01616500 OPEQUON CREEK NEAR MARTINSBURG, WV

Potomac Basin
Conococheague-Opequon Subbasin

LOCATION.--Lat 39°25′25″, long 77°56′20″ referenced to North American Datum of 1927, Berkeley County, WV, Hydrologic Unit 02070004, on right bank 300 ft upstream from Evans Run, 2.3 mi upstream from Tuscarora Creek, 3.0 mi southeast of Martinsburg, and at mile 11.6.

DRAINAGE AREA.--273 mi^2.

SURFACE-WATER RECORDS

PERIOD OF RECORD.--May 1905 to June 1906 (monthly mean discharge published in WSP 1302, and annual maximum published in WSP 1672), July 1947 to current year (daily discharge and peaks).

REVISED RECORDS.--WSP 1702: 1959. WDR WV-97-1: Drainage area, 1936(M), 1967(M), 1968(P), 1969(M).

GAGE.--Water-stage recorder with satellite telemeter. Datum of gage is 354.33 ft above NAVD 88 (VERTCON conversion of 354.89 ft above NGVD 29). Prior to July 1906, nonrecording gage at approximately the same site at different datum. July 23, 1947 to July 22, 1948, nonrecording gage at present site and datum.

REMARKS.--Water-discharge records good. Some diurnal fluctuation at low flow caused by upstream mills in Virginia and since July 18, 1988, by wastewater treatment plant, 1,000 ft upstream from Opequon Creek near Berryville, Va (01615000); drainage area 57.4 mi^2.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in March 1936 reached a stage of about 17.5 ft, from information by local residents, estimated discharge, 19,100 ft^3/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,900 ft^3/s and (or) maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct 30	2200	*6,390	*13.46
Jan 16	1745	2,150	8.60
Jan 31	1930	5,060	12.04

Minimum discharge, 63 ft^3/s, Oct. 18, gage height, 1.82 ft.

Suggested citation: U.S. Geological Survey, 2014, Water-resources data for the United States, Water Year 2013: U.S. Geological Survey Water-Data Report WDR-US-2013, site 01616500, accessed at http://wdr.water.usgs.gov/wy2013/pdfs/01616500.2013.pdf

01616500 OPEQUON CREEK NEAR MARTINSBURG, WV—Continued

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

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	78	658	122	268	1,540	347	275	162	148	138	114	93
2	96	406	120	257	613	291	252	153	149	130	112	91
3	145	311	120	247	464	260	233	149	285	125	105	87
4	111	260	119	233	396	237	221	146	224	123	108	84
5	93	229	118	222	356	223	215	143	171	117	104	81
6	84	210	116	219	330	263	208	141	163	122	127	79
7	79	198	117	229	302	330	200	153	219	112	129	78
8	77	187	117	241	285	558	197	815	278	119	133	77
9	77	176	125	233	274	503	193	693	214	117	132	78
10	76	168	169	224	251	393	187	380	217	115	120	79
11	74	161	157	221	251	330	183	616	584	114	111	77
12	71	157	142	228	254	438	200	513	320	124	105	77
13	69	197	133	221	237	784	230	322	263	137	107	76
14	68	251	127	210	237	439	193	265	463	120	114	75
15	70	196	124	231	234	353	182	240	257	112	102	74
16	69	179	123	1,370	242	317	177	226	198	109	97	75
17	67	167	122	1,100	241	289	182	211	186	105	94	78
18	69	156	125	542	222	269	184	199	168	101	94	77
19	216	153	123	382	217	312	199	191	237	99	96	75
20	186	149	119	328	216	335	389	189	183	98	94	75
21	113	144	171	288	205	295	266	181	163	99	93	76
22	97	140	205	259	198	267	216	216	150	104	90	101
23	89	135	168	230	195	248	198	236	143	377	95	95
24	83	131	156	220	192	235	190	253	142	217	115	85
25	80	127	157	209	186	269	184	217	198	138	101	80
26	77	127	177	207	193	355	172	186	151	119	93	77
27	76	134	380	200	610	449	165	170	140	112	89	76
28	76	137	427	198	479	364	164	169	141	116	91	76
29	383	130	375	229	---	309	171	163	137	126	97	74
30	4,090	126	348	309	---	280	169	159	140	112	93	74
31	2,530	---	302	3,780	---	266	---	152	---	106	89	---
Total	9,569	5,900	5,404	13,335	9,420	10,608	6,195	8,009	6,432	3,963	3,244	2,400
Mean	309	197	174	430	336	342	206	258	214	128	105	80.0
Max	4,090	658	427	3,780	1,540	784	389	815	584	377	133	101
Min	67	126	116	198	186	223	164	141	137	98	89	74
Cfsm	1.13	0.72	0.64	1.58	1.23	1.25	0.76	0.95	0.79	0.47	0.38	0.29
In.	1.30	0.80	0.74	1.82	1.28	1.45	0.84	1.09	0.88	0.54	0.44	0.33

