

Water-Data Report 2011

01466500 MCDONALDS BRANCH IN BYRNE STATE FOREST, NJ

DELAWARE RIVER BASIN

LOCATION.--Lat 39°53'06", long 74°30'19" referenced to North American Datum of 1983, Woodland Township, Burlington County, NJ, Hydrologic Unit 02040202, on right bank, 25 ft upstream from culvert on Butterworth Road in Brendan T. Byrne State Forest, 3.4 mi upstream from confluence with Cooper Branch, and 7.0 mi southeast of Browns Mills.

DRAINAGE AREA.--2.35 mi².

SURFACE-WATER RECORDS

PERIOD OF RECORD.--October 1953 to current year. Prior to October 1962, published as "McDonald Branch in Lebanon State Forest". October 1962 through September 2003, published as "McDonalds Branch in Lebanon State Forest".

REVISED RECORDS.--WDR NJ-82-2: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 117.73 ft above NGVD of 1929 (levels from New Jersey Geological Survey benchmark).

REMARKS.--Records fair, except for estimated daily discharges, which are poor. Gage-height record is collected upstream of concrete control, and discharge record, which includes leakage around control, is measured at site 785 ft downstream. Several measurements of water temperature were made during the year. Satellite telemetry at station.

PEAK DISCHARGES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 7.0 ft³/s and (or) maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jul 8	2045	7.4	1.72
Aug 28	1015	*61	*2.54

