Water-Data Report 2013

03029500 CLARION RIVER AT COOKSBURG, PA

Allegheny Basin
Clarion Subbasin

LOCATION.--Lat 41°19′50″, long 79°12′33″ referenced to North American Datum of 1927, Clarion County, PA, Hydrologic Unit 05010005, on right bank at downstream side of bridge on State Highway 36 at Cooksburg, 300 ft downstream from Toms Run, and 2.7 mi upstream from Cathers Run.

DRAINAGE AREA.--807 mi^2.

SURFACE-WATER RECORDS

PERIOD OF RECORD.--October 1938 to current year. Monthly discharge only for October, November 1938, published in WSP 1305.

REVISED RECORDS.--WSP 1305: 1939 (M). WDR PA-85-3: 1979 (M). WDR-US-2007: 2006. WDR-US-2011: 2004.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 1,147.00 ft above National Geodetic Vertical Datum of 1929 (from benchmark). Prior to May 17, 1939, non-recording gage at same site and datum. Satellite telemetry at station.

COOPERATION.--Funding for the operation of this station is provided by Brookfield Power, the Pennsylvania Department of Environmental Protection, and the U.S. Geological Survey through the National Streamflow Information Program.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Flow regulated since June 1952 by East Branch Clarion River Lake (station 03027000) and at low flow by industrial plants above station. Several measurements of water temperature were made during the year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since 1935, 19 ft, Mar 17, 1936, from floodmarks, discharge, about 56,000 ft^3/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 10,000 ft^3/s and (or) maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan 31	1430	11,600	10.19
Apr 11	1200	10,500	9.69
Jun 28	0015	*12,900	*10.77

Minimum discharge, 250 ft^3/s, Oct. 14, 15, gage height, 2.08 ft.

03029500 CLARION RIVER AT COOKSBURG, PA—Continued

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013
DAILY MEAN VALUES
[e, estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	364	2,460	380	1,320	e3,570	e1,050	2,120	1,340	856	2,840	536	1,580
2	343	2,160	368	1,260	e2,860	e977	2,320	1,180	770	5,950	517	1,400
3	316	1,750	459	1,190	e2,460	e916	2,020	1,080	756	5,670	507	879
4	312	1,460	644	1,130	e2,210	962	1,790	1,020	670	3,850	552	774
5	296	1,250	682	1,150	e1,850	908	1,650	987	605	2,820	460	582
6	302	1,070	935	1,070	e1,570	892	1,540	923	626	2,200	410	479
7	318	945	819	1,010	e1,320	850	1,410	843	1,370	1,830	397	421
8	336	850	1,090	966	e1,240	843	1,380	793	1,380	1,560	418	395
9	317	768	1,490	940	e1,130	853	1,420	839	1,050	1,350	514	387
10	292	715	2,100	962	e1,050	921	1,500	893	835	1,290	578	391
11	285	689	4,720	1,010	1,270	1,350	7,330	1,110	1,860	1,620	491	420
12	281	630	3,570	2,470	1,620	3,430	7,480	1,310	2,250	1,410	404	382
13	264	735	2,870	4,350	1,450	4,670	7,950	1,080	3,450	1,120	406	435
14	257	947	2,430	6,690	1,250	3,520	5,260	966	4,710	1,010	547	460
15	267	770	2,100	5,400	e1,110	2,820	3,940	906	2,940	915	468	378
16	292	709	1,870	4,260	e1,010	2,410	3,100	871	2,300	844	388	349
17	304	667	1,920	3,520	e936	2,100	2,590	788	1,980	781	357	337
18	281	638	5,210	2,920	e819	1,790	2,160	710	1,590	992	339	324
19	353	604	5,130	2,490	e831	1,630	1,910	656	1,310	1,410	326	314
20	711	581	4,080	2,340	e849	1,570	2,060	620	1,070	926	321	308
21	512	564	5,930	1,940	e778	1,390	1,710	590	905	769	322	335
22	407	538	4,990	1,550	e729	1,250	1,430	550	783	645	311	512
23	352	502	3,810	1,290	e704	1,140	1,280	548	666	649	320	634
24	320	493	3,090	e1,120	e662	1,040	1,250	556	569	764	331	434
25	307	489	2,560	e1,220	e621	1,020	1,730	535	547	644	314	373
26	291	465	2,220	e1,330	e607	1,030	1,530	474	914	537	304	342
27	280	447	2,090	e1,350	e809	1,030	1,310	434	4,260	498	308	326
28	296	432	1,840	e1,580	e1,130	1,050	1,280	452	9,020	1,230	335	305
29	426	413	1,630	e2,010	---	1,060	1,280	748	4,180	1,350	418	296
30	4,430	394	1,520	e2,950	---	1,230	1,530	1,570	3,070	768	364	302
31	3,520	---	1,370	e5,450	---	1,590	---	969	---	600	326	---
Total	17,632	25,135	73,917	68,238	36,445	47,292	75,260	26,341	57,292	48,842	12,589	14,854
Mean	569	838	2,384	2,201	1,302	1,526	2,509	850	1,910	1,576	406	495
Max	4,430	2,460	5,930	6,690	3,570	4,670	7,950	1,570	9,020	5,950	578	1,580
Min	257	394	368	940	607	843	1,250	434	547	498	304	296
Cfsm	0.70	1.04	2.95	2.73	1.61	1.89	3.11	1.05	2.37	1.95	0.50	0.61
In.	0.81	1.16	3.41	3.15	1.68	2.18	3.47	1.21	2.64	2.25	0.58	0.68