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1947 - 2013, BY WATER YEAR (WY)

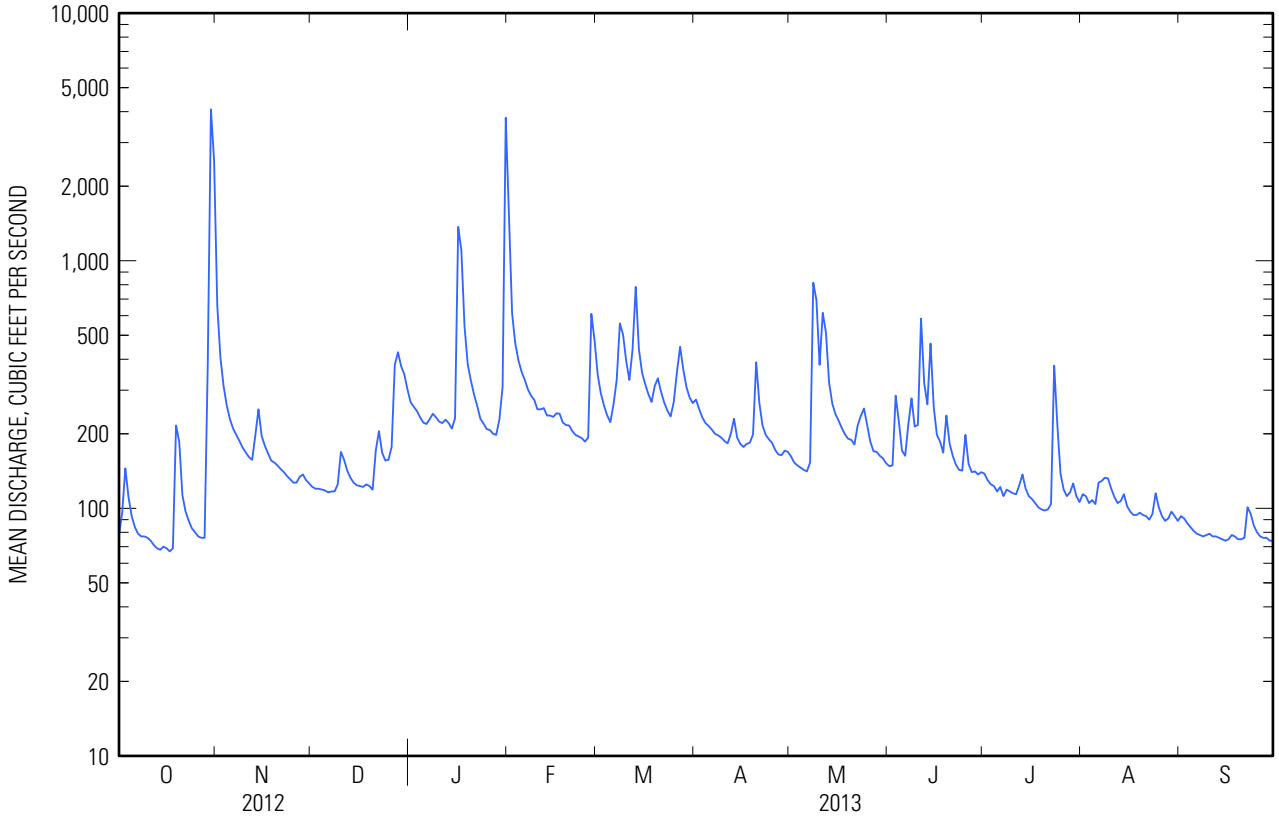
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	152	181	251	281	333	452	381	288	220	142	132	138
Max	788	609	821	1,337	1,269	1,461	1,199	1,091	1,190	456	772	970
(WY)	(1977)	(1997)	(1973)	(1996)	(1998)	(1993)	(1984)	(1988)	(1972)	(1972)	(1996)	(1996)
Min	30.5	35.1	33.7	39.6	49.9	97.2	97.8	86.0	62.3	49.4	36.6	35.2
(WY)	(1948)	(1966)	(1966)	(1966)	(2002)	(2002)	(1954)	(1969)	(1999)	(1966)	(1966)	(1947)