01466500 MCDONALDS BRANCH IN BYRNE STATE FOREST, NJ—Continued

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

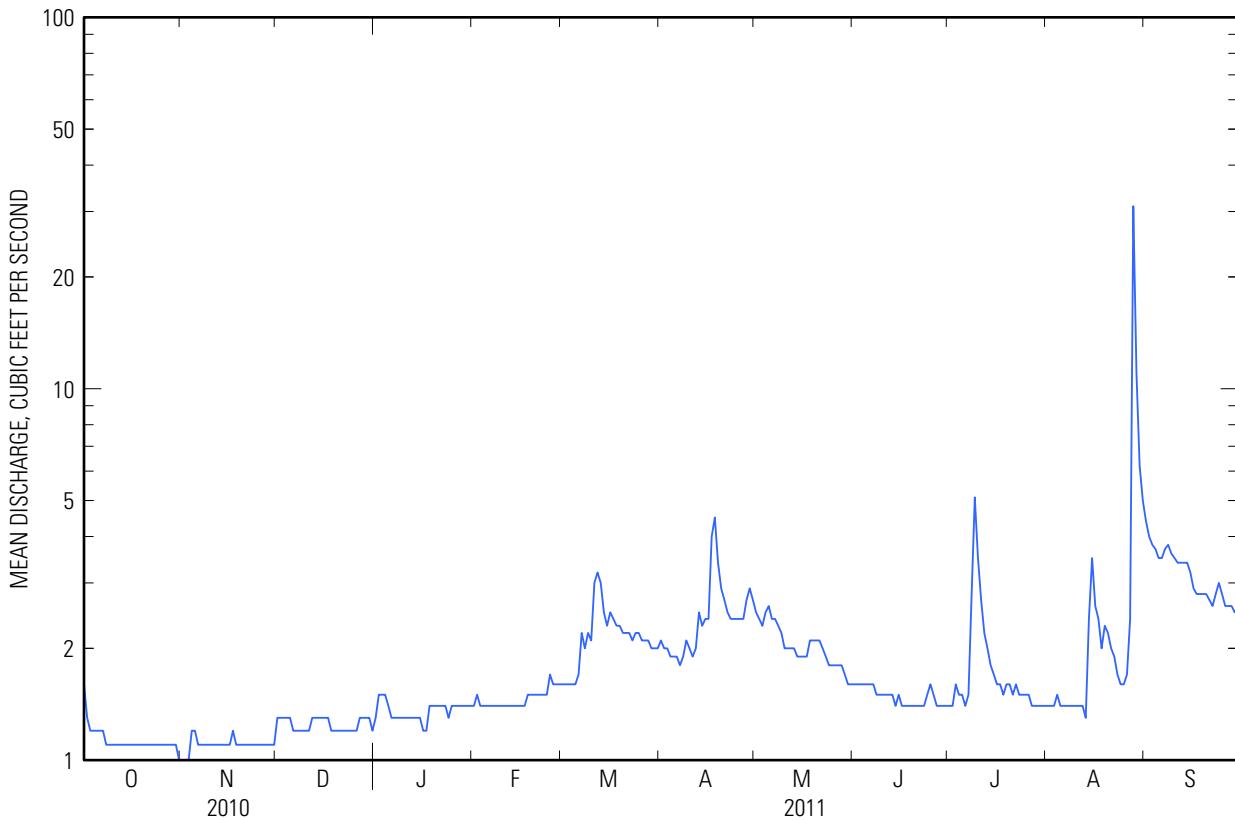
Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	1.6	1.0	1.3	e1.3	1.4	1.6	2.1	2.5	1.6	1.4	1.4	4.4
2	1.3	1.0	1.3	e1.5	1.5	1.6	2.0	2.4	1.6	1.4	1.4	4.0
3	1.2	1.0	1.3	e1.5	1.4	1.6	2.0	2.3	1.6	1.6	1.4	3.8
4	1.2	1.2	1.3	e1.5	1.4	1.6	1.9	2.5	1.6	1.5	1.5	3.7
5	1.2	1.2	1.3	e1.4	1.4	1.6	1.9	2.6	1.6	1.5	1.4	3.5
6	1.2	1.1	1.2	e1.3	1.4	1.7	1.9	2.4	1.6	1.4	1.4	3.5
7	1.2	1.1	1.2	e1.3	1.4	2.2	1.8	2.4	1.6	1.5	1.4	3.7
8	1.1	1.1	1.2	e1.3	1.4	2.0	1.9	2.3	1.5	2.8	1.4	3.8
9	1.1	1.1	1.2	e1.3	1.4	2.2	2.1	2.2	1.5	5.1	1.4	3.6
10	1.1	1.1	1.2	e1.3	1.4	2.1	2.0	2.0	1.5	3.5	1.4	3.5
11	1.1	1.1	1.2	e1.3	1.4	3.0	1.9	2.0	1.5	2.7	1.4	3.4
12	1.1	1.1	1.3	e1.3	1.4	3.2	2.0	2.0	1.5	2.2	1.4	3.4
13	1.1	1.1	1.3	e1.3	1.4	3.0	2.5	2.0	1.5	2.0	1.3	3.4
14	1.1	1.1	1.3	e1.3	1.4	2.5	2.3	1.9	1.4	1.8	2.4	3.4
15	1.1	1.1	1.3	e1.3	1.4	2.3	2.4	1.9	1.5	1.7	3.5	3.2
16	1.1	1.1	1.3	1.2	1.4	2.5	2.4	1.9	1.4	1.6	2.6	2.9
17	1.1	1.2	1.3	1.2	1.4	2.4	4.0	1.9	1.4	1.6	2.4	2.8
18	1.1	1.1	1.2	1.4	1.5	2.3	4.5	2.1	1.4	1.5	2.0	2.8
19	1.1	1.1	1.2	1.4	1.5	2.3	3.4	2.1	1.4	1.6	2.3	2.8
20	1.1	1.1	1.2	1.4	1.5	2.2	2.9	2.1	1.4	1.6	2.2	2.8
21	1.1	1.1	1.2	1.4	1.5	2.2	2.7	2.1	1.4	1.5	2.0	2.7
22	1.1	1.1	1.2	1.4	1.5	2.2	2.5	2.0	1.4	1.6	1.9	2.6
23	1.1	1.1	1.2	1.4	1.5	2.1	2.4	1.9	1.4	1.5	1.7	2.8
24	1.1	1.1	1.2	1.3	1.5	2.2	2.4	1.8	1.5	1.5	1.6	3.0
25	1.1	1.1	e1.2	1.4	1.7	2.2	2.4	1.8	1.6	1.5	1.6	2.8
26	1.1	1.1	e1.2	1.4	1.6	2.1	2.4	1.8	1.5	1.5	1.7	2.6
27	1.1	1.1	e1.3	1.4	1.6	2.1	2.4	1.8	1.4	1.4	2.4	2.6
28	1.1	1.1	e1.3	1.4	1.6	2.1	2.7	1.8	1.4	1.4	31	2.6
29	1.1	1.1	e1.3	1.4	---	2.0	2.9	1.7	1.4	1.4	11	2.5
30	1.1	1.1	e1.3	1.4	---	2.0	2.7	1.6	1.4	1.4	6.2	2.6
31	1.0	---	e1.2	1.4	---	2.0	---	1.6	---	1.4	5.0	---
Total	35.2	33.0	38.7	42.1	40.9	67.1	73.4	63.4	44.5	56.1	101.7	95.2
Mean	1.14	1.10	1.25	1.36	1.46	2.16	2.45	2.05	1.48	1.81	3.28	3.17
Max	1.6	1.2	1.3	1.5	1.7	3.2	4.5	2.6	1.6	5.1	31	4.4
Min	1.0	1.0	1.2	1.2	1.4	1.6	1.8	1.6	1.4	1.4	1.3	2.5
Cfsm	0.48	0.47	0.53	0.58	0.62	0.92	1.04	0.87	0.63	0.77	1.40	1.35
In.	0.56	0.52	0.61	0.67	0.65	1.06	1.16	1.00	0.70	0.89	1.61	1.51

