

Water-Data Report 2011

01402000 MILLSTONE RIVER AT BLACKWELLS MILLS, NJ

RARITAN RIVER BASIN

LOCATION.--Lat 40°28'30", long 74°34'33" referenced to North American Datum of 1983, Hillsborough Township, Somerset County, NJ, Hydrologic Unit 02030105, on left bank 30 ft downstream from highway bridge on Blackwells Mills Causeway at Blackwells Mills, 0.3 mi downstream from Six Mile Run, and 2.0 mi south of Borough of Millstone.

DRAINAGE AREA.--258 mi².

SURFACE-WATER RECORDS

PERIOD OF RECORD.--June 1903 to December 1904 (gage heights only), August 1921 to current year. Monthly discharge only for some periods, published in WSP 1302. Published as "at Millstone" 1903-04.

REVISED RECORDS.--WSP 1552: 1924-25(M), 1926. WDR US-2011: 1999, 2007, 2010.

GAGE.--Water-stage recorder. Concrete control since Nov 18, 1933. Datum of gage is 26.97 ft above NGVD of 1929. June 27, 1903 to Dec 31, 1904, non-recording gage at bridge 2.0 mi downstream at Millstone at different datum. Aug 4, 1921 to Aug 16, 1928, non-recording gage at present site and datum.

REMARKS.--Records good, except for daily discharges greater than 2000 ft³/s, which are fair. Inflow from and losses to Delaware and Raritan Canal upstream of station. Flow slightly regulated by Carnegie Lake, capacity, 310,000,000 gal and several smaller reservoirs, combined capacity, 49,800,000 gal. Several measurements of water temperature were made during the year. Satellite telemetry at station.

REVISIONS.--Peak discharges for the annual maximum for the 1999, 2007, and 2010 water years have been revised as shown in the following table. These values supersede the peak flows published in their respective annual water data reports.

Water Year	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
1999	Sep 17, 1999	0400	20,300	21.01
2007	Apr 16, 2007	1245	17,100	19.24
2010	Mar 14, 2010	1030	12,200	16.15

Daily discharges for Sep 17, 1999, Apr 16, 2007, and Mar 14, 2010 have been revised as shown in the following table. These values supersede the daily discharges published in their respective annual water data reports.

Water Year	Date	Daily Mean Discharge (ft ³ /s)
1999	Sep 17, 1999	17,400
2007	Apr 16, 2007	15,700
2010	Mar 14, 2010	11,200

PEAK DISCHARGES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,000 ft³/s and (or) maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar 7	1700	4,310	9.88
Mar 11	1945	3,630	9.19
Apr 17	1600	7,480	12.59
Aug 15	0830	4,960	10.26
Aug 28	1815	*20,700	*21.24
Sep 8	2115	8,930	13.77