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1939 - 1951, BY WATER YEAR (WY) (PRIOR TO REGULATION)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	590	1,085	1,475	1,891	1,961	3,055	2,969	1,971	1,154	579	288	348
Max	2,134	4,241	3,050	3,962	3,881	6,815	6,288	3,965	2,789	1,765	580	1,078
(WY)	(1946)	(1951)	(1941)	(1950)	(1951)	(1945)	(1940)	(1943)	(1946)	(1942)	(1950)	(1945)
Min	113	170	337	417	764	1,610	725	606	261	158	94.2	82.8
(WY)	(1950)	(1950)	(1944)	(1944)	(1941)	(1949)	(1946)	(1941)	(1939)	(1949)	(1944)	(1943)

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SUMMARY STATISTICS

	Water Years 1939 - 1951	
Annual mean	1,444	
Highest annual mean	2,023	1951
Lowest annual mean	953	1944
Highest daily mean	24,600	Dec 30 1942
Lowest daily mean	43	Aug 30 1939
Annual seven-day minimum	50	Aug 29 1939
Maximum peak flow	32,700	Jul 19 1942
Maximum peak stage	14.96	Jul 19 1942
Instantaneous low flow	41	Aug 30 1939
Annual runoff (cfsm)	1.79	
Annual runoff (inches)	24.31	
10 percent exceeds	3,350	
50 percent exceeds	793	
90 percent exceeds	140	

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1952 - 2013, BY WATER YEAR (WY)

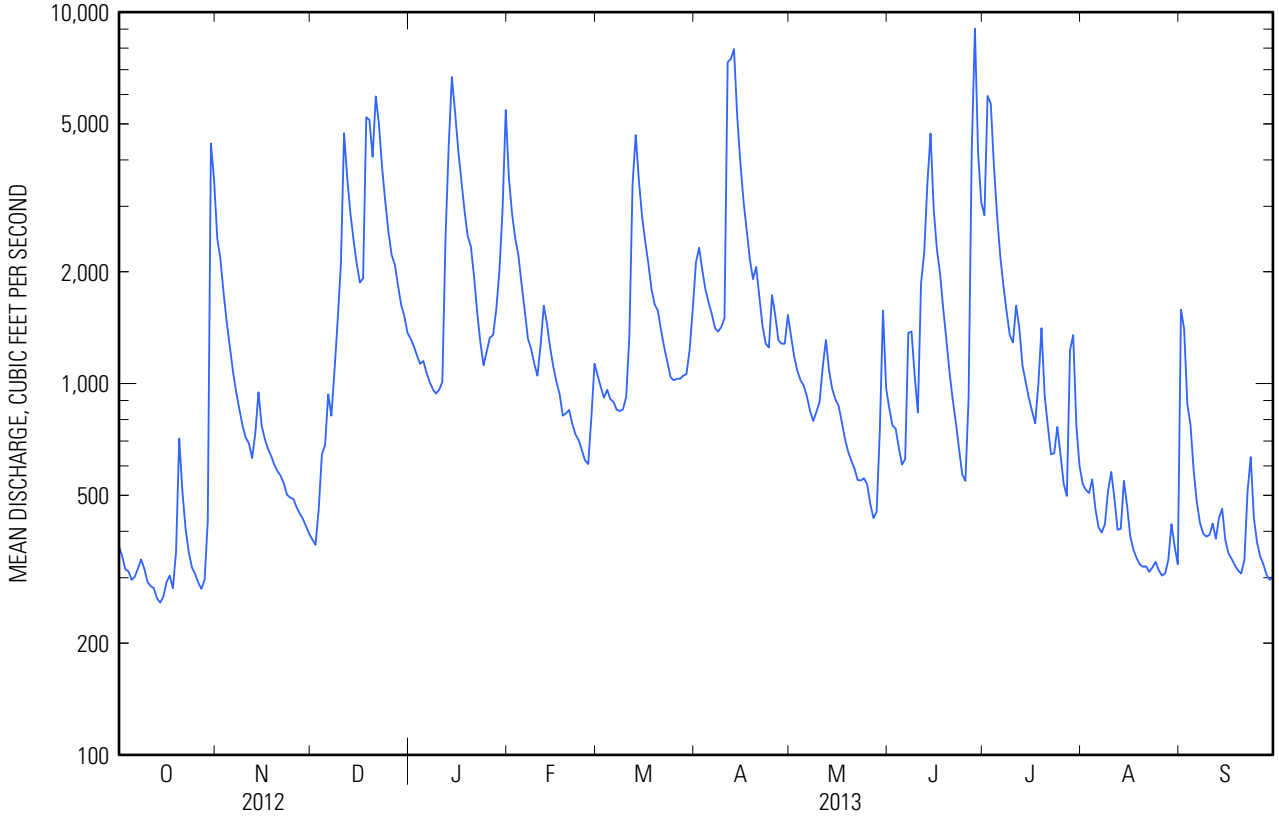
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	819	1,337	1,859	1,740	1,758	2,803	2,504	1,830	1,156	793	645	693
Max	4,168	3,906	3,821	5,654	4,138	6,185	5,260	4,314	5,307	2,565	2,732	3,993
(WY)	(2007)	(1986)	(1978)	(1952)	(1976)	(1979)	(2011)	(2002)	(1972)	(1992)	(1994)	(2004)
Min	86.6	204	150	211	369	764	734	566	325	139	117	109
(WY)	(1952)	(1961)	(1961)	(1961)	(1987)	(1969)	(2012)	(1985)	(1999)	(1952)	(1952)	(1952)