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1954 - 2011, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	1.51	1.67	2.04	2.27	2.38	2.88	2.89	2.56	2.09	1.80	1.75	1.60
Max	4.45	4.82	5.75	4.78	5.69	7.18	5.74	6.86	5.35	4.15	5.65	4.31
(WY)	(1959)	(1973)	(1973)	(1973)	(1973)	(2010)	(1984)	(1998)	(1979)	(1958)	(1958)	(1958)
Min	0.80	0.85	0.87	0.85	0.83	0.94	1.10	1.17	1.05	0.90	0.80	0.71
(WY)	(1996)	(2008)	(2002)	(2002)	(2002)	(2002)	(2002)	(1995)	(1995)	(2002)	(2002)	(1995)

01466500 MCDONALDS BRANCH IN BYRNE STATE FOREST, NJ—Continued**SUMMARY STATISTICS**

	Calendar Year 2010	Water Year 2011	Water Years 1954 - 2011	
Annual total	998.92	691.3		
Annual mean	2.74	1.89	2.12	
Highest annual mean			3.85	1973
Lowest annual mean			0.95	2002
Highest daily mean	18	Mar 14	31	Aug 28, 2011
Lowest daily mean	0.98	Sep 22	1.0	Many days
Annual seven-day minimum	0.99	Sep 20	1.0	Oct 28
Maximum peak flow			61	Aug 28, 2011
Maximum peak stage			2.54	Aug 28, 2011
Instantaneous low flow			1.0	Many days
Annual runoff (cfsm)	1.16	0.806		0.901
Annual runoff (inches)	15.81	10.94		12.24
10 percent exceeds	5.2	2.8		3.5
50 percent exceeds	1.6	1.5		1.8
90 percent exceeds	1.1	1.1		1.1



01466500 MCDONALDS BRANCH IN BYRNE STATE FOREST, NJ—Continued**WATER-QUALITY RECORDS**

PERIOD OF RECORD.--Water years 1963-96, 1998 to current year.

PERIOD OF DAILY RECORD.--

DISSOLVED OXYGEN: August 1984 to September 1992, September 2000.
 pH: October 1981 to March 1982, May 1984 to September 1992, September 2000.
 SPECIFIC CONDUCTANCE: December 1968 to September 1992, September 2000.
 WATER TEMPERATURE: October 1960 to September 1992, September 2000.

