

Delaware River Basin Commission

Existing Water Quality Atlas of the Delaware River Special Protection Waters



DRBC Special Protection Waters Program

September 2016 – Edition 1.0



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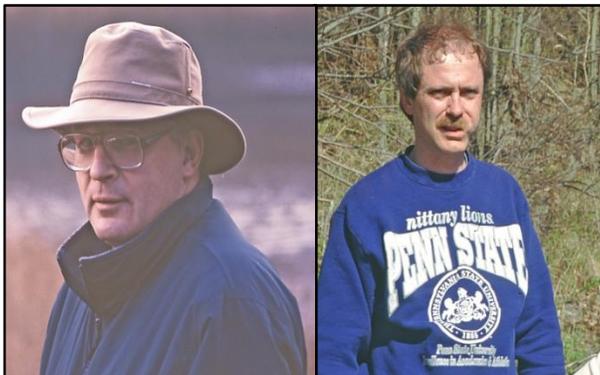
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During this project, we lost two of the program's most visionary and influential leaders from its earliest days: **Richard C. Albert** (far left) and **Todd W. Kratzer** (left). Though both had departed DRBC before this project started, they continued to provide expert guidance until their final days. As engineers, scientists, and most importantly friends and mentors, they were integral to turning the concept of anti-degradation into practical science and water resource protection policy that keeps clean water clean. They are sorely missed.

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Abbreviations

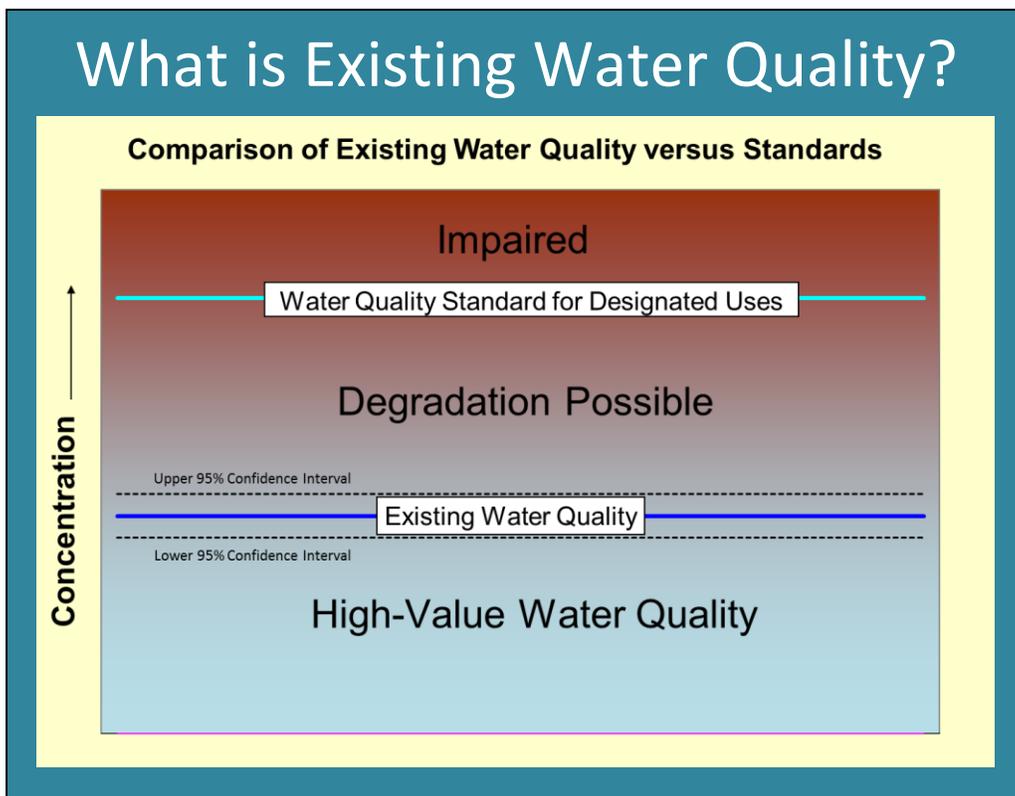
#/100 ml	Colonies per 100 milliliters, a unit of bacteria concentration
BaSE	Baseline Streamflow Estimator (USGS computer application)
BCP	Boundary Control Point: A fixed monitoring location on a tributary to the Delaware River.
CDF	Cumulative Distribution Function, a statistical plot
CFS	Cubic Feet per Second
DO	Dissolved Oxygen
DO%	Dissolved Oxygen Percent Saturation
DEWA	Delaware Water Gap
DRBC	Delaware River Basin Commission
DWGNRA	Delaware Water Gap National Recreation Area
EWQ	Existing Water Quality, the baseline water quality defined for antidegradation targets
ICP	Interstate Control Point: A fixed monitoring location on the Delaware River
LDEL	Lower Delaware (Delaware River mile 134.3 at Trenton to mile 209.5 at Portland)
mg/L	Milligrams per Liter, a unit of concentration
N+N	Nitrate plus Nitrite
NMC	No Measurable Change, specifically defined in DRBC rules
NJDEP	New Jersey Department of Environmental Protection
NWIS	USGS National Water Information System
NYSDEC/NYDEC	New York State Department of Environmental Conservation
OP	Orthophosphate
PADEP	Pennsylvania Department of Environmental Protection
Post-EWQ	The 2009-2011 test water quality data used to assess water quality changes from baseline
QAPP	Quality Assurance Project Plan
QA/QC	Quality Assurance / Quality Control
SPW	Special Protection Waters
SRMP	Scenic Rivers Monitoring Program
SpC	Specific Conductance
TDS	Total Dissolved Solids
TKN	Total Kjeldahl Nitrogen
TN	Total Nitrogen
TP	Total Phosphorus
TSS	Total Suspended Solids
UDSRR	Upper Delaware Scenic and Recreational River
µg/L	Micrograms per liter, a unit of concentration
µS/cm	Micro-Siemens per centimeter, a unit of specific conductance
UPDE	Upper Delaware
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
WQN	Water Quality Network: PADEP's long-term fixed water quality stations

Introduction

This document has been prepared to inform the Delaware River Basin Commission’s (DRBC) Special Protection Waters (SPW) policies. Using data collected in the past 15 years, DRBC, along with state and federal monitoring agencies, has improved the scientific record of background water quality conditions known as Existing Water Quality (EWQ). We have completed EWQ definition at Delaware River and tributary locations throughout the Upper, Middle and Lower Delaware River. Delaware River or interstate West Branch Delaware River sites are termed “Interstate Control Points” (ICP) and tributary sites are “Boundary Control Points” (BCP).

The DRBC Special Protection Waters are organized into Upper, Middle and Lower Delaware reaches in alignment with the National Park Service (NPS) Upper Delaware Scenic and Recreational River (UPDE, Figure 2), the Delaware Water Gap National Recreation Area (DEWA, Figure 3), and the Lower Delaware Scenic and Recreational River (LDEL, Figure 4). All are part of the National Wild and Scenic Rivers system. DRBC and NPS share operation of the Scenic Rivers Monitoring Program (SRMP), a long term water quality monitoring partnership in the Upper and Middle Delaware, while DRBC monitors Lower Delaware sites.

DRBC rules state that It is the policy of DRBC to maintain the quality of interstate waters, where existing quality is better than the established stream quality objectives, unless it can be affirmatively demonstrated to the Commission that such change is justifiable as a result of necessary economic or social development or to improve significantly another body of water. Furthermore, it is the policy of the Commission that there be no measurable change in existing water quality except towards natural conditions in waters considered by the Commission to have exceptionally high scenic, recreational, ecological and/or water supply values (DRBC Administrative Manual – Part III; Water Quality Regulations; 18 CFR Part 410; Article 3, Section 3.10.3). The difference between EWQ and stream quality objectives (or water quality standards) is shown in Figure 1.



