Water-Data Report 2008

05474500 Mississippi River at Keokuk, IA

Upper Mississippi-Skunk-Wapsipinicon Basin
Flint-Henderson Subbasin

LOCATION.--Lat 40°23′37″, long 91°22′27″ referenced to North American Datum of 1927, in SE ¼ SW ¼ sec.30, T.65 N., R.4 W., Lee County, IA, Hydrologic Unit 07080104, near right bank in tailwater of dam and power plant of Ameren in 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 mi^2.

SURFACE-WATER RECORDS

PERIOD OF RECORD.--January 1878 to current year.

GAGE.--Water-stage recorder. Datum of gage is 477.41 ft above NGVD of 1929 (levels by U.S. Army Corps of Engineers). January 1, 1878 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 sea level.

COOPERATION.--Records provided by Ameren (formerly Union Electric Company).

REMARKS.--Discharge computed from records of operation of turbines in power plant and spillway gates in dam. Minor flow regulation caused by power plant 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.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 6, 1851 reached a stage of 21.0 ft, current site and datum, estimated as 13.5 ft at Galland, discharge 360,000 ft^3/s.

05474500 Mississippi River at Keokuk, IA—Continued

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2007 TO SEPTEMBER 2008
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	52,800	120,000	42,500	50,100	51,000	47,200	117,000	278,000	139,000	207,000	85,200	41,300
2	55,400	115,000	43,400	38,900	50,700	59,200	121,000	296,000	145,000	190,000	85,600	41,700
3	62,600	110,000	37,800	36,600	51,400	101,000	128,000	297,000	156,000	184,000	74,900	40,100
4	73,700	106,000	33,100	41,700	51,600	126,000	128,000	284,000	171,000	171,000	70,600	41,200
5	79,900	103,000	33,700	42,400	53,800	126,000	136,000	268,000	173,000	162,000	65,800	43,500
6	86,400	96,600	33,100	47,900	57,700	126,000	139,000	254,000	171,000	149,000	66,200	40,200
7	90,800	90,900	32,700	59,600	56,200	117,000	144,000	243,000	174,000	138,000	68,400	35,800
8	95,800	86,700	34,400	85,800	56,200	103,000	151,000	232,000	182,000	128,000	66,500	35,800
9	99,100	75,500	35,300	91,500	55,000	87,500	157,000	218,000	192,000	133,000	62,700	36,700
10	99,300	64,700	34,700	108,000	52,400	84,800	171,000	208,000	202,000	137,000	59,000	42,300
11	98,900	68,500	40,200	97,000	48,100	77,400	174,000	208,000	209,000	133,000	55,500	40,100
12	99,800	67,400	46,300	90,000	46,000	68,600	182,000	216,000	228,000	130,000	49,000	36,300