REMARKS.--Chemical analyses are from samples collected as water flows over the weir at the gaging station. All discharge record represents flow at a point 785 ft downstream of the gaging station. Discharges at the weir may be about 1 ft³/s less than the discharge values in the following water-quality table. Cooperative Network Site Descriptor: Background, NJ Department of Environmental Protection Watershed Management Area 19. Samples on December 8, 2010, and February 16, June 8, and August 15, 2011 were collected as part of the Ambient Surface-Water-Quality Monitoring Network. All other samples were collected as part of the U.S. Geological Survey Hydrologic Benchmark Network.

COOPERATION.--Physical measurements and samples for laboratory analyses on December 8, 2010, and February 16, June 8, and August 15, 2011 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. Analyses of samples collected as part of the Hydrologic Benchmark Network were performed by the USGS New York Water Science Center Laboratory in Troy, New York.

**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]

Date	Sample start time	Barometric pressure, mm Hg (00025)	Tempera-ture, air, °C (00020)	Absorbance, UV, organic		Discharge, instantane-ous, ft ³ /s (00061)	Dissolved oxygen, water, unfiltered, mg/L (00300)	Dissolved oxygen, water, unfiltered, % saturation (00301)	pH, water, unfiltered, field, standard units (00400)
				UV, 254 nm, 1 constituents, cm path length, water, filtered, units	280 nm, 1 cm path length, water, filtered, units				
12-08-2010	0900	758	6.0	.118	.089	1.2	4.2	34	4.4
02-16-2011	0930	770	5.4	.182	.136	1.4	8.4	68	4.3
06-08-2011	1015	758	22.7	.283	.215	1.5	2.7	27	4.2
08-15-2011	1100	750	21.2	1.22	.931	4.0	3.0	27	4.1

01466500 MCDONALDS BRANCH IN BYRNE STATE FOREST, NJ—Continued

WATER-QUALITY DATA
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011

Part 2 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]

Date	Sample start time	Turbidity, water, unfiltered, broad band light source				Dissolved				Suspended	
		Specific conductance, water, unfiltered, µS/cm at 25 °C (00095)	Temperature, water, °C (00010)	Including 90 +/- 30 degrees, ratiometric correction, NTRU (63676)	Dissolved solids at multiple angles (400-680 nm), detectors at 180 °C, water, dried at 180 °C, water, filtered, mg/L (70300)	Dissolved solids, water, filtered, sum of constituents, mg/L (70301)	Hardness, water, mg/L as CaCO ₃ (00900)	Solids, water, unfiltered, mg/L (00530)	Calcium, water, filtered, mg/L (00915)		
12-08-2010	0900	42	6.7	.6	23	< 19	3.42	3	.45		
02-16-2011	0930	47	4.7	.5	30	< 21	4.50	11	.65		
06-08-2011	1015	--	14.5	.3	31	< 17	2.54	--	.41		
08-15-2011	1100	53	18.2	1.2	58	--	2.60	--	.49		

WATER-QUALITY DATA
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011

Part 3 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]

Date	Sample start time	ANC, water, unfiltered, fixed endpoint (inorganic)				Carbon				Inorganic carbon, suspended sediment, total, mg/L (00688)	Silica, water, filtered, mg/L as SiO ₂ (00955)
		Magnesium, water, filtered, mg/L (00925)	Potassium, water, filtered, mg/L (00935)	Sodium, water, filtered, mg/L (00930)	Laboratory titration, mg/L as CaCO ₃ (90410)	plus organic, suspended sediment, total, mg/L (00694)	Chloride, water, filtered, mg/L (00940)	Fluoride, water, filtered, mg/L (00950)			
12-08-2010	0900	.554	.29	2.05	< 1.7	.19	3.82	< .04	< .03	5.1	
02-16-2011	0930	.695	.36	2.21	< 1.7	.18	3.75	< .04	< .03	4.9	
06-08-2011	1015	.369	.20	1.89	< 4	< .05	3.79	< .04	.04	4.1	
08-15-2011	1100	.336	.16	1.55	--	.92	3.47	< .04	< .03	3.1	

