	8.50	210	52	20	3.0	0.90
03-25-87	75.00	125	20	13.0	420	8.30	190	46	19	5.4	0.70
03-24-87	125.00	200	60	13.0	820	7.20	420	100	42	13	0.10
08-12-87	62.00	20	20	13.0	1320	6.70	630	170	51	33	4.3
08-13-87	53.00	100	30	12.0	820	7.00	420	120	30	9.4	4.0
08-12-87	54.00	150	30	12.5	730	7.10	370	110	23	13	2.7
08-11-87	82.00	550	30	12.0	690	6.70	340	97	23	10	1.6
08-12-87	146.00	350	60	12.0	800	6.80	390	100	34	8.6	3.6
08-11-87	25.00	15	20	11.5	580	6.80	390	110	28	9.3	3.1
08-11-87	25.00	14	20	13.0	660	6.90	300	87	19	8.8	0.90
08-11-87	87.00	200	30	12.5	865	6.70	400	110	30	11	2.9
08-12-87	27.00	12	30	12.0	690	6.70	360	93	30	7.6	2.3
08-11-87	42.00	55	30	12.0	730	6.90	370	99	30	12	2.8
08-04-87	22.00	40	20	12.0	710	7.40	330	86	27	15	2.6
08-10-87	40.00	78	360	14.0	950	7.21	400	110	31	41	3.9
08-11-87	60.00	150	20	14.0	600	7.36	320	84	26	5.5	2.6
08-11-87	108.00	30	240	13.0	725	7.63	300	77	26	41	5.2
08-11-87	131.00	130	60	14.0	785	7.70	290	67	29	63	7.5
08-10-87	42.00	150	60	13.0	705	7.33	360	95	29	11	3.2
08-10-87	61.00	57	210	14.0	800	7.12	410	110	34	16	3.2
07-28-87	150.00	600	20	11.0	590	7.60	280	70	25	5.8	0.70

GROUND-WATER-QUALITY DATA

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DATE	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SiO2) (00955)	SOLIDS, RESIDUE AT 105 DEG. C, DIS- SOLVED (MG/L) (00515)	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)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P) (00671)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C) (00681)
08-04-87	190	8.0	45	0.25	27	--	226	<0.100	0.500	0.080	2.1
08-04-87	164	16	26	0.25	23	--	222	8.20	<0.010	0.100	0.9
08-13-87	317	8.0	630	1.6	9.8	--	1310	<0.100	1.20	0.030	0.4
02-20-87	160	20	110	0.20	19	356	--	0.710	0.070	0.160	--
02-26-87	178	18	52	0.20	17	293	--	0.200	--	--	--
02-26-87	272	5.0	62	0.25	21	388	--	4.44	0.020	0.090	--
02-26-87	233	26	97	0.20	15	434	--	5.33	0.080	0.030	--
02-26-87	244	80	63	0.25	27	462	--	<0.020	0.580	0.370	--
03-23-87	284	3.0	35	0.40	16	362	--	<0.020	1.20	0.180	--
08-07-87	210	14	32	0.20	13	--	286	4.00	<0.010	0.080	0.6
08-07-87	209	30	41	0.25	15	--	306	4.60	<0.010	0.020	1.1
08-17-87	240	22	86	0.45	24	--	406	3.10	<0.010	0.060	2.0
08-17-87	304	24	77	0.20	28	--	472	1.30	<0.010	0.040	1.2
07-30-87	200	9.0	22	0.15	13	--	240	7.90	<0.010	<0.010	0.5
07-29-87	240	18	24	0.15	13	--	300	6.90	<0.010	<0.010	0.6
03-24-87	256	2.0	9.6	0.40	11	290	--	<0.020	0.050	<0.010	--
08-18-87	314	22	76	0.20	27	--	530	9.80	0.040	<0.010	1.1
04-03-87	302	30	120	0.40	30	524	--	<0.020	1.30	0.230	--
08-07-87	203	3.0	34	0.25	12	--	224	<0.100	<0.010	<0.010	0.4
08-25-87	310	<0.50	8.8	0.30	32	--	272	0.200	1.40	0.090	1.2
08-25-87	310	0.50	10	0.30	30	--	252	<0.100	1.40	0.090	1.2
08-26-87	306	40	100	0.30	21	--	488	0.600	0.370	0.030	1.2
08-25-87	304	42	110	0.25	22	--	544	4.20	0.220	0.050	1.0
02-20-87	145	1.5	10	0.30	19	186	--	0.070	<10.0	0.030	--
08-06-87	192	44	54	0.30	22	--	390	17.0	<0.010	<0.010	1
08-06-87	227	94	200	0.30	25	--	880	33.0	<0.010	<0.010	1.3
08-06-87	138	24	40	0.30	20	--	292	11.0	<0.010	<0.010	0.9
08-19-87	376	12	45	0.25	18	--	396	<0.100	1.10	0.100	1.5
04-03-87	290	1.0	120	0.75	24	434	--	<0.020	0.490	0.010	--
04-03-87	296	2.0	360	0.75	20	815	--	<0.020	1.00	<0.010	--
04-03-87	272	1.0	45	0.50	25	338	--	<0.020	0.520	0.010	--
08-06-87	276	25	30	0.20	15	--	346	4.00	<0.010	<0.010	1.1
10-21-86	250	8.0	68	0.15	21	416	--	0.020	0.440	0.740	--
08-18-87	294	58	33	0.25	27	--	494	9.10	0.180	0.010	1.2
08-18-87	204	8.0	72	0.15	24	--	242	<0.100	<0.010	0.020	0.8
04-09-87	215	2.0	34	0.25	7.0	254	--	<0.200	--	--	--
08-05-87	162	8.0	36	0.15	10	--	228	6.00	<0.010	<0.010	0.8
03-25-87	88	24	19	<0.10	19	234	--	16.2	<0.010	0.030	--
03-24-87	312	45	54	0.10	20	466	--	5.11	<0.010	<0.010	--
08-12-87	401	75	180	0.30	25	--	862	12.0	0.010	0.070	1.1
08-13-87	359	16	78	0.25	21	--	436	0.200	0.210	0.060	0.2
08-12-87	268	20	90	0.25	21	--	398	5.80	<0.010	0.110	0.9
08-11-87	241	24	75	0.30	16	--	402	1.20	<0.010	<0.010	1.2
08-12-87	318	18	73	0.35	26	--	454	5.50	<0.010	0.110	0.7
08-11-87	297	22	80	0.30	25	--	460	2.60	0.030	<0.010	0.9
08-11-87	195	16	94	0.35	20	--	358	0.600	0.010	<0.010	1.7
08-11-87	300	20	110	0.40	22	--	482	0.200	0.290	0.030	1.6
08-12-87	331	11	37	0.30	15	--	330	3.20	<0.010	0.060	0.8
08-11-87	278	19	84	0.35	18	--	442	3.60	0.070	0.130	1.4
08-04-87	262	21	48	0.20	24	--	340	8.60	<0.010	0.030	0.8
08-10-87	322	100	53	0.20	23	--	482	2.90	<0.010	<0.010	0.4
08-11-87	263	12	62	0.20	26	--	300	2.30	0.060	<0.010	0.4
08-11-87	418	10	30	0.35	20	--	372	<0.100	1.70	0.270	2.7
08-11-87	420	11	37	0.25	9.0	--	386	<0.100	3.80	<0.010	0.9
08-10-87	277	24	100	0.20	26	--	384	<0.100	0.010	<0.010	1.0
08-10-87	344	18	98	0.20	24	--	450	1.50	<0.010	<0.010	0.8
07-28-87	186	18	39	0.10	12	--	296	1.40	<0.010	<0.010	0.5

DATE	IRON, DIS- SOLVED (UG/L AS FE) (01046)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	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)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	MERCURY DIS- SOLVED (UG/L AS HG) (71890)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	SILVER, DIS- SOLVED (UG/L AS AG) (01075)
08-04-87	15000	890	--	--	--	--	--	--	--	--	--
08-04-87	20	<20	--	--	--	--	--	--	--	--	--
08-13-87	1400	100	--	--	--	--	--	--	--	--	--
02-20-87	1400	100	<10	310	<1	<10	<10	<10	<1.0	<10	<10
02-26-87	80	500	<10	130	<1	<10	<10	<10	<1.0	<10	<10
02-26-87	<20	<20	<10	140	<1	<10	<10	<10	<1.0	<10	<10
02-26-87	580	1000	<10	180	<1	<10	<10	<10	<1.0	<10	<10
02-26-87	14000	1600	<10	510	<1	<10	<10	<10	<1.0	<10	<10
03-23-87	2400	170	<10	170	<1	<10	<10	<10	<1.0	<10	<10
08-07-87	<20	<20	--	--	--	--	--	--	--	--	--
08-07-87	<20	<20	--	--	--	--	--	--	--	--	--
08-17-87	<20	120	--	--	--	--	--	--	--	--	--
08-17-87	20	80	--	--	--	--	--	--	--	--	--
07-30-87	<20	<20	--	--	--	--	--	--	--	--	--
07-29-87	<20	<20	--	--	--	--	--	--	--	--	--
03-24-87	230	50	<10	410	<1	<10	<10	<10	<1.0	<10	<10
08-18-87	<20	<20	--	--	--	--	--	--	--	--	--
04-03-87	2700	190	<10	<50	<1	<10	<10	<10	<1.0	<10	<10
08-07-87	200	<20	--	--	--	--	--	--	--	--	--
08-25-87	3000	40	--	--	--	--	--	--	--	--	--
08-25-87	3000	50	--	--	--	--	--	--	--	--	--
08-26-87	840	170	--	--	--	--	--	--	--	--	--
08-25-87	390	180	--	--	--	--	--	--	--	--	--
02-20-87	20	--	<10	200	<1	<10	<10	<10	<1.0	<10	<10
08-06-87	<20	70	--	--	--	--	--	--	--	--	--
08-06-87	<20	<20	--	--	--	--	--	--	--	--	--
08-06-87	40	<20	--	--	--	--	--	--	--	--	--
08-19-87	2300	80	--	--	--	--	--	--	--	--	--
04-03-87	1100	260	<10	<50	<1	<10	<10	<10	<1.0	<10	<10
04-03-87	760	340	<10	<50	<1	<10	<10	<10	<1.0	<10	<10
04-03-87	1400	90	<10	70	<1	<10	<10	<10	<1.0	<10	<10
08-06-87	<20	<20	--	--	--	--	--	--	--	--	--
10-21-86	--	1300	<10	260	<1	<10	<10	<10	<1.0	<10	<10
08-18-87	<20	<20	--	--	--	--	--	--	--	--	--
08-18-87	620	290	--	--	--	--	--	--	--	--	--
04-09-87	130	<20	<10	60	<1	<10	10	<10	<1.0	<10	<10
08-05-87	<20	<20	--	--	--	--	--	--	--	--	--
03-25-87	30	<20	<10	<50	<1	<10	<10	<10	<1.0	<10	<10
03-24-87	<20	<20	<10	250	<1	<10	<10	<10	<1.0	<10	<10
08-12-87	410	340	--	--	--	--	--	--	--	--	--
08-13-87	160	1200	--	--	--	--	--	--	--	--	--
08-12-87	<20	80	--	--	--	--	--	--	--	--	--
08-11-87	1200	540	--	--	--	--	--	--	--	--	--
08-12-87	<20	40	--	--	--	--	--	--	--	--	--
08-11-87	90	310	--	--	--	--	--	--	--	--	--
08-11-87	<20	1500	--	--	--	--	--	--	--	--	--
08-11-87	600	340	--	--	--	--	--	--	--	--	--
08-12-87	<20	50	--	--	--	--	--	--	--	--	--
08-11-87	60	200	--	--	--	--	--	--	--	--	--
08-04-87	<20	<20	--	--	--	--	--	--	--	--	--
08-10-87	<20	70	--	--	--	--	--	--	--	--	--
08-11-87	<20	60	--	--	--	--	--	--	--	--	--
08-11-87	6000	80	--	--	--	--	--	--	--	--	--
08-11-87	3200	140	--	--	--	--	--	--	--	--	--
08-10-87	1100	270	--	--	--	--	--	--	--	--	--
08-10-87	230	280	--	--	--	--	--	--	--	--	--
07-28-87	<20	<20	--	--	--	--	--	--	--	--	--