13	106,000	59,800	50,600	84,700	45,000	80,900	188,000	225,000	267,000	132,000	50,900	80,800
14	108,000	62,900	53,500	82,900	44,900	94,600	192,000	230,000	308,000	136,000	51,900	171,000
15	107,000	60,800	53,300	72,500	43,800	112,000	194,000	230,000	349,000	133,000	48,300	151,000
16	106,000	54,600	51,600	65,300	46,300	124,000	198,000	224,000	388,000	128,000	47,400	132,000
17	108,000	54,100	48,400	65,200	51,800	130,000	199,000	214,000	438,000	122,000	44,400	105,000
18	112,000	54,200	43,600	54,700	64,400	138,000	198,000	205,000	413,000	118,000	44,300	88,400
19	129,000	54,100	47,100	45,200	64,800	139,000	204,000	196,000	411,000	112,000	45,800	77,900
20	132,000	52,400	49,700	33,700	62,200	141,000	214,000	188,000	396,000	113,000	45,000	67,500
21	138,000	54,500	48,500	43,500	55,400	148,000	224,000	178,000	368,000	120,000	43,500	64,400
22	141,000	51,900	48,200	41,400	56,700	156,000	232,000	168,000	342,000	135,000	41,600	59,000
23	133,000	53,200	47,200	43,700	54,900	158,000	234,000	162,000	313,000	140,000	39,500	52,200
24	131,000	52,700	46,600	42,600	53,100	148,000	236,000	153,000	293,000	134,000	36,100	48,500
25	128,000	49,700	50,600	40,100	50,000	145,000	235,000	150,000	275,000	127,000	37,100	43,400
26	126,000	48,200	52,800	40,200	50,000	136,000	236,000	141,000	269,000	118,000	36,200	42,900
27	123,000	47,300	54,100	42,800	50,300	128,000	237,000	138,000	264,000	111,000	35,300	46,300
28	123,000	45,600	54,500	43,600	49,000	124,000	246,000	140,000	266,000	108,000	34,200	45,200
29	124,000	47,400	54,900	46,600	48,100	126,000	257,000	143,000	245,000	99,700	37,600	43,500
30	124,000	44,100	55,100	49,900	---	119,000	267,000	142,000	229,000	103,000	43,500	42,100
31	122,000	---	53,000	50,300	---	121,000	---	141,000	---	90,500	42,700	---
Total	3,315,500	2,051,800	1,410,500	1,778,400	1,520,800	3,592,200	5,739,000	6,370,000	7,976,000	4,142,200	1,614,700	1,836,100
Mean	107,000	68,390	45,500	57,370	52,440	115,900	191,300	205,500	265,900	133,600	52,090	61,200
Max	141,000	120,000	55,100	108,000	64,800	158,000	267,000	297,000	438,000	207,000	85,600	171,000
Min	52,800	44,100	32,700	33,700	43,800	47,200	117,000	138,000	139,000	90,500	34,200	35,800
Ac-ft	6,576,000	4,070,000	2,798,000	3,527,000	3,017,000	7,125,000	11,380,000	12,630,000	15,820,000	8,216,000	3,203,000	3,642,000
Cfsm	0.90	0.57	0.38	0.48	0.44	0.97	1.61	1.73	2.23	1.12	0.44	0.51
In.	1.04	0.64	0.44	0.56	0.48	1.12	1.79	1.99	2.49	1.29	0.50	0.57