01466500 MCDONALDS BRANCH IN BYRNE STATE FOREST, NJ—Continued

WATER-QUALITY DATA
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011

Part 4 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]

Date	Sample start time	Ammonia		Nitrate		Phos- phorus, water, filtered,	Phosphorus, water, unfiltered,	Total nitrogen, water, filtered,	Total nitrogen, water, unfiltered,	
		Sulfate, water, filtered,	plus organic nitrogen, water, filtered,	Ammonia, water, filtered,	plus nitrite, water, filtered,					
		mg/L (00945)	mg/L as N (00623)	mg/L as N (00608)	mg/L as N (00631)	mg/L (49570)	mg/L as P (00666)	mg/L as P (00665)	mg/L (00602)	mg/L (00600)
12-08-2010	0900	5.26	.10	<.010	<.02	.05	<.004	<.004	<.12	<.17
02-16-2011	0930	6.86	.13	.015	.04	.04	<.004	<.004	.17	.21
06-08-2011	1015	3.39	.14	--	<.02	<.02	<.004	.005	<.16	<.18
08-15-2011	1100	2.87	.58	.011	<.02	.11	.004	.011	<.60	<.71

WATER-QUALITY DATA
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011

Part 5 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]

Date	Sample start time	Barium, water, unfiltered,	Beryllium, water, unfiltered,	Cadmium, water, unfiltered,	Chromium, water, unfiltered,	Copper, water, unfiltered,	Iron, water, unfiltered,	Lead, water, unfiltered,	Manganese, water, unfiltered,	Mercury, water, unfiltered,
		recoverable, µg/L (01007)	recoverable, µg/L (01012)	recoverable, µg/L (01027)	recoverable, µg/L (01034)	recoverable, µg/L (01042)	recoverable, µg/L (01045)	recoverable, µg/L (01051)	recoverable, µg/L (01055)	recoverable, µg/L (71900)
12-08-2010	0900	--	--	--	--	--	--	--	--	--
02-16-2011	0930	13.4	.03	<.05	<.21	<.70	106	.55	11.5	<.005
06-08-2011	1015	--	--	--	--	--	--	--	--	--
08-15-2011	1100	12.6	.04	.08	.42	.94	772	2.78	11.3	.011

01466500 MCDONALDS BRANCH IN BYRNE STATE FOREST, NJ—Continued

WATER-QUALITY DATA
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011

Part 6 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]

Date	Sample start time	Nickel, water, unfiltered, recoverable, µg/L (01067)	Silver, water, unfiltered, recoverable, µg/L (01077)	Zinc, water, unfiltered, recoverable, µg/L (01092)	Arsenic, water, filtered, µg/L (01000)	Arsenic, water, unfiltered, µg/L (01002)	Boron, water, unfiltered, recoverable, µg/L (01022)	Selenium, water, unfiltered, µg/L (01147)	Organic carbon, suspended sediment, total, mg/L (00689)	Organic carbon, water, filtered, mg/L (00681)
12-08-2010	0900	--	--	--	--	--	--	--	.19	3.3
02-16-2011	0930	.53	<.01	7.6	.13	.23	7	.12	.18	4.8
06-08-2011	1015	--	--	--	--	--	--	--	<.12	6.7
08-15-2011	1100	.89	<.01	11.8	.66	.68	9	.19	.92	29.7

WATER-QUALITY DATA, HYDROLOGIC BENCHMARK NETWORK
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011

Part 1 of 2

[ANC, acid neutralizing capacity; CaCO₃, calcium carbonate; N, nitrogen; SiO₂, silicon dioxide; meq/L, milliequivalents per liter; mg/L, milligrams per liter; °C, degrees Celsius; µg/L, micrograms per liter; <, less than]