GROUND-WATER-QUALITY DATA

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DATE	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	GROSS ALPHA, DIS- SOLVED (PCI/L AS U-NAT) (01515)	GROSS BETA, DIS- SOLVED (PCI/L AS CS-137) (03515)	RADIUM 226, DIS- SOLVED (PCI/L) (09503)	RADIUM 228 DIS- SOLVED (PCI/L AS RA-228) (81366)	ATRA- ZINE, TOTAL (UG/L) (39630)	CYAN- AZINE TOTAL (UG/L) (81757)	METRI- BUZIN IN WHOLE WATER (UG/L) (81408)	ALA- CHLOR TOTAL RECOVER (UG/L) (77825)	METOLA- CHLOR IN WHOLE WATER (UG/L) (39356)	BUTY- LATE, TOTAL (UG/L) (00000)
08-04-87	--	--	--	--	--	0.11	<0.10	<0.10	<0.10	<0.10	<0.10
08-04-87	--	--	--	--	--	0.47	<0.10	<0.10	<0.10	<0.10	<0.10
08-13-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
02-20-87	<20	5.4	2.0	0.3	1.8	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
02-26-87	40	2.0	1.0	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
02-26-87	<20	1.6	<1.0	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
02-26-87	20	4.3	2.0	0.5	<0.80	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
02-26-87	<20	2.5	<1.1	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
03-23-87	<20	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-07-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-07-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-17-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	0.12	<0.10
08-17-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
07-30-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
07-29-87	--	--	--	--	--	0.29	<0.10	<0.10	<0.10	<0.10	<0.10
03-24-87	<20	--	--	--	--	--	--	--	--	--	--
08-18-87	--	--	--	--	--	2.3	0.77	1.10	0.21	3.30	<0.10
04-03-87	<20	2.1	32	--	--	--	--	--	--	--	--
08-07-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-25-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	--
08-25-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	--
08-26-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	--
08-25-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	--
02-20-87	30	2.7	3.0	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-06-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-06-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-06-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-19-87	--	--	--	--	--	0.59	<0.10	<0.10	<0.10	0.34	<0.10
04-03-87	<20	3.7	19	1.1	1.5	--	--	--	--	--	--
04-03-87	<20	26	19	3.2	2.3	--	--	--	--	--	--
04-03-87	<20	2.0	6.0	--	--	--	--	--	--	--	--
08-06-87	--	--	--	--	--	0.13	<0.10	<0.10	<0.10	<0.10	<0.10
10-21-86	<20	3.8	1.0	1.0	0.70	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-18-87	--	--	--	--	--	1.6	<0.10	<0.10	0.10	0.25	<0.10
08-18-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
04-09-87	<10	2.8	5.0	1.2	<0.80	--	--	--	--	--	--
08-05-87	--	--	--	--	--	0.16	<0.10	<0.10	<0.10	<0.10	<0.10
03-25-87	<20	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
03-24-87	20	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-12-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-13-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-12-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-11-87	--	--	--	--	--	0.56	<0.10	<0.10	<0.10	0.10	<0.10
08-12-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-11-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-11-87	--	--	--	--	--	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-11-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-12-87	--	--	--	--	--	<0.10	<0.10	<0.10	0.10	<0.10	<0.10
08-11-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-04-87	--	--	--	--	--	1.0	<0.10	<0.10	<0.10	<0.10	<0.10
08-10-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-11-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-11-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-11-87	--	--	--	--	--	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
08-10-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-10-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
07-28-87	--	--	--	--	--	0.55	<0.10	<0.10	0.25	0.13	<0.10

DATE	TRI- FLURA- LIN TOTAL RECOVER (UG/L) (39030)	CHLOR- AMBEN TOTAL (UG/L) (82051)	DICAMBA (MED- IBEN) (BAN- VEL D) TOTAL (UG/L) (82052)	2,4-D, TOTAL (UG/L) (39730)	SILVEX, TOTAL (UG/L) (39760)	CARBO- FURAN (UG/L) (81405)	CHLOR- PYRIFOS TOTAL (UG/L) (81403)	ETHO- PROP TOTAL (UG/L) (81758)	DYFO- NATE (UG/L) (81294)	PHORATE OTAL (UG/L) (39023)	TERBU- FOS (UG/L) (82088)
08-04-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-04-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-13-87	<0.10	--	--	--	--	--	--	--	--	--	--
02-20-87	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
02-26-87	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
02-26-87	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
02-26-87	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
02-26-87	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
03-23-87	<0.10	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-07-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-07-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-17-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-17-87	<0.10	--	--	--	--	--	--	--	--	--	--
07-30-87	<0.10	--	--	--	--	--	--	--	--	--	--
07-28-87	<0.10	--	--	--	--	--	--	--	--	--	--
03-24-87	--	--	--	--	--	--	--	--	--	--	--
08-18-87	<0.10	--	--	--	--	--	--	--	--	--	--
04-03-87	--	--	--	--	--	--	--	--	--	--	--
08-07-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-25-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-25-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-26-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-25-87	<0.10	--	--	--	--	--	--	--	--	--	--
02-20-87	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-06-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-06-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-06-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-18-87	<0.10	--	--	--	--	--	--	--	--	--	--
04-03-87	--	--	--	--	--	--	--	--	--	--	--
04-03-87	--	--	--	--	--	--	--	--	--	--	--
04-03-87	--	--	--	--	--	--	--	--	--	--	--
08-06-87	<0.10	--	--	--	--	--	--	--	--	--	--
10-21-86	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-18-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-18-87	<0.10	--	--	--	--	--	--	--	--	--	--
04-08-87	--	--	--	--	--	--	--	--	--	--	--
08-05-87	<0.10	--	--	--	--	--	--	--	--	--	--
03-25-87	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
03-24-87	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-12-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-13-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-12-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-11-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-12-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-11-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-11-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-11-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-12-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-11-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-04-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-10-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-11-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-11-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-11-87	<0.20	--	--	--	--	--	--	--	--	--	--
08-10-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-10-87	<0.10	--	--	--	--	--	--	--	--	--	--
07-28-87	<0.10	--	--	--	--	--	--	--	--	--	--

GROUND-WATER-QUALITY DATA

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MAP STATION NUMBER	STATION NUMBER	LOCAL WELL NUMBER	DATE	LOCAL WELL NAME	COUNTY	SAMPLE DATE	SAMPLE TIME	GEO- LOGIC UNIT
58	432558094564101	10035W35CDAD	1979	Superior 1	Dickinson	02-20-87	1045	110QRNR
59	431822094582601	09835W16ADDD	1947	Terril 1	Dickinson	02-20-87	1230	110QRNR
60	423135090383201	08903E18AADD	1969	Dubuque 9	Dubuque	08-05-87	1100	111ALVM
61	422910091072701	08902W30DCCC	1959	Dyersville 1	Dubuque	07-28-87	1215	350SLRN
62	423305091064901	08902W05CBEB	1898	New Vienna 1	Dubuque	07-28-87	1350	350SLRN
63	425606091565501	09409W30ABAA	1978	Hawkeye 1	Fayette	08-06-87	1100	112FLSC
64	425027091391301	09307W27ACD	1968	Wadena 2	Fayette	08-02-87	0900	111ALVM
65	425720091484201	09408W17DBAC	1957	West Union 2	Fayette	08-05-87	1530	355NIGR
66	425719091483301	09408W17DABC	1935	West Union 3	Fayette	07-29-87	0950	355NIGR
67	424312093132101	09120W05DADD	1975	Hampton 6	Franklin	08-19-87	1100	110QRNR
68	425341093132501	09320W05DADD	1956	Sheffield 2	Franklin	08-19-87	1215	110QRNR
69	425342093133101	09320W05DDBB	1977	Sheffield 3	Franklin	08-19-87	1240	111ALVM
70	404432095361701	08941W31BAAA	1981	Sidney 6	Fremont	10-16-86	0945	111ALVM
71	415550094115101	08229W11BDBC	1945	Rippey 1	Greene	08-25-87	1730	112RLCL
72	421327092492101	08617W34BABB	1978	Beaman 2	Grundy	03-24-87	0900	330MSSP
73	415034094254801	08131W11BDCA	1910	Bagley 1	Guthrie	08-20-87	1045	112FLSC
74	414101094303701	07931W06CDCB	1984	Guthrie Center 4	Guthrie	08-25-87	1110	217DKOT
75	414624094211201	08030W04BBAD	1962	Yale 2	Guthrie	08-20-87	1215	112FLSC
76	421833093382001	08724W34BBBC	1951	Jewell 2	Hamilton	03-13-87	1030	112FLSC
77	415118095361501	08141W03DBBD	1925	Dunlap 1	Harrison	08-14-87	1045	111BRRV
78	415119095361601	08141W03DBBD	1984	Dunlap 3	Harrison	08-14-87	1120	111ALVM
79	414236096012501	08045W25DABD	1951	Mondamin 2	Harrison	09-28-87	1130	111ALVM
80	415004095552101	08144W12CCCD	1967	Pisgah 2	Harrison	02-06-87	1030	111ALVM
81	431443092261401	09714W01DDAB	1914	Elma 1	Howard	07-29-87	1205	112FLSC
82	424836094030101	09227W05DAAD	1966	Hardy 2	Humboldt	03-13-87	1230	110QRNR
83	423911094233402	09130W33ACCC	1967	Pioneer 3	Humboldt	02-19-87	1045	112FLSC
84	422018095205101	08739W23ABDD	1923	Arthur 1	Ida	08-27-87	1200	112FLSC
85	421908095353701	08741W26CBEB	1972	Battle Creek 3	Ida	08-27-87	1315	112FLSC
86	423033095250501	08939W23CADA	1957	Galva 2	Ida	09-23-87	1215	112FLSC
87	422106095280201	08740W14ACBB	1965	Ida Grove 3	Ida	07-23-87	1045	112FLSC
88	414745091521201	08109W26BCDC	1942	Amara 5	Iowa	08-17-87	1100	111ALVM
89	414736091534501	08109W28DBDB	1967	Middle Amara 8	Iowa	08-17-87	1200	111ALVM
90	414335092175001	08012W19BCCC	1941	Victor 1	Iowa	03-24-87	1000	112FLSC
91	420432090401201	08402E24AAB	1953	Maquoketa 3	Jackson	03-24-87	1500	112FLSC
92	420414090113204	08407E19BD	1935	Sabula 2	Jackson	03-25-87	1200	350SLRN
93	414300092544401	08018W26ABBB	1954	Kellogg 2	Jasper	07-30-87	1530	111ALVM
94	413911093071402	07920W13ADCB	1975	Newton 3a	Jasper	08-13-87	0830	111ALVM
95	405925092100001	07211W31DCBD	1958	Batavia 1	Jefferson	03-26-87	1405	112FLSC
96	412916091254501	07705W09DAB	1972	Lone Tree 2	Johnson	03-23-87	1200	112FLSC
97	420607091011001	08402W12A	1913	Onslow 1	Jones	03-25-87	0900	112FLSC
98	415852090572701	08301W21DAAC	1977	Oxford Junction 2	Jones	07-28-87	0945	111ALVM
99	411817092195101	07513W14BBDD	1979	Delta 7	Keokuk	08-14-87	1255	111ALVM
100	412809092142201	07712W15CCBC	1986	Keswick 3	Keokuk	08-14-87	1440	111ALVM
101	411849092115401	07512W12CBBCA	1958	Sigourney 5	Keokuk	08-03-87	0910	111ALVM
102	430424094142701	09529W02CABC	1968	Algona 6	Kossuth	02-20-87	1430	217DKOT
103	403748091174301	06704W02CBBA	1967	Fort Madison 1	Lee	03-26-87	0900	110QRNR
104	403226091252702	06605W03CDAA	1985	Montrose 2	Lee	03-26-87	1100	111ALVM
105	415959091433101	08308W13ACDB	1970	Cedar Rapids S9	Linn	08-13-87	1430	111ALVM
106	420025091414601	08307W17BBBB	1964	Cedar Rapids W3	Linn	08-20-87	0930	111ALVM
107	421138091471801	08508W09BAB	1966	Center Point 1	Linn	08-20-87	1145	344SOLN
108	420200091363002	08307W01BAAA	1953	Marion 2	Linn	03-23-87	1300	355NIGR
109	411539091222001	07505W36ACBB	1967	Columbus City 2	Louisa	08-13-87	1240	112FLSC
110	411652091213802	07504W19CDA	1987	Columbus Junction 4	Louisa	08-13-87	1130	112FLSC
111	410557091023701	07302W25BBCC	1973	Oakville 1	Louisa	08-13-87	0920	110QRNR
112	411056091111501	07403W27BDDD	1976	Wapello 3	Louisa	08-13-87	1030	112FLSC

