Water-Data Report 2012

04108660 KALAMAZOO RIVER AT NEW RICHMOND, MI

Southeastern Lake Michigan Basin
Kalamazoo Subbasin

LOCATION.--Lat 42°39′03″, long 86°06′24″ referenced to North American Datum of 1927, in NE ¼ NW ¼ sec.17, T.3 N., R.15 W., Allegan County, MI, Hydrologic Unit 04050003, on left bank at upstream side of pedestrian bridge in municipal park at Old Allegan Rd, 0.4 mi north of New Richmond, and 0.6 mi upstream from Mann Creek.

DRAINAGE AREA.--1,950 mi^2.

SURFACE-WATER RECORDS

PERIOD OF RECORD.--April 1994 to October 1995, October 2002 to current year. Published as "near New Richmond" October 2002 to September 2010.

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 595 ft above NGVD 29, from topographic map. October 2002 to March 2011 water-stage recorder at site 1.2 mi downstream at different datum (station 04108670).

REMARKS.--Records good except for estimated daily discharges, which are fair. Flow regulated by powerplants upstream from station. Gage-height telemeter at station.

Suggested citation: U.S. Geological Survey, 2013, Water-resources data for the United States, Water Year 2012: U.S. Geological Survey Water-Data Report WDR-US-2012, site 04108660, accessed at http://wdr.water.usgs.gov/wy2012/pdfs/04108660.2012.pdf

04108660 KALAMAZOO RIVER AT NEW RICHMOND, MI—Continued

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2011 TO SEPTEMBER 2012
DAILY MEAN VALUES
[e, estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	1,910	1,940	2,980	2,490	3,440	3,020	2,660	2,150	1,530	979	997	757
2	1,900	2,060	3,000	2,580	3,430	3,720	2,460	2,350	1,510	983	881	842
3	1,880	2,060	3,060	2,710	3,320	4,170	2,420	2,300	1,680	963	868	864
4	1,750	1,840	3,210	2,660	3,280	4,350	2,460	2,750	1,620	914	832	981
5	1,630	1,860	3,280	2,530	3,200	4,490	2,590	2,680	1,480	e894	926	951
6	1,670	1,840	3,520	2,470	3,050	4,470	2,540	2,740	1,430	e890	822	960
7	1,590	1,790	3,650	2,520	2,970	4,340	2,420	2,830	1,380	e897	751	858
8	1,520	1,810	3,540	2,480	2,830	4,070	2,230	2,790	1,360	e887	755	908
9	1,520	2,130	3,490	2,420	2,630	3,940	2,060	2,640	1,340	e890	838	916
10	1,450	2,110	3,430	2,300	2,480	3,790	1,980	2,540	1,280	894	959	927
11	1,490	2,460	3,250	2,260	e2,380	3,400	2,020	2,290	1,200	830	1,180	924
12	1,490	2,550	3,010	2,230	e2,270	3,180	1,940	2,150	1,190	e816	1,120	898
13	1,440	2,590	2,780	2,310	2,210	3,240	1,900	2,120	1,170	e767	1,220	895
14	1,490	2,590	2,730	2,410	2,220	3,190	1,900	1,860	1,130	823	1,340	887
15	1,620	2,450	2,950	e2,340	2,180	3,280	2,100	1,860	1,210	832	1,150	825
16	1,530	2,340	3,240	e2,340	2,230	3,300	2,700	1,850	1,200	774	1,200	826
17	1,480	2,140	3,530	2,370	2,370	3,210	3,210	1,820	1,140	779	1,110	860
18	1,510	2,040	3,510	2,530	2,580	3,060	3,520	1,770	1,080	794	1,060	970
19	1,700	2,090	3,440	2,920	2,690	2,970	3,250	1,660	1,160	1,000	1,190	983
20	1,990	1,870	3,330	e2,930	2,620	2,830	2,990	1,590	1,070	1,060	1,150	958
21	2,380	1,830	3,180	e2,720	2,590	2,690	2,920	1,580	1,110	908	994	899
22	2,790	1,820	3,070	e2,630	2,430	2,380	2,870	1,670	1,080	928	824	900
23	2,730	1,870	2,970	2,990	2,350	2,570	2,770	1,590	992	923	858	1,050
24	2,830	1,910	2,740	3,390	2,410	2,650	2,270	1,440	1,050	916	869	1,070
25	2,720	2,070	2,620	3,840	2,470	2,730	2,220	1,470	1,090	942	888	1,040
26	2,830	2,210	2,520	4,070	2,480	2,880	2,180	1,440	1,050	971	865	1,070
27	2,750	2,400	2,500	3,810	2,490	3,020	2,050	1,350	944	976	905	1,010
28	2,480	2,310	2,480	3,600	2,440	2,950	2,060	1,380	919	952	844	933
29	2,400	2,660	2,330	3,590	2,550	2,750	2,130	1,370	915	901	914	898
30	2,090	2,810	2,330	3,540	---	2,690	2,050	1,370	947	797	903	896
31	2,210	---	2,410	3,440	---	2,760	---	1,330	---	908	891	---
Total	60,770	64,450	94,080	87,420	76,590	102,090	72,870	60,730	36,257	27,788	30,104	27,756
Mean	1,960	2,148	3,035	2,820	2,641	3,293	2,429	1,959	1,209	896	971	925
Max	2,830	2,810	3,650	4,070	3,440	4,490	3,520	2,830	1,680	1,060	1,340	1,070
Min	1,440	1,790	2,330	2,230	2,180	2,380	1,900	1,330	915	767	751	757
Cfsm	1.01	1.10	1.56	1.45	1.35	1.69	1.25	1.00	0.62	0.46	0.50	0.47
In.	1.16	1.23	1.79	1.67	1.46	1.95	1.39	1.16	0.69	0.53	0.57	0.53

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1994 - 2012, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	1,600	2,011	2,451	2,589	2,536	3,351	2,779	2,646	2,364	1,681	1,567	1,523
Max	2,591	2,938	3,756	3,900	4,125	4,691	4,326	3,970	4,717	2,799	2,544	4,245
(WY)	(2010)	(2010)	(2009)	(2005)	(2009)	(2009)	(2009)	(2011)	(2010)	(2010)	(1994)	(2008)
Min	1,033	1,220	1,360	1,261	1,169	1,797	1,670	1,776	1,209	896	888	837
(WY)	(2006)	(2003)	(2003)	(2003)	(2003)	(2003)	(2004)	(2005)	(2012)	(2012)	(2003)	(2003)

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SUMMARY STATISTICS

	Calendar Year 2011		Water Year 2012		Water Years 1994 - 2012	
Annual total	945,720		740,905			
Annual mean	2,591		2,024		2,260	
Highest annual mean					3,157	2009
Lowest annual mean					1,412	2003
Highest daily mean	7,020	Apr 30	4,490	Mar 5	11,700	Dec 30, 2008
Lowest daily mean	1,210	Feb 3	751	Aug 7	665	Sep 21, 2003
Annual seven-day minimum	1,300	Sep 5	798	Jul 12	696	Sep 16, 2003
Maximum peak flow			4,520	Mar 5	[a]12,900	Dec 29, 2008
Maximum peak stage			14.51	Mar 5	[b]16.51	Apr 29, 2011
Annual runoff (cfsm)	1.33		1.04		1.16	
Annual runoff (inches)	18.04		14.13		15.75	
10 percent exceeds	4,140		3,250		3,850	
50 percent exceeds	2,360		2,060		2,010	
90 percent exceeds	1,450		895		1,080	

[a] Gage height 13.26 ft, site and datum then in use.
[b] Present site and datum.

04108660 KALAMAZOO RIVER AT NEW RICHMOND, MI—Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1994 to 1996, 2003 to current year.

PERIOD OF DAILY RECORD.----
SPECIFIC CONDUCTANCE: April 2011 to current year.
pH: April 2011 to current year.
WATER TEMPERATURE: April 2011 to current year.
DISSOLVED OXYGEN: April 2011 to current year.
TURBIDITY: April 2011 to current year.

INSTRUMENTATION.--Water-quality monitor telemeter, set for 15-minute measurement interval.