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DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011
DAILY MEAN VALUES
[e, estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	1,220	82	597	107	165	1,010	306	358	173	113	77	628
2	1,180	79	1,420	158	296	595	357	315	144	108	66	399
3	387	81	589	277	685	425	310	286	120	372	56	309
4	217	199	340	288	588	360	268	306	109	600	90	242
5	165	469	244	239	471	328	275	393	105	311	111	202
6	140	327	202	196	604	590	319	337	105	214	90	746
7	117	222	175	175	746	3,550	278	265	102	189	78	4,440
8	97	174	153	158	892	2,870	252	228	96	393	70	7,070
9	82	152	140	150	900	1,560	503	202	106	705	165	6,460
10	73	134	126	138	628	990	452	184	111	610	290	2,780
11	66	123	124	131	417	2,930	358	169	116	309	235	1,430
12	111	118	441	130	340	2,860	345	161	141	192	135	689
13	117	115	1,160	130	289	1,730	1,450	153	136	146	90	476
14	103	109	697	123	332	822	1,500	147	128	116	1,480	387
15	164	107	372	118	923	548	809	275	184	101	4,610	315
16	141	108	261	119	812	723	644	782	150	93	3,320	263
17	114	218	208	117	814	945	5,630	648	506	85	1,540	221
18	92	246	179	159	1,520	650	4,430	932	433	78	511	185
19	113	211	163	407	1,870	489	1,970	1,430	232	69	603	164
20	125	176	153	609	1,230	396	847	888	170	65	1,130	150
21	113	151	144	541	624	428	573	749	141	63	546	141
22	105	e130	137	362	474	516	456	495	126	62	2,040	154
23	95	e105	131	e260	381	533	731	426	159	58	2,420	304
24	89	e95	126	e215	329	1,210	982	400	245	55	1,240	1,030
25	87	e90	120	183	1,190	1,020	1,510	325	507	56	483	715
26	90	e100	119	175	2,260	615	1,070	265	517	86	477	472
27	102	e110	130	195	1,550	454	611	225	350	70	459	307
28	139	e100	125	200	1,020	379	578	195	203	61	15,200	492
29	111	e90	108	188	---	333	778	192	155	84	14,700	574
30	94	e75	103	177	---	298	456	215	126	152	5,690	639
31	87	---	104	166	---	281	---	205	---	84	2,040	---
Total	5,936	4,496	9,091	6,591	22,350	30,438	29,048	12,151	5,896	5,700	60,042	32,384
Mean	191	150	293	213	798	982	968	392	197	184	1,937	1,079
Max	1,220	469	1,420	609	2,260	3,550	5,630	1,430	517	705	15,200	7,070
Min	66	75	103	107	165	281	252	147	96	55	56	141
Cfsm	0.74	0.58	1.14	0.82	3.09	3.81	3.75	1.52	0.76	0.71	7.51	4.18
In.	0.86	0.65	1.31	0.95	3.22	4.39	4.19	1.75	0.85	0.82	8.66	4.67

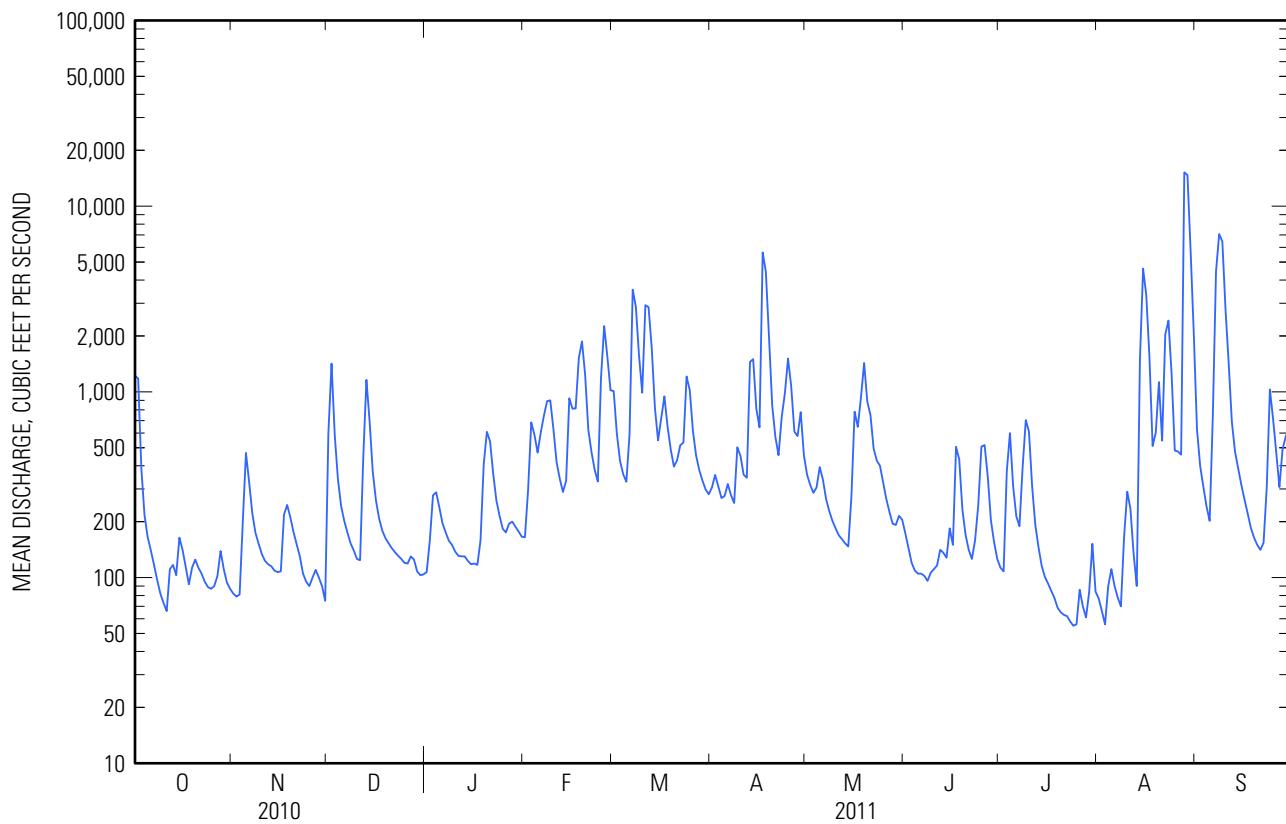
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1922 - 2011, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	221	338	488	513	564	700	555	360	254	241	234	234
Max	1,296	1,113	1,550	1,743	1,199	2,003	1,838	1,264	1,217	1,808	1,937	1,277
(WY)	(2006)	(1973)	(1997)	(1979)	(1925)	(2010)	(2007)	(1989)	(2003)	(1975)	(2011)	(1938)
Min	42.6	51.2	67.0	62.9	105	158	103	82.8	45.5	19.3	17.3	20.2
(WY)	(1942)	(1966)	(1966)	(1981)	(1934)	(1985)	(1985)	(1963)	(1963)	(1966)	(1981)	(1980)