01616500 OPEQUON CREEK NEAR MARTINSBURG, WV—Continued

SUMMARY STATISTICS

	Calendar Year 2012		Water Year 2013		Water Years 1947 - 2013	
Annual total	68,652		84,479			
Annual mean	188		231		246	
Highest annual mean					581	1996
Lowest annual mean					85.7	1954
Highest daily mean	4,090	Oct 30	4,090	Oct 30	[a]15,000	Jan 20, 1996
Lowest daily mean	59	Sep 17	67	Oct 17	26	Oct 25, 1947
Annual seven-day minimum	64	Sep 11	69	Oct 12	27	Sep 7, 1966
Maximum peak flow			6,390	Oct 30	[b]23,400	Jan 20, 1996
Maximum peak stage			13.46	Oct 30	18.76	Jan 20, 1996
Instantaneous low flow			63	Oct 18	25	Oct 25, 1947
Annual runoff (cfsm)	0.687		0.848		0.900	
Annual runoff (inches)	9.35		11.51		12.23	
10 percent exceeds	272		359		480	
50 percent exceeds	138		169		144	
90 percent exceeds	77		79		60	

[a] Estimated.
[b] From rating curve extended above 7,100 ft³/s.



01616500 OPEQUON CREEK NEAR MARTINSBURG, WV—Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--June 2005 to current year.

COOPERATION.--This site is sampled as part of the Chesapeake Bay Program's Non-Tidal Monitoring Network in cooperation with the West Virginia Department of Environmental Protection, Division of Water and Waste Management.

WATER-QUALITY DATA
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013

Part 1 of 4

[%, percent; FNU, Formazin nephelometric units; LED, light-emitting diode; N, nitrogen; P, phosphorus; ft, feet; ft³/s, cubic feet per second; mg/L, milligrams per liter; mm Hg, millimeters of mercury; mm, millimeters; nm, nanometers; °C, degrees Celsius; µS/cm, microsiemens per centimeter; --, no data; <, less than; E, estimated]

Date	Sample start time	Sample type	Barometric pressure, mm Hg (00025)	Temperature, air, °C (00020)	Discharge, instantaneous, ft³/s (00061)	Dissolved oxygen, water, unfiltered, mg/L (00300)	Dissolved oxygen, water, unfiltered, % saturation (00301)	pH, water, unfiltered, field, standard units (00400)	Specific conductance, water, unfiltered, µS/cm at 25°C (00095)	Temperature, water, °C (00010)
10-17-2012	**1140**	Regular	751	16.0	64	10.4	97	8.3	766	11.8
10-30-2012	**1330**	Regular	732	12.0	4,140	9.7	86	7.9	212	8.7
11-07-2012	**1015**	Regular	749	5.0	199	11.1	94	8.2	636	7.3
12-12-2012	**1455**	Regular	761	5.0	143	13.8	115	8.4	653	7.7
12-12-2012	**1456**	Replicate	761	5.0	--	--	--	--	--	--
01-16-2013	**1400**	Regular	748	4.5	1,880	11.1	91	7.9	383	6.4
01-24-2013	**0845**	Regular	758	-7.0	221	13.0	92	8.2	634	1.0
01-24-2013	**0846**	Replicate	758	-7.0	--	13.0	92	8.2	634	1.0
02-13-2013	**1250**	Regular	750	6.0	239	11.6	98	8.2	620	7.3
03-14-2013	**1230**	Regular	752	5.0	430	12.0	101	8.1	459	7.3
04-17-2013	**1540**	Regular	756	21.5	183	10.1	108	8.1	635	18.4
05-09-2013	**0840**	Regular	749	E 12.2	898	8.6	85	7.8	392	14.4
05-15-2013	**1315**	Regular	747	31.0	241	9.9	99	8.1	588	14.5
06-13-2013	**0835**	Regular	741	E 22.0	272	7.4	85	7.9	571	20.9
07-17-2013	**1310**	Regular	758	34.0	105	8.4	105	8.2	706	26.5
08-14-2013	**1440**	Regular	753	21.0	110	9.0	105	8.3	738	22.2
09-09-2013	**1640**	Regular	757	23.0	81	9.8	109	8.3	789	20.7
09-09-2013	**1641**	Replicate	--	--	--	--	--	--	--	--