REMARKS.--Interruptions in the water-quality record were due to instrument malfunction. Specific conductance records rated excellent except for the following periods: Oct. 8-17, Oct. 22 to Nov. 2, Nov. 23 to Dec. 5, Dec. 26 to Jan. 5, Jan. 27, 28, Jan. 31 to Feb. 11, Feb. 20-28, Mar. 2-7, 24-26, Mar. 29 to Apr. 3, Apr. 14-25, May 12-23, July 10-13, 18-26, Aug. 21-29, Sept. 7-26, rated good; Nov. 3-11, Dec. 6-13, Jan. 6-13, Feb. 12-16, Mar. 8-12, Apr. 4-6, rated fair; Nov. 12-18, Dec. 14-21, Jan. 14-26, Mar. 13-22, rated poor. pH and water temperature records rated excellent. Dissolved oxygen records rated excellent except for the following periods: Mar. 14-22, May 21-23, rated good. Turbidity records rated excellent except for the following periods: Oct. 24 to Nov. 5, Nov. 24-26, Jan. 29, 30, Feb. 1, 17, Mar. 2-5, 27, May 31 to June 3, July 4-10, 13-15, rated good; Nov. 6, 27-30, Jan. 31, Feb. 2, 18, Mar. 6-9, 28, Apr. 13, June 4-8, July 16, 17, 20, 21, rated fair; Nov. 7-18, Dec. 1-9, Feb. 3-10, 19-22, Mar. 10-20, Mar. 30 to Apr. 2, Apr. 14, June 9-20, July 18, 19, 22-26, Aug. 7, 8, Sept. 17, rated poor.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum recorded, 654 microsiemens, Sept. 11, 2011; minimum recorded, 322 microsiemens, June 3, 2011.
pH: Maximum recorded, 8.7 std. units, July 13, 2012; minimum recorded, 7.6 std. units, June 2, 3, 2011.
WATER TEMPERATURE: Maximum recorded, 31.0°C, July 6, 2012, may have been higher during period of erroneous record July 6-13, 2012; minimum recorded, 0.0°C, Jan. 19, 20, 21, 22, 2012.
DISSOLVED OXYGEN: Maximum recorded, 14.0 mg/L, Jan. 18, Feb. 28, 2012; minimum recorded, 5.8 mg/L, June 8, Aug. 2, 3, 4, 2011.
TURBIDITY: Maximum recorded, 190 FNU, May 4, 2012; minimum recorded, 2.9 FNU, Oct. 17, 2011.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum recorded, 650 microsiemens, Sept. 26; minimum recorded, 456 microsiemens, Mar. 13.
pH: Maximum recorded, 8.7 std. units, July 13; minimum recorded, 7.7 std. units, July 6, 8, Aug. 7.
WATER TEMPERATURE: Maximum recorded, 31.0°C, July 6, may have been higher during period of erroneous record July 6-13; minimum recorded, 0.0°C, Jan. 19, 20, 21, 22.
DISSOLVED OXYGEN: Maximum recorded, 14.0 mg/L, Jan. 18, Feb. 28; minimum recorded, 5.9 mg/L, July 5, 6, Aug. 7.
TURBIDITY: Maximum recorded, 190 FNU, May 4; minimum recorded, 2.9 FNU, Oct. 17.

04108660 KALAMAZOO RIVER AT NEW RICHMOND, MI—Continued

SPECIFIC CONDUCTANCE, WATER, UNFILTERED, MICROSIEMENS PER CENTIMETER AT 25 DEGREES CELSIUS
WATER YEAR OCTOBER 2011 TO SEPTEMBER 2012

Day	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
		October			November			December			January	
1	595	579	585	565	554	557	597	588	592	560	555	558
2	589	581	585	570	565	568	588	568	576	563	551	558
3	597	588	591	577	566	573	576	572	574	561	558	560
4	596	582	587	579	566	572	575	560	568	565	559	562
5	592	581	584	582	578	580	569	561	566	565	560	563
6	593	585	589	592	581	589	568	544	556	566	562	564
7	596	586	593	597	589	593	544	530	537	570	564	568
8	601	589	596	590	579	586	536	529	533	579	569	575
9	602	593	597	588	581	584	536	531	533	587	579	584
10	606	595	601	590	583	587	538	533	536	584	579	582
11	609	594	602	595	589	593	541	537	540	589	581	586
12	611	598	607	595	588	592	551	541	547	589	582	587
13	607	595	602	591	583	588	557	550	552	590	583	586
14	610	595	603	590	583	588	559	549	554	598	590	595
15	629	601	621	592	588	590	560	547	552	604	598	602
16	640	626	632	595	589	592	561	554	559	609	602	606
17	645	623	634	595	593	594	560	547	555	610	605	608
18	644	638	640	596	593	595	552	546	549	617	608	612
19	647	633	639	602	596	600	557	551	554	627	617	624
20	633	622	625	603	598	600	561	556	559	628	620	624
21	642	630	639	606	601	604	557	543	553	629	618	625
22	638	619	629	615	602	608	543	530	536	634	618	628
23	619	574	595	622	613	618	532	514	523	629	605	616
24	574	564	570	624	620	622	517	511	513	614	605	610
25	577	572	574	632	623	629	513	508	511	606	559	585
26	574	556	563	632	620	627	514	500	508	559	517	547
27	561	554	558	621	600	605	519	508	513	517	467	491
28	555	550	551	609	601	604	550	517	536	578	495	558
29	554	548	551	612	607	610	548	544	546	579	567	574
30	560	548	553	607	594	598	556	545	550	573	557	569
31	561	555	557	---	---	---	555	544	548	560	552	557
Month	647	548	595	632	554	595	597	500	546	634	467	583

04108660 KALAMAZOO RIVER AT NEW RICHMOND, MI—Continued

SPECIFIC CONDUCTANCE, WATER, UNFILTERED, MICROSIEMENS PER CENTIMETER AT 25 DEGREES CELSIUS
WATER YEAR OCTOBER 2011 TO SEPTEMBER 2012

Day	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
		February			March			April			May	
1	573	552	563	601	589	595	566	556	561	584	574	579
2	576	567	573	601	528	568	566	557	562	584	577	581
3	573	568	571	528	502	510	568	562	566	585	569	581
4	581	573	578	524	508	513	570	561	567	570	539	550
5	581	570	575	526	515	522	571	565	569	560	553	557
6	581	575	579	520	515	518	576	561	570	553	527	541
7	593	580	590	522	487	505	570	558	566	528	519	524
8	590	578	585	489	478	483	572	561	566	543	520	533
9	579	571	576	483	465	476	568	556	563	547	542	545
10	573	564	570	472	459	464	565	560	563	552	547	550
11	580	567	574	471	461	466	574	559	569	556	548	553
12	587	580	583	467	461	463	570	560	566	558	551	555
13	592	579	587	465	456	461	574	562	568	560	550	557
14	599	581	587	463	457	460	579	565	574	568	551	561
15	601	596	599	472	463	469	578	556	566	570	560	566
16	604	598	601	483	469	475	578	564	571	561	555	558
17	609	599	605	530	483	515	576	556	569	559	551	555
18	606	602	604	541	530	537	562	526	545	565	552	555
19	605	592	599	547	535	542	527	519	522	579	565	570
20	594	586	590	548	534	539	523	518	521	590	570	584
21	591	586	589	562	548	557	525	520	523	587	567	577
22	588	583	585	571	553	564	552	522	526	598	577	590
23	594	585	590	572	550	561	555	546	552	612	591	607
24	586	577	582	561	552	556	564	550	557	608	599	601
25	580	577	578	579	561	571	567	550	559	601	596	599
26	583	575	580	582	569	577	566	550	558	596	590	592
27	603	578	590	572	555	565	576	566	572	595	586	589
28	605	592	599	564	555	559	575	565	571	598	594	596
29	604	585	594	564	552	559	586	566	578	597	593	595
30	---	---	---	561	553	557	577	569	574	594	589	591
31	---	---	---	564	553	559	---	---	---	589	583	586
Month	609	552	585	601	456	525	586	518	560	612	519	570

04108660 KALAMAZOO RIVER AT NEW RICHMOND, MI—Continued

SPECIFIC CONDUCTANCE, WATER, UNFILTERED, MICROSIEMENS PER CENTIMETER AT 25 DEGREES CELSIUS
WATER YEAR OCTOBER 2011 TO SEPTEMBER 2012