01402000 MILLSTONE RIVER AT BLACKWELLS MILLS, NJ—Continued**SUMMARY STATISTICS**

	Calendar Year 2010	Water Year 2011		Water Years 1922 - 2011	
Annual total	150,563	224,123			
Annual mean	413	614		391	
Highest annual mean				690	1975
Lowest annual mean				165	1985
Highest daily mean	11,200	Mar 14	15,200	Aug 28	17,400 Aug 28, 1971
Lowest daily mean	31	Sep 9	55	Jul 24	5.0 Sep 16, 1923
Annual seven-day minimum	33	Sep 5	61	Jul 19	6.3 Aug 7, 1966
Maximum peak flow			20,700	Aug 28	22,200 Aug 28, 1971
Maximum peak stage			a21.24	Aug 28	a21.24 Aug 28, 2011
Instantaneous low flow			53	Jul 24, 25, Aug 3	5.0 Sep 16, 1923
Annual runoff (cfsm)	1.60		2.38		1.52
Annual runoff (inches)	21.71		32.32		20.59
10 percent exceeds	870		1,210		837
50 percent exceeds	165		245		202
90 percent exceeds	48		93		60

^a Due to backwater from change in floodplain conditions.



01402000 MILLSTONE RIVER AT BLACKWELLS MILLS, NJ—Continued**WATER-QUALITY RECORDS**

PERIOD OF RECORD.--Water years 1962-69, 1973, 1976-80, 1991 to current year.

REMARKS.--Cooperative Network Site Descriptor: Watershed Integrator, New Jersey Department of Environmental Protection, Watershed Management Area 10.

COOPERATION.--Physical measurements and samples for laboratory analyses were provided by personnel of the NJ Department of Environmental Protection. Determination of concentrations of ammonia in filtered water was performed by the NJ Department of Health and Senior Services, Environmental and Chemical Laboratory (DHSS-ECL) except during the period May 12 through August 25, 2011 when the determination was performed by the National Water-Quality Laboratory. Determination of concentrations of suspended solids in unfiltered water was performed by the DHSS-ECL except during the period June 17 through August 25, 2011 when samples could not be accepted. Analysis of the split and concurrent replicate samples was performed by the Laboratory Branch of the U.S. Environmental Protection Agency, Region II, Division of Environmental Science and Assessment.