Upper and Middle Delaware River Special Protection Waters rules were passed by DRBC in 1992. Within those rules Existing Water Quality was defined on a reach-wide basis (DRBC 2013, pages 18-22) for the Delaware River only. The rules listed tributaries within SPW purview, but EWQ was not defined for those watersheds. EWQ was based upon the best available water quality data at the time.

Figure 1. Existing Water Quality vs. Water Quality Standards.

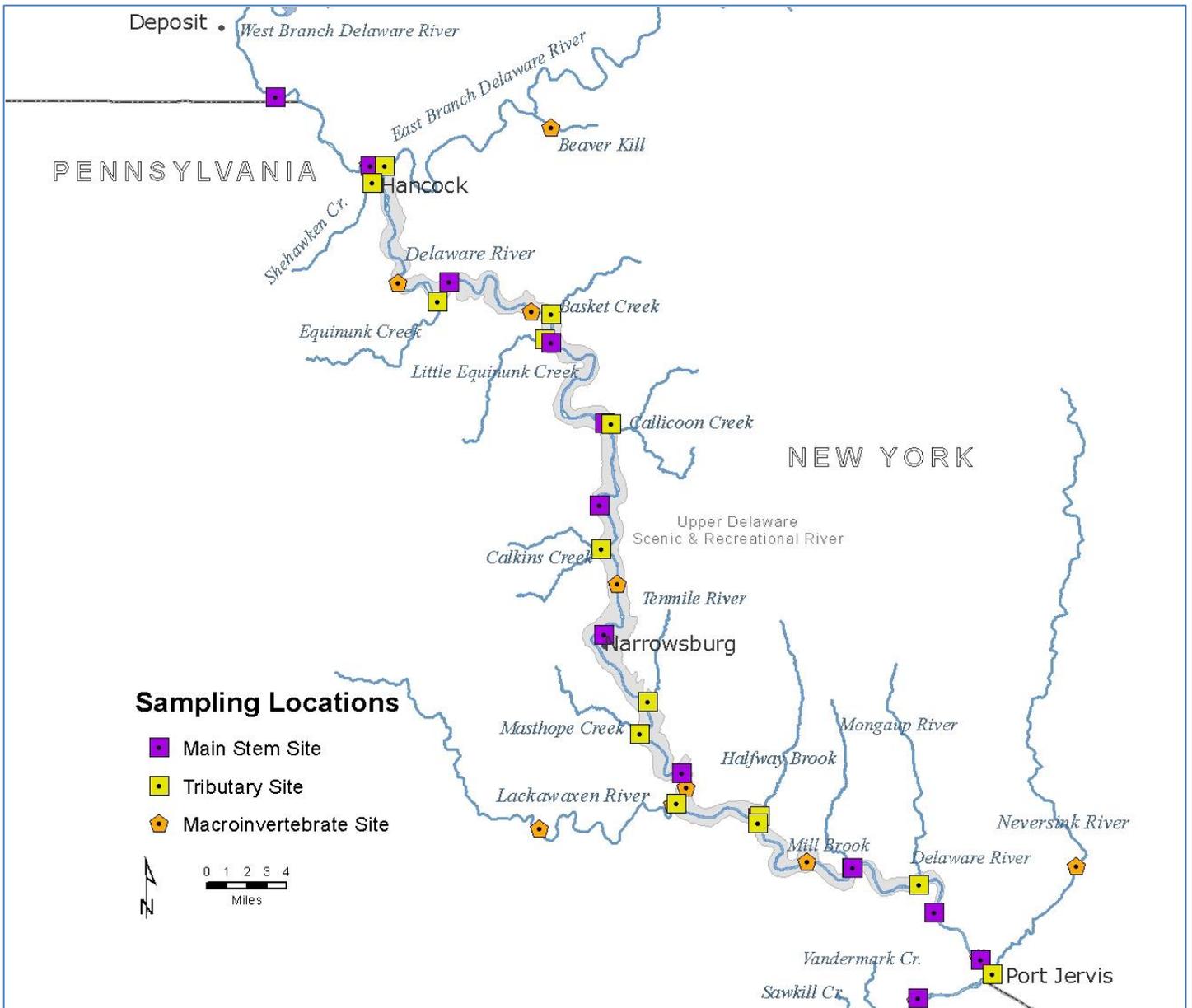


Figure 2: Upper Delaware River monitoring locations of the Scenic Rivers Monitoring Program and the Delaware River Biomonitoring Program. The boundaries of the Upper Delaware Scenic and Recreational River are shown as the light gray border around the Delaware River.

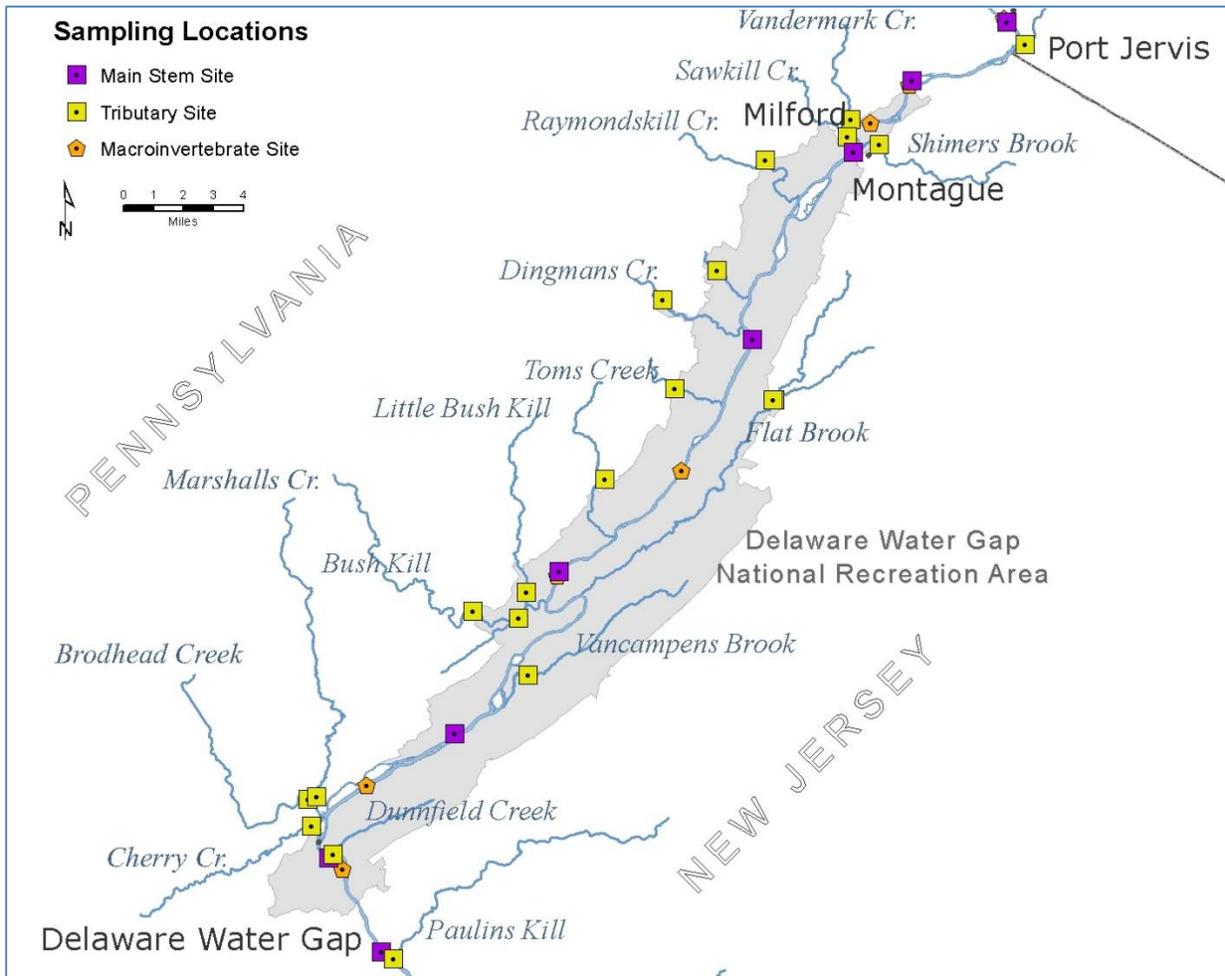


Figure 3: Middle Delaware monitoring locations encompass the Delaware Water Gap National Recreation Area (light gray shaded) and the segment of the Delaware River and its tributaries from Millrift, NY to Delaware Water Gap, PA.