Day	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
		June			July			August			September	
1	586	578	582	607	588	595	637	596	615	600	574	592
2	598	580	591	604	586	593	620	601	611	604	591	596
3	602	596	599	599	584	591	608	601	605	610	577	600
4	602	598	599	617	579	600	619	588	602	596	573	584
5	598	592	595	615	599	607	620	583	602	628	593	607
6	593	583	587	608	564	597	627	590	605	626	606	611
7	589	584	586	608	593	602	625	580	597	619	600	610
8	588	583	585	609	591	599	608	568	592	616	602	607
9	587	584	585	---	---	---	619	587	598	610	602	607
10	589	585	587	---	---	---	594	569	582	616	606	611
11	592	582	586	602	583	593	609	573	592	620	613	616
12	596	585	591	589	555	575	624	601	608	618	602	608
13	604	591	598	612	558	586	643	607	623	617	604	612
14	594	583	588	606	590	598	647	617	633	625	609	615
15	593	582	588	610	596	600	629	585	615	628	609	618
16	593	580	585	608	591	601	593	578	587	614	602	609
17	602	573	585	607	589	599	591	578	583	626	607	617
18	609	593	600	626	598	610	593	583	588	623	612	617
19	621	604	613	618	597	606	594	581	587	644	623	636
20	637	618	629	610	599	605	591	577	584	641	629	635
21	635	620	628	600	589	593	590	577	583	644	630	637
22	636	615	624	614	597	606	587	567	577	637	625	631
23	637	621	629	616	609	613	581	568	575	645	629	636
24	641	622	630	614	607	611	573	558	567	646	630	638
25	648	615	629	627	612	622	584	558	576	647	634	642
26	636	609	622	623	609	617	583	566	574	650	638	644
27	632	610	616	615	605	610	591	564	576	638	631	635
28	635	593	606	610	605	608	599	584	591	631	611	619
29	633	605	614	613	605	610	625	581	599	618	609	612
30	619	591	602	614	598	606	625	595	606	621	616	618
31	---	---	---	614	527	590	598	586	590	---	---	---
Month	648	573	602	---	---	---	647	558	594	650	573	617

04108660 KALAMAZOO RIVER AT NEW RICHMOND, MI—Continued

pH, WATER, UNFILTERED, FIELD, STANDARD UNITS
WATER YEAR OCTOBER 2011 TO SEPTEMBER 2012

Day	Max	Min	Median	Max	Min	Median	Max	Min	Median	Max	Min	Median
		October			November			December			January	
1	8.0	8.0	8.0	8.2	8.1	8.1	8.3	8.2	8.2	8.3	8.2	8.3
2	8.2	8.0	8.0	8.2	8.1	8.2	8.2	8.2	8.2	8.3	8.3	8.3
3	8.2	8.1	8.2	8.2	8.1	8.2	8.2	8.2	8.2	8.3	8.3	8.3
4	8.3	8.1	8.2	8.3	8.1	8.2	8.2	8.2	8.2	8.3	8.3	8.3
5	8.3	8.2	8.2	8.3	8.2	8.2	8.2	8.2	8.2	8.3	8.3	8.3
6	8.4	8.2	8.3	8.3	8.2	8.2	8.2	8.1	8.2	8.3	8.3	8.3
7	8.3	8.2	8.3	8.3	8.2	8.2	8.2	8.1	8.1	8.3	8.3	8.3
8	8.3	8.2	8.3	8.2	8.2	8.2	8.2	8.1	8.1	8.3	8.3	8.3
9	8.3	8.2	8.2	8.2	8.1	8.2	8.2	8.2	8.2	8.3	8.3	8.3
10	8.3	8.2	8.2	8.3	8.1	8.2	8.2	8.2	8.2	8.3	8.2	8.3
11	8.3	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.3	8.2	8.3
12	8.3	8.1	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.3	8.2	8.3
13	8.2	8.1	8.2	8.2	8.1	8.1	8.2	8.2	8.2	8.3	8.3	8.3
14	8.2	8.0	8.1	8.2	8.1	8.2	8.2	8.2	8.2	8.3	8.3	8.3
15	8.2	8.1	8.2	8.2	8.1	8.2	8.2	8.1	8.2	8.3	8.3	8.3
16	8.3	8.2	8.2	8.3	8.2	8.2	8.2	8.2	8.2	8.3	8.3	8.3
17	8.4	8.2	8.2	8.3	8.2	8.2	8.2	8.1	8.2	8.3	8.3	8.3
18	8.4	8.3	8.3	8.3	8.2	8.2	8.2	8.1	8.1	8.3	8.3	8.3
19	8.3	8.3	8.3	8.3	8.2	8.2	8.2	8.1	8.2	8.3	8.3	8.3
20	8.3	8.2	8.2	8.3	8.2	8.2	8.2	8.2	8.2	8.3	8.2	8.2
21	8.2	8.2	8.2	8.3	8.2	8.3	8.2	8.1	8.2	8.3	8.2	8.2
22	8.2	8.2	8.2	8.3	8.2	8.3	8.2	8.2	8.2	8.2	8.2	8.2
23	8.2	8.1	8.1	8.4	8.3	8.3	8.2	8.2	8.2	8.2	8.2	8.2
24	8.1	8.0	8.1	8.3	8.3	8.3	8.3	8.2	8.2	8.2	8.2	8.2
25	8.2	8.1	8.1	8.3	8.3	8.3	8.2	8.2	8.2	8.2	8.1	8.1
26	8.1	8.0	8.1	8.3	8.2	8.2	8.3	8.2	8.2	8.1	8.0	8.1
27	8.1	8.0	8.1	8.2	8.2	8.2	8.3	8.2	8.2	8.2	8.1	8.1
28	8.1	8.0	8.1	8.3	8.2	8.2	8.3	8.2	8.2	8.2	8.1	8.2
29	8.1	8.1	8.1	8.3	8.2	8.2	8.3	8.2	8.3	8.2	8.2	8.2
30	8.2	8.0	8.1	8.3	8.2	8.2	8.3	8.2	8.3	8.2	8.2	8.2
31	8.2	8.1	8.1	---	---	---	8.3	8.2	8.3	8.2	8.2	8.2
Max	8.4	8.3	8.3	8.4	8.3	8.3	8.3	8.2	8.3	8.3	8.3	8.3
Min	8.0	8.0	8.0	8.2	8.1	8.1	8.2	8.1	8.1	8.1	8.0	8.1