SUMMARY STATISTICS

	Calendar Year 2012		Water Year 2013		Water Years 1952 - 2013	
Annual total	427,988		503,837			
Annual mean	1,169		1,380		1,494	
Highest annual mean					2,413	2004
Lowest annual mean					912	2001
Highest daily mean	7,230	Jan 28	9,020	Jun 28	43,200	Jun 23, 1972
Lowest daily mean	234	Sep 13	257	Oct 14	59	Sep 14, 1952
Annual seven-day minimum	255	Sep 11	277	Oct 10	67	Sep 8, 1952
Maximum peak flow			12,900	Jun 28	[a]53,300	Jun 23, 1972
Maximum peak stage			10.77	Jun 28	[b]18.84	Jun 23, 1972
Instantaneous low flow			250	Oct 14[c]	57	Sep 14, 1952
Annual runoff (cfsm)	1.45		1.71		1.85	
Annual runoff (inches)	19.73		23.23		25.15	
10 percent exceeds	2,580		3,000		3,270	
50 percent exceeds	674		945		924	
90 percent exceeds	282		329		297	

[a] From rating curve extended above 40,000 ft³/s based on straight-line extension.
[b] From peak-stage indicator.
[c] Also Oct 15.

03029500 CLARION RIVER AT COOKSBURG, PA—Continued



03029500 CLARION RIVER AT COOKSBURG, PA—Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--April 2002 to current year.

REMARKS.--Analyses for pH, water temperature, specific conductance, and dissolved oxygen were performed on site. All other sample analyses were performed at the Pennsylvania Department of Environmental Protection laboratory in Harrisburg, Pa. Occasionally, values for filtered parameters may exceed values for the corresponding unfiltered parameter. These results are within the limits of analytical precision and methods.

COOPERATION.--Water-quality samples were collected as part of the Pennsylvania Department of Environmental Protection Water-Quality Network (WQN) with cooperation from the Pennsylvania Department of Environmental Protection.

WATER-QUALITY DATA
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013

Part 1 of 4

[ANC, acid neutralizing capacity; $CaCO_3$, calcium carbonate; N, nitrogen; P, phosphorus; ft^3/s, cubic feet per second; mg/L, milligrams per liter; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; --, no data; <, less than; M, presence verified but not quantified]

Date	Sample start time	Discharge, instantaneous, ft^3/s (00061)	Dissolved oxygen, water, unfiltered, mg/L (00300)	Osmotic pressure, water, unfiltered, millios-moles per kilogram (82550)	pH, water, unfiltered, field, standard units (00400)	pH, water, unfiltered, laboratory, standard units (00403)	Specific conduc-tance, water, unfiltered, laboratory, µS/cm at 25°C (90095)	Specific conduc-tance, water, unfiltered, µS/cm at 25°C (00095)	Tempera-ture, water, °C (00010)	Dissolved solids dried at 180°C, water, filtered, mg/L (70300)
11-19-2012	**1315**	602	12.8	< 1.0	7.3	7.4	216	217	4.0	106
03-21-2013	**0830**	1,410	14.1	5.0	--	7.2	196	107	.4	124
05-08-2013	**1230**	793	9.5	5.0	7.7	7.6	205	204	17.1	120
07-17-2013	**0900**	780	7.2	4.0	7.5	7.5	230	229	23.7	154
09-05-2013	**0800**	602	7.8	4.0	7.6	7.5	231	228	19.8	152