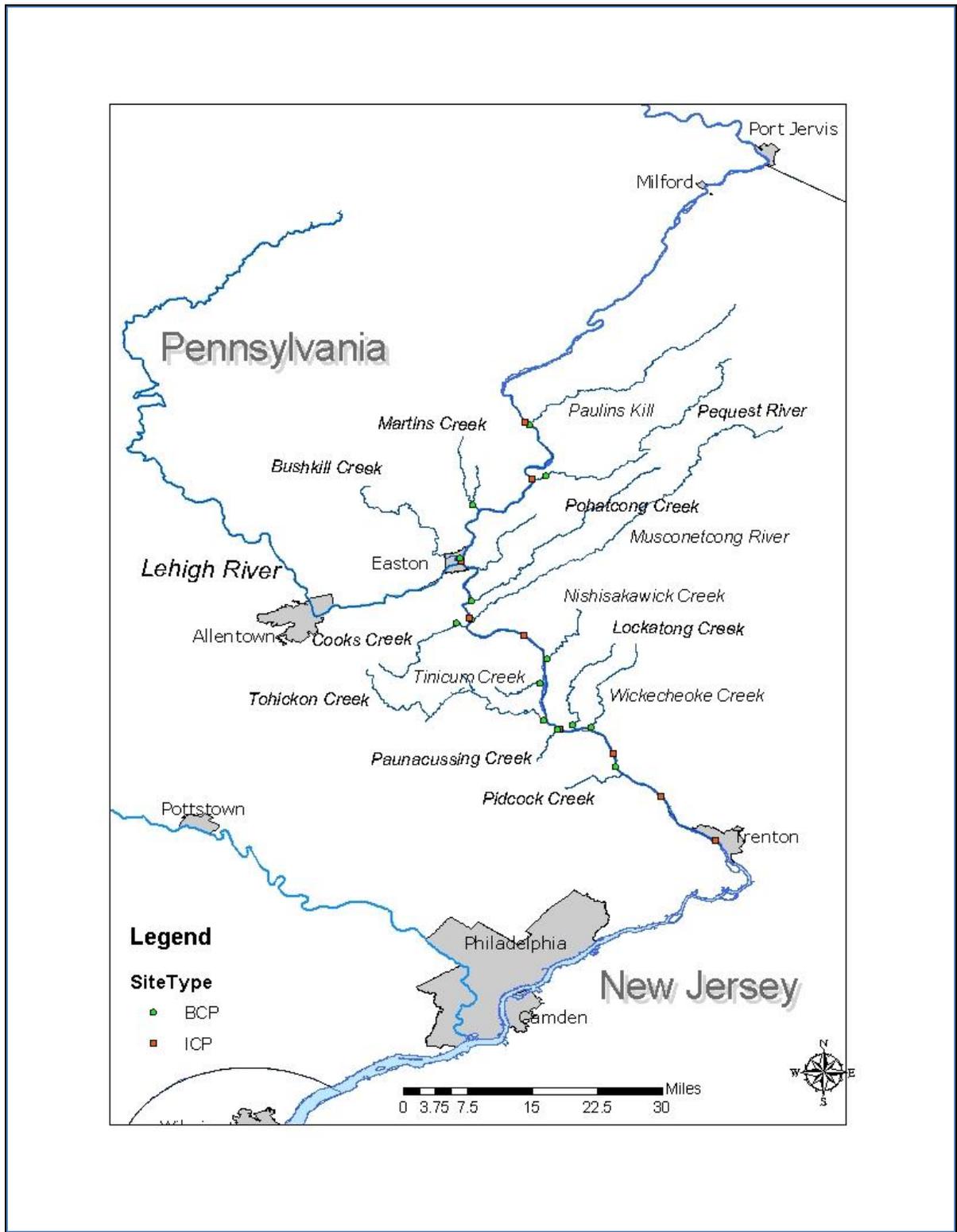


Figure 4: Lower Delaware monitoring locations encompass the NPS-designated segments of the Lower Delaware Recreational River. The Lower Delaware from Portland, PA to Trenton, NJ has been designated by DRBC as Significant Resource Waters.

The Lower Delaware was permanently added to the SPW program in 2008 using site-specific Existing Water Quality from a 2000-2004 baseline period. Those tables are presented in this document so that a complete EWQ record exists for the entire non-tidal portion of the Delaware River and its tributaries. The tables are listed longitudinally from upstream to downstream, and include some small corrections to the tables presented in DRBC water quality rules.

The first purpose of EWQ is well-served by 1992 reach-wide EWQ: to create discharge limits for wastewater treatment facilities so that EWQ does not degrade. However, there are information gaps filled by subsequent studies and presented here:

- Definition of EWQ upon tributaries to the Delaware River (1992 reach-wide EWQ was defined only for the river itself and not the tributaries); and
- Improving Delaware River EWQ from reach-wide to site-specific quality.

The second purpose of EWQ is as a baseline for replicable assessment of measurable changes over time. 1992 reach-wide EWQ was problematic for assessment of the Upper and Middle Delaware. Assessing measurable change from the 1992 reach-wide targets has been impossible for several reasons:

- The data upon which EWQ was based were unevenly distributed geographically and temporally within the river segments, making it impossible to go back and reassess water quality in the same way as originally defined;
- Quality assurance of the data was incomplete;
- Detection limits were much higher than now; and
- Some of the statistical methods used to define EWQ, though considered suitable at the time, have been shown to be inappropriate for the practical application of the rules.

In order to achieve the assessment objective as a replicable process, DRBC and NPS started in 2006 to revisit EWQ definition on a site-specific basis in the Upper and Middle Delaware River. While working for passage of Lower Delaware SPW regulations in 2007, it was noted that DRBC successfully made use of site-specific Existing Water Quality targets and have since demonstrated a practical and repeatable assessment process. The first Lower Delaware assessment of measurable change took place from 2009-2011, and provided a practical and replicable precedent for future assessments, and whose results are available in the following DRBC publication:

Delaware River Basin Commission. 2016. Lower Delaware River Special Protection Waters Assessment of Measurable Changes to Existing Water Quality, Round 1: Baseline EWQ (2000-2004) vs. Post-EWQ (2009-2011). Delaware River Basin Commission, DRBC/NPS Scenic Rivers Monitoring Program, West Trenton, NJ. Authors: Robert Limbeck, Eric Wentz, Erik Silldorff, John Yagecic, Thomas Fikslin, Namsoo Suk.

Using the same control-point study design method as in the Lower Delaware, the objectives of this project were to:

- Improve our ability to detect water quality changes at specific sites over time;
- Provide previously-missing site specific EWQ for tributaries to the Upper and Middle Delaware River; and
- Enable determination of water quality and hydrologic impacts of each tributary upon the Delaware River.

As a technical document, we expect these data to inform policy decisions. The primary use of these baseline site-specific data is to be able to assess changes in the river over time so that SPW program effectiveness can be measured. The 1992 reach-wide tables can still be used to inform effluent limitation development, but they are unsuitable for assessment. By defining EWQ in a replicable manner at specific sites, we can now revisit those sites in the future and definitively repeat the assessment process. These site-specific targets will serve to provide a consistent baseline against which future changes may be compared at a 95% confidence level.

This document contains summaries of water quality information for 85 Control Points of the Upper, Middle and Lower Delaware River. There are 28 ICP locations on the Delaware River and West Branch Delaware River. There are 57 tributary watershed BCP locations: 11 BCP sites are in New York, 30 in Pennsylvania, and 16 in New Jersey. There is also a summary table of population changes in each BCP watershed (Table 1). As of 2016, DRBC and NPS are still working to define EWQ at 7 sites: Alexauken Creek, NJ; Hakhokake Creek, NJ; Cherry Creek, PA; Flat Brook at Flatbrookville, NJ; Beaver Brook, NY; Little Equinunk Creek, PA; and Basket Creek, NY. These tables will be updated once SRMP monitoring efforts are complete. In the future, additional tributaries will be added to the network as necessary.