04108660 KALAMAZOO RIVER AT NEW RICHMOND, MI—Continued

pH, WATER, UNFILTERED, FIELD, STANDARD UNITS
WATER YEAR OCTOBER 2011 TO SEPTEMBER 2012

Day	Max	Min	Median	Max	Min	Median	Max	Min	Median	Max	Min	Median
		February			March			April			May	
1	8.2	8.2	8.2	8.4	8.3	8.4	8.4	8.2	8.2	8.4	8.2	8.3
2	8.3	8.2	8.2	8.4	8.3	8.3	8.4	8.1	8.2	8.4	8.2	8.3
3	8.2	8.2	8.2	8.3	8.2	8.2	8.3	8.1	8.2	8.4	8.1	8.2
4	8.3	8.2	8.2	8.3	8.2	8.2	8.3	8.1	8.2	8.3	8.0	8.2
5	8.3	8.2	8.2	8.3	8.2	8.2	8.4	8.1	8.2	8.3	8.1	8.2
6	8.3	8.2	8.2	8.3	8.2	8.2	8.4	8.2	8.3	8.2	8.1	8.1
7	8.3	8.2	8.2	8.3	8.2	8.2	8.4	8.2	8.3	8.1	8.0	8.1
8	8.4	8.2	8.3	8.3	8.1	8.2	8.4	8.2	8.3	8.1	8.0	8.0
9	8.4	8.3	8.3	8.3	8.2	8.2	8.4	8.2	8.3	8.2	8.0	8.1
10	8.3	8.3	8.3	8.4	8.2	8.3	8.4	8.2	8.3	8.2	8.0	8.1
11	8.4	8.3	8.3	8.4	8.2	8.3	8.5	8.3	8.3	8.2	8.0	8.1
12	8.4	8.3	8.3	8.3	8.2	8.3	8.5	8.3	8.4	8.3	8.1	8.2
13	8.4	8.3	8.3	8.4	8.2	8.3	8.5	8.3	8.4	8.3	8.2	8.2
14	8.4	8.3	8.3	8.4	8.2	8.3	8.4	8.3	8.4	8.3	8.2	8.2
15	8.4	8.3	8.3	8.3	8.1	8.2	8.4	8.3	8.3	8.3	8.1	8.2
16	8.4	8.2	8.3	8.4	8.1	8.2	8.3	8.2	8.2	8.3	8.2	8.3
17	8.4	8.3	8.3	8.4	8.1	8.2	8.4	8.2	8.3	8.3	8.2	8.3
18	8.4	8.3	8.3	8.4	8.2	8.3	8.3	8.1	8.2	8.4	8.3	8.3
19	8.4	8.3	8.3	8.4	8.2	8.3	8.2	8.0	8.1	8.3	8.2	8.3
20	8.4	8.3	8.3	8.4	8.1	8.2	8.1	8.0	8.1	8.3	8.2	8.2
21	8.4	8.3	8.3	8.4	8.1	8.2	8.2	8.0	8.1	8.2	8.1	8.2
22	8.4	8.3	8.3	8.3	8.0	8.2	8.2	8.0	8.1	8.2	8.1	8.1
23	8.4	8.3	8.4	8.2	8.1	8.1	8.3	8.1	8.2	8.3	8.0	8.2
24	8.4	8.3	8.4	8.2	8.0	8.1	8.2	8.1	8.2	8.3	8.2	8.2
25	8.4	8.3	8.4	8.2	8.1	8.1	8.4	8.1	8.2	8.2	8.1	8.2
26	8.4	8.4	8.4	8.3	8.0	8.1	8.4	8.2	8.3	8.2	8.1	8.1
27	8.4	8.4	8.4	8.3	8.1	8.2	8.4	8.2	8.3	8.2	8.1	8.1
28	8.5	8.3	8.4	8.4	8.1	8.2	8.4	8.2	8.3	8.3	8.2	8.2
29	8.4	8.3	8.4	8.4	8.2	8.3	8.5	8.2	8.3	8.2	8.1	8.2
30	---	---	---	8.3	8.2	8.2	8.4	8.2	8.3	8.2	8.1	8.1
31	---	---	---	8.4	8.2	8.2	---	---	---	8.1	8.0	8.0
Max	8.5	8.4	8.4	8.4	8.3	8.4	8.5	8.3	8.4	8.4	8.3	8.3
Min	8.2	8.2	8.2	8.2	8.0	8.1	8.1	8.0	8.1	8.1	8.0	8.0

04108660 KALAMAZOO RIVER AT NEW RICHMOND, MI—Continued

pH, WATER, UNFILTERED, FIELD, STANDARD UNITS
WATER YEAR OCTOBER 2011 TO SEPTEMBER 2012

Day	Max	Min	Median	Max	Min	Median	Max	Min	Median	Max	Min	Median
		June			July			August			September	
1	8.0	7.9	8.0	8.1	7.9	8.0	8.2	8.0	8.1	8.2	7.8	8.0
2	8.0	8.0	8.0	8.2	7.9	8.0	8.3	8.0	8.1	8.1	7.9	8.0
3	8.0	8.0	8.0	8.2	7.9	8.1	8.3	8.0	8.1	8.4	8.0	8.1
4	8.0	7.9	7.9	8.1	7.8	8.0	8.3	8.0	8.1	8.2	8.0	8.1
5	8.1	8.0	8.0	8.0	7.8	7.9	8.3	7.9	8.0	8.1	7.9	8.0
6	8.2	8.1	8.2	8.1	7.7	7.9	8.1	7.8	8.0	8.0	7.8	7.9
7	8.3	8.2	8.3	8.2	7.8	7.9	8.4	7.7	8.1	8.0	7.8	7.9
8	8.3	8.2	8.2	8.1	7.7	7.9	8.5	7.8	8.2	8.1	7.8	7.9
9	8.2	8.2	8.2	---	---	---	8.2	8.1	8.1	8.3	8.0	8.0
10	8.3	8.2	8.2	---	---	---	8.1	8.0	8.0	8.1	7.9	8.0
11	8.3	8.1	8.2	8.4	8.0	8.2	8.2	7.9	8.0	8.2	8.0	8.1
12	8.3	8.0	8.2	8.5	8.0	8.4	8.4	8.0	8.2	8.2	8.0	8.1
13	8.2	8.0	8.1	8.7	8.1	8.4	8.3	8.0	8.1	8.1	8.0	8.0
14	8.3	8.1	8.2	8.6	8.1	8.4	8.4	8.0	8.2	8.0	7.9	8.0
15	8.3	8.1	8.2	8.5	8.2	8.3	8.4	8.2	8.3	8.1	7.9	8.0
16	8.2	8.1	8.2	8.6	8.0	8.3	8.4	8.2	8.3	8.1	7.9	8.0
17	8.2	8.0	8.1	8.4	8.0	8.2	8.4	8.0	8.2	8.1	7.9	8.0
18	8.1	7.9	8.0	8.4	8.0	8.2	8.3	8.1	8.2	8.0	7.9	8.0
19	8.2	8.0	8.1	8.3	8.0	8.2	8.3	8.2	8.2	8.1	7.8	7.9
20	8.2	7.9	8.1	8.4	8.1	8.2	8.4	8.2	8.3	8.2	8.0	8.0
21	8.1	8.0	8.1	8.5	8.2	8.3	8.4	8.2	8.3	8.2	8.0	8.1
22	8.0	8.0	8.0	8.4	8.2	8.3	8.4	8.1	8.3	8.1	8.0	8.0
23	8.1	8.0	8.0	8.4	8.2	8.3	8.4	8.2	8.3	8.2	8.0	8.1
24	8.2	8.0	8.1	8.3	8.1	8.2	8.3	8.2	8.2	8.2	8.0	8.1
25	8.1	8.0	8.0	8.2	8.0	8.1	8.2	8.0	8.1	8.3	8.1	8.2
26	8.3	8.0	8.2	8.2	8.0	8.2	8.2	8.0	8.1	8.4	8.1	8.2
27	8.3	8.1	8.2	8.2	8.0	8.1	8.1	8.0	8.0	8.3	8.2	8.3
28	8.4	8.1	8.2	8.3	8.0	8.1	8.0	7.9	8.0	8.3	8.2	8.3
29	8.2	8.0	8.1	8.3	8.0	8.2	8.2	7.9	8.0	8.3	8.2	8.2
30	8.3	8.0	8.1	8.4	8.1	8.2	8.2	8.0	8.1	8.3	8.1	8.2
31	---	---	---	8.3	8.1	8.2	8.2	8.0	8.1	---	---	---
Max	8.4	8.2	8.3	---	---	---	8.5	8.2	8.3	8.4	8.2	8.3
Min	8.0	7.9	7.9	---	---	---	8.0	7.7	8.0	8.0	7.8	7.9