GROUND-WATER-QUALITY DATA

DATE	DEPTH OF WELL, TOTAL (FEET) (72008)	FLOW RATE (GPM) (00058)	PUMP OR FLOW PERIOD PRIOR TO SAM- PLING (MIN) (72004)	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH (STAND- ARD UNITS) (00400)	HARD- NESS (MG/L AS CACO3) (00900)	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)
02-20-87	105.00	42	30	9.0	1080	7.10	580	160	43	11	6.4
02-20-87	120.00	90	30	10.0	910	7.20	480	140	31	12	5.0
08-05-87	125.00	--	10	18.0	355	8.20	170	42	17	6.6	3.2
07-28-87	126.00	475	20	13.0	960	7.20	420	100	42	28	5.0
07-28-87	170.00	50	20	12.0	710	7.30	350	85	34	7.9	<0.10
08-06-87	85.00	58	10	15.5	665	7.30	320	100	18	10	1.2
08-02-87	47.00	58	10	15.5	680	7.40	350	90	31	6.2	4.6
08-05-87	90.00	250	10	16.5	870	7.30	410	110	34	15	2.8
07-29-87	55.00	410	30	11.0	880	7.20	410	110	33	18	3.6
08-19-87	54.00	300	60	12.0	750	7.11	390	100	34	4.7	3.5
08-19-87	27.00	45	60	15.0	600	7.24	280	74	24	3.5	0.70
08-19-87	27.00	70	60	15.0	500	7.17	240	60	21	5.8	2.3
10-16-86	32.00	200	60	13.0	595	7.10	310	88	23	14	2.6
08-25-87	135.00	110	60	12.0	750	7.05	360	95	31	20	4.8
03-24-87	100.00	--	60	11.0	760	7.70	410	100	40	13	2.8
08-20-87	85.00	116	30	12.0	600	7.23	300	78	26	5.3	3.2
08-25-87	65.00	300	15	14.0	410	7.20	170	47	13	8.2	1.3
08-20-87	82.00	120	20	12.0	550	7.24	310	79	27	4.6	2.8
03-13-87	65.00	180	20	12.0	1100	7.10	500	130	42	10	5.3
08-14-87	83.00	130	15	13.0	960	6.90	500	130	42	16	4.8
08-14-87	100.00	290	20	12.0	740	7.40	380	98	32	10	4.2
09-28-87	90.00	100	45	12.5	1320	6.80	610	160	52	45	5.4
02-06-87	142.00	--	30	12.5	640	7.30	340	86	31	7.9	4.7
07-29-87	143.00	180	25	11.0	590	7.60	270	77	20	7.1	1.9
03-13-87	90.00	--	30	11.0	990	7.20	430	110	37	18	5.8
02-19-87	90.00	11	60	10.5	1290	7.10	570	150	47	69	3.7
08-27-87	24.00	100	20	13.0	720	7.04	340	95	26	12	0.40
08-27-87	59.00	250	30	13.0	680	7.22	340	88	28	8.6	4.0
07-23-87	48.00	90	20	11.0	860	7.30	410	120	28	19	2.8
07-23-87	68.00	450	10	14.0	970	7.20	440	130	27	31	3.2
08-17-87	33.00	55	20	12.0	950	6.98	420	110	35	27	13
08-17-87	34.00	--	>30	13.0	615	7.08	300	73	28	13	3.0
03-24-87	349.00	165	20	13.5	1840	7.90	700	170	67	200	8.6
03-24-87	99.00	550	360	14.0	785	7.10	390	92	38	18	1.5
03-25-87	200.00	165	210	13.0	600	7.40	320	80	30	8.8	1.3
07-30-87	30.00	55	45	12.0	480	6.60	190	50	17	10	1.6
08-13-87	54.00	300	20	12.0	630	7.53	330	81	30	6.8	1.1
03-26-87	100.00	55	180	14.0	725	7.50	300	78	25	62	3.6
03-23-87	159.00	300	120	13.0	548	7.40	270	76	20	21	1.4
03-25-87	275.00	10	20	12.0	590	7.40	310	79	28	8.9	1.3
07-28-87	50.00	275	60	12.0	640	6.90	320	80	28	6.1	4.2
08-14-87	30.00	10	20	15.0	380	6.80	160	43	13	10	<0.10
08-14-87	31.00	40	20	12.0	610	7.60	300	77	25	12	3.2
08-03-87	35.00	80	2880	12.0	610	7.20	280	80	20	12	1.5
02-20-87	141.00	500	30	11.0	1000	6.80	410	110	32	62	5.3
03-26-87	148.00	500	60	14.0	455	7.50	--	--	--	--	2.5
03-26-87	82.00	207	60	13.0	575	7.50	320	82	28	7.1	0.40
08-13-87	58.00	1500	20	19.0	440	7.97	200	55	16	9.4	3.8
08-20-87	64.00	1500	--	14.0	542	7.50	260	69	22	9.4	3.8
08-20-87	49.00	105	240	12.0	715	7.03	300	99	14	20	3.6
03-23-87	441.00	600	180	17.0	570	7.50	200	49	18	6.8	0.90
08-13-87	167.00	15	30	13.0	760	7.50	320	78	31	38	3.8
08-13-87	105.00	150	20	14.0	720	7.60	290	75	25	43	4.5
08-13-87	126.00	100	20	14.0	400	7.40	200	54	16	6.9	1.6
08-13-87	77.00	210	20	13.0	390	7.70	180	52	12	5.5	1.8

GROUND-WATER-QUALITY DATA

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DATE	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SiO2) (00955)	SOLIDS, RESIDUE AT 105 DEG. C, DIS- SOLVED (MG/L) (00515)	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)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P) (00671)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C) (00681)
02-20-87	360	5.5	240	0.25	26	728	--	<0.020	0.550	0.020	--
02-20-87	364	3.0	130	0.40	28	574	--	<0.020	0.490	0.050	--
08-05-87	151	12	38	0.15	12	--	184	<0.100	0.350	0.200	4.6
07-28-87	286	72	96	0.15	12	--	530	9.90	<0.010	0.030	0.9
07-28-87	297	30	24	0.20	23	--	380	6.00	<0.010	<0.010	0.7
08-06-87	254	15	75	0.20	15	--	390	0.600	0.010	<0.010	0.9
08-02-87	316	10	36	0.15	13	--	382	2.70	<0.010	<0.010	0.8
08-05-87	313	33	40	0.20	24	--	488	12.0	<0.010	<0.010	1
07-29-87	300	56	36	0.20	19	--	458	13.0	<0.010	<0.010	0.9
08-19-87	308	12	84	0.20	28	--	418	<0.100	0.230	0.030	0.9
08-19-87	204	9.0	20	0.15	25	--	326	15.0	<0.010	0.030	0.5
08-19-87	210	9.0	22	0.15	23	--	250	1.20	<0.010	0.020	0.9
10-16-86	288	6.0	40	0.30	19	250	--	0.070	0.090	0.230	--
08-25-87	422	0.50	8.0	0.45	27	--	358	<0.100	2.00	0.340	2.8
03-24-87	364	5.0	67	0.35	13	446	--	0.180	0.800	0.040	--
06-20-87	310	0.50	9.8	0.35	14	--	300	0.100	0.200	0.050	0.4
08-25-87	108	14	32	0.20	22	--	188	9.90	<0.010	0.030	0.4
08-20-87	309	1.0	14	0.50	19	--	308	0.600	0.050	0.020	0.4
03-13-87	321	26	130	0.15	32	550	--	<0.020	1.20	0.130	--
08-14-87	384	25	91	0.30	27	--	616	9.00	<0.010	0.040	0.5
08-14-87	322	12	56	0.25	26	--	472	4.30	0.120	0.070	0.4
09-28-87	532	47	170	0.20	34	--	866	<0.100	1.50	0.190	3.7
02-06-87	352	1.0	5.1	0.30	25	356	--	0.470	--	--	--
07-29-87	202	20	54	0.20	12	--	298	5.00	0.010	<0.010	0.6
03-13-87	379	22	60	0.25	26	460	--	<0.020	0.770	0.010	--
02-19-87	434	3.0	270	0.40	19	874	--	<0.020	0.950	0.100	--
08-27-87	271	14	59	0.45	18	--	412	7.90	<0.010	0.010	0.9
08-27-87	280	5.5	46	0.30	25	--	400	8.70	<0.010	0.020	0.3
07-23-87	304	19	110	0.30	17	--	538	9.90	0.350	0.010	1.0
07-23-87	300	22	96	1.6	23	--	596	4.60	<0.010	0.070	0.9
08-17-87	272	48	150	0.20	20	--	510	8.30	0.050	<0.010	3.2
08-17-87	248	28	54	0.25	17	--	310	2.20	0.040	<0.010	1.2
03-24-87	250	5.0	800	0.30	12	1500	--	<0.020	7.50	0.030	--
03-24-87	310	36	53	0.15	19	440	--	5.55	<0.010	<0.010	--
03-25-87	278	11	30	0.15	22	338	--	4.22	0.090	<0.010	--
07-30-87	103	12	72	0.20	20	--	258	5.90	<0.010	<0.010	1.3
06-13-87	241	15	72	0.20	23	--	324	9.70	<0.010	<0.010	0.4
03-26-87	388	1.0	23	0.40	16	426	--	<0.020	1.10	0.210	--
03-23-87	304	0.50	10	0.30	24	278	--	<0.020	1.80	0.270	--
03-25-87	326	1.0	14	0.20	13	314	--	0.040	0.750	0.010	--
07-28-87	270	14	36	0.20	16	--	362	4.40	0.090	0.020	1.2
08-14-87	117	12	61	0.20	18	--	152	<0.100	0.100	<0.010	0.8
08-14-87	291	10	38	0.35	17	--	262	<0.100	0.940	<0.010	1.7
08-03-87	226	18	75	0.25	17	--	308	<0.100	0.020	0.050	0.7
02-20-87	366	20	110	0.35	23	610	--	<0.020	0.410	0.120	--
03-26-87	--	--	16	<0.10	22	244	--	<0.020	3.90	0.860	--
03-26-87	240	9.0	44	<0.10	26	330	--	3.77	0.010	0.070	--
08-13-87	170	22	37	0.25	11	--	180	1.30	0.060	<0.010	1.3
08-20-87	225	19	28	0.20	14	--	228	<0.100	0.860	0.170	0.8
08-20-87	200	56	62	0.15	13	--	390	4.00	0.020	0.050	1.2
03-23-87	165	11	42	0.15	11	312	--	<0.020	0.050	<0.010	--
08-13-87	417	5.0	3.8	0.40	20	--	348	<0.100	2.30	0.060	1.1
08-13-87	368	14	16	0.30	15	--	324	<0.100	1.50	<0.010	1.3
08-13-87	220	1.5	4.4	0.15	16	--	128	<0.100	0.400	<0.010	1.2
08-13-87	160	3.0	40	0.15	19	--	150	<0.100	0.160	0.020	0.7

DATE	IRON, DIS- SOLVED (UG/L AS FE) (01046)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	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)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	MERCURY DIS- SOLVED (UG/L AS HG) (71890)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	SILVER, DIS- SOLVED (UG/L AS AG) (01075)
02-20-87	3500	580	<10	<50	<1	<10	<10	<10	<1.0	<10	<10
02-20-87	2600	210	<10	<50	<1	<10	<10	<10	<1.0	<10	<10
08-05-87	1900	2600	--	--	--	--	--	--	--	--	--
07-28-87	<20	<20	--	--	--	--	--	--	--	--	--
07-28-87	<20	<20	--	--	--	--	--	--	--	--	--
08-06-87	620	310	--	--	--	--	--	--	--	--	--
08-02-87	<20	<20	--	--	--	--	--	--	--	--	--
08-05-87	<20	<20	--	--	--	--	--	--	--	--	--
07-29-87	<20	<20	--	--	--	--	--	--	--	--	--
08-19-87	1100	410	--	--	--	--	--	--	--	--	--
08-19-87	<20	<20	--	--	--	--	--	--	--	--	--
08-19-87	20	100	--	--	--	--	--	--	--	--	--
10-16-86	1100	230	<10	210	<1	<10	<10	<10	<1.0	<10	<10
08-25-87	2400	370	--	--	--	--	--	--	--	--	--
03-24-87	110	200	<10	100	<1	<10	<10	<10	<1.0	<10	<10
08-20-87	140	1500	--	--	--	--	--	--	--	--	--
08-25-87	<20	30	--	--	--	--	--	--	--	--	--
08-20-87	840	770	--	--	--	--	--	--	--	--	--
03-13-87	5900	140	<10	310	<1	<10	<10	<10	<1.0	<10	<10
08-14-87	<20	30	--	--	--	--	--	--	--	--	--
08-14-87	<20	90	--	--	--	--	--	--	--	--	--
09-28-87	10000	450	--	--	--	--	--	--	--	--	--
02-06-87	--	<20	<10	220	<1	<10	<10	<10	<1.0	<10	<10
07-29-87	<20	<20	--	--	--	--	--	--	--	--	--
03-13-87	1300	140	10	160	<1	<10	<10	<10	<1.0	<10	<10
02-19-87	2300	510	<10	<50	<1	<10	<10	<10	<1.0	<10	<10
08-27-87	<20	<20	--	--	--	--	--	--	--	--	--
08-27-87	<20	<20	--	--	--	--	--	--	--	--	--
07-23-87	460	20	--	--	--	--	--	--	--	--	--
07-23-87	<20	<20	--	--	--	--	--	--	--	--	--
08-17-87	<20	320	--	--	--	--	--	--	--	--	--
08-17-87	230	780	--	--	--	--	--	--	--	--	--
03-24-87	1500	50	<10	<50	<1	<10	<10	<10	<1.0	<10	<10
03-24-87	<20	<20	<10	100	<1	<10	<10	<10	<1.0	<10	<10
03-25-87	<20	660	<10	70	<1	<10	<10	<10	<1.0	<10	<10
07-30-87	180	150	--	--	--	--	--	--	--	--	--
08-13-87	<20	120	--	--	--	--	--	--	--	--	--
03-26-87	2400	40	<10	110	<1	<10	<10	<10	<1.0	<10	<10
03-23-87	3900	50	<10	310	<1	<10	<10	<10	<1.0	<10	<10
03-25-87	1700	<20	<10	280	<1	<10	<10	<10	<1.0	<10	<10
07-28-87	<20	<20	--	--	--	--	--	--	--	--	--
08-14-87	5300	1000	--	--	--	--	--	--	--	--	--
08-14-87	2700	40	--	--	--	--	--	--	--	--	--
08-03-87	3200	490	--	--	--	--	--	--	--	--	--
02-20-87	1800	360	<10	100	<1	<10	<10	<10	<1.0	<10	<10
03-26-87	5300	1600	<10	--	<1	<10	<10	<10	<1.0	<10	<10
03-26-87	520	180	<10	170	<1	<10	<10	<10	<1.0	<10	<10
08-13-87	50	190	--	--	--	--	--	--	--	--	--
08-20-87	2100	880	--	--	--	--	--	--	--	--	--
08-20-87	220	70	--	--	--	--	--	--	--	--	--
03-23-87	370	50	<10	140	<1	<10	<10	<10	<1.0	<10	<10
08-13-87	1100	30	--	--	--	--	--	--	--	--	--
08-13-87	1100	100	--	--	--	--	--	--	--	--	--
08-13-87	770	130	--	--	--	--	--	--	--	--	--
08-13-87	550	170	--	--	--	--	--	--	--	--	--