Date	Sample start time	Temper-ature, water, °C (00010)	Hardness, water, mg/L as CaCO ₃ (00900)	Calcium, water, filtered, mg/L (00915)	Magne-sium, water, filtered, mg/L (00925)	Potassium, water, filtered, mg/L (00935)	Sodium, water, filtered, mg/L (00930)	ANC, water, unfiltered, Gran titration, meq/L (00409)	Chloride, water, filtered, mg/L (00940)	Silica, water, filtered, mg/L as SiO ₂ (00955)
02-15-2011	1010	5.0	4.56	.698	.684	.460	2.25	-22.1	3.72	2.27
04-19-2011	0750	9.9	4.05	.777	.512	.131	2.31	-128	4.24	1.06
08-01-2011	1610	--	2.82	.506	.378	.212	1.78	8.4	3.71	1.99
08-16-2011	1115	19.6	2.75	.532	.346	.190	1.77	-41.5	3.49	1.58
08-19-2011	0025	18.2	3.02	.580	.381	.194	1.81	-30.2	3.64	1.79
08-27-2011	1445	17.6	2.70	.492	.357	.224	1.78	-58.8	3.59	1.87
08-27-2011	2100	19.7	4.69	1.35	.322	.453	1.53	-88.1	2.57	1.06
08-28-2011	0210	21.6	2.68	.673	.242	.225	1.52	-96.8	3.42	.846
08-28-2011	0505	21.4	2.98	.826	.223	.264	1.57	-128	3.87	.777
08-28-2011	0830	21.2	4.05	1.23	.236	.277	1.62	-126	3.80	.983
09-02-2011	1230	17.3	4.05	.957	.403	.224	1.88	-106	3.89	1.71
09-07-2011	1335	18.4	2.85	.623	.314	.131	1.91	-85.6	4.10	1.75
09-23-2011	0020	15.8	2.52	.510	.304	.119	1.88	-86.8	4.12	1.96
09-25-2011	0225	16.9	2.56	.513	.310	.216	1.88	-90.1	4.01	1.91
09-28-2011	0635	17.1	2.29	.426	.298	.173	1.86	-89.8	4.05	1.92
09-30-2011	1720	17.0	2.16	.396	.286	.163	1.86	-93.9	4.08	1.81

01466500 MCDONALDS BRANCH IN BYRNE STATE FOREST, NJ—Continued

**WATER-QUALITY DATA, HYDROLOGIC BENCHMARK NETWORK
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011**

Part 2 of 2

[ANC, acid neutralizing capacity; CaCO₃, calcium carbonate; N, nitrogen; SiO₂, silicon dioxide; meq/L, milliequivalents per liter; mg/L, milligrams per liter; °C, degrees Celsius; µg/L, micrograms per liter; <, less than]

Date	Sample start time	Sulfate, water, filtered, mg/L (00945)	Ammonia, water, unfiltered, mg/L as N (00610)	Nitrate, water, filtered, mg/L as N (00618)	Aluminum, water, filtered, µg/L (01106)	Organic carbon, water, filtered, mg/L (00681)	Organic monomeric aluminum, water, unfiltered, µg/L (49288)
02-15-2011	1010	6.14	<.028	.043	206	4.67	49
04-19-2011	0750	7.08	.032	<.028	437	16.5	171
08-01-2011	1610	2.88	.029	<.028	137	5.94	65
08-16-2011	1115	2.07	.075	<.028	423	22.6	218
08-19-2011	0025	2.34	.037	<.028	362	20.7	167
08-27-2011	1445	2.13	.030	<.028	277	15.5	134
08-27-2011	2100	1.42	.065	<.028	746	28.7	236
08-28-2011	0210	1.27	.036	<.028	388	28.6	205
08-28-2011	0505	1.23	.038	<.028	414	27.3	183
08-28-2011	0830	1.29	.033	<.028	544	28.4	214
09-02-2011	1230	2.70	.029	<.028	498	21.7	198
09-07-2011	1335	2.20	.045	<.028	484	21.9	215
09-23-2011	0020	2.22	.045	<.028	320	17.1	158
09-25-2011	0225	2.03	.038	<.028	345	18.5	166
09-28-2011	0635	1.96	.040	<.028	331	16.3	146
09-30-2011	1720	1.81	.033	<.028	314	17.2	147