04108660 KALAMAZOO RIVER AT NEW RICHMOND, MI—Continued

TEMPERATURE, WATER, DEGREES CELSIUS
WATER YEAR OCTOBER 2011 TO SEPTEMBER 2012

Day	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
		October			November			December			January	
1	14.5	12.7	13.6	9.7	7.7	8.5	5.3	4.4	4.8	3.1	2.2	2.8
2	14.4	12.1	13.1	10.1	8.5	9.1	5.0	4.5	4.8	2.2	0.7	1.4
3	14.8	12.2	13.3	9.7	8.7	9.0	4.8	3.9	4.3	1.0	0.6	0.7
4	14.9	12.3	13.4	9.1	7.5	8.2	5.3	4.6	5.0	0.9	0.1	0.4
5	15.6	13.0	14.0	9.1	7.4	8.1	5.1	4.7	4.9	1.5	0.3	0.8
6	16.5	14.0	14.9	9.9	7.6	8.5	4.7	3.8	4.1	2.4	1.2	1.6
7	17.2	14.5	15.6	9.7	9.1	9.4	3.9	3.4	3.7	2.1	1.5	1.8
8	17.5	15.2	16.3	9.6	9.2	9.4	3.6	3.0	3.3	2.1	1.0	1.5
9	17.8	15.3	16.3	10.4	9.6	9.9	3.2	2.2	2.6	2.6	1.3	1.8
10	17.4	15.8	16.5	9.6	7.9	8.6	2.2	1.4	1.8	2.9	1.7	2.2
11	18.4	16.1	17.1	8.2	7.7	7.9	1.8	0.9	1.3	2.8	1.7	2.2
12	18.3	16.2	17.1	8.5	6.7	7.5	1.8	0.9	1.3	2.8	2.1	2.4
13	17.6	16.3	16.7	9.1	8.0	8.5	2.0	1.4	1.7	2.2	1.1	1.4
14	16.9	14.9	15.7	9.0	8.0	8.3	3.2	2.0	2.3	1.2	0.9	1.1
15	14.9	13.6	14.1	9.0	7.6	8.2	4.5	3.2	4.1	0.9	0.2	0.5
16	14.4	13.4	13.8	8.7	7.3	8.0	3.9	3.0	3.3	1.4	0.1	0.6
17	13.7	12.0	12.7	7.3	5.8	6.3	3.4	2.9	3.0	1.4	0.7	1.3
18	12.8	11.7	12.1	6.4	5.2	5.7	3.5	2.9	3.2	0.9	0.4	0.6
19	12.2	10.8	11.4	6.4	5.5	5.9	3.9	3.1	3.5	0.5	0.0	0.2
20	10.8	10.1	10.3	6.6	6.2	6.5	3.6	2.9	3.2	0.2	0.0	0.1
21	10.1	9.4	9.8	6.4	5.1	5.7	3.8	3.3	3.5	0.2	0.0	0.0
22	10.2	8.5	9.2	5.9	5.0	5.3	3.8	3.6	3.8	0.1	0.0	0.0
23	10.5	8.6	9.4	6.1	4.8	5.3	3.6	3.1	3.3	0.6	0.1	0.4
24	11.0	9.6	10.2	6.0	4.8	5.4	3.6	3.0	3.2	0.3	0.1	0.1
25	11.1	9.5	10.2	6.7	5.0	5.7	3.4	2.9	3.1	0.3	0.1	0.2
26	10.9	10.4	10.6	7.1	6.2	6.6	3.7	3.0	3.2	0.6	0.2	0.4
27	10.7	10.0	10.3	7.5	6.7	7.3	3.4	2.9	3.1	1.4	0.6	0.9
28	10.3	8.7	9.5	6.7	6.1	6.4	2.9	2.2	2.4	1.3	0.8	1.0
29	10.0	9.0	9.4	6.4	5.5	5.8	3.1	2.1	2.4	1.0	0.7	0.8
30	9.3	7.8	8.5	5.7	4.8	5.2	3.0	2.5	2.7	1.2	0.4	0.8
31	9.3	8.5	8.9	---	---	---	3.5	2.8	3.0	3.1	1.1	1.9
Month	18.4	7.8	12.7	10.4	4.8	7.3	5.3	0.9	3.2	3.1	0.0	1.0

04108660 KALAMAZOO RIVER AT NEW RICHMOND, MI—Continued

TEMPERATURE, WATER, DEGREES CELSIUS
WATER YEAR OCTOBER 2011 TO SEPTEMBER 2012

Day	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
		February			March			April			May	
1	3.0	2.1	2.4	4.6	3.6	3.9	11.6	10.1	10.8	14.1	11.5	12.6
2	3.2	2.1	2.5	4.2	3.6	3.9	13.4	10.1	11.4	17.5	13.0	14.8
3	3.6	2.8	3.1	4.1	2.9	3.4	13.9	10.7	12.0	19.5	15.5	17.1
4	4.5	3.1	3.7	3.5	2.4	2.9	14.2	11.2	12.5	20.4	17.4	18.7
5	4.4	2.7	3.5	3.2	2.0	2.5	14.2	11.0	12.4	20.1	17.1	18.3
6	4.0	3.0	3.4	5.1	2.1	3.3	14.4	10.8	12.4	18.5	17.1	17.9
7	3.4	3.3	3.4	6.5	4.6	5.3	15.0	11.1	12.8	18.0	16.3	16.9
8	3.5	2.4	2.9	6.9	5.8	6.5	15.0	12.3	13.4	18.7	15.5	16.8
9	3.5	2.0	2.6	5.8	4.5	5.0	14.8	12.0	13.2	18.3	15.8	17.0
10	2.9	1.3	2.1	6.5	4.0	5.0	13.5	11.0	11.5	18.5	15.2	16.7
11	1.3	0.6	0.9	7.7	5.1	6.2	13.4	10.1	11.4	19.3	15.1	17.0
12	1.8	0.5	1.0	8.8	6.6	7.5	13.5	9.7	11.4	18.6	17.1	17.5
13	1.7	0.4	1.0	10.2	7.7	8.7	13.5	9.9	11.6	19.8	16.5	17.8
14	1.4	0.8	1.0	12.2	7.8	9.6	13.5	11.9	12.6	20.0	16.5	18.1
15	3.1	1.0	1.7	13.4	11.3	12.1	15.6	12.7	13.9	20.2	16.7	18.4
16	3.0	2.1	2.4	14.7	11.7	12.9	15.1	13.4	14.5	20.1	17.7	18.8
17	3.3	1.8	2.4	16.6	13.3	14.6	14.8	12.0	13.3	20.6	16.7	18.4
18	3.5	2.2	2.7	17.1	14.8	15.7	14.8	11.8	13.2	21.8	18.1	19.7
19	3.6	1.6	2.5	18.1	15.5	16.6	14.9	13.7	14.2	22.8	18.9	20.7
20	4.1	1.7	2.7	19.3	16.2	17.5	14.7	12.9	13.7	23.3	20.2	21.7
21	3.6	2.7	3.0	20.1	17.2	18.3	15.1	11.9	13.2	22.5	19.9	20.8
22	4.3	2.6	3.3	20.4	17.4	18.7	14.3	12.0	13.1	21.6	18.3	19.7
23	3.8	2.6	3.1	19.6	18.5	18.9	14.3	11.3	12.7	22.3	18.6	20.2
24	3.3	1.9	2.6	18.5	17.4	17.8	14.7	11.2	12.7	23.7	20.2	21.8
25	2.8	2.0	2.4	18.9	16.4	17.5	13.6	11.6	12.5	23.3	21.3	22.2
26	3.7	1.6	2.5	17.4	14.1	15.5	14.1	12.3	13.0	22.6	20.4	21.3
27	3.2	2.2	2.4	15.4	12.9	13.8	14.6	10.9	12.5	24.3	20.9	22.4
28	4.2	2.0	2.8	15.2	13.1	14.0	13.5	11.2	11.8	25.1	22.2	23.6
29	4.9	2.9	3.6	14.6	12.1	13.3	13.9	10.4	11.9	24.9	22.7	23.7
30	---	---	---	13.6	10.7	11.4	13.1	11.5	11.9	23.6	21.3	22.4
31	---	---	---	11.9	10.0	10.8	---	---	---	22.2	19.7	20.3
Month	4.9	0.4	2.5	20.4	2.0	10.7	15.6	9.7	12.6	25.1	11.5	19.1