WATER-QUALITY DATA
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013

Part 2 of 4

[ANC, acid neutralizing capacity; $CaCO_3$, calcium carbonate; N, nitrogen; P, phosphorus; ft^3/s, cubic feet per second; mg/L, milligrams per liter; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; --, no data; <, less than; M, presence verified but not quantified]

Date	Sample start time	Hardness, water, mg/L as $CaCO_3$ (00900)	Suspended solids, water, unfiltered, mg/L (00530)	Calcium, water, unfiltered, recover-able, mg/L (00916)	Magne-sium, water, unfiltered, recover-able, mg/L (00927)	Sodium, water, unfiltered, recover-able, mg/L (00929)	ANC, water, unfiltered, fixed endpoint (pH 4.5) titration, laboratory, mg/L as $CaCO_3$ (00417)	Bromide, water, filtered, mg/L (71870)	Chloride, water, filtered, mg/L (00940)	Sulfate, water, filtered, mg/L (00945)
11-19-2012	**1315**	48	< 5	13.2	3.7	20.7	17	0.1	15.4	52.4
03-21-2013	**0830**	43	< 5	11.1	3.7	15.7	13	M	21.7	37.5
05-08-2013	**1230**	54	< 5	14.0	4.6	14.7	22	M	13.3	49.8
07-17-2013	**0900**	62	< 5	16.2	5.3	16.1	26	M	13.6	58.2
09-05-2013	**0800**	65	10	17.7	5.1	17.7	28	M	14.1	53.7

03029500 CLARION RIVER AT COOKSBURG, PA—Continued

WATER-QUALITY DATA
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013

Part 3 of 4

[ANC, acid neutralizing capacity; $CaCO_3$, calcium carbonate; N, nitrogen; P, phosphorus; ft^3/s, cubic feet per second; mg/L, milligrams per liter; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; --, no data; <, less than; M, presence verified but not quantified]

Date	Sample start time	Ammonia, water, unfiltered, mg/L as N (00610)	Nitrate, water, unfiltered, mg/L as N (00620)	Nitrite, water, unfiltered, mg/L as N (00615)	Orthophosphate, water, unfiltered, mg/L as P (70507)	Phosphorus, water, unfiltered, mg/L as P (00665)	Total nitrogen, water, unfiltered, mg/L (00600)	Aluminum, water, unfiltered, recoverable, µg/L (01105)	Barium, water, unfiltered, recoverable, µg/L (01007)	Copper, water, unfiltered, recoverable, µg/L (01042)
11-19-2012	**1315**	< .020	0.44	< .040	< .01	0.011	0.64	< 200	M	< 4
03-21-2013	**0830**	< .020	.46	.050	< .01	.011	.62	< 200	M	< 4
05-08-2013	**1230**	< .020	.37	< .040	< .01	.011	.50	< 200	M	< 4
07-17-2013	**0900**	.020	.27	< .040	< .01	.014	.40	< 200	M	< 4
09-05-2013	**0800**	.030	.38	< .040	< .01	.014	.65	400	M	< 4

WATER-QUALITY DATA
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013

Part 4 of 4

[ANC, acid neutralizing capacity; $CaCO_3$, calcium carbonate; N, nitrogen; P, phosphorus; ft^3/s, cubic feet per second; mg/L, milligrams per liter; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; --, no data; <, less than; M, presence verified but not quantified]

Date	Sample start time	Iron, water, unfiltered, recoverable, µg/L (01045)	Lead, water, unfiltered, recoverable, µg/L (01051)	Manganese, water, unfiltered, recoverable, µg/L (01055)	Nickel, water, unfiltered, recoverable, µg/L (01067)	Strontium, water, unfiltered, recoverable, micrograms per liter (01082)	Zinc, water, unfiltered, recoverable, µg/L (01092)	Boron, water, unfiltered, recoverable, micrograms per liter (01022)	Selenium, water, unfiltered, µg/L (01147)
11-19-2012	**1315**	200	< 1.0	50	< 50	80	< 10	< 200	< 7
03-21-2013	**0830**	170	< 1.0	120	< 50	70	20	< 200	< 7
05-08-2013	**1230**	180	< 1.0	60	< 50	100	< 10	< 200	< 7
07-17-2013	**0900**	300	< 1.0	60	< 50	110	< 10	< 200	< 7
09-05-2013	**0800**	950	< 1.0	210	< 50	100	20	< 200	< 7