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1879 - 2008, BY WATER YEAR (WY)

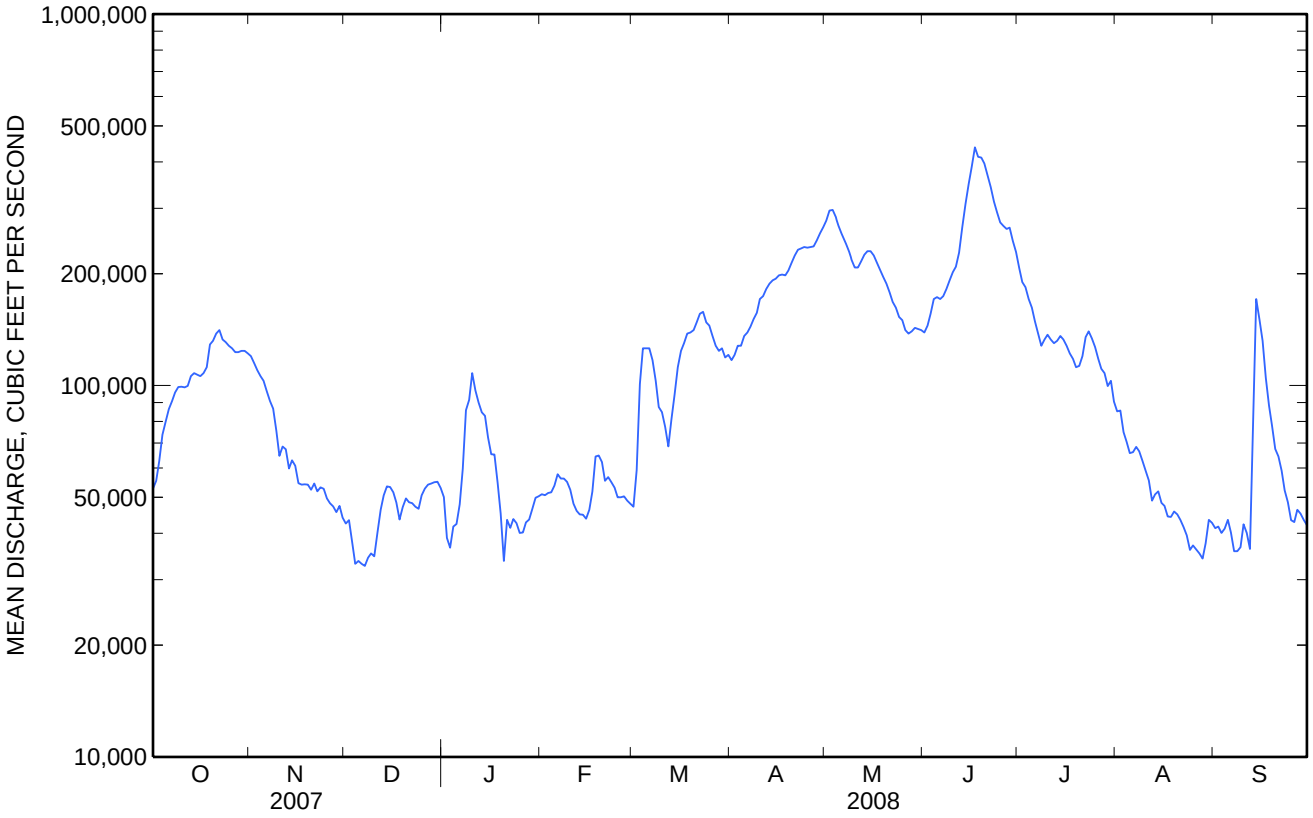
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	51,340	51,140	38,910	36,470	43,080	80,640	120,700	110,200	96,380	75,020	49,780	47,450
Max	221,100	211,300	125,600	101,600	95,620	185,400	250,100	260,700	265,900	385,800	223,000	163,300
(WY)	(1882)	(1882)	(1983)	(1973)	(1984)	(1973)	(1993)	(1888)	(2008)	(1993)	(1993)	(1993)
Min	16,060	16,020	13,450	14,650	15,790	21,780	32,930	27,600	17,400	16,280	13,030	15,530
(WY)	(1934)	(1934)	(1934)	(1940)	(1899)	(1934)	(1895)	(1934)	(1934)	(1988)	(1936)	(1976)

05474500 Mississippi River at Keokuk, IA—Continued

SUMMARY STATISTICS

	Calendar Year 2007		Water Year 2008		Water Years 1879 - 2008	
Annual total	29,624,700		41,347,200			
Annual mean	81,160		113,000		66,800	
Highest annual mean					162,500	1993
Lowest annual mean					21,540	1934
Highest daily mean	196,000	Aug 28	438,000	Jun 17	438,000	Jun 17, 2008
Lowest daily mean	24,500	Feb 19	32,700	Dec 7	5,000	Dec 27, 1933
Annual seven-day minimum	27,000	Feb 15	33,900	Dec 4	8,270	Dec 25, 1933
Maximum peak flow					446,000	Jul 10, 1993
Maximum peak stage					27.58	Jul 10, 1993[a]
Annual runoff (ac-ft)	58,760,000		82,010,000		48,400,000	
Annual runoff (cfsm)	0.682		0.949		0.561	
Annual runoff (inches)	9.26		12.93		7.63	
10 percent exceeds	156,000		229,000		134,000	
50 percent exceeds	67,100		90,800		51,200	
90 percent exceeds	33,100		42,400		23,100	

[a]From floodmark.



05474500 Mississippi River at Keokuk, IA—Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--November 1974 to September 1987, June 2008.

REMARKS.--Water-quality samples were collected in June 2008 to assess the impact of historic flooding on surface-water quality. For samples collected in this time period, flow-integrating sample-collection techniques were not always possible due to safety and equipment considerations.