**WATER-QUALITY DATA
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011**

Part 1 of 6

[%, percent; ANC, acid neutralizing capacity; CaCO₃, calcium carbonate; N, nitrogen; NTRU, nephelometric turbidity ratio unit; P, phosphorus; SiO₂, silicon dioxide; cm, centimeter; ft³/s, cubic feet per second; mg/L, milligrams per liter; mm Hg, millimeters of mercury; nm, nanometers; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; <, less than; E, estimated]

Date	Sample start time	Medium name	Sample type	Barometric pressure, mm Hg (00025)	Temperature, air, °C (00020)	Tempera-ture, water, filtered, units per centimeter (50624)	Absorbance, UV, 254 nm, 1 cm path length, water, filtered, units per centimeter (61726)	Absorbance, UV, organic constituents, 280 nm, 1 cm path length, water, filtered, units per centimeter	Discharge, instantane-ous, ft ³ /s (00061)
								UV, 254 nm, 1 cm path length, water, filtered, units per centimeter	
11-30-2010	0800	Surface water	Regular	771	2.5	.095	.073	E 75	
02-10-2011	0900	Surface water	Replicate	762	-5.0	.110	.085	655	
02-10-2011	0900	QC sample - Surface water	Split Replicate	--	--	--	--	--	
02-10-2011	0901	QC sample - Surface water	Concurrent Replicate	--	--	--	--	--	
06-17-2011	0900	Surface water	Regular	760	21.0	.171	.131	590	
09-01-2011	0950	QC sample - Artificial	Field Blank	--	--	--	--	--	
09-01-2011	1000	Surface water	Regular	768	22.0	.354	.275	600	

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WATER-QUALITY DATA
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011

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[%, percent; ANC, acid neutralizing capacity; CaCO₃, calcium carbonate; N, nitrogen; NTRU, nephelometric turbidity ratio unit; P, phosphorus; SiO₂, silicon dioxide; cm, centimeter; ft³/s, cubic feet per second; mg/L, milligrams per liter; mm Hg, millimeters of mercury; nm, nanometers; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; <, less than; E, estimated]

Date	Sample start time	Dissolved oxygen, water, unfiltered, % saturation	pH, water, unfiltered, field, standard units	Specific conductance, water, unfiltered, µS/cm at 25 °C	Temperature, water, °C	Turbidity, water, unfiltered, broad band light source (400-680 nm), detectors at multiple angles including 90 +/- 30 degrees, ratiometric correction, NTRU (63676)	Dissolved solids dried at 180 °C, water, filtered, mg/L	Dissolved solids, water, filtered, sum of constituents, mg/L
		(00300)	(00301)	(00400)	(00095)	(00010)	(63676)	(70301)
11-30-2010	0800	9.9	74	7.5	389	5.5	3.3	214
02-10-2011	0900	12.2	87	7.1	780	1.3	8.4	417
02-10-2011	0900	--	--	--	--	--	--	450
02-10-2011	0901	--	--	--	--	--	--	440
06-17-2011	0900	6.2	70	7.3	328	21.0	62	196
09-01-2011	0950	--	--	--	--	--	--	--
09-01-2011	1000	6.0	67	7.0	188	21.0	16	118
								101

WATER-QUALITY DATA
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011

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[%, percent; ANC, acid neutralizing capacity; CaCO₃, calcium carbonate; N, nitrogen; NTRU, nephelometric turbidity ratio unit; P, phosphorus; SiO₂, silicon dioxide; cm, centimeter; ft³/s, cubic feet per second; mg/L, milligrams per liter; mm Hg, millimeters of mercury; nm, nanometers; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; <, less than; E, estimated]

Date	Sample start time	Hardness, water, mg/L as CaCO ₃	Suspended solids, water, unfiltered, mg/L	Calcium, water, filtered, mg/L	Magnesium, water, filtered, mg/L	Potassium, water, filtered, mg/L	Sodium, water, filtered, mg/L	ANC, water, unfiltered, fixed endpoint (pH 4.5) titration, laboratory, mg/L as CaCO ₃	Carbon (inorganic) plus organic, suspended sediment, total, mg/L	Chloride, water, filtered, mg/L
		(00900)	(00530)	(00915)	(00925)	(00935)	(00930)	(90410)	(00694)	(00940)
11-30-2010	0800	105	4	23.6	11.2	4.85	32.2	52	.87	52.6
02-10-2011	0900	106	2	25.7	10.1	2.66	101	27	.33	202
02-10-2011	0900	108	< 10	25.0	11.0	3.20	100	28	--	200
02-10-2011	0901	110	< 10	26.0	11.0	3.30	110	28	--	200
06-17-2011	0900	76.6	--	16.9	8.33	3.68	28.6	43	4.12	51.5
09-01-2011	0950	--	--	--	--	--	--	--	--	--
09-01-2011	1000	44.2	8	10.5	4.37	2.90	15.1	27	1.38	23.8