GROUND-WATER-QUALITY DATA

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DATE	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	GROSS ALPHA, DIS- SOLVED (PCI/L AS U-NAT) (01515)	GROSS BETA, DIS- SOLVED (PCI/L AS CS-137) (03515)	RADIUM 226, DIS- SOLVED (PCI/L) (09503)	RADIUM 228 DIS- SOLVED (PCI/L AS RA-228) (81366)	ATRA- ZINE, TOTAL (UG/L) (39630)	CYAN- AZINE TOTAL (UG/L) (81757)	METRI- BUZIN IN WHOLE WATER (UG/L) (81408)	ALA- CHLOR TOTAL RECOVER (UG/L) (77825)	METOLA- CHLOR IN WHOLE WATER (UG/L) (39356)	BUTY- LATE, TOTAL (UG/L) (00000)
02-20-87	<20	7.9	<1.0	0.4	<0.90	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
02-20-87	<20	2.5	3.0	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-05-87	--	--	--	--	--	0.17	<0.10	<0.10	<0.10	<0.10	<0.10
07-28-87	--	--	--	--	--	0.42	<0.10	<0.10	<0.10	<0.10	<0.10
07-28-87	--	--	--	--	--	0.19	<0.10	<0.10	<0.10	<0.10	<0.10
08-06-87	--	--	--	--	--	0.29	<0.10	<0.10	<0.10	<0.10	<0.10
08-02-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-05-87	--	--	--	--	--	0.32	<0.10	<0.10	<0.10	<0.10	<0.10
07-29-87	--	--	--	--	--	0.20	<0.10	<0.10	<0.10	<0.10	<0.10
08-19-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-19-87	--	--	--	--	--	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-19-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
10-16-86	<20	4.5	2.0	0.5	1.2	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-25-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	--
03-24-87	<20	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-20-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-25-87	--	--	--	--	--	2.7	0.65	0.16	<0.10	1.80	--
08-20-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
03-13-87	6400	<0.3	3.0	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-14-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	--	<0.10
08-14-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
09-28-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
02-06-87	30	4.5	3.0	0.4	<0.80	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
07-29-87	--	--	--	--	--	0.25	<0.10	<0.10	0.11	<0.10	<0.10
03-13-87	<20	7.5	2.0	7.2	<0.90	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
02-19-87	<20	4.6	<1.0	0.8	<0.90	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-27-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-27-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
07-23-87	--	--	--	--	--	3.6	0.35	<0.10	<0.10	<0.10	<0.10
07-23-87	--	--	--	--	--	0.18	<0.10	<0.10	<0.10	<0.10	<0.10
08-17-87	--	--	--	--	--	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-17-87	--	--	--	--	--	0.25	0.19	<0.10	<0.10	<0.10	<0.10
03-24-87	<20	--	--	--	--	--	--	--	--	--	--
03-24-87	<20	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
03-25-87	<20	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
07-30-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-13-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
03-26-87	<20	--	--	--	--	0.18	<0.10	<0.10	<0.10	<0.10	<0.10
03-23-87	<20	--	--	--	--	--	--	--	--	--	--
03-25-87	<20	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
07-28-87	--	--	--	--	--	17	3.0	0.40	8.40	6.30	<0.10
08-14-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-14-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-03-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
02-20-87	<20	10	18	3.0	2.4	--	--	--	--	--	--
03-26-87	--	--	--	--	--	0.20	<0.10	<0.10	<0.10	<0.10	<0.10
03-26-87	<20	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-13-87	--	--	--	--	--	0.43	<0.10	<0.10	<0.10	0.11	<0.10
08-20-87	--	--	--	--	--	0.20	<0.10	<0.10	<0.10	<0.10	<0.10
08-20-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
03-23-87	<20	--	--	--	--	--	--	--	--	--	--
08-13-87	--	--	--	--	--	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
08-13-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-13-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-13-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10

[illegible]

GROUND-WATER-QUALITY DATA

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MAP STATION NUMBER	STATION NUMBER	LOCAL WELL NUMBER	DATE	LOCAL WELL NAME	COUNTY	SAMPLE DATE	SAMPLE TIME	GEO- LOGIC UNIT
113	432031096175301	09846W05AACC	1979	Alvord 3	Lyon	07-21-87	1040	111ALVM
114	431646096142901	09816W26ACDD	1976	Doon 4	Lyon	07-21-87	1220	111ALVM
115	432622096101901	10045W33CBAB	1925	Rock Rapids 2	Lyon	07-21-87	0910	111ALVM
116	411726093503201	07526W15CCDA	1979	Saint Charles 3	Madison	10-21-86	1315	111ALVM
117	412803093182601	07721W17CCAC	1967	Swan 1	Marion	08-12-87	1500	111ALVM
118	420613092593601	08418W07BACA		Albion 2	Marshall	08-31-87	1400	111ALVM
119	420020092465001	08317W13BA	1955	Le Grand 2	Marshall	07-30-87	1130	339PFC
120	410116095464101	07243W22CAC	1972	Glenwood 3	Mills	02-19-87	1115	112PLSC
121	410114095300001	06841W14CDBB	1965	Hastings 1	Mills	02-26-87	0945	111ALVM
122	420420095545702	08444W24CAAC	1963	Castana 2	Monona	07-23-87	0830	111ALVM
123	420241095422001	08442W35CABB	1974	Ute 3	Monona	08-14-87	0915	111SDRV
124	410857095094201	07338W01DBDC	1935	Elliot 1	Montgomery	02-20-87	1215	112PLSC
125	415559094591501	07136W21DDAB	1974	Villisca 7	Montgomery	02-19-87	1430	111ALVM
126	412321091034801	07602W15AACB	1958	Muscatine 5	Muscatine	08-19-87	0920	111ALVM
127	430517095364602	09640W31DBCD		Primghar 3	O'Brien	07-22-87	0830	112PLSC
128	430546094411601	09633W36ABBC	1979	Emmetsburg 4	Palo Alto	08-18-87	1030	111ALVM
129	424948096332901	09348W31BDDC	1959	Akron 4	Plymouth	08-05-87	1450	112PLSC
130	424921096334701	09348W31CCDD	1969	Akron 5	Plymouth	08-05-87	1420	112PLSC
131	424838096161001	09246W03CCAB	1971	Brunsville 3	Plymouth	08-05-87	1600	110QRNR
132	423737096173201	09046W08ADDD	1956	Hinton 2	Plymouth	07-22-87	1510	110QRNR
133	423531095593901	09044W24CC	1981	Kingsley 3	Plymouth	08-13-87	1345	111ALVM
134	424305096145301	09146W11BDD	1967	Merrill 3	Plymouth	07-22-87	1400	110QRNR
135	424921095581501	09243W06BABA	1956	Remsen 3	Plymouth	08-06-87	1620	110QRNR
136	424528096362001	09249W27DAAB	1965	Westfield 1	Plymouth	08-05-87	1230	110QRNR
137	424528096362501	09249W27DAAB	1980	Westfield 2	Plymouth	08-05-87	1155	110QRNR
138	425058094510802	09334W27BBAA	1961	Laurens 5	Pocahontas	02-18-87	1145	112PLSC
139	423750094355804	09032W10AAAD	1970	Palmer 5	Pocahontas	02-18-87	1330	112PLSC
140	425240094371002	09332W15BBBB	1977	Plover 2	Pocahontas	02-18-87	1015	112PLSC
141	414409093241001	08022W15CBDC	1981	Bondurant 4	Polk	08-05-87	0820	111ALVM
142	414051093190902	07921W05CAAA	1958	Mitchellville 2	Polk	08-12-87	1200	111ALVM
143	414051093190903	07921W05CAAA	1977	Mitchellville 3	Polk	08-12-87	1300	111ALVM
144	414627093424302	08125W01BACB	1980	Polk City 4	Polk	08-11-87	1500	112PLSC
145	413415093432501	07825W10CCDC	1951	West Des Moines 6	Polk	08-03-87	1600	111ALVM
146	413342093432801	07825W15CAAC	1954	West Des Moines 9	Polk	08-12-87	0930	111ALVM
147	412653095370901	07742W25ABE	1966	Neola 3	Pottawattamie	08-04-87	0915	217DKOT
148	411356095360801	07441W07ABBA	1979	Treynor 3	Pottawattamie	02-19-87	0920	112PLSC
149	414337092265707	08014W23BDB	1954	Brooklyn 3	Poweshiek	03-24-87	1345	112PLSC
150	414645092203801	08113W34DCA	1956	Hartwick 1	Poweshiek	03-24-87	1115	112PLSC
151	422644095085501	08837W09DDAD	1973	Early 2	Sac	08-27-87	1000	112PLSC
152	421826095025101	08736W33BCAA	1978	Lake View 3	Sac	07-23-87	1340	112PLSC
153	421909095162201	08738W28DBBA	1972	Odebolt 7	Sac	08-27-87	1110	112PLSC
154	421617095051001	08636W07CDBB	1971	Wall Lake 3	Sac	08-28-87	--	112PLSC
155	414932095201902	08139W13CACB	1981	Defiance 4	Shelby	08-11-87	0830	111ALVM
156	414622095250101	08039W05ACAA	1968	Earling 1	Shelby	08-04-87	1345	111ALVM
157	414627095245501	08039W05BACA	1974	Earling 5	Shelby	08-04-87	1400	112PLSC
158	413434095033701	07837W11AAAD	1968	Elk Horn 10	Shelby	08-04-87	1530	111ALVM
159	413842095184201	07938W19ABAB	1978	Harlan 20	Shelby	08-04-87	1300	111ALVM
160	413810095185401	07938W19BDD	1978	Harlan 27	Shelby	08-04-87	1330	111ALVM
161	414724095124001	08138W36AAAB	1969	Irwin 4	Shelby	08-04-87	1215	111WNRV
162	414350095283101	08040W23BBDA	1968	Panama 3	Shelby	08-04-87	0915	111ALVM
163	413049095254501	07839W34ACCD	1968	Shelby 5	Shelby	08-04-87	1045	111ALVM
164	425941096002701	09444W02ABCB	1939	Alton 2	Sioux	07-22-87	1025	112PLSC
165	431504096000901	09744W02ADCD	1976	Boyd 3	Sioux	07-21-87	1450	110QRNR
166	425946096292901	09448W03AAAB	1960	Hawarden 6	Sioux	07-22-87	1200	110QRNU
167	425948096295401	09448W03ABBA	1967	Hawarden 7	Sioux	08-06-87	0945	110QRNU
168	430431095542101	09543W03DBAC	1961	Hospers 3	Sioux	08-06-87	1130	110QRNR
169	425756096104501	09445W17AACA	1915	Maurice 1	Sioux	08-06-87	0755	110QRNR
170	430108096093801	09545W28DBAA	1970	Orange City WB 2	Sioux	08-06-87	1415	110QRNR
171	420130093380901	08324W03CDBB	1982	Ames 17	Story	04-01-87	1430	112PLSC
172	415329093360801	08224W26AAB	1948	Huxley 2	Story	04-01-87	1115	112PLSC
173	415307093234701	08222W27BDD	1946	Maxwell 2	Story	04-01-87	1215	112PLSC
174	415305093235901	08222W27CAB	1978	Maxwell 3	Story	04-01-87	1300	112PLSC