WATER-QUALITY DATA
WATER YEAR OCTOBER 2007 TO SEPTEMBER 2008

Part 1 of 7

[Remark codes: <, less than; E, estimated; M, presence verified but not quantified.]

Date	Time	Instantaneous discharge, cfs (00061)	Velocity at point in stream, ft/s (81904)	Stream width, feet (00004)	pH, water, unfltrd field, std units (00400)	Specific conductance, wat unf µS/cm 25 degC (00095)	Temperature, water, deg C (00010)	Alkalinity, wat flt inf tit field, mg/L as CaCO3 (39086)	Bicarbonate, wat flt infl pt titr., field, mg/L (00453)	Carbonate, wat flt infl pt titr., field, mg/L (00452)	Chloride, water, fltrd, mg/L (00940)	Sulfate water, fltrd, mg/L (00945)	Ammonia water, fltrd, mg/L as N (00608)
Jun													
18...	1530	389,000	5.01	2,640	7.2	299	23.1	106	129	.2	8.77	11.3	.042

WATER-QUALITY DATA
WATER YEAR OCTOBER 2007 TO SEPTEMBER 2008

Part 2 of 7

[Remark codes: <, less than; E, estimated; M, presence verified but not quantified.]

Date	Nitrate + nitrite water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Total nitrogen, wat unf by analysis, mg/L (62855)	Orthophosphate, water, fltrd, mg/L as P (00671)	Phosphorus, water, unfltrd mg/L as P (00665)	1-Methylnaphthalene, water, unfltrd µg/L (81696)	2,6-Dimethylnaphthalene, water, unfltrd µg/L (62805)	2-Methylnaphthalene, water, unfltrd µg/L (30194)	3,4-Dichlorophenyl isocyanate wat unf µg/L (63145)	3-beta-Coprostanol, water, unfltrd µg/L (62806)	3-Methyl-1H-indole, water, unfltrd µg/L (62807)	3-tert-Butyl-4-hydroxyanisole wat unf µg/L (61702)	4-Cumylphenol, water, unfltrd µg/L (62808)
Jun													
18...	4.08	.158	4.93	.117	.42	<.2	<.2	<.2	E.04	<.8	<.2	<.2	<.2

WATER-QUALITY DATA
WATER YEAR OCTOBER 2007 TO SEPTEMBER 2008

Part 3 of 7

[Remark codes: <, less than; E, estimated; M, presence verified but not quantified.]

Date	4-n-Octylphenol, water, unfltrd µg/L (62809)	4-Nonylphenol, all isomers wat unf µg/L (62829)	4-Nonylphenol diethoxylate, wat unf µg/L (61703)	4-Nonylphenol monoethoxylate, wat unf µg/L (61704)	4t-Octylphenol diethoxylate, wat flt µg/L (61705)	4t-Octylphenol monoethoxylate, wat flt µg/L (61706)	4-tert-Octylphenol, water, unfltrd µg/L (62810)	5-Methyl-1H-benzotriazole, wat unf µg/L (61944)	Acetophenone water, unfltrd µg/L (62811)	AHTN, water, unfltrd µg/L (62812)	Anthracene, water, unfltrd µg/L (34220)	9,10-Anthraquinone water, unfltrd µg/L (62813)	Atrazine, water, unfltrd µg/L (39630)
Jun													
18...	<.2	<2	<3	<2.0	<.32	<1	<.2	<2	<.3	<.2	<.2	<.2	2.7

05474500 Mississippi River at Keokuk, IA—Continued

WATER-QUALITY DATA
WATER YEAR OCTOBER 2007 TO SEPTEMBER 2008
Part 4 of 7
[Remark codes: <, less than; E, estimated; M, presence verified but not quantified.]