01402000 MILLSTONE RIVER AT BLACKWELLS MILLS, NJ—Continued

WATER-QUALITY DATA
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011

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[%, percent; ANC, acid neutralizing capacity; CaCO₃, calcium carbonate; N, nitrogen; NTRU, nephelometric turbidity ratio unit; P, phosphorus; SiO₂, silicon dioxide; cm, centimeter; ft³/s, cubic feet per second; mg/L, milligrams per liter; mm Hg, millimeters of mercury; nm, nanometers; °C, degrees Celsius; µS/cm, microsiemens per centimeter; µg/L, micrograms per liter; <, less than; E, estimated]

Date	Sample start time	Inorganic		Silica, water, filtered, mg/L as SiO ₂ (00955)		Sulfate, water, filtered, mg/L (00945)		Ammonia plus organic nitrogen, water, filtered, mg/L as N (00623)		Ammonia, water, filtered, mg/L as N (00608)		Nitrate plus nitrite, water, filtered, mg/L as N (00631)		Particulate nitrogen, suspended in water, mg/L (49570)		Phosphorus, water, filtered, mg/L as P (00666)	
		Fluoride, water, filtered, mg/L (00950)	Inorganic carbon, suspended sediment, total, mg/L (00688)														
11-30-2010	0800	.18	<.03	5.6	31.5	.40	<.010	4.12	.14	.33							
02-10-2011	0900	.10	<.03	9.8	21.1	.35	.067	2.53	.06	.07							
02-10-2011	0900	.07	--	--	22.0	E .28	.053	2.70	--	.057							
02-10-2011	0901	.08	--	--	22.0	E .31	.058	2.60	--	.055							
06-17-2011	0900	.15	<.03	7.0	21.4	.47	.076	2.47	.41	.25							
09-01-2011	0950	--	--	--	--	--	--	--	--	--							
09-01-2011	1000	.07	<.03	9.5	13.9	.59	.086	1.14	.13	.11							

WATER-QUALITY DATA
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011

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Date	Sample start time	Total Phosphorus, water, unfiltered, mg/L as P (00665)		Total nitrogen, water, filtered, mg/L (00602)		Total nitrogen, water, unfiltered, mg/L (00600)		Copper, water, filtered, µg/L (01040)		Lead, water, filtered, µg/L (01049)		Mercury, water, filtered, µg/L (71890)		Nickel, water, filtered, µg/L (01065)		Zinc, water, filtered, µg/L (01090)		Arsenic, water, filtered, µg/L (01000)	
11-30-2010	0800	.41	4.5	4.7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
02-10-2011	0900	.09	2.9	2.9	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
02-10-2011	0900	.100	E 3.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
02-10-2011	0901	.100	E 2.9	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
06-17-2011	0900	.46	2.9	3.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
09-01-2011	0950	--	--	--	<.50	<.01	<.005	<.005	<.09	I.7	<.02								
09-01-2011	1000	.15	1.7	1.9	--	--	--	--	--	--	--	--	--	--	--	--	--	--	

01402000 MILLSTONE RIVER AT BLACKWELLS MILLS, NJ—Continued

WATER-QUALITY DATA
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011

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Date	Sample start time	Organic carbon, suspended sediment, total, mg/L (00689)	Organic carbon, water, filtered, mg/L (00681)
11-30-2010	0800	.87	3.2
02-10-2011	0900	.33	3.0
02-10-2011	0900	--	2.7
02-10-2011	0901	--	2.7
06-17-2011	0900	4.11	4.7
09-01-2011	0950	--	--
09-01-2011	1000	1.38	8.4