04108660 KALAMAZOO RIVER AT NEW RICHMOND, MI—Continued

TEMPERATURE, WATER, DEGREES CELSIUS
WATER YEAR OCTOBER 2011 TO SEPTEMBER 2012

Day	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
		June			July			August			September	
1	19.7	17.9	18.6	26.5	24.6	25.6	27.1	24.6	25.8	25.4	22.9	24.1
2	20.5	17.3	18.6	27.9	24.6	26.2	27.1	24.6	25.9	25.5	22.9	24.0
3	21.1	18.2	19.4	28.0	26.1	27.1	28.5	25.4	26.8	26.4	23.6	24.8
4	21.1	18.0	19.5	29.2	26.5	27.9	29.1	26.0	27.7	25.9	24.5	25.2
5	21.2	18.4	19.6	29.6	27.3	28.6	27.9	26.5	27.2	25.6	24.0	24.8
6	22.1	18.6	20.2	---	26.8	---	26.5	24.0	25.3	26.0	24.0	24.9
7	22.2	19.5	20.6	30.2	28.4	29.5	27.3	23.0	25.5	25.0	22.9	23.4
8	22.8	19.3	20.8	---	27.7	---	27.6	24.1	26.0	23.3	21.8	22.5
9	23.9	20.9	22.1	---	---	---	26.0	23.7	24.6	23.0	21.4	22.2
10	24.9	21.6	23.0	---	---	---	23.7	21.6	22.4	22.5	20.3	21.3
11	25.1	22.6	23.8	28.0	25.5	26.8	24.4	21.5	22.7	22.6	20.3	21.4
12	24.7	22.9	23.6	28.5	24.7	27.0	23.5	21.2	22.2	23.2	20.6	21.8
13	23.7	20.9	22.2	28.5	24.8	27.0	22.6	21.2	21.6	22.6	21.1	21.8
14	24.5	21.1	22.6	29.3	25.9	27.6	23.6	21.0	22.1	21.6	19.9	20.7
15	25.8	22.0	23.7	28.7	26.7	27.7	23.8	21.5	22.6	21.1	18.8	20.0
16	25.5	23.2	24.3	28.8	25.4	27.7	23.2	21.6	22.3	21.1	18.7	20.0
17	25.4	23.0	24.1	29.9	26.7	28.6	23.1	21.5	22.2	21.1	18.8	19.9
18	25.8	22.6	24.0	29.3	27.2	28.6	22.8	20.0	21.3	20.7	18.9	19.7
19	27.5	24.1	25.6	28.7	26.6	27.5	23.1	20.8	21.8	19.2	17.6	18.3
20	27.4	25.2	26.2	28.2	25.9	26.9	23.0	20.8	21.7	19.3	17.8	18.4
21	26.9	24.6	25.4	27.3	25.2	26.2	22.6	20.4	21.5	18.4	16.8	17.2
22	26.1	23.4	24.7	27.8	25.2	26.4	23.1	19.8	21.6	16.9	16.1	16.4
23	26.1	23.3	24.7	29.0	26.2	27.5	24.1	20.9	22.4	16.4	15.6	15.9
24	25.6	24.0	24.8	28.5	26.8	27.2	25.0	22.1	23.5	16.5	14.6	15.4
25	25.4	23.5	24.4	28.2	25.1	26.4	25.5	22.7	24.0	17.0	14.9	15.8
26	25.7	22.7	24.1	27.9	26.4	26.9	24.9	23.3	24.2	17.3	15.7	16.4
27	25.8	23.0	24.5	26.9	25.4	26.1	25.8	23.8	24.7	16.5	14.7	15.4
28	27.5	23.9	25.7	27.3	24.7	25.9	24.9	22.5	23.6	17.4	15.4	16.3
29	26.8	24.8	25.5	26.8	24.2	25.5	25.1	22.4	23.6	17.0	14.9	15.9
30	26.5	23.8	25.2	27.5	24.4	26.1	25.4	22.5	23.9	16.6	14.8	15.7
31	---	---	---	27.3	24.1	25.9	26.2	23.5	24.7	---	---	---
Month	27.5	17.3	23.1	---	---	---	29.1	19.8	23.7	26.4	14.6	20.0

04108660 KALAMAZOO RIVER AT NEW RICHMOND, MI—Continued

DISSOLVED OXYGEN, WATER, UNFILTERED, MILLIGRAMS PER LITER
WATER YEAR OCTOBER 2011 TO SEPTEMBER 2012

Day	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
		October			November			December			January	
1	9.6	8.4	9.0	11.0	10.1	10.5	12.2	11.5	11.8	12.8	12.4	12.6
2	10.0	8.8	9.4	11.4	10.3	10.7	12.4	11.5	11.9	13.3	12.6	12.9
3	10.2	8.8	9.5	10.8	10.0	10.3	12.3	12.0	12.1	13.7	13.0	13.3
4	10.6	9.0	9.7	11.4	10.2	10.7	12.1	11.7	11.8	13.8	13.2	13.5
5	10.7	9.3	10	11.8	10.6	11.1	12.2	11.6	11.8	13.7	13.3	13.5
6	11.2	9.3	10.1	11.7	10.5	11.0	12.3	11.9	12.0	13.6	13.1	13.3
7	10.6	9.1	9.7	11.3	10.2	10.7	12.5	11.9	12.1	13.6	13.1	13.3
8	10.3	8.8	9.5	10.8	10.1	10.3	12.7	12.1	12.3	13.8	13.2	13.4
9	10.2	8.5	9.3	10.2	9.9	10.0	13.0	12.3	12.6	13.5	13.2	13.3
10	10.0	8.4	9.1	10.9	9.8	10.3	13.4	12.7	13.0	13.4	12.9	13.1
11	9.8	7.8	8.9	11.0	10.3	10.6	13.6	13.0	13.2	13.4	12.9	13.1
12	9.7	8.1	8.9	11.1	10.3	10.6	13.8	13.1	13.4	13.0	12.7	12.8
13	8.9	8.2	8.6	10.5	10.1	10.2	13.6	13.2	13.4	13.2	12.7	12.9
14	9.0	7.9	8.4	10.7	10.1	10.4	13.4	12.8	13.1	13.3	12.9	13.1
15	9.5	8.3	8.9	11.2	10.1	10.5	12.8	12.2	12.4	13.8	13.1	13.4
16	9.7	8.4	9.0	11.5	10.3	10.8	12.6	12.3	12.5	13.7	13.3	13.5
17	10.2	8.7	9.5	11.4	10.7	11.0	12.6	12.2	12.4	13.6	13.0	13.2
18	10.6	9.0	9.8	12.4	11.1	11.7	12.8	12.1	12.4	14.0	13.3	13.6
19	9.8	9.1	9.5	11.9	11.2	11.5	12.5	12.1	12.3	13.8	13.5	13.6
20	9.9	9.2	9.5	12.1	11.0	11.4	12.9	12.2	12.5	13.6	13.3	13.5
21	10.0	9.3	9.7	12.4	11.5	11.8	12.6	12.1	12.2	13.8	13.4	13.5
22	10.4	9.7	10	12.0	11.5	11.7	12.3	12.0	12.2	13.8	13.4	13.6
23	10.4	9.6	10.0	12.6	11.5	11.9	12.9	12.1	12.4	13.7	13.2	13.4
24	10.2	9.7	9.9	12.4	11.7	11.9	13.0	12.3	12.5	13.8	13.4	13.6
25	10.3	9.6	9.9	12.4	11.6	11.9	12.8	12.3	12.5	13.7	13.4	13.5
26	9.8	9.3	9.4	11.7	11.2	11.4	13.0	12.3	12.6	13.4	13.1	13.2
27	10.0	9.2	9.5	11.2	10.8	11.0	12.6	12.2	12.4	13.4	13.0	13.1
28	10.2	9.4	9.8	11.9	11.0	11.3	13.3	12.5	12.8	13.4	12.9	13.1
29	10.6	9.7	10.1	11.7	11.1	11.3	13.1	12.6	12.8	13.4	13.0	13.2
30	10.8	9.8	10.2	12.0	11.2	11.5	12.8	12.5	12.6	13.5	13.1	13.2
31	11.2	10.1	10.5	---	---	---	13.2	12.4	12.7	13.4	12.9	13.1
Month	11.2	7.8	9.5	12.6	9.8	11.0	13.8	11.5	12.5	14.0	12.4	13.3