Table 1: Population of Boundary Control Point watersheds of the Upper, Middle and Lower Delaware. The Special Protection Waters region grew more between 2000 and 2010 than each of its Delaware River Basin states: PA +3.43%; NJ +4.49%; NY +2.12%; SPW Region +11.3% (CensusViewer.com, accessed 6/22/2016).

SPWunit	RiverMile	EWQ Watershed	Population 2000	Population 2010	Change	%
LDEL	146.3	Pidcock Creek, PA	1,960	2,012	52	2.6
LDEL	149.5	Alexauken Creek, NJ	2,409	2,496	87	3.6
LDEL	152.5	Wickecheoke Creek, NJ	3,095	3,167	72	2.3
LDEL	154.0	Lockatong Creek, NJ	2,413	2,514	101	4.2
LDEL	155.6	Paunacussing Creek, PA	2,359	2,588	199	8.4
LDEL	157.0	Tohickon Creek, PA	38,249	42,600	4,351	11.4
LDEL	161.6	Tinicum Creek, PA	3,297	3,103	(194)	-5.9
LDEL	164.1	Nishisakawick Creek, NJ	2,077	2,114	37	1.8
LDEL	167.2	Hakhokake Creek, NJ	4,262	4,325	63	7.4
LDEL	173.7	Cooks Creek, PA	4,744	4,813	69	1.4
LDEL	174.6	Musconetcong River, NJ	84,699	89,538	4,659	5.5
LDEL	177.4	Pohatcong Creek, NJ	19,781	19,547	(234)	-1.2
LDEL	182.0	Lopatcong Creek, NJ	11,262	14,540	3,278	29.1
LDEL	183.7	Lehigh River, PA	604,954	676,939	71,985	11.9
LDEL	184.1	Bushkill Creek, at Easton, PA	59,221	70,864	11,643	19.7
LDEL	190.7	Martins Creek, PA	18,814	19,952	1,138	6.0
LDEL	197.8	Pequest River, NJ	31,927	34,023	2,096	6.6
LDEL	207.0	Paulins Kill, NJ	37,762	39,226	1,464	3.9
DEWA	209.5	Slateford Creek, PA	173	283	110	63.9
DEWA	211.4	Dunnfield Creek, NJ	4	5	1	27.1
DEWA	212.8	Cherry Creek, PA	1,915	2,204	289	15.1
DEWA	213.0	Brodhead Creek, PA	85,986	103,182	17,196	20.0
DEWA	213.0	Marshalls Creek, PA	6,975	9,023	2,048	29.4
DEWA	219.9	Van Campens Brook, NJ	4	5	1	35.4
DEWA	225.3	Flat Brook at Flatbrookville, NJ	2,028	2,272	244	12.0
DEWA	225.3	Big Flat Brook @ DEWA Bdy, NJ	682	797	115	16.9
DEWA	225.3	Little Flat Brook @ DEWA Bdy, NJ	1,285	1,444	159	12.3
DEWA	226.9	Bush Kill Creek at DEWA Bdy, PA	10,920	16,114	5,194	47.6
DEWA	226.9	Little Bushkill Creek at DEWA Bdy, PA	2,398	3,452	1,054	44.0
DEWA	226.9	Sand Hill Creek at DEWA Bdy, PA	452	729	277	61.2
DEWA	230.4	Toms Creek at DEWA Bdy, PA	2,074	2,299	225	10.9
DEWA	236.4	Hornbecks Creek at DEWA Bdy, PA	1,927	2,264	337	17.5
DEWA	239.2	Dingmans Creek at DEWA Bdy, PA	2,563	3,032	469	18.3
DEWA	240.3	Adams Creek at DEWA Bdy, PA	1,337	1,615	278	20.8
DEWA	243.9	Raymondskill Creek at DEWA Bdy, PA	6,461	8,924	2,463	38.1
DEWA	246.6	Shimers Brook at DEWA Bdy, NJ	1,659	1,804	145	8.8
DEWA	247.0	Sawkill Creek at DEWA Bdy, PA	2,644	3,085	441	16.7
DEWA	247.5	Vandermark Creek at DEWA Bdy, PA	771	815	44	5.7
DEWA	253.6	Neversink River, NY	35,783	37,668	1,885	5.3
UPDE	261.1	Mongaup River, NY	19,151	19,570	419	2.2
UPDE	265.6	Mill Brook, NY	983	1,234	251	25.6
UPDE	273.2	Shohola Creek, PA	3,545	4,322	777	21.9

SPWunit	RiverMile	EWQ Watershed	Population 2000	Population 2010	Change	%
UPDE	273.4	Halfway Brook, NY	1,210	1,327	117	9.6
UPDE	275.4	Beaver Brook, NY	697	778	81	11.6
UPDE	277.7	Lackawaxen River, PA	49,519	57,006	7,487	15.1
UPDE	282.5	Masthope Creek, PA	1,253	1,434	181	14.5
UPDE	284.2	Tenmile River, NY	1,191	1,310	119	10.0
UPDE	295.6	Calkins Creek, PA	1,707	1,631	-76	-4.4
UPDE	303.6	Callicoon Creek, NY	6,512	6,448	-64	-1.0
UPDE	312.2	Little Equinunk Creek, PA	640	613	-27	-4.2
UPDE	313.5	Basket Creek, NY	240	226	-14	-5.8
UPDE	322.5	Equinunk Creek, PA	1,136	1,002	-134	-11.8
UPDE	330.7	East Branch Delaware River, NY	17,165	16,537	-628	-3.7
UPDE	331.0	Shehawken Creek, PA to WBR	290	290	0	0.0
UPDE	331.2	West Branch Delaware R. at Hancock, NY/PA	23,212	23,774	562	2.4
UPDE	331.9	Sands Creek, PA to WBR	259	265	6	2.4
UPDE	335.0	Balls Creek, NY to WBR	242	215	-27	-11.2
UPDE	339.8	West Branch Delaware River Hale Eddy, NY	22,075	22,598	523	2.4
UPDE	344.8	Oquaga Creek, NY to WBR	1,346	1,303	-43	-3.2
TOTALS			1,239,601	1,379,842	+140,241	11.3

Note: Indented watersheds are not counted in totals. They are sub-watersheds to those not indented above them. For example, Sands Creek, Balls Creek, West Branch Delaware River at Hale Eddy and Oquaga Creek are sub-watersheds to West Branch Delaware River at Hancock listed above them.

Methods

The remainder of this document consists of watershed and river segment maps, watershed facts, flow statistics, and site-specific EWQ tables. The document is intended to be updated annually as additional information becomes available. This online document is also accompanied by DRBC interactive mapping services where the same information can be used in combination with other available layers of geographic information.

All watershed maps were prepared by DRBC using ArcMap 10.3. ArcMap watershed polygons were used to summarize and compare U.S. Census 2000 and 2010 block data (<https://www.census.gov/geo/maps-data/>), aggregated to watershed level and presented here. The maps show monitoring locations where EWQ was defined, wastewater discharge points with National Pollutant Discharge Elimination System (NPDES) permits, and U.S. Geological Survey stream gage locations. Future editions of the EWQ Atlas will include improved NPDES locations and inventories of dischargers, land use and population updates as well as other GIS analyses such as road density, stream crossings, dams and reservoirs, water withdrawals, and other features that affect water quality.

Extensive use was made of the USGS Stream Stats application: <http://water.usgs.gov/osw/streamstats/>. StreamStats is described as follows from the website (accessed July 11, 2016):

StreamStats is a Web application that incorporates a Geographic Information System (GIS) to provide users with access to an assortment of analytical tools that are useful for a variety of water-resources planning and management purposes, and for engineering and design purposes. In version 3 as well as beta version 4, StreamStats users can select USGS data-collection station locations shown on a map and obtain previously published information for the stations, including descriptive information, and previously published basin characteristics and streamflow statistics. Currently, StreamStats provides additional tools that allow users to select sites on ungaged streams and do the following:

- obtain the drainage-basin boundary (version 3 and beta version 4),
- compute selected basin characteristics (version 3 and beta version 4),
- estimate selected streamflow statistics using regression equations (version 3 & beta version 4),
- download a shapefile of the drainage-basin boundary, as well as any computed basin characteristics and flow statistics (version 3 and beta version 4),
- edit the delineated basin boundary (beta version 4 only),
- modify the basin characteristics that are used as explanatory variables in the regression equations and get new estimates of streamflow statistics (beta version 4 only),
- print the map (beta version 4 only),
- measure distances between user-selected points on the map (beta version 4 only),
- plot the elevation profile between user-selected points on the map (beta version 4 only).

The streamflow statistics that StreamStats can provide for data-collection stations and for user-selected un-gaged sites vary among the states that are implemented in StreamStats and among data-collection stations within states. Unless otherwise noted on a state's introductory page, estimates obtained for un-gaged sites assume natural flow conditions at the site.

All monitoring sites were delineated using Stream Stats version 2.0 and 3.0 in 2012-2014, including watershed land use (National Land Cover Data 2001) statistics and flow statistics. We also used another USGS product developed for DRBC from the Pennsylvania Baseline Streamflow Estimator, or BaSE (http://pa.water.usgs.gov/projects/surfacewater/flow_estimation/) to estimate mean daily stream flow at un-gaged sites. These estimates were associated with our water quality samples at some sites where we could not adequately measure stream flow in any other way. The version of BaSE used by DRBC was developed by Marla Stuckey of USGS specifically for the Delaware River Basin. Updated land use and flow statistics from Stream Stats updates will be included in future editions of this EWQ Atlas. The most important flow statistic presented is Harmonic Mean Flow, which best represents the flow conditions under which EWQ samples were taken.

Both Stream Stats and BaSE work best where the stream experiences natural flow conditions, so we could not use these tools where flow is managed or where reservoirs and quarries modify the natural stream flow. This includes: all Delaware River locations; East Branch and West Branch Delaware River; Lackawaxen River, PA; Mongaup River, NY; Neversink River, NY; Paulins Kill, NJ; Bushkill Stream, Easton, PA; Lehigh River, PA; Musconetcong River, NJ; and Tohickon Creek, PA. Fortunately there are USGS gages on all these streams so there was no need to use Stream Stats or BaSE to estimate flow at these sites. Stream Stats was used only to summarize basin characteristics and delineate the watershed areas; and flow statistics were calculated directly from the USGS gage data.

For site-specific Existing Water Quality tables, the Scenic Rivers Monitoring Program sampled selected control points biweekly within the May through September periods from 2006-2011 (See DRBC Quality Assurance Project Plans, DRBC 2006-2013). Data produced from three USGS/NPS water quality studies are also included: DEWA 2002-2004 (Hickman and Fischer 2008); UPDE 2005-2007 (Siemion and Murdoch 2010); and UPDE 2012-2015 (Senior 2015, report in progress). In addition these targets include co-located quarterly or monthly long term monitoring data collected by USGS, PADEP, NYSDEC, and NJDEP from 1999-2011 or later. All data are available from DRBC in a water quality database maintained by the DRBC Science and Water Quality Section, or online at the following locations:

USGS and State data: U.S. Geological Survey, NWIS: <http://waterdata.usgs.gov/nwis>;
 SRMP and State data: U.S. Environmental Protection Agency, STORET: <http://www.epa.gov/storet/>;
 or combined NWIS/STORET data at the National Water Quality Data Portal: <http://waterqualitydata.us/portal/> hosted by the [National Water Quality Monitoring Council](#).

The EWQ tables are composed of mixed agency data at some locations, and only SRMP or USGS data at other locations. In the Lower Delaware 2000-2004 EWQ definition period, DRBC built and maintained its own independent and well-controlled data set, using co-located USGS and State data only to check DRBC results. In the Upper and Middle Delaware this was not economically feasible for all of the sites. We used existing data from other agencies and supplemented SRMP data. USGS and states typically do not collect the exact same water quality parameters as the SRMP. USGS often collects dissolved forms of several parameters, while SRMP tests for total forms in order to maintain consistency with historical SRMP samples from the 1980's and 1990's.

As a result of the mixed data approach to defining EWQ used here, the EWQ tables are not exactly alike. Some sites contain long lists of parameters where all agencies sampled, and the lists include dissolved and total forms, ions, and metals. USGS and state data are comparable with DRBC data where parameters are measured in common, though monitoring objectives differed. USGS and state data typically are long-term quarterly sampling results or short synoptic surveys, while the SRMP monitoring objective requires more frequent May through September sampling within specific 3 to 5 year periods, but not necessarily every year for many years like the states and USGS. DRBC employs the same EPA-approved field and laboratory methods as USGS and the states, and maintains quality assurance practices so that SRMP data are of sufficient quality to be comparable with other agencies.

The sections are organized by River Mile and Site in upstream to downstream order. For example, the northernmost sites are upstream of the Upper Delaware Scenic and Recreational River: 3448 BCP Oquaga Creek, NY, a tributary BCP to the West Branch Delaware River at interstate River Mile 344.8; and 3398 ICP West Branch Delaware River at Hale Eddy, an ICP located at interstate River Mile 339.8. At the southern end of the Middle Delaware is 2095 BCP Slateford Creek at National Park Drive, PA. The Slateford Creek site is a Pennsylvania BCP located at River Mile 209.5. From Portland, PA south to Trenton are listed all ICP and BCP monitoring locations previously published in DRBC rules, along with newer sites. Each map shows the watershed's location in the Delaware River Basin.

The last page of each section shows the site-specific definition of Existing Water Quality by parameter, including:

N	Number of samples;
Median	The Median concentration;
L95CL	Lower 95% confidence limit;
U95CL	Upper 95% confidence limit;
Period of Record (all May-Sep data)	Agencies and years the samples were taken; OR
Flow Relationship	Regression equation if significantly related to flow, from DRBC rules

Data Sufficiency for Existing Water Quality Definition

Some EWQ tables are incomplete, and will be updated over time in future editions of this document. These are sites where sampling is still underway and EWQ has not yet been completely defined, or where insufficient data exist to define EWQ. Depending on observed range and variability of a given parameter, we require 20 to 50 or more samples to adequately describe EWQ with 95% confidence so that the confidence limits approximately correspond to (at most) the 40th and 60th percentiles of the data distributions. Using the median concentration keeps out extreme values, keeps out undetected laboratory results, and gives a reliable indication of water quality concentrations expected under normal summer conditions. There are some parameters presented with as few as 5 samples. These are from various one-time studies where the results showed very low concentrations and very low variability – there were no extreme outliers, and even though 95% confidence limits included just about all of the data, variability was so low that the upper and lower values were similar.

USGS and NPS recently completed sampling and reporting EWQ for the following Upper Delaware control points, yet the number of results are insufficient to describe EWQ: Oquaga Creek, NY; Balls Creek, PA; Sands Creek, NY; and Shehawken Creek, PA. The SRMP is sampling Basket Creek and Little Equinunk Creek in 2016 and 2017 to provide additional data for EWQ definition, and will also sample Shehawken Creek, PA in 2018. The SRMP has not yet completed sampling Beaver Brook, NY. It's table will be updated after the 2016 sampling season is completed. Summary statistics are shown for the sites possessing few data, but additional sampling must be conducted to fully define EWQ. Until water quality is sufficiently described for EWQ, the tables are not ready for regulatory use but present water quality found at the site.

In the Middle Delaware, some EWQ work remains for the following control points: Flat Brook, NJ; and Cherry Creek, PA. The Flat Brook table will be updated after the 2016 sampling season, and Cherry Creek will be completed after the 2017 season.

In the Lower Delaware, DRBC began sampling Alexauken Creek, NJ, and Hakihokake Creek, NJ in 2014. Existing NJDEP/USGS data are being supplemented by DRBC data, and EWQ will be completed after the 2016 sampling season. Based upon an analysis of dischargers in Lower Delaware watersheds, DRBC will add three more BCP's starting in 2017: Jacobs Creek, NJ; Jericho Creek, PA; and Gallows Run, PA. All are previously unmonitored and contain two or more dischargers regulated under the National Pollutant Discharge Elimination System (NPDES).

Once data are numerous and of sufficient quality, the EWQ tables are considered complete and would not be changed unless found in error or unless new parameters are added, such as site-specific biological targets presently being created by the Delaware River Biomonitoring Program. Overall EWQ definition is nearly complete, providing baseline EWQ tables for:

- All watersheds of 20 square miles or more;
- Smaller streams that represent physiographic regions or ecoregions of the Delaware River;
- Watersheds containing significant wastewater discharge projects;
- Streams of local or national interest such as Wild and Scenic or state-designated high-quality streams; or
- Streams requested by agencies, municipalities, non-governmental organizations or private citizens.

Finally, there are parameters in some of these tables that serve as indicators of natural gas development: Barium, Strontium and others that we monitored using 2009-2010 archived samples (DRBC 2010). These parameters represent background water quality and serve as baseline antidegradation targets.

DRBC Usage of Existing Water Quality Tables

These tables are expected to be used for the following:

1. In DRBC Water Quality Regulations (WQRs), there are currently 24 site-specific EWQ tables. Presently, staff have created an additional 61 tables, for a total of 85 EWQ tables. Adoption of all 85 pages directly into the WQRs would be very cumbersome. DRBC rules could be streamlined by adoption of this document as SPW guidance under "best available scientific data" rule provisions. These tables represent the best scientific information available, and DRBC rules provide for use of these data without direct inclusion in the rules.
2. At all ICP and BCP sites: as baseline EWQ for future assessment of measurable changes to Delaware River and tributary water quality. These assessments are not comparisons to water quality standards, but of measurable changes relative to EWQ upper or lower confidence intervals. These tables are water quality targets, not criteria. The main question to be answered each study period: did water quality statistically change at this location?

3. At BCP sites: as EWQ targets for Special Protection Waters discharge permits, non-point source planning, and water quality modeling in selected watersheds. For these sites, we calculate pollutant loadings to the Delaware River (using harmonic mean flow), and answer the questions:
 - a. Does this tributary improve or degrade the Delaware River?
 - b. Are the pollutant loadings from dischargers or from other sources?
 - c. Do cumulative pollutant loadings cause the antidegradation target to be exceeded?
 - d. What regulatory actions, whether through permitting or voluntary improvements, are necessary to maintain Existing Water Quality?

Reach-Wide vs. Site-Specific Existing Water Quality

ICP site-specific targets are not expected to replace the Upper and Middle Delaware reach-wide targets of 1992, since those targets have been in the WQRs for a long time. However, more parameters that might be useful for permitting are added in these tables, such as those that might be associated with natural gas development activities (strontium, barium, some metals) as well as others (enterococcus, E. coli, TDS, pH, water temperature and more) that were not included in 1992 rules.

ICP tables are meant to be used for assessment of measurable changes, but not necessarily for permitting unless the WQRs are revised. Use of these Upper and Middle Delaware River ICP targets for permitting has not yet been addressed by the Commission.

Monitoring and Data Quality Improvements since 1992

Pertinent to the Special Protection Waters rules and potential revisions, it must be noted that both water quality and standard statistical practices have changed since 1992:

- Delaware River concentrations have substantially declined since 1992 for many parameters in the water quality tables, and additional parameters have been defined since 1992.
- Laboratory analytical methods have improved since 1992, and we are now able to measure water quality at much lower concentrations than in the past.
- Standard statistical practices for water resources are better understood. Current practices employ non-parametric statistics (the median and its confidence intervals), which are better suited to non-normal water quality data distributions. There were common but unfavorable practices in 1992 such as:
 - substitution of replacement values in undetected results;
 - use of geometric means (an estimation of the median) and t-tests instead of medians and more powerful non-parametric tests for water quality comparisons; and
 - creation of confidence intervals by back-calculating from geometric mean confidence intervals (making the confidence intervals too narrow).

Since water quality test methods, quality assurance practices, statistical practices, computing power and data quality practices have significantly improved since 1992, DRBC staff maintains that the reach-wide targets of 1992 are less scientifically defensible as true “existing water quality” at the time than more recent data. Richard Albert, one of the originators of Special Protection Waters, often referred to the 1992 reach-wide targets as “numerical policy.” He acknowledged that the targets were based on unsystematically-gathered available data.

In the late 1990’s a SRMP statistical workgroup reviewed the statistical basis for the 1992 tables and recognized the difficulties in replicable assessment of measurable change using these un-replicable data (Evans, April 1998). Regarding this review, Richard Albert commented (Albert, May 1998):

“At the recent SPW workshop, I attempted to explain that our existing water quality/no measurable change definition embodies both technical and policy decisions (remember the numbers are not water quality standards). In essence we used science to develop the numbers, but the Commission’s decision to use them for anti-degradation purposes was a policy decision.

Once the Commission made this policy decision, the number of samples inherent in the numbers, the years represented by the samples, whether the analyses were composited or not, the precise locations where data were collected, laboratory protocols, and so forth do not particularly matter. The data could have come from the Ohio.

...In all respects except one, it does not matter anymore how real this is or not. The one exception is the link between monitoring and the criteria. If the primary assumption made at the time of SPW adoption is invalid, i.e., that the existing water quality/measurable change definition was not representative of the water quality in the reach for which it was adopted; there is a problem...”

The problem Richard Albert cautioned about was real, although based upon best available data at the time and upon ‘standard’ statistical practices at the time, both of which have been proven either poor by today’s data quality standards or improperly used by judgment of statistical experts. None of the samples upon which 1992 EWQ was based were ever collected with the intention of establishing EWQ. EWQ was established after the fact. The samples upon which 1992 EWQ was partially based were collected either monthly or quarterly by USGS and state programs for long term trend analyses. Data were very rich at these few locations. The rest of the data were collected by DRBC and NPS as part of summer monitoring projects all over the Upper and Middle Delaware. DRBC/NPS samples were collected unsystematically and there were few samples collected at any of the more than 100 sites. 1980-1988 Upper and Middle Delaware data were retrieved from the EPA STORET data system and the USGS NWIS system and combined regardless of data quality to form the reach-wide 1992 EWQ tables. The 1992 tables were geographically unbalanced, representative only of wherever the most samples were collected. Much of the data and some of the statistical practices were flawed, and the collective reach-wide data did not represent many locations within the reach because of the geographic imbalance (Breidt and Boes 1989).

The reach-wide targets could not reliably be used for assessment of water quality changes over time. Thus the SRMP decision was made, once Lower Delaware site-specific EWQ was completed and successfully applied, that we would revisit the Upper and Middle Delaware to produce the EWQ tables presented here, with data gathered with the intention of creating site specific EWQ. The information presented here is better documented, water quality surveys were designed for the purpose of future assessment, and it is more cost-effective to work on a site-specific or smaller-reach basis.

During early analyses of these data, we noted several patterns and presented them at technical meetings (Limbeck 2013-2016). Some of those points should be emphasized here and considered within policy discussions:

1. For many parameters, concentrations are now lower than they were in 1992 (See example, Figure 3). Only Total Kjeldahl Nitrogen (TKN), alkalinity and hardness remained the same as in 1992 and closely match 1992 EWQ reach-wide patterns. Only specific conductance increased beyond the 1992 targets (Figure 4). Policy implications must be considered regarding update of 1992 EWQ to levels protective of current water quality.
2. Among parameters whose concentrations did not change since 1992, the reach-wide targets do not fully reflect actual water quality conditions within each reach due to spatially uneven patterns (See dissolved oxygen example, Figure 5).
3. The non-parametric approach employed in the Lower Delaware is superior to the parametric geometric means and confidence intervals of the 1992 data. Consider the non-normal, skewed distribution of many water quality parameters:
 - a. The effect that outlier values (common in water quality data) have on means but not on medians;
 - b. Data transformation is not necessary with the non-parametric approach;

c. Log-transformations and geometric means are ways to estimate the median, not the mean (Helsel 2013).

Given the above considerations, we abandoned reach-wide geometric means of 1992 in favor of the median for our site-specific targets. The approach used in 1992 was not recommended by expert statisticians at the time (Breidt et. al. 1991), and is less powerful than non-parametric tests for measures of frequency and typical water quality changes (Helsel and Hirsch 2002; Helsel 2013). Helsel recommends parametric tests only for measures of mass, total volumes and long term chronic effects. None are employed here, so the non-parametric approach is proper.

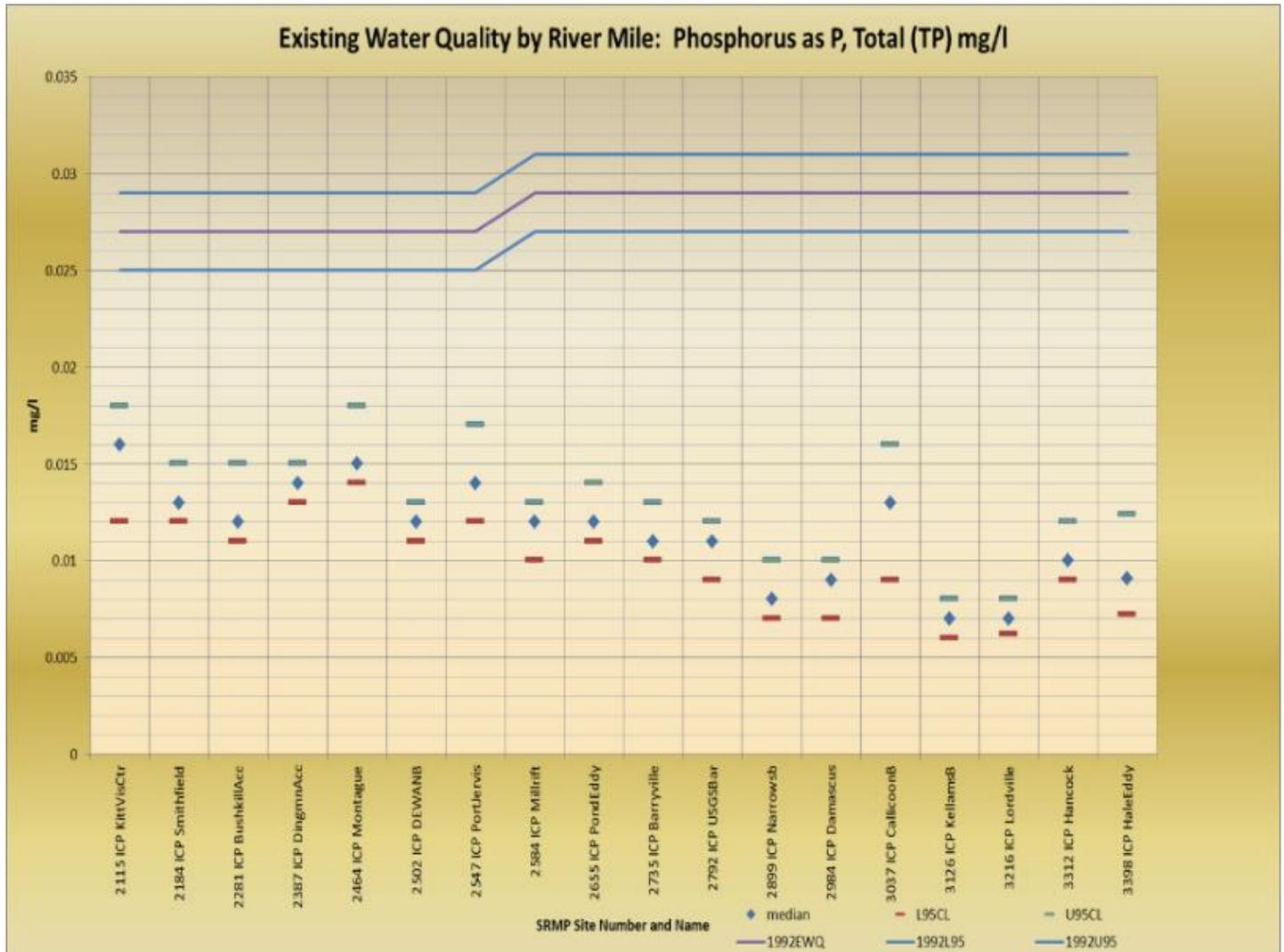


Figure 3: Most parameters are now (2006-2013) present at lower concentrations than they were in 1992 reach-wide EWQ. Total phosphorus concentrations are shown above as an example, but the same pattern holds for nitrogen forms (ammonia, nitrate), fecal coliform bacteria, and total suspended solids (TSS).

Downstream-----Upstream

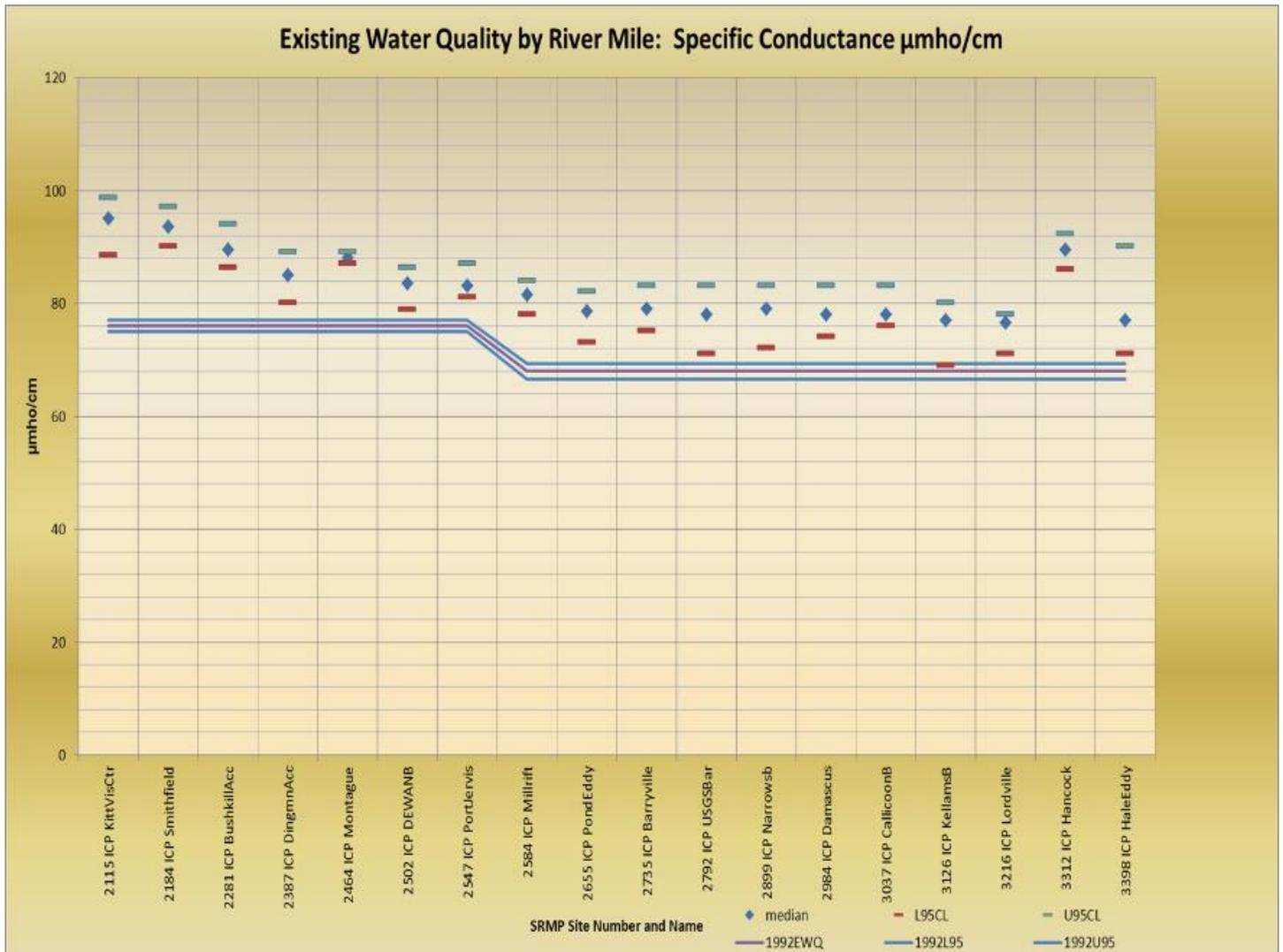


Figure 4: Specific conductance is now (2006-2013) higher than the upper limits of 1992 reach-wide EWQ. This is common throughout the northeastern United States (Kaushal et. al. 2005). Specific conductance is not regulated by water quality criteria. This is the only parameter listed in 1002 rules that universally increased in concentration since 1992. Among parameters not listed in 1992 rules, chloride concentrations have also increased substantially.

Downstream-----Upstream

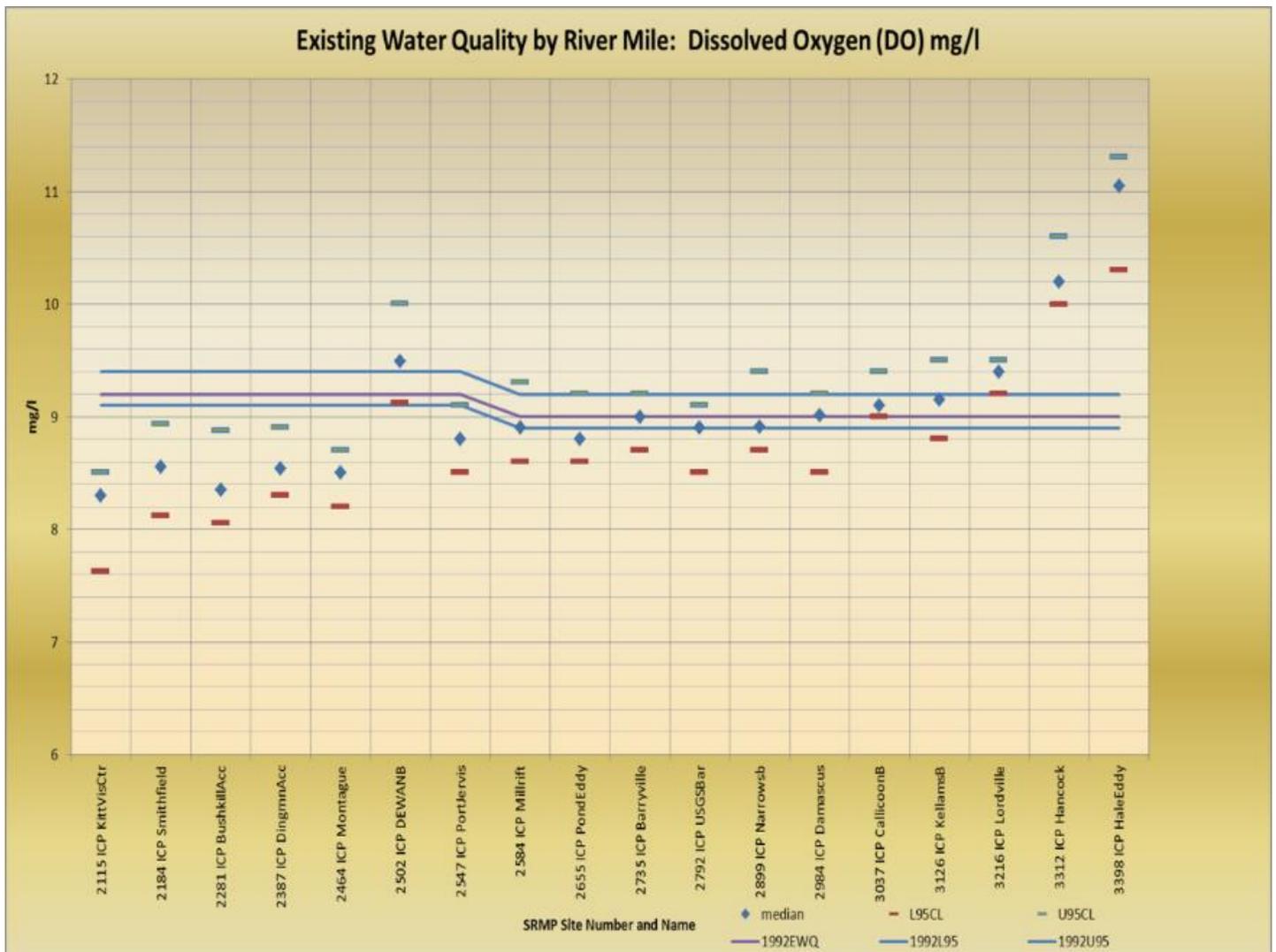


Figure 5: Even though 2006-2013 dissolved oxygen concentrations collectively remained the same as in 1992 EWQ, the present longitudinal pattern of concentrations does not match 1992 reach-wide EWQ. In both the Upper and Middle Delaware there are sites where DO concentrations are not within upper or lower reach-wide EWQ boundaries. The apparently worsened condition shown in the Middle Delaware (left) is not real, but an unfair comparison with the reach-wide combination of spatially and temporally uneven sampling that constructed 1992 EWQ. The declining upstream to downstream pattern in Upper and Middle Delaware concentration was similar to that of today, but the data used to construct 1992 EWQ were under-represented in places that differed from the reach-wide means.

Downstream-----Upstream

What Comes Next

There are several items and recommendations to consider as we continue to characterize the Special Protection Waters region:

1. This document is expected to be annually revised and updated as new sites and parameters are completed; as land use and population changes; and as new information is gathered for each watershed or river segment.
2. Wastewater discharge information data sets are gradually improving, and soon it will be possible to more accurately quantify cumulative pollutant loadings to streams. DRBC staff desire to monitor the effectiveness of the Special Protection Waters program: beginning with accurate lists of dischargers in each watershed and river segment; then compiling permit information, history since 1992, and monitoring reports to quantify the amounts of wastewater flows and pollutant loadings from all point sources, similar to the way DRBC and the states track water use. Over 150 wastewater dockets have thus far been issued under the Special Protection Waters rules, but it is not yet cumulatively known what pollutant load savings have been achieved by our regulated community within an antidegradation framework.
3. Additional guidance products are necessary for successful implementation of Special Protection Waters:
 - a. Guide to assessment of measurable change using the numerical targets presented here;
 - b. Guide to permitting wastewater projects, especially in light of administrative agreements between DRBC and the Delaware River Basin states;
 - c. Methods and guidance for cumulative assessment of multiple pollutant sources within watersheds;
 - d. Guidance for use of these antidegradation targets as objectives for watershed planning and restoration;
 - e. Geographic Information System products in support of SPW objectives.
4. On the non-point source front, all projects approved under section 3.8 of the DRBC compact (DRBC 1961) require some type of conformance with a Non-Point Source Pollution Control Plan (NPSPCP), albeit one for a site specific project, or conformance with a municipal stormwater ordinance, or with a state model ordinance. In addition, DRBC had a hand in crafting the USDA Conservation Reserve Enhancement Program (CREP) for Pennsylvania's Delaware River Basin counties, but does not participate, manage, or track results of the program. There are many agencies and organizations that implement non-point source improvement projects, and DRBC has tracked many of these for its State of the Basin reports (DRBC 2008, 2013) within goals and objectives of the Water Resources Plan