01616500 OPEQUON CREEK NEAR MARTINSBURG, WV—Continued

WATER-QUALITY DATA
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013

Part 2 of 4

[%, percent; FNU, Formazin nephelometric units; LED, light-emitting diode; N, nitrogen; P, phosphorus; ft, feet; ft^3/s, cubic feet per second; mg/L, milligrams per liter; mm Hg, millimeters of mercury; mm, millimeters; nm, nanometers; °C, degrees Celsius; µS/cm, microsiemens per centimeter; --, no data; <, less than; E, estimated]

Date	Sample start time	Turbidity, water, unfiltered, monochrome near infrared LED light, 780-900 nm, detection angle 90 +/- 2.5 degrees, FNU (63680)	Gage height, ft (00065)	Suspended solids, water, unfiltered, mg/L (00530)	Carbon (inorganic plus organic), suspended sediment, total, mg/L (00694)	Ammonia, water, filtered, mg/L as NH4 (71846)	Ammonia, water, filtered, mg/L as N (00608)	Nitrate plus nitrite, water, filtered, mg/L as N (00631)	Nitrate, water, filtered, mg/L (71851)
10-17-2012	1140	--	1.84	< 15	--	< .013	< .010	1.25	5.50
10-30-2012	1330	--	12.20	195	--	.046	.035	1.01	4.43
11-07-2012	1015	--	1.98	< 15	--	.036	.028	2.23	9.87
12-12-2012	1455	< 1.0	2.30	< 15	.26	< .013	< .010	1.72	7.58
12-12-2012	1456	--	2.30	< 15	.30	< .013	< .010	1.68	7.41
01-16-2013	1400	--	7.53	243	20.9	.030	.023	1.11	4.90
01-24-2013	0845	3.1	2.74	< 15	.37	.014	.011	2.28	10.1
01-24-2013	0846	3.1	2.74	17	.29	.014	.011	2.28	10.1
02-13-2013	1250	1.8	2.88	< 15	.36	.015	.012	2.26	9.98
03-14-2013	1230	11	3.73	< 15	.89	.048	.038	1.47	6.47
04-17-2013	1540	2.6	2.75	< 15	.58	.033	.026	1.55	6.74
05-09-2013	0840	66	5.16	92	7.08	.106	.083	.967	4.22
05-15-2013	1315	6.5	2.84	< 15	.87	.119	.093	1.57	6.83
06-13-2013	0835	26	2.98	46	2.15	.059	.046	1.49	6.49
07-17-2013	1310	4.9	2.07	< 15	.73	.028	.022	1.62	7.14
08-14-2013	1440	6.1	2.09	< 15	.69	.020	.015	1.70	7.48
09-09-2013	1640	2.2	1.88	< 15	.35	.020	.015	1.68	7.39
09-09-2013	1641	--	--	< 15	.47	.021	.017	1.69	7.42

01616500 OPEQUON CREEK NEAR MARTINSBURG, WV—Continued

WATER-QUALITY DATA
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013

Part 3 of 4

[%, percent; FNU, Formazin nephelometric units; LED, light-emitting diode; N, nitrogen; P, phosphorus; ft, feet; ft³/s, cubic feet per second; mg/L, milligrams per liter; mm Hg, millimeters of mercury; mm, millimeters; nm, nanometers; °C, degrees Celsius; µS/cm, microsiemens per centimeter; --, no data; <, less than; E, estimated]