GROUND-WATER-QUALITY DATA

DATE	DEPTH OF WELL, TOTAL (FEET) (72008)	FLOW RATE (GPM) (00058)	PUMP OR FLOW PERIOD PRIOR TO SAM- PLING (MIN) (72004)	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH (STAND- ARD UNITS) (00400)	HARD- NESS (MG/L AS CACO3) (00900)	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)
07-21-87	37.00	60	150	12.0	1200	7.60	580	150	49	32	5.1
07-21-87	50.00	15	15	11.0	930	7.50	410	100	40	16	3.6
07-21-87	38.00	200	15	10.0	950	7.30	450	120	36	13	4.3
10-21-86	51.00	50	20	13.0	495	7.10	210	66	10	23	2.0
08-12-87	35.00	20	20	22.0	990	7.07	520	130	48	22	4.2
08-31-87	26.00	--	20	13.5	740	7.19	380	98	34	12	1.2
07-30-87	95.00	--	120	13.0	730	7.40	330	89	27	16	1.5
02-19-87	93.00	800	45	11.5	840	6.70	440	120	34	12	5.1
02-26-87	53.00	--	45	13.0	640	7.10	300	79	25	19	2.9
07-23-87	58.00	--	20	12.0	880	7.30	460	120	39	10	5.6
08-14-87	59.00	125	30	13.0	855	6.90	420	110	35	9.3	4.4
02-20-87	56.00	112	30	11.0	350	6.60	160	42	13	7.6	1.1
02-19-87	41.00	90	30	11.0	630	6.80	270	75	19	18	2.5
08-19-87	64.00	500	840	14.0	460	7.71	240	65	20	9.1	3.7
07-22-87	24.00	60	90	15.0	720	7.30	360	94	31	8.4	0.20
08-18-87	35.00	300	60	12.0	730	7.34	320	88	25	25	4.8
08-05-87	50.00	200	45	11.5	1200	6.84	640	180	46	20	8.0
08-05-87	59.00	300	300	14.5	1230	6.65	610	160	52	25	5.0
08-05-87	30.00	110	20	11.0	870	6.51	500	140	37	18	3.8
07-22-87	52.00	45	20	12.0	1130	7.30	600	170	43	11	5.3
08-13-87	41.00	225	20	10.5	610	6.80	300	84	21	6.6	2.9
07-22-87	42.00	200	15	12.0	900	7.30	430	110	38	15	4.4
08-06-87	36.00	75	30	13.5	990	6.89	510	140	38	18	4.6
08-05-87	41.00	35	20	11.0	1600	6.78	760	210	58	27	9.2
08-05-87	47.00	85	30	16.0	1300	6.89	640	180	46	20	7.2
02-18-87	229.00	211	20	11.0	1600	7.20	800	210	67	88	7.5
02-18-87	165.00	70	30	12.0	1700	7.30	710	170	69	140	7.9
02-18-87	46.00	60	30	8.5	830	7.20	410	100	38	8.8	3.8
08-05-87	70.00	350	15	11.0	690	7.50	330	88	27	6.3	2.7
08-12-87	61.00	250	20	12.0	625	7.44	330	85	28	7.7	1.2
08-12-87	67.00	250	20	12.0	675	7.30	350	90	30	6.6	1.2
08-11-87	68.00	100	60	15.0	680	7.47	350	92	28	8.6	2.9
08-03-87	41.00	300	20	14.0	970	7.60	360	96	28	55	4.8
08-12-87	51.00	278	1080	14.0	675	7.36	350	93	28	12	2.7
08-04-87	122.00	--	30	13.0	930	6.92	460	120	38	7.9	3.5
02-19-87	248.00	<115	45	12.0	880	7.30	350	94	28	70	4.5
03-24-87	110.00	200	15	12.5	1900	8.00	510	110	56	200	11
03-24-87	410.00	--	--	13.5	1850	8.00	700	180	61	180	7.6
08-27-87	44.00	100	30	11.0	660	7.20	310	83	26	9.8	3.7
07-23-87	105.00	270	30	13.0	780	7.50	380	100	32	12	2.6
08-27-87	30.00	50	20	12.0	760	7.11	390	110	27	9.5	2.9
08-28-87	43.00	500	60	12.0	910	6.91	440	120	33	17	4.5
08-11-87	55.00	25	600	12.0	890	7.00	470	120	41	9.6	4.3
08-04-87	40.00	18	240	12.0	680	6.70	320	84	27	9.7	4.0
08-04-87	40.00	23	240	12.0	709	6.63	340	94	26	8.9	3.2
08-04-87	41.00	33	30	13.0	800	6.41	360	100	26	11	3.6
08-04-87	36.00	72	30	11.0	1310	6.25	560	160	38	33	5.4
08-04-87	36.00	72	30	10.5	790	6.63	380	110	26	9.0	3.9
08-04-87	41.00	70	30	12.0	810	7.08	400	110	31	14	3.0
08-04-87	40.00	15	30	12.0	925	6.83	460	130	34	7.9	4.7
08-04-87	45.00	20	30	15.5	610	6.43	280	74	23	7.8	0.60
07-22-87	35.00	75	20	11.0	870	7.30	380	97	34	32	4.1
07-21-87	31.00	150	15	14.0	850	7.80	420	110	36	11	4.3
07-22-87	37.00	130	120	12.0	1210	7.20	580	160	44	30	6.2
08-06-87	44.00	170	60	12.5	940	6.99	470	110	48	22	9.7
08-06-87	47.00	50	20	10.5	1260	6.76	600	170	43	18	5.2
08-06-87	30.00	55	20	12.0	1050	7.02	540	140	47	19	4.3
08-06-87	69.00	150	30	12.5	930	6.89	470	120	41	23	4.6
04-01-87	154.00	830	4320	13.0	890	7.20	450	120	36	16	2.2
04-01-87	237.00	90	20	12.0	1620	7.90	130	29	13	310	20
04-01-87	122.00	220	20	12.0	700	7.30	340	93	26	22	3.7
04-01-87	47.00	175	20	12.0	670	7.20	340	89	28	15	2.3

GROUND-WATER-QUALITY DATA

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DATE	ALKA- LITY LAB (MG/L AS CACO3) (90410)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SiO2) (00955)	SOLIDS, RESIDUE AT 105 DEG. C, DIS- SOLVED (MG/L) (00515)	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)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P) (00671)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C) (00681)
07-21-87	348	68	240	0.20	14	--	826	5.30	0.030	0.020	2.5
07-21-87	259	16	150	0.50	16	--	540	0.200	0.150	0.020	2.7
07-21-87	285	26	120	0.30	18	--	600	18.0	<0.010	0.040	1
10-21-86	234	5.5	38	0.30	22	192	--	<0.020	0.840	0.890	--
08-12-87	304	9.5	350	0.30	27	--	454	7.90	<0.010	<0.010	1.1
08-31-87	306	28	70	0.20	20	--	418	5.30	<0.010	0.030	1.0
07-30-87	241	26	76	0.20	25	--	410	6.80	<0.010	<0.010	1
02-19-87	400	12	34	0.30	27	516	--	<0.020	0.660	0.430	--
02-26-87	216	19	66	0.25	20	368	--	6.88	<0.010	0.130	--
07-23-87	375	20	82	0.30	20	--	548	2.50	0.040	0.010	0.6
08-14-87	318	24	60	0.25	21	--	466	13.0	<0.010	0.050	0.9
02-20-87	137	4.0	12	0.25	22	188	--	5.11	<0.010	0.080	--
02-19-87	160	44	100	0.20	28	388	--	<0.020	0.250	0.470	--
08-19-87	184	14	60	0.15	13	--	228	0.200	0.020	0.050	1.7
07-22-87	290	14	62	0.65	21	--	444	7.80	0.040	0.110	1.6
08-18-87	248	37	79	0.25	26	--	428	0.500	0.150	0.020	1.4
08-05-87	356	30	240	0.20	25	--	814	14.0	<0.010	<0.010	1.7
08-05-87	361	44	220	0.35	27	--	836	16.0	<0.010	<0.010	1.4
08-05-87	355	15	160	0.50	20	--	598	0.600	0.030	0.010	1.5
07-22-87	343	16	240	0.35	22	--	770	12.0	<0.010	0.050	1.1
08-13-87	240	6.0	56	0.30	21	--	296	4.70	<0.010	0.100	0.8
07-22-87	353	22	71	0.35	26	--	548	9.90	<0.010	0.030	0.7
08-06-87	327	28	160	0.45	22	--	615	9.70	<0.010	0.020	1.5
08-05-87	332	62	270	0.30	25	--	1060	45.0	<0.010	0.090	2.0
08-05-87	335	33	190	0.30	26	--	852	28.0	<0.010	0.060	1.4
02-18-87	397	2.0	600	0.35	21	1210	--	0.440	2.30	0.020	--
02-18-87	537	7.0	430	0.35	31	1210	--	<0.020	2.90	0.300	--
02-18-87	311	38	97	0.40	29	440	--	<0.020	0.290	0.010	--
08-05-87	270	18	37	0.30	18	--	338	8.80	<0.010	<0.010	1.3
08-12-87	280	50	40	0.20	23	--	302	4.20	<0.010	<0.010	0.5
08-12-87	277	14	61	0.20	22	--	344	6.50	<0.010	<0.010	0.5
08-11-87	323	17	56	0.20	26	--	356	0.100	0.940	<0.010	1.6
08-03-87	308	86	62	0.35	22	--	502	1.00	<0.010	<0.010	0.9
08-12-87	280	24	71	0.25	24	--	358	1.40	<0.010	<0.010	0.6
08-04-87	356	21	140	0.35	24	--	552	<0.100	0.290	0.650	1.3
02-19-87	386	3.0	90	0.30	29	570	--	0.080	1.80	0.180	--
03-24-87	190	9.0	670	0.65	11	1310	--	<0.020	5.00	<0.010	--
03-24-87	174	13	940	0.25	11	1560	--	<0.020	5.70	0.010	--
08-27-87	251	12	82	0.25	15	--	372	11.0	0.030	0.050	0.8
07-23-87	288	15	81	0.20	27	--	466	8.80	0.050	<0.010	0.7
08-27-87	272	9.0	110	0.40	24	--	464	<0.100	0.160	0.070	0.7
08-28-87	286	42	100	0.35	11	--	506	6.00	0.020	0.040	1.2
08-11-87	365	20	100	0.35	27	--	542	<0.100	0.460	0.100	1.7
08-04-87	254	24	90	0.50	28	--	406	<0.100	0.750	0.360	1.9
08-04-87	304	15	70	0.30	27	--	384	0.200	0.350	0.230	1.7
08-04-87	336	29	82	0.25	31	--	446	<0.100	0.690	0.660	2.4
08-04-87	476	84	140	0.20	19	--	760	<0.100	0.990	0.430	2.7
08-04-87	310	18	110	0.25	15	--	484	<0.100	0.340	0.290	1.6
08-04-87	322	32	76	0.25	21	--	454	5.70	0.020	0.050	1.0
08-04-87	380	12	120	0.30	38	--	580	<0.100	1.80	1.10	2.3
08-04-87	202	14	27	0.30	20	--	302	1.50	<0.010	0.110	1.8
07-22-87	335	40	76	0.35	14	--	516	0.600	0.680	0.030	2.2
07-21-87	284	41	71	0.15	14	--	578	26.0	<0.010	0.030	1.1
07-22-87	323	36	310	0.20	24	--	844	9.30	0.010	0.140	1.1
08-06-87	303	24	180	0.45	20	--	578	3.40	0.530	0.010	2.0
08-06-87	274	50	130	0.25	21	--	824	53.0	<0.010	0.080	1.9
08-06-87	352	30	160	0.50	23	--	644	12.0	0.020	<0.010	1.2
08-06-87	318	32	170	0.50	23	--	578	<0.100	0.580	0.120	1.8
04-01-87	305	38	140	0.35	18	558	--	<0.020	0.290	0.120	--
04-01-87	259	48	500	2.2	9.0	1000	--	0.810	0.030	0.010	--
04-01-87	337	14	54	0.65	14	362	--	<0.020	3.30	0.030	--
04-01-87	316	14	38	0.35	23	362	--	0.020	0.780	0.090	--

GROUND-WATER-QUALITY DATA

DATE	IRON, DIS- SOLVED (UG/L AS FE) (01046)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	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)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	MERCURY DIS- SOLVED (UG/L AS HG) (71890)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	SILVER, DIS- SOLVED (UG/L AS AG) (01075)
07-21-87	84	380	--	--	--	--	--	--	--	--	--
07-21-87	90	990	--	--	--	--	--	--	--	--	--
07-21-87	<20	<20	--	--	--	--	--	--	--	--	--
10-21-86	12000	1200	<10	210	<1	<10	<10	<10	<1.0	<10	<10
08-12-87	<20	980	--	--	--	--	--	--	--	--	--
08-31-87	<20	<20	--	--	--	--	--	--	--	--	--
07-30-87	<20	<20	--	--	--	--	--	--	--	--	--
02-19-87	14000	890	10	750	<1	<10	<10	<10	<1.0	<10	<10
02-26-87	<20	<20	<10	160	<1	<10	<10	<10	<1.0	<10	<10
07-23-87	<20	1400	--	--	--	--	--	--	--	--	--
08-14-87	<20	<20	--	--	--	--	--	--	--	--	--
02-20-87	<20	<20	<10	460	<1	<10	<10	<10	<1.0	<10	<10
02-19-87	12000	1700	<10	330	<1	<10	<10	<10	<1.0	<10	<10
08-19-87	<20	80	--	--	--	--	--	--	--	--	--
07-22-87	<20	<20	--	--	--	--	--	--	--	--	--
08-18-87	<20	300	--	--	--	--	--	--	--	--	--
08-05-87	<20	50	--	--	--	--	--	--	--	--	--
08-05-87	<20	90	--	--	--	--	--	--	--	--	--
08-05-87	340	570	--	--	--	--	--	--	--	--	--
07-22-87	<20	<20	--	--	--	--	--	--	--	--	--
08-13-87	30	190	--	--	--	--	--	--	--	--	--
07-22-87	<20	<20	--	--	--	--	--	--	--	--	--
08-06-87	<20	110	--	--	--	--	--	--	--	--	--
08-05-87	<20	60	--	--	--	--	--	--	--	--	--
08-05-87	<20	40	--	--	--	--	--	--	--	--	--
02-18-87	120	140	<10	<50	<1	<10	<10	<10	<1.0	<10	<10
02-18-87	1800	260	<10	<50	<1	<10	<10	<10	<1.0	<10	<10
02-18-87	100	200	<10	270	<1	<10	<10	<10	<1.0	<10	<10
08-05-87	380	60	--	--	--	--	--	--	--	--	--
08-12-87	440	290	--	--	--	--	--	--	--	--	--
08-12-87	370	250	--	--	--	--	--	--	--	--	--
08-11-87	3500	140	--	--	--	--	--	--	--	--	--
08-03-87	<20	120	--	--	--	--	--	--	--	--	--
08-12-87	540	230	--	--	--	--	--	--	--	--	--
08-04-87	2500	2900	--	--	--	--	--	--	--	--	--
02-19-87	330	180	<10	60	<1	<10	<10	<10	<1.0	<10	<10
03-24-87	530	400	<10	<50	<1	<10	<10	<10	<1.0	<10	<10
03-24-87	2000	80	<10	<50	<1	<10	<10	<10	<1.0	<10	<10
08-27-87	<20	<20	--	--	--	--	--	--	--	--	--
07-23-87	40	<20	--	--	--	--	--	--	--	--	--
08-27-87	2700	210	--	--	--	--	--	--	--	--	--
08-28-87	510	500	--	--	--	--	--	--	--	--	--
08-11-87	1800	570	--	--	--	--	--	--	--	--	--
08-04-87	6000	1300	--	--	--	--	--	--	--	--	--
08-04-87	12000	2000	--	--	--	--	--	--	--	--	--
08-04-87	17000	950	--	--	--	--	--	--	--	--	--
08-04-87	17000	6700	--	--	--	--	--	--	--	--	--
08-04-87	9500	1800	--	--	--	--	--	--	--	--	--
08-04-87	190	250	--	--	--	--	--	--	--	--	--
08-04-87	10000	1000	--	--	--	--	--	--	--	--	--
08-04-87	<20	<20	--	--	--	--	--	--	--	--	--
07-22-87	<20	930	--	--	--	--	--	--	--	--	--
07-21-87	<20	280	--	--	--	--	--	--	--	--	--
07-22-87	<20	<20	--	--	--	--	--	--	--	--	--
08-06-87	<20	200	--	--	--	--	--	--	--	--	--
08-06-87	<20	<20	--	--	--	--	--	--	--	--	--
08-06-87	<20	<20	--	--	--	--	--	--	--	--	--
08-06-87	4500	1000	--	--	--	--	--	--	--	--	--
04-01-87	8200	520	<10	220	<1	<10	<10	<10	<1.0	<10	<10
04-01-87	40	30	<10	<50	<1	<10	<10	<10	<1.0	<10	<10
04-01-87	1600	80	<10	140	<1	<10	<10	<10	<1.0	<10	<10
04-01-87	2000	330	<10	280	<1	<10	<10	<10	<1.0	<10	<10