Date	BDE congenr 47, water, unfltrd µg/L (63147)	Benzo-[a]-pyrene, water, unfltrd µg/L (34247)	Benzo-phenone water, unfltrd µg/L (62814)	beta-Sitos-terol, water, unfltrd µg/L (62815)	beta-Stigmas tanol, water, unfltrd µg/L (61948)	Bis(2-ethyl-hexyl) phthal-ate, wat unf µg/L (39100)	Bisphe-nol A, water, unfltrd µg/L (62816)	Broma-cil, water, unfltrd µg/L (30234)	Caf-feine, water, unfltrd µg/L (81436)	Camphor water, unfltrd µg/L (62817)	Car-baryl, water, unfltrd µg/L (39750)	Carba-zole, water, unfltrd µg/L (77571)	Chlor-pyrifos water, unfltrd µg/L (38932)
Jun 18...	<.2	<.2	<.2	<.8	<.8	<2	<.4	<.3	<.2	<.2	<.2	<.2	<.2

WATER-QUALITY DATA
WATER YEAR OCTOBER 2007 TO SEPTEMBER 2008
Part 5 of 7
[Remark codes: <, less than; E, estimated; M, presence verified but not quantified.]

Date	Choles-terol, water, unfltrd µg/L (62818)	Coti-nine, water, unfltrd µg/L (61945)	DEET, water, unfltrd µg/L (61947)	Diazi-non, water, unfltrd µg/L (39570)	Di-chlor-vos, water, unfltrd µg/L (30218)	Di-ethyl phthal-ate, water, unfltrd µg/L (34336)	D-Limo-nene, water, unfltrd µg/L (62819)	Fluor-anthene water, unfltrd µg/L (34376)	HHCB, water, unfltrd µg/L (62823)	Indole, water, unfltrd µg/L (62824)	Isobor-neol, water, unfltrd µg/L (62825)	Iso-phorone water, unfltrd µg/L (34408)	Iso-quin-oline, water, unfltrd µg/L (62826)
Jun 18...	M	<.8	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2	<.2

WATER-QUALITY DATA
WATER YEAR OCTOBER 2007 TO SEPTEMBER 2008
Part 6 of 7
[Remark codes: <, less than; E, estimated; M, presence verified but not quantified.]

Date	Menthol water, unfltrd µg/L (62827)	Metal-axyl, water, unfltrd µg/L (04254)	Methyl salicy-late, water, unfltrd µg/L (62828)	Metola-chlor, water, unfltrd µg/L (82612)	p-Cresol, water, unfltrd µg/L (77146)	Penta-chloro-phenol, water, unfltrd µg/L (39032)	Phenan-threne, water, unfltrd µg/L (34461)	Phenol, water, unfltrd µg/L (34694)	Prome-ton, water, unfltrd µg/L (39056)	Pyrene, water, unfltrd µg/L (34469)	Tri-butyl phos-phate, water, unfltrd µg/L (62832)	Tri-closan, water, unfltrd µg/L (61708)	Tri-ethyl citrate water, unfltrd µg/L (62833)
Jun 18...	<.2	<.2	<.2	1.4	<.2	M	<.2	<.2	<.2	<.2	<.2	<.2	<.2

05474500 Mississippi River at Keokuk, IA—Continued

WATER-QUALITY DATA
WATER YEAR OCTOBER 2007 TO SEPTEMBER 2008
Part 7 of 7
[Remark codes: <, less than; E, estimated; M, presence verified but not quantified.]

Date	Tri-phenyl phos-phate, water, unfltrd µg/L (62834)	Tris(2-butoxy-ethyl) phos-phate, wat unf µg/L (62830)	Tris(2-chloro-ethyl) phos-phate, wat unf µg/L (62831)	Tris-(diCl-i-Pr) phos-phate, wat unf µg/L (61707)	1,4-Di-chloro-benzene water, unfltrd µg/L (34571)	Tri-bromo-methane water, unfltrd µg/L (32104)	Iso-propyl-benzene water, unfltrd µg/L (77223)	Naphth-alene, water, unfltrd µg/L (34696)	Tetra-chloro-ethene, water, unfltrd µg/L (34475)	Sus-pended sedi-ment concen-tration mg/L (80154)
Jun										
18...	<.2	<.2	M	M	<.2	<.2	<.2	<.2	<.4	262