04108660 KALAMAZOO RIVER AT NEW RICHMOND, MI—Continued

DISSOLVED OXYGEN, WATER, UNFILTERED, MILLIGRAMS PER LITER
WATER YEAR OCTOBER 2011 TO SEPTEMBER 2012

Day	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
		February			March			April			May	
1	13.2	12.7	12.9	13.3	12.4	12.8	12.2	9.8	10.8	12.0	9.7	10.7
2	13.4	12.8	13.0	12.9	12.2	12.4	12.6	9.9	11.0	11.9	9.7	10.6
3	13.1	12.5	12.8	12.5	11.8	12.1	12.2	9.8	10.8	11.4	8.6	9.7
4	13.2	12.4	12.7	13.1	12.3	12.6	12.2	9.5	10.6	10.5	8.0	9.0
5	13.3	12.4	12.8	13.6	12.6	13.0	12.3	9.5	10.7	9.4	7.5	8.4
6	13.1	12.4	12.7	13.6	12.9	13.2	12.4	9.5	10.8	8.9	7.7	8.2
7	13.1	12.3	12.6	13.2	12.3	12.6	12.6	9.7	10.9	8.3	7.5	7.9
8	13.6	12.5	13.0	12.6	11.4	11.9	11.9	9.4	10.5	8.9	7.7	8.2
9	13.6	12.7	13.1	13.3	12.0	12.5	12.0	9.5	10.6	9.1	7.7	8.3
10	13.2	12.7	12.9	13.7	12.2	12.9	11.8	9.8	10.7	9.7	8.0	8.7
11	13.8	13.0	13.3	13.6	12.0	12.7	12.5	10.0	11.1	10.2	8.3	9.1
12	13.7	13.2	13.4	12.9	11.6	12.2	12.7	10.2	11.4	10.2	8.7	9.4
13	13.8	13.3	13.5	13.4	11.2	12.1	12.8	10.4	11.4	10.3	8.7	9.4
14	13.7	13.2	13.4	13.1	11.2	12.0	12.0	10.4	11.1	10.6	8.7	9.5
15	13.8	13.4	13.6	12.2	10.1	11.1	11.5	9.9	10.6	9.8	8.4	9.1
16	13.6	13.0	13.3	12.4	9.8	10.9	10.4	8.9	9.7	10.1	8.7	9.3
17	13.6	13.0	13.3	12.3	9.5	10.7	11.5	8.9	10.1	10.1	8.6	9.3
18	13.6	12.9	13.2	12.2	9.1	10.4	11.0	9.0	9.8	10.9	8.6	9.5
19	13.6	13.0	13.2	11.9	8.9	10.2	10.0	8.3	9.1	9.9	8.5	9.1
20	13.6	12.9	13.2	11.5	8.6	9.8	9.3	8.5	8.8	9.6	8.0	8.7
21	13.2	12.7	12.9	11.1	8.3	9.5	11.0	8.7	9.6	8.9	7.6	8.2
22	13.5	12.6	12.9	10.3	7.8	8.9	11.2	8.8	9.8	8.8	7.4	8.0
23	13.4	12.5	12.9	9.5	7.9	8.4	11.6	9.0	10.2	8.9	7.9	8.4
24	13.5	12.4	12.8	9.5	7.5	8.3	11.0	9.1	10.0	9.2	7.8	8.4
25	13.6	12.7	13.0	10.2	7.9	8.8	11.5	9.3	10.2	8.6	7.5	8.0
26	13.8	12.9	13.3	11.0	7.8	9.2	11.5	9.4	10.3	8.3	7.3	7.7
27	13.8	12.8	13.2	11.6	8.7	10	11.5	9.6	10.4	8.8	7.3	8.0
28	14.0	13.0	13.4	12.1	8.8	10.2	11.3	9.7	10.4	8.9	7.4	8.1
29	13.6	12.6	13.0	12.5	9.2	10.6	12.5	10.0	11.1	8.8	7.2	8.0
30	---	---	---	10.8	9.6	10.1	11.1	9.9	10.3	9.2	7.3	8.3
31	---	---	---	12.8	9.7	10.9	---	---	---	8.5	7.7	8.2
Month	14.0	12.3	13.1	13.7	7.5	11.1	12.8	8.3	10.4	12.0	7.2	8.8

04108660 KALAMAZOO RIVER AT NEW RICHMOND, MI—Continued

DISSOLVED OXYGEN, WATER, UNFILTERED, MILLIGRAMS PER LITER
WATER YEAR OCTOBER 2011 TO SEPTEMBER 2012

Day	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
		June			July			August			September	
1	8.2	7.7	8.0	9.6	7.4	8.6	9.8	6.9	8.2	10.5	6.0	8.1
2	8.5	7.8	8.1	10.6	7.4	8.8	9.8	7.0	8.3	9.3	7.1	8.1
3	8.7	7.6	8.1	10.2	7.2	8.6	9.5	6.9	8.0	11.2	7.1	8.8
4	9.1	7.7	8.4	9.8	6.8	8.1	9.8	6.6	8.1	9.9	7.2	8.4
5	9.6	8.0	8.8	9.0	5.9	7.4	9.9	6.6	7.9	10.0	7.2	8.4
6	10.4	8.4	9.3	---	---	---	9.5	6.6	7.8	9.8	7.3	8.4
7	9.2	8.3	8.7	10.2	6.2	7.8	12.0	5.9	8.7	9.2	7.2	8.0
8	9.1	8.2	8.6	9.4	6.1	7.5	12.9	6.0	9.0	9.8	7.2	8.4
9	9.0	7.9	8.4	---	---	---	8.4	7.1	7.8	11.3	8.0	9.3
10	9.0	7.6	8.2	---	---	---	8.0	6.8	7.4	10.3	7.8	9.0
11	9.1	7.3	8.1	10.5	6.4	8.2	10.2	6.9	8.2	10.6	8.0	9.3
12	9.9	7.2	8.3	10.9	6.3	8.7	11.1	7.7	9.3	10.6	8.3	9.4
13	8.9	6.8	7.8	11.3	6.8	8.8	9.3	7.2	8.3	10.1	8.1	9.0
14	9.8	7.3	8.4	10.6	6.6	8.4	11.1	7.5	9.0	9.8	8.1	9.0
15	9.9	7.4	8.5	10.5	6.3	8.2	11.0	7.8	9.3	10.3	8.3	9.3
16	9.6	7.3	8.3	10.9	6.5	8.7	10.1	8.2	9.1	10.4	8.3	9.3
17	8.8	6.8	7.6	10.7	6.4	8.4	10.5	8.0	9.1	10.6	8.5	9.5
18	7.6	6.6	7.1	9.9	6.0	7.9	10.5	7.8	9.0	10.2	8.4	9.3
19	8.4	6.6	7.3	7.6	6.0	6.8	10.5	8.1	9.2	10.8	8.5	9.5
20	8.0	6.4	7.1	8.8	6.0	7.2	10.7	8.6	9.5	11.1	8.8	9.8
21	7.6	6.5	7.0	9.6	6.5	8.0	10.8	8.3	9.4	10.2	8.6	9.4
22	7.7	6.6	7.0	10.0	6.6	8.2	10.9	8.1	9.6	10.1	8.7	9.3
23	8.1	6.4	7.2	10.2	6.8	8.3	10.9	8.1	9.4	10.3	8.9	9.6
24	8.8	6.7	7.6	8.7	6.6	7.6	10.6	8.1	9.3	10.8	9.1	9.8
25	8.5	7.2	7.9	8.9	6.5	7.5	10.0	7.8	8.8	11.5	9.3	10.2
26	10.9	7.1	8.9	7.8	6.2	6.9	9.5	7.5	8.5	10.8	9.4	10.0
27	10.7	7.5	9.0	8.0	6.2	6.9	9.5	7.4	8.3	10.9	9.4	10.1
28	11.8	7.5	9.4	8.9	6.4	7.5	8.9	6.8	8.1	11.2	9.4	10.2
29	9.9	7.3	8.8	9.0	6.7	7.8	9.6	7.3	8.4	10.9	9.6	10.1
30	10.8	7.4	9.1	10.4	6.9	8.4	10.2	7.4	8.7	10.5	9.0	9.7
31	---	---	---	9.5	7.0	8.1	10.2	7.6	8.7	---	---	---
Month	11.8	6.4	8.2	---	---	---	12.9	5.9	8.7	11.5	6.0	9.2

04108660 KALAMAZOO RIVER AT NEW RICHMOND, MI—Continued

TURBIDITY, WATER, UNFILT, NEAR IR LED LIGHT, 780-900 NM, DETECT ANG. 90 DEG, FORMAZIN NEPHELOMETRIC UNITS
WATER YEAR OCTOBER 2011 TO SEPTEMBER 2012