Date	Sample start time	Nitrate, water, filtered, mg/L as N (00618)	Nitrite, water, filtered, mg/L (71856)	Nitrite, water, filtered, mg/L as N (00613)	Organic nitrogen, water, filtered, mg/L (00607)	Organic nitrogen, water, unfiltered, mg/L (00605)	Orthophosphate, water, filtered, mg/L (00660)	Orthophosphate, water, filtered, mg/L as P (00671)	Particulate nitrogen, suspended in water, mg/L (49570)	Phosphorus, water, filtered, mg/L as P (00666)
10-17-2012	**1140**	1.24	0.014	0.004	--	< .32	0.315	0.103	--	--
10-30-2012	**1330**	1.00	.024	.007	--	1.4	.214	.070	--	--
11-07-2012	**1015**	2.23	.009	.003	--	.20	.235	.077	--	--
12-12-2012	**1455**	1.71	.024	.007	< .15	< .28	.385	.126	.038	.145
12-12-2012	**1456**	1.67	.023	.007	< .17	< .32	.330	.108	.051	.126
01-16-2013	**1400**	1.11	.017	.005	.34	1.0	.132	.043	1.46	.052
01-24-2013	**0845**	2.28	.014	.004	.12	.10	.132	.043	.031	.046
01-24-2013	**0846**	2.27	.013	.004	.26	.10	.122	.040	.020	.041
02-13-2013	**1250**	2.25	.017	.005	.23	.21	.121	.039	.021	.047
03-14-2013	**1230**	1.46	.020	.006	.26	.17	.072	.024	.107	.030
04-17-2013	**1540**	1.52	.101	.031	.25	.25	.060	.020	.075	.027
05-09-2013	**0840**	.953	.046	.014	.35	.76	.101	.033	.588	.042
05-15-2013	**1315**	1.54	.104	.032	.30	.27	.153	.050	.077	.057
06-13-2013	**0835**	1.47	.087	.027	.32	.37	.218	.071	.151	.074
07-17-2013	**1310**	1.61	.027	.008	.01	.21	.384	.125	.070	.134
08-14-2013	**1440**	1.69	.029	.009	.22	.22	.392	.128	.067	.138
09-09-2013	**1640**	1.67	.051	.015	.30	.29	.296	.097	.051	.115
09-09-2013	**1641**	1.68	.051	.016	.21	.05	.284	.093	.055	.110

01616500 OPEQUON CREEK NEAR MARTINSBURG, WV—Continued

WATER-QUALITY DATA
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013

Part 4 of 4

[%, percent; FNU, Formazin nephelometric units; LED, light-emitting diode; N, nitrogen; P, phosphorus; ft, feet; ft^3/s, cubic feet per second; mg/L, milligrams per liter; mm Hg, millimeters of mercury; mm, millimeters; nm, nanometers; °C, degrees Celsius; µS/cm, microsiemens per centimeter; --, no data; <, less than; E, estimated]

Date	Sample start time	Phosphorus, water, unfiltered, mg/L as P (00665)	Total nitrogen, water, filtered, analytically determined, mg/L (62854)	Total nitrogen, water, unfiltered, analytically determined, mg/L (62855)	Total nitrogen, water, unfiltered, mg/L (00600)	Suspended sediment, sieve diameter, percent smaller than 0.0625 mm (70331)	Suspended sediment concen-tration, mg/L (80154)
10-17-2012	**1140**	0.138	--	1.57	--	--	1
10-30-2012	**1330**	.389	--	2.47	--	95	201
11-07-2012	**1015**	.087	--	2.46	--	--	7
12-12-2012	**1455**	.14	1.87	2.00	1.9	--	< .5
12-12-2012	**1456**	1.52	1.85	2.00	1.9	--	1
01-16-2013	**1400**	.30	1.47	2.18	2.9	88	304
01-24-2013	**0845**	.06	2.41	2.39	2.4	--	8
01-24-2013	**0846**	.06	2.54	2.39	2.6	--	6
02-13-2013	**1250**	.05	2.50	2.48	2.5	--	7
03-14-2013	**1230**	.04	1.77	1.68	1.9	--	14
04-17-2013	**1540**	.03	1.83	1.83	1.9	--	8
05-09-2013	**0840**	.12	1.40	1.82	2.0	94	100
05-15-2013	**1315**	.07	1.96	1.93	2.0	--	10
06-13-2013	**0835**	.10	1.86	1.91	2.0	--	32
07-17-2013	**1310**	.14	1.66	1.85	1.7	--	13
08-14-2013	**1440**	.14	1.93	1.93	2.0	--	12
09-09-2013	**1640**	.11	2.00	1.99	2.0	--	4
09-09-2013	**1641**	.10	1.91	1.76	2.0	--	4