GROUND-WATER-QUALITY DATA

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DATE	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	GROSS ALPHA, DIS- SOLVED (PCI/L AS U-NAT) (01515)	GROSS BETA, DIS- SOLVED (PCI/L AS CS-137) (03515)	RADIUM 226, DIS- SOLVED (PCI/L) (09503)	RADIUM 228 DIS- SOLVED (PCI/L AS RA-228) (81366)	ATRA- ZINE, TOTAL (UG/L) (39630)	CYAN- AZINE TOTAL (UG/L) (81757)	METRI- BUZIN IN WHOLE WATER (UG/L) (81408)	ALA- CHLOR TOTAL RECOVER (UG/L) (77825)	METOLA- CHLOR IN WHOLE WATER (UG/L) (39356)	BUTY- LATE, TOTAL (UG/L) (00000)
07-21-87	--	--	--	--	--	2.0	0.44	0.48	<0.10	<0.10	<0.10
07-21-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
07-21-87	--	--	--	--	--	0.87	<0.10	<0.10	<0.10	<0.10	<0.10
10-21-86	<20	1.8	4.0	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-12-87	--	--	--	--	--	<0.10	<0.10	0.15	0.49	<0.10	<0.10
08-31-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
07-30-87	--	--	--	--	--	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
02-19-87	<20	5.4	3.0	0.9	2.5	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
02-26-87	30	2.0	7.0	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
07-23-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-14-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
02-20-87	40	1.2	<1.0	0	0.0	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
02-19-87	<20	2.2	1.0	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-19-87	--	--	--	--	--	0.24	<0.10	<0.10	<0.10	<0.10	<0.10
07-22-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-18-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-05-87	--	--	--	--	--	0.16	<0.10	<0.10	<0.10	<0.10	<0.10
08-05-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-05-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
07-22-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-13-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
07-22-87	--	--	--	--	--	0.35	<0.10	<0.10	<0.10	<0.10	<0.10
08-06-87	--	--	--	--	--	1.8	<0.10	0.14	<0.10	<0.10	<0.10
08-05-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-05-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
02-18-87	40	5.4	3.0	2.6	1.4	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
02-18-87	<20	2.3	<1.1	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
02-18-87	190	3.4	4.0	0.4	1.3	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-05-87	--	--	--	--	--	0.41	<0.10	<0.10	<0.10	<0.10	<0.10
08-12-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-12-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-11-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-03-87	--	--	--	--	--	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-12-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-04-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
02-19-87	<20	0.4	<1.0	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
03-24-87	<20	--	--	--	--	--	--	--	--	--	--
03-24-87	200	--	--	--	--	--	--	--	--	--	--
08-27-87	--	--	--	--	--	0.11	<0.10	<0.10	<0.10	<0.10	<0.10
07-23-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-27-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-28-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	--
08-11-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-04-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-04-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-04-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-04-87	--	--	--	--	--	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-04-87	--	--	--	--	--	0.29	<0.10	<0.10	<0.10	<0.10	<0.10
08-04-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-04-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-04-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
07-22-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
07-21-87	--	--	--	--	--	1.5	<0.10	2.00	1.90	25.0	<0.10
07-22-87	--	--	--	--	--	3.9	<0.10	<0.10	<0.10	<0.10	<0.10
08-06-87	--	--	--	--	--	0.13	<0.10	<0.10	<0.10	<0.10	<0.10
08-06-87	--	--	--	--	--	21	0.61	1.60	0.66	200	<0.10
08-06-87	--	--	--	--	--	0.16	0.12	<0.10	<0.10	<0.10	<0.10
08-06-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
04-01-87	<20	2.2	1.0	--	--	--	--	--	--	--	--
04-01-87	<20	5.3	10	0.2	0.90	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
04-01-87	<20	4.0	4.0	0.5	2.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
04-01-87	<20	0.4	5.0	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10

DATE	TRI- FLURA- LIN TOTAL RECOVER (UG/L) (39030)	CHLOR- AMBN TOTAL (UG/L) (82051)	DICAMBA (MED- IBEN) (BAN- VEL D) TOTAL (UG/L) (82052)	2,4-D, TOTAL (UG/L) (39730)	SILVEX, TOTAL (UG/L) (39760)	CARBO- FURAN (UG/L) (81405)	CHLOR- PYRIFOS TOTAL (UG/L) (81403)	ETHO- PROP TOTAL (UG/L) (81758)	DYFO- NATE (UG/L) (81294)	PHORATE OTAL (UG/L) (39023)	TERBU- FOS (UG/L) (82088)
07-21-87	<0.10	<0.10	<0.10	<0.10	<0.10	--	--	<0.10	<0.10	<0.10	<0.10
07-21-87	<0.10	<0.10	<0.10	<0.10	<0.10	--	--	<0.10	<0.10	<0.10	<0.10
07-21-87	<0.10	<0.10	<0.10	<0.10	<0.10	--	--	<0.10	<0.10	<0.10	<0.10
10-21-86	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-12-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-31-87	<0.10	--	--	--	--	--	--	--	--	--	--
07-30-87	<0.10	--	--	--	--	--	--	--	--	--	--
02-19-87	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
02-26-87	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
07-23-87	<0.10	<0.10	<0.10	<0.10	<0.10	--	--	<0.10	<0.10	<0.10	<0.10
08-14-87	<0.10	--	--	--	--	--	--	--	--	--	--
02-20-87	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
02-19-87	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-19-87	<0.10	--	--	--	--	--	--	--	--	--	--
07-22-87	<0.10	<0.10	<0.10	<0.10	<0.10	--	--	<0.10	<0.10	<0.10	<0.10
08-18-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-05-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-05-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-05-87	<0.10	--	--	--	--	--	--	--	--	--	--
07-22-87	<0.10	<0.10	<0.10	<0.10	<0.10	--	--	<0.10	<0.10	<0.10	<0.10
08-13-87	<0.10	--	--	--	--	--	--	--	--	--	--
07-22-87	<0.10	<0.10	<0.10	<0.10	<0.10	--	--	<0.10	<0.10	<0.10	<0.10
08-06-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-05-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-05-87	<0.10	--	--	--	--	--	--	--	--	--	--
02-18-87	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
02-18-87	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
02-18-87	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-05-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-12-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-12-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-11-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-03-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-12-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-04-87	<0.10	--	--	--	--	--	--	--	--	--	--
02-19-87	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
03-24-87	--	--	--	--	--	--	--	--	--	--	--
03-24-87	--	--	--	--	--	--	--	--	--	--	--
08-27-87	<0.10	--	--	--	--	--	--	--	--	--	--
07-23-87	<0.10	<0.10	<0.10	<0.10	<0.10	--	--	<0.10	<0.10	<0.10	<0.10
08-27-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-28-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-11-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-04-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-04-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-04-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-04-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-04-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-04-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-04-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-04-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-04-87	<0.10	--	--	--	--	--	--	--	--	--	--
07-22-87	<0.10	<0.10	<0.10	<0.10	<0.10	--	--	<0.10	<0.10	<0.10	<0.10
07-21-87	<0.10	<0.10	<0.10	<0.10	<0.10	--	--	<0.10	<0.10	<0.10	<0.10
07-22-87	<0.10	<0.10	<0.10	<0.10	<0.10	--	--	<0.10	<0.10	<0.10	<0.10
08-06-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-06-87	<0.10	--	--	--	--	--	--	--	--	--	--
08-06-87	<0.10	--	--	--	--	--	--	--	--	--	--
04-01-87	--	--	--	--	--	--	--	--	--	--	--
04-01-87	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
04-01-87	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
04-01-87	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10

MAP STATION NUMBER	STATION NUMBER	LOCAL WELL NUMBER	DATE	LOCAL WELL NAME	COUNTY	SAMPLE DATE	SAMPLE TIME	GEO- LOGIC UNIT
175	415430092180101	08213W13DDA	1950	Belle Plaine 3	Tama	08-03-87	1200	111ALVM
178	415502092240106	08213W18AAC	1961	Chelsea 2	Tama	09-17-87	1100	111ALVM
177	421120092430403	08516W09ACC	1986	Gladbrook 8	Tama	07-30-87	0950	111ALVM
178	421120092430403	08516W09ACC	1986	Gladbrook 8	Tama	09-17-87	1330	111ALVM
179	415852092424901	08316W21DCAB	1970	Montour 2	Tama	09-17-87	1200	112PLSC
180	415753092350201	08315W27CDD	1966	Tama 5	Tama	08-28-87	1300	112PLSC
181	404454094372901	06933W27ADDD	1971	Conway 1	Taylor	08-04-87	1445	112PLSC
182	410625094074901	07329W24ADDC	1971	Lorimor 1	Union	09-30-87	1200	111ALVM
183	410907092375101	07315W06CADD	1970	Eddyville 2	Wapello	08-14-87	1030	112PLSC
184	413037093290301	07823W34DDCA	1971	Carlisle 4	Warren	10-21-86	1130	111ALVM
185	411336093433101	07425W10CAC	1979	New Virginia 4	Warren	10-21-86	1650	112PLSC
186	411806093440501	07525W16ADCA	1979	Saint Marys 2	Warren	10-21-86	1410	112PLSC
187	411735091333801	07506W21BBBB	1977	Ainsworth 5	Washington	03-18-87	1200	360OVCB
188	432218093462301	09925W23CCCC	1915	Thompson 1	Winnebago	03-31-87	1115	361MQKT
189	422441096124001	08846W28BCBA	1971	Bronson 1	Woodbury	10-08-86	1600	112PLSC
190	422831095465101	08942W34DDDD	1927	Correctionville 1 E	Woodbury	08-07-87	0900	111ALVM
191	422759095402502	08842W01ADCC	1959	Cushing 2	Woodbury	08-13-87	1145	111ALVM
192	421405095433001	08642W27BCDA	1939	Danbury 3	Woodbury	08-07-87	1110	111ALVM
193	421352096054802	08645W28CBCC	1951	Hornick 2	Woodbury	10-09-86	1200	112PLSC
194	421406096134501	08646W29CBAB	1981	Sloan 4	Woodbury	09-28-87	1400	111ALVM
195	421351095555001	08644W26DECA		Smithland 1	Woodbury	10-09-86	1245	112PLSC
196	431558093250401	09822W35BCBB	1980	Fertile 1	Worth	03-31-87	1345	344CDVL
197	423958093535701	09126W27DBAB	1980	Eagle Grove 5	Wright	08-19-87	0930	112PLSC

GROUND-WATER-QUALITY DATA

DATE	DEPTH OF WELL, TOTAL (FEET) (72008)	FLOW RATE (GPM) (00058)	PUMP OR FLOW PERIOD PRIOR TO SAM- PLING (MIN) (72004)	TEMPER- ATURE WATER (DEG C) (00010)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH (STAND- ARD UNITS) (00400)	HARD- NESS (MG/L AS CACO3) (00900)	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)
08-03-87	42.00	<119	20	11.0	940	7.20	460	130	34	11	1.5
09-17-87	36.00	90	20	14.0	425	7.48	220	63	16	5.3	0.70
07-30-87	34.00	100	60	13.0	540	7.30	260	75	17	5.7	<0.10
08-17-87	34.00	100	300	14.0	520	7.20	260	78	17	6.7	0.40
09-17-87	55.00	60	20	12.0	640	7.19	320	89	23	16	2.9
08-28-87	43.00	500	20	13.0	550	7.63	270	72	22	10	1.5
08-04-87	56.00	--	30	13.0	770	6.80	300	84	22	24	2.6
09-30-87	31.00	42	30	12.0	372	6.10	160	48	9.0	7.9	1.5
08-14-87	35.00	125	15	13.0	700	7.30	340	94	25	10	2.3
10-21-86	50.00	425	10	13.5	507	7.60	280	74	24	8.3	2.7
10-21-86	51.00	--	30	14.0	496	7.10	240	73	13	11	1.2
10-21-86	55.00	20	10	14.5	352	7.30	170	44	14	9.6	<0.10
03-18-87	1200.00	120	60	24.0	1590	7.10	390	92	40	190	22
03-31-87	249.00	240	20	10.0	730	7.20	320	82	27	32	4.8
10-08-86	235.00	570	30	12.0	580	7.23	300	78	25	7.3	4.8
08-07-87	26.00	30	20	12.0	820	7.04	420	120	30	7.4	5.3
08-13-87	36.00	90	30	10.0	945	7.00	470	130	35	13	3.5
08-07-87	62.00	180	30	12.0	860	6.75	430	110	37	9.6	4.5
10-09-86	127.00	110	30	11.0	620	7.40	330	89	25	12	6.1
09-28-87	105.00	300	30	11.5	1210	6.90	520	130	47	50	5.6
10-09-86	62.00	120	30	11.0	760	7.35	420	120	30	12	4.4
03-31-87	240.00	110	20	12.0	770	7.10	380	97	34	9.3	2.0
08-19-87	70.00	450	30	14.0	770	7.28	360	87	35	15	4.2

GROUND-WATER-QUALITY DATA

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DATE	ALKA- LITY LAB (MG/L AS CACO3) (90410)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SiO2) (00955)	SOLIDS, RESIDUE AT 105 DEG. C, DIS- SOLVED (MG/L) (00515)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00831)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P) (00671)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C) (00681)
08-03-87	240	16	130	0.20	17	--	592	7.20	<0.010	0.010	1.4
09-17-87	172	5.5	56	0.15	17	--	254	0.600	0.100	0.230	0.8
07-30-87	217	17	60	0.20	16	--	288	0.200	0.140	0.030	1.6
08-17-87	219	9.5	56	0.20	24	--	306	0.200	0.130	0.210	1.4
09-17-87	241	18	66	0.25	19	--	406	5.30	0.040	0.060	1.0
08-28-87	177	15	82	0.30	26	--	344	6.60	<0.010	0.090	0.6
08-04-87	186	28	170	0.20	27	--	450	2.50	0.590	0.390	1.9
09-30-87	142	4.0	44	0.25	40	--	246	<0.100	0.400	1.40	2.1
08-14-87	233	20	110	0.15	15	--	338	3.30	<0.010	<0.010	0.6
10-21-86	202	16	59	0.20	22	230	--	0.400	0.020	0.090	--
10-21-86	226	5.0	33	0.25	21	304	--	0.330	0.560	0.440	--
10-21-86	132	4.5	17	0.35	27	244	--	7.55	0.010	0.210	--
03-18-87	222	67	610	1.2	11	1120	--	<0.020	1.40	0.010	--
03-31-87	388	0.50	25	0.40	17	430	--	<0.020	1.10	0.010	--
10-08-86	258	<0.50	4.9	0.35	23	318	--	0.470	<0.010	0.150	--
08-07-87	254	23	68	0.25	17	--	472	22.0	<0.010	<0.010	1.4
08-13-87	266	24	100	0.30	21	--	568	28.0	<0.010	0.030	0.9
08-07-87	327	22	61	0.35	23	--	488	13.0	<0.010	0.010	0.8
10-09-86	324	2.0	18	0.50	28	386	--	<0.020	0.200	0.100	--
09-28-87	471	99	71	0.40	34	--	726	<0.100	0.830	<0.010	2.2
10-09-86	360	7.0	49	0.35	27	470	--	1.49	0.070	0.100	--
03-31-87	368	<0.50	52	0.55	16	428	--	<0.020	0.450	0.010	--
08-19-87	370	<0.50	34	0.40	33	--	432	<0.100	0.620	0.060	0.9

[illegible]

GROUND-WATER-QUALITY DATA

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DATE	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	GROSS ALPHA, DIS- SOLVED (PCI/L AS U-NAT) (01515)	GROSS BETA, DIS- SOLVED (PCI/L AS CS-137) (03515)	RADIUM 226, DIS- SOLVED (PCI/L) (09503)	RADIUM 228 DIS- SOLVED (PCI/L AS RA-228) (81366)	ATRA- ZINE, TOTAL (UG/L) (39630)	CYAN- AZINE TOTAL (UG/L) (81757)	METRI- BUZIN IN WHOLE WATER (UG/L) (81408)	ALA- CHLOR TOTAL RECOVER (UG/L) (77825)	METOLA- CHLOR IN WHOLE WATER (UG/L) (39356)	BUTY- LATE, TOTAL (UG/L) (00000)
08-03-87	--	--	--	--	--	0.17	<0.10	<0.10	<0.10	<0.10	<0.10
09-17-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
07-30-87	--	--	--	--	--	0.37	<0.10	<0.10	<0.10	0.10	<0.10
09-17-87	--	--	--	--	--	0.27	<0.10	<0.10	<0.10	<0.10	<0.10
09-17-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-28-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-04-87	--	--	--	--	--	1.4	<0.10	<0.10	2.10	<0.10	<0.10
09-30-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-14-87	--	--	--	--	--	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
10-21-86	<20	1.9	3.0	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
10-21-86	190	0.9	2.0	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
10-21-86	<20	0.3	<1.0	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
03-18-87	<20	--	--	--	--	--	--	--	--	--	--
03-31-87	<20	2.3	<1.0	--	--	--	--	--	--	--	--
10-08-86	20	1.0	6.0	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-07-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
08-13-87	--	--	--	--	--	0.32	<0.10	0.24	<0.10	<0.10	<0.10
08-07-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
10-09-86	<20	1.1	5.0	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
09-28-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
10-09-86	<20	2.1	2.0	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
03-31-87	<20	2.0	<1.0	--	--	--	--	--	--	--	--
08-19-87	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10

GROUND-WATER-QUALITY DATA

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MAP STATION NUMBER	STATION NUMBER	LOCAL WELL NUMBER	DATE	LOCAL WELL NAME	COUNTY	SAMPLE DATE	GEO- LOGIC UNIT	DEPTH OF WELL (FEET)
1	411727094374001	07533W15DDBB	1976	Fontanelle 5	Adair	08-04-87	111ALVM	39
2	412852094275101	07731W07CAAB	1977	Menlo 3	Adair	08-04-87	111ALVM	25
14	423902092272502	09114W35DA	1984	Janesville 3	Bremer	07-30-87	350SLRN	120
14	424319092283401	09114W03CABB	1967	Waverly 5	Bremer	07-29-87	340DVSL	157
50	415055094131202	08129W10BBBA	1969	Dawson 2	Dallas	08-04-87	111ALVM	22
57	422834091281601	08905W31DAAB	1970	Manchester 6	Delaware	07-28-87	350SLRN	150
60	422910091072701	08902W30DCCC	1959	Dyersville 1	Dubuque	07-28-87	350SLRN	126
62	423305091064901	08902W05CBBB	1898	New Vienna 1	Dubuque	07-28-87	350SLRN	170
66	425719091483301	09408W17DABC	1935	West Union 3	Fayette	07-29-87	355NIGR	55
81	431443092261401	09714W01DDAB	1914	Elma 1	Howard	07-29-87	112PLSC	143
86	423033095250501	08939W23CADA	1957	Galva 2	Ida	07-23-87	112PLSC	48
87	422106095280201	08740W14ACBB	1965	Ida Grove 3	Ida	07-23-87	112PLSC	68
93	414300092544401	08018W26ABBB	1954	Kellogg 2	Jasper	07-30-87	111ALVM	30
98	415852090572701	08301W21DAAC	1977	Oxford Junction 2	Jones	07-28-87	111ALVM	50
101	411849092115401	07512W12CBCA	1958	Sigourney 5	Keokuk	08-03-87	111ALVM	35
113	432031096175301	09846W05AACC	1979	Alvord 3	Lyon	07-21-87	111ALVM	37
114	431646096142901	09816W26ACDD	1976	Doon 4	Lyon	07-21-87	111ALVM	50
115	432622096101901	10045W33CBAB	1925	Rock Rapids 2	Lyon	07-21-87	111ALVM	38
119	420020092465001	08317W13BA	1955	Le Grand 2	Marshall	07-30-87	339PPCH	95
122	420420095545702	08444W24CAAC	1963	Castana 2	Monona	07-23-87	111ALVM	58
127	430517095364602	09640W31DBCD		Pringhar 3	O'Brien	07-22-87	112PLSC	24
132	423737096173201	09046W08ADDD	1956	Hinton 2	Plymouth	07-22-87	110QRNR	52
134	424305096145301	09146W11BBDD1	1967	Merrill 3	Plymouth	07-22-87	110QRNR	42
136	424528096362001	09249W27DAAA	1965	Westfield 1	Plymouth	08-05-87	110QRNR	41
141	414409093241001	08022W15CBDC	1981	Bondurant 4	Polk	08-05-87	111ALVM	70
145	413415093432501	07825W10CDDC	1951	West Des Moines 6	Polk	08-03-87	111ALVM	41
152	421826095025101	08736W33BCAA	1978	Lake View 3	Sac	07-23-87	112PLSC	105
164	425941096002701	09444W02ABCB	1939	Alton 2	Sioux	07-22-87	112PLSC	35
165	431504096000901	09744W02ADCD	1976	Boyd 3	Sioux	07-21-87	110QRNR	31
166	425946096292901	09448W03AAAB	1960	Hawarden 6	Sioux	07-22-87	110QRNU	37
166	425946096292901	09448W03AAAB	1960	Hawarden 6	Sioux	07-22-87	110QRNU	37
175	415430092180101	08213W13DDA	1950	Belle Plaine 3	Tama	08-03-87	111ALVM	42
177	421120092430403	08516W09ACCC	1986	Gladbrook 8	Tama	07-30-87	111ALVM	34
181	404454094372901	06933W27ADDD	1971	Conway 1	Taylor	08-04-87	112PLSC	56

DATE	DI- CHLORO- BROMO- METHANE TOTAL (UG/L) (32101)	CARBON- TETRA- CHLORO- RIDE TOTAL (UG/L) (32102)	1,2-DI- CHLORO- ETHANE TOTAL (UG/L) (32103)	BROMO- FORM TOTAL (UG/L) (32104)	CHLORO- DI- BROMO- METHANE TOTAL (UG/L) (32105)	CHLORO- FORM TOTAL (UG/L) (32106)	TOLUENE TOTAL (UG/L) (34010)	BENZENE TOTAL (UG/L) (34030)	CHLORO- BENZENE TOTAL (UG/L) (34301)	ETHYL- BENZENE TOTAL (UG/L) (34371)	METHYL- ENE CHLORO- RIDE TOTAL (UG/L) (34423)
08-04-87	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
08-04-87	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
07-30-87	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
07-29-87	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
08-04-87	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
07-28-87	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
07-28-87	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
07-28-87	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
07-29-87	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
07-29-87	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
07-23-87	1.0	<1.0	<1.0	8.0	3.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
07-23-87	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
07-30-87	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
07-28-87	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
08-03-87	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
07-21-87	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
07-21-87	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
07-21-87	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
07-30-87	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
07-23-87	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
07-22-87	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
07-22-87	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
07-22-87	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
08-05-87	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
08-05-87	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
08-03-87	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
07-23-87	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
07-22-87	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
07-22-87	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
07-22-87	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
07-22-87	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
07-21-87	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
08-03-87	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
07-30-87	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
08-04-87	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	9.0	<1.0	<1.0	<5.0

[illegible]

DATE	1,3-DI- CHLORO- BENZENE TOTAL (UG/L) (34566)	1,4-DI- CHLORO- BENZENE TOTAL (UG/L) (34571)	2- DI- CHLORO- ETHYL- VINYL- ETHER TOTAL (UG/L) (34576)	CHLORO- DI- FLUORO- METHANE TOTAL (UG/L) (34668)	NAPHTH- ALENE TOTAL (UG/L) (34696)	CIS 1,3-DI- CHLORO- PROPENE TOTAL (UG/L) (34704)	VINYL CHLO- RIDE TOTAL (UG/L) (39175)	TRI- CHLORO- ETHYL- ENE TOTAL (UG/L) (39180)	STYRENE TOTAL (UG/L) (77128)	XYLENE WATER WHOLE TOT REC (UG/L) (81551)
08-04-87	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
08-04-87	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
07-30-87	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
07-29-87	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
08-04-87	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
07-28-87	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
07-28-87	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
07-28-87	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
07-29-87	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
07-29-87	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
07-23-87	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
07-23-87	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
07-30-87	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
07-28-87	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
08-03-87	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
07-21-87	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
07-21-87	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
07-21-87	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
07-30-87	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
07-23-87	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
07-22-87	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
07-22-87	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
07-22-87	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
08-05-87	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
08-05-87	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
08-03-87	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
07-23-87	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
07-22-87	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
07-22-87	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
07-22-87	<3.0	<3.0	<3.0	<3.0	--	<3.0	<3.0	<3.0	<3.0	<3.0
07-21-87	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
08-03-87	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
07-30-87	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
08-04-87	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

PRECIPITATION WATER-QUALITY DATA

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BIG SPRING FISH HATCHERY NEAR ELKADER, IOWA

LOCATION.--Lat 42°54'35", long 91°28'11", in SE1/4 SE1/4 sec. 31, T.94 N., R.5 W., Clayton County, Hydrologic Unit 07060004, 3.0 mi north and 2.8 mi west of Elkader, Iowa.

OWNER.--U.S. Geological Survey.

PERIOD OF RECORD.--August 1984 to current year.

INSTRUMENTATION.--Wet/dry precipitation collector, weighing-bucket type recording rain gage with alter wind shield and event recorder and National Weather Service standard 8-inch rain and snow gage (back-up only).

EXTREMES FOR PERIOD OF RECORD.--Maximum field pH, 6.98, May 5 to May 12, 1987; minimum field pH, 3.83, July 30 to August 6, 1985.

EXTREMES FOR CURRENT YEAR.--Maximum field pH, 6.98, May 5 to May 12, 1987; minimum field pH, 4.06, June 16 to June 23, 1987.

WET DEPOSITION DATA

DATE	PH (STAND- ARD UNITS (00400)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P) (00671)
OCT 01-07	4.72	12.4	0.030	0.009	0.020	0.003	1.09	0.04	0.131	0.148	<0.033
OCT 07-14	--	--	0.404	0.093	0.020	0.019	3.35	0.07	0.442	0.412	<0.033
OCT 14-21	--	--	--	--	--	--	--	--	--	--	--
OCT 21-28	--	--	0.208	0.034	0.028	0.018	2.74	0.06	0.400	0.436	<0.003
OCT 28-NOV 04	--	--	0.475	0.052	0.053	0.026	2.75	0.06	0.375	0.996	0.007
NOV 04-11	--	--	1.528	0.478	0.075	0.188	2.73	0.11	0.307	<0.015	<0.003
NOV 11-18	--	--	0.373	0.071	0.039	0.006	0.34	0.04	0.244	0.156	<0.003
NOV 18-25	--	--	0.364	0.046	0.099	0.034	2.29	0.14	0.642	0.685	<0.003
NOV 25-DEC 02	--	--	0.306	0.077	0.165	0.026	1.71	0.10	0.331	0.397	<0.003
DEC 02-09	--	--	0.131	0.018	0.065	0.004	0.99	0.07	1.657	0.342	<0.003
DEC 09-16	--	--	--	--	--	--	--	--	--	--	--
DEC 16-23	--	--	--	--	--	--	--	--	--	--	--
DEC 23-30	--	--	--	--	--	--	--	--	--	--	--
DEC 30 1986- JAN 6 1987	--	--	--	--	--	--	--	--	--	--	--
JAN 06-13	5.28	4.6	0.400	0.083	0.054	0.026	0.39	0.06	0.151	0.171	<0.003
JAN 13-20	--	--	1.075	0.191	0.745	0.325	1.30	0.78	1.019	0.576	<0.014
JAN 20-27	6.33	10.5	1.399	0.187	0.097	0.033	0.92	0.14	0.517	0.459	<0.003
JAN 27-FEB 03	--	--	0.750	0.105	0.206	0.097	5.92	0.46	1.316	1.317	<0.003
FEB 03-10	--	--	--	--	--	--	--	--	--	--	--
FEB 10-17	--	--	--	--	--	--	--	--	--	--	--
FEB 17-24	--	--	4.900	0.234	0.293	0.128	3.52	0.28	0.888	1.782	<0.003
FEB 24-MAR 03	--	--	0.102	0.029	0.036	0.033	1.98	0.1	0.357	0.257	<0.007
MAR 03-10	--	--	--	--	--	--	--	--	--	--	--
MAR 10-17	5.01	18.8	0.510	0.051	0.024	0.022	3.01	0.08	0.582	1.011	<0.003
MAR 17-24	4.20	60.5	0.348	0.064	0.144	0.069	4.54	0.22	0.402	0.506	<0.003
MAR 24-31	--	--	0.184	0.043	0.066	0.047	1.97	0.13	0.306	0.521	<0.003
MAR 31-APR 07	--	--	--	--	--	--	--	--	--	--	--
APR 07-14	--	--	0.252	0.081	0.051	0.076	3.20	0.15	0.848	1.019	<0.003
APR 14-21	4.62	37.6	0.613	0.085	0.082	0.089	3.26	0.15	0.466	0.747	<0.003
APR 21-28	4.74	14.0	0.157	0.029	0.058	0.037	1.97	0.08	0.215	0.420	<0.003
APR 28-MAY 05	--	--	5.680	0.455	0.219	0.287	7.20	0.36	1.885	3.240	0.003

PRECIPITATION WATER-QUALITY DATA.--Continued

BIG SPRINGS FISH HATCHERY NEAR ELKADER, IOWA

WET DEPOSITION DATA

DATE	PH (STAND- ARD UNITS) (00400)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P) (00671)
MAY 05-12	6.98	35.4	3.380	0.555	0.123	0.284	3.76	0.32	0.970	1.774	0.007
MAY 12-19	5.57	13.5	0.772	0.179	0.028	0.022	1.92	0.11	0.391	0.685	<0.003
MAY 19-26	4.78	16.8	0.160	0.022	0.043	0.037	2.61	0.10	0.386	0.762	<0.003
MAY 26- JUN 02	--	--	0.513	0.090	0.129	0.044	1.81	0.22	0.320	0.459	<0.003
JUN 02-09	--	--	0.041	0.005	0.058	0.004	0.03	0.04	<0.007	<0.016	<0.003
JUN 09-16	--	--	0.426	0.088	0.147	0.084	6.74	2.73	0.999	0.475	<0.007
JUN 16-23	4.06	45.8	0.323	0.091	0.041	0.017	5.26	0.11	0.699	0.607	<0.007
JUN 23-30	6.24	9.3	0.708	0.079	0.038	0.034	1.35	0.08	0.360	0.443	<0.007
JUN 30- JUL 07	--	--	0.096	0.017	0.083	0.008	0.04	0.08	0.007	0.039	<0.007
JUL 07-14	5.50	7.4	0.430	0.080	0.112	0.070	1.09	0.16	0.249	0.140	<0.007
JUL 14-21	--	--	0.607	0.098	0.040	0.034	0.58	0.04	0.169	0.179	<0.007
JUL 21-28	--	--	0.286	0.032	0.044	0.015	1.68	0.09	0.175	0.171	<0.007
JUL 28- AUG 04	--	--	1.674	0.219	0.086	0.053	1.33	0.16	0.431	0.342	<0.007
AUG 04-11	--	--	0.104	0.019	0.026	0.004	1.17	0.04	0.107	0.016	<0.007
AUG 11-18	--	--	0.156	0.022	0.045	0.020	2.74	0.07	0.238	0.327	<0.007
AUG 18-25	--	--	0.528	0.054	0.087	0.039	1.35	0.13	0.306	0.233	<0.007
AUG 25- SEP 01	--	--	0.042	0.007	0.029	0.003	1.39	0.05	0.140	0.054	<0.007
SEP 01-08	--	--	1.813	0.362	0.087	0.059	1.95	0.12	0.393	1.027	<0.007
SEP 08-15	--	--	0.255	0.059	0.033	0.015	0.80	0.08	0.253	0.358	<0.007
SEP 15-22	--	--	0.053	0.009	0.024	0.011	0.95	0.09	0.160	0.187	<0.007
SEP 22-29	--	--	0.988	0.158	0.198	0.112	2.87	0.16	0.519	0.599	<0.007

PRECIPITATION WATER-QUALITY DATA

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MCNAY RESEARCH STATION NEAR CHARITON, IOWA

LOCATION.--Lat 40°57'47", long 93°23'32", in SW1/4 NE1/4 sec. 9, T.71 N., R.23 W., Lucas County, Hydrologic Unit 10280201, 3.1 mi east and 2.0 mi north of Derby, Iowa, 3.4 mi west and 2.8 mi south of Chariton, Iowa.

OWNER.--U.S. Geological Survey.

PERIOD OF RECORD.--September 1984 to current year.

INSTRUMENTATION.--Wet/dry precipitation collector, weighing-bucket type recording rain gage with alter wind shield and event recorder. National Weather Service standard 8-inch rain and snow gage (back-up only).

EXTREMES FOR PERIOD OF RECORD.--Maximum field pH, 6.91, March 25 to April 1, 1986; minimum field pH, 3.84, February 12 to February 19, 1985.

EXTREMES FOR CURRENT YEAR.--Maximum field pH, 6.46, April 28 to May 5, 1987; minimum field pH, 4.02, March 24 to March 31, 1987.

WET DEPOSITION DATA

DATE	PH (STANDARD UNITS) (00400)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P) (00671)
OCT 01-07	4.77	9.3	0.039	0.005	0.040	0.005	0.95	0.04	0.178	0.140	<0.003
OCT 07-14	4.40	21.4	0.088	0.015	0.036	0.009	2.42	<0.03	0.195	0.342	<0.003
OCT 14-21	--	--	--	--	--	--	--	--	--	--	--
OCT 21-28	4.17	22.7	0.072	0.006	0.015	0.013	2.43	0.04	0.297	0.358	<0.003
OCT 28-NOV 04	4.24	39.5	0.640	0.037	0.042	0.029	4.20	0.08	0.628	0.731	<0.003
NOV 04-11	5.25	8.2	0.643	0.045	0.041	0.035	1.48	0.07	0.269	0.226	<0.003
NOV 11-18	--	--	--	--	--	--	--	--	--	--	--
NOV 18-25	4.38	35.5	0.335	0.019	0.137	0.023	3.02	0.10	0.617	0.591	<0.003
NOV 25-DEC 02	4.54	16.8	0.284	0.023	0.174	0.014	1.75	0.13	0.346	0.163	<0.003
DEC 02-09	4.59	14.5	0.067	0.007	0.033	0.010	1.29	0.06	0.322	0.171	<0.003
DEC 09-16	--	--	--	--	--	--	--	--	--	--	--
DEC 16-23	--	--	--	--	--	--	--	--	--	--	--
DEC 23-30	--	--	--	--	--	--	--	--	--	--	--
DEC 30 1986- JAN 6 1987	--	--	--	--	--	--	--	--	--	--	--
JAN 06-13	5.52	4.9	0.351	0.017	0.048	0.016	0.52	0.08	0.149	0.171	<0.003
JAN 13-20	--	--	0.860	0.114	0.324	0.100	0.53	0.27	0.544	0.079	<0.003
JAN 20-27	--	--	--	--	--	--	--	--	--	--	--
JAN 27-FEB 03	--	--	1.694	0.135	0.652	0.082	4.65	0.52	0.799	0.467	<0.024
FEB 03-10	4.77	16.4	0.144	0.021	0.045	<0.003	0.82	0.11	0.340	<0.016	<0.003
FEB 10-17	--	--	--	--	--	--	--	--	--	--	--
FEB 17-24	--	--	--	--	--	--	--	--	--	--	--
FEB 24-MAR 03	4.49	15.5	0.040	0.01	0.008	0.005	1.71	0.04	0.280	0.311	<0.003
MAR 03-10	--	--	--	--	--	--	--	--	--	--	--
MAR 10-17	4.51	28.4	0.268	0.029	0.052	0.026	3.32	0.09	0.768	0.941	<0.003
MAR 17-24	4.59	17.1	0.080	0.013	0.030	0.006	1.66	0.07	0.231	0.202	<0.003
MAR 24-31	4.02	41.6	0.352	0.038	0.079	0.024	4.69	0.13	0.646	0.731	<0.003
MAR 31-APR 07	--	--	0.345	0.073	0.567	0.027	1.19	0.46	0.284	0.288	<0.01
APR 07-14	5.13	18.8	0.186	0.018	0.027	0.012	1.99	0.07	0.324	0.296	<0.003
APR 14-21	4.86	25.6	0.773	0.058	0.117	0.060	3.44	0.15	0.653	1.229	<0.003
APR 21-28	--	6.2	0.289	0.025	0.046	0.022	0.63	0.06	0.412	0.262	<0.003
APR 28-MAY 05	6.46	15.5	1.282	0.123	0.068	0.032	2.09	0.13	0.591	0.440	<0.003

WET DEPOSITION DATA

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FACTORS FOR CONVERTING INCH-POUND UNITS TO INTERNATIONAL SYSTEM UNITS (SI)

The following factors may be used to convert the inch-pound units published herein to the International System of Units (SI).

Multiply inch-pound units	By	To obtain SI units
<i>Length</i>		
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)
<i>Area</i>		
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)
<i>Volume</i>		
gallons (gal)	3.785×10^0	liters (L)
	3.785×10^0	cubic decimeters (dm ³)
	3.785×10^{-3}	cubic meters (m ³)
million gallons	3.785×10^3	cubic meters (m ³)
	3.785×10^{-3}	cubic hectometers (hm ³)
cubic feet (ft ³)	2.832×10^1	cubic decimeters (dm ³)
	2.832×10^{-2}	cubic meters (m ³)
cfs-days	2.447×10^3	cubic meters (m ³)
	2.447×10^{-3}	cubic hectometers (hm ³)
acre-feet (acre-ft)	1.233×10^3	cubic meters (m ³)
	1.233×10^{-3}	cubic hectometers (hm ³)
	1.233×10^{-6}	cubic kilometers (km ³)
<i>Flow</i>		
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)
<i>Mass</i>		
tons (short)	9.072×10^{-1}	megagrams (Mg) or metric tons

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