Day	Max	Min	Median	Max	Min	Median	Max	Min	Median	Max	Min	Median
	October			November			December			January		
1	---	---	---	7.0	4.3	5.0	7.7	5.5	6.5	7.6	3.4	4.5
2	---	---	---	7.6	5.2	6.0	8.1	5.4	6.8	6.4	4.1	4.9
3	---	---	---	6.9	5.2	6.0	11	6.3	7.7	18	4.8	5.9
4	---	---	---	6.4	4.4	5.2	28	6.9	14	9.7	5.2	6.4
5	---	---	---	6.2	4.4	5.0	22	12	17	9.7	4.7	6.9
6	---	---	---	6.5	4.4	5.2	38	18	27	9.6	4.1	5.2
7	---	---	---	8.4	5.0	5.9	21	11	15	7.2	4.8	6.1
8	---	---	---	8.4	5.4	6.5	19	9.8	12	6.5	4.7	5.5
9	---	---	---	10	6.2	7.5	12	8.9	11	8.1	4.8	5.5
10	---	---	---	10	6.7	7.6	---	---	---	---	---	---
11	---	---	---	8.0	6.4	7.0	---	---	---	6.6	5.6	5.9
12	---	---	---	9.6	6.3	6.9	---	---	---	6.1	4.6	5.1
13	---	---	---	10	7.8	8.6	---	---	---	---	---	---
14	---	---	---	9.9	6.9	8.0	---	---	---	---	---	---
15	---	---	---	8.6	6.0	7.1	---	---	---	7.0	4.8	---
16	---	---	---	7.6	5.6	6.4	---	---	---	6.8	5.6	---
17	---	---	---	6.8	5.0	5.7	---	---	---	---	---	---
18	6.0	3.0	3.9	7.3	4.9	5.4	---	---	---	8.7	5.5	6.4
19	6.4	3.9	5.3	7.1	4.9	5.4	---	---	---	8.7	6.1	6.9
20	8.2	4.5	6.0	7.7	4.2	5.6	---	---	---	9.5	6.8	8.5
21	9.6	6.0	7.2	5.5	3.7	4.3	---	---	---	9.2	6.8	7.6
22	7.5	4.9	6.2	4.8	3.3	3.8	6.7	4.9	5.5	7.9	5.2	6.0
23	9.7	5.8	7.2	5.1	3.7	4.0	6.1	4.8	5.2	19	5.6	12
24	9.0	6.1	7.5	6.0	3.8	4.6	6.6	4.9	5.7	13	7.6	8.5
25	8.6	5.4	6.6	8.8	5.0	5.9	6.1	4.7	5.4	20	8.2	12
26	7.9	5.7	6.7	8.7	5.4	6.5	6.8	4.9	5.8	20	14	18
27	7.5	5.5	6.3	9.5	6.0	7.4	6.4	4.9	5.2	14	9.5	12
28	7.2	5.1	5.9	8.2	6.0	6.7	6.6	4.2	5.1	11	7.0	8.2
29	6.7	4.9	5.8	8.3	6.1	6.8	7.4	3.9	4.7	8.1	6.2	7.0
30	6.1	4.8	5.3	8.3	6.3	6.7	8.0	4.9	5.7	8.6	6.9	7.6
31	6.3	4.4	5.3	---	---	---	7.9	4.3	5.0	10	6.0	7.4
Max	---	---	---	10	7.8	8.6	---	---	---	---	---	---
Min	---	---	---	4.8	3.3	3.8	---	---	---	---	---	---

04108660 KALAMAZOO RIVER AT NEW RICHMOND, MI—Continued

TURBIDITY, WATER, UNFILT, NEAR IR LED LIGHT, 780-900 NM, DETECT ANG. 90 DEG, FORMAZIN NEPHELOMETRIC UNITS
WATER YEAR OCTOBER 2011 TO SEPTEMBER 2012

Day	Max	Min	Median	Max	Min	Median	Max	Min	Median	Max	Min	Median
		February			March			April			May	
1	8.2	5.2	6.3	13	9.8	11	6.6	4.9	5.5	30	10	12
2	8.3	5.6	7.0	19	11	13	---	---	---	21	14	16
3	10	6.9	7.6	23	18	20	---	---	---	46	16	24
4	8.5	5.6	6.2	21	17	18	---	---	---	190	22	79
5	9.2	4.8	5.7	20	17	19	---	---	---	120	67	87
6	15	4.6	6.7	19	12	15	13	8.0	9.4	86	58	73
7	9.1	3.9	4.4	13	9.9	11	13	7.2	9.3	80	37	44
8	5.9	3.9	4.7	11	8.5	9.3	16	9.3	11	60	33	35
9	10	4.2	5.6	11	7.9	9.0	17	11	13	61	29	33
10	---	---	---	9.5	7.3	8.2	68	11	13	---	---	---
11	---	---	---	13	8.9	10	15	9.5	11	---	---	---
12	---	---	---	12	8.8	9.9	17	9.6	12	---	---	---
13	---	---	---	11	8.2	9.3	40	9.4	14	---	---	---
14	---	---	---	13	8.6	9.9	32	10	15	---	---	---
15	---	---	---	19	12	14	---	---	---	---	---	---
16	---	---	---	22	12	16	---	---	---	---	---	---
17	6.2	3.9	5.1	20	12	14	---	---	---	---	---	---
18	11	4.2	6.3	15	12	14	---	---	---	---	---	---
19	9.7	5.8	7.1	17	11	13	---	---	---	---	---	---
20	7.9	5.7	6.7	---	---	---	---	---	---	---	---	---
21	7.3	4.8	5.2	---	---	---	---	---	---	---	---	---
22	---	---	---	---	---	---	---	---	---	---	---	---
23	---	---	---	26	14	18	---	---	---	19	12	14
24	---	---	---	---	---	---	---	---	---	18	11	14
25	---	---	---	---	---	---	---	---	---	30	12	19
26	---	---	---	---	---	---	12	8.5	9.5	35	13	17
27	---	---	---	14	8.5	10	12	6.8	9.1	27	12	15
28	---	---	---	10	---	---	15	7.5	9.1	35	16	18
29	24	4.3	13	---	---	---	15	7.7	9.9	24	15	18
30	---	---	---	6.7	5.3	5.9	21	10	16	26	17	20
31	---	---	---	6.8	5.0	5.7	---	---	---	26	16	19
Max	---	---	---	---	---	---	---	---	---	---	---	---
Min	---	---	---	---	---	---	---	---	---	---	---	---

04108660 KALAMAZOO RIVER AT NEW RICHMOND, MI—Continued

TURBIDITY, WATER, UNFILT, NEAR IR LED LIGHT, 780-900 NM, DETECT ANG. 90 DEG, FORMAZIN NEPHELOMETRIC UNITS
WATER YEAR OCTOBER 2011 TO SEPTEMBER 2012

Day	Max	Min	Median	Max	Min	Median	Max	Min	Median	Max	Min	Median
		June			July			August			September	
1	29	16	21	33	14	17	25	5.5	11	25	3.1	5.2
2	20	12	15	44	14	20	15	4.6	6.1	24	5.4	9.8
3	23	16	18	34	13	16	18	5.4	7.0	22	7.8	11
4	22	12	14	22	9.6	14	22	5.8	7.5	25	8.2	14
5	21	13	16	42	7.1	11	26	9.8	13	15	3.8	7.0
6	30	12	16	35	4.7	8.2	43	8.8	16	12	3.9	6.1
7	29	13	18	29	7.9	11	90	9.2	30	18	3.7	5.2
8	25	11	13	24	6.5	9.5	---	---	---	13	4.4	6.8
9	28	8.8	14	42	6.9	11	---	---	---	15	3.4	5.3
10	37	8.0	12	48	9.4	13	---	---	---	15	3.3	5.4
11	25	8.9	11	24	7.8	9.6	---	---	---	9.1	3.8	5.4
12	31	9.4	11	32	7.9	12	---	---	---	12	4.2	6.3
13	26	8.7	12	67	5.8	11	---	---	---	30	5.0	11
14	32	8.9	13	36	8.3	12	10	4.1	5.5	20	6.6	12
15	23	11	13	34	7.5	13	14	3.9	6.7	19	3.9	9.8
16	27	11	14	37	4.4	7.2	9.9	3.7	5.0	17	4.1	5.6
17	25	9.7	12	54	11	29	12	4.9	8.2	---	---	---
18	73	10	14	28	4.9	11	18	6.5	9.4	---	---	---
19	55	8.2	14	33	9.1	22	14	5.7	8.5	---	---	---
20	31	8.8	12	30	13	22	17	4.6	8.3	---	---	---
21	65	11	17	30	13	16	10	4.6	6.0	---	---	---
22	---	---	---	52	12	28	11	3.1	4.6	---	---	---
23	---	---	---	54	6.4	16	14	4.0	5.4	---	---	---
24	36	12	14	35	5.6	13	35	7.6	14	---	---	---
25	37	8.5	18	32	8.2	13	41	7.2	13	---	---	---
26	40	8.8	14	38	12	16	36	7.4	10	---	---	---
27	33	8.4	14	36	15	17	---	---	---	20	8.7	12
28	20	9.4	13	28	12	16	---	---	---	26	9.7	13
29	41	11	16	26	7.8	13	---	---	---	30	9.9	13
30	37	14	17	45	7.7	9.9	16	4.9	8.3	28	9.3	13
31	---	---	---	66	6.7	12	22	6.2	10	---	---	---
Max	---	---	---	67	15	29	---	---	---	---	---	---
Min	---	---	---	22	4.4	7.2	---	---	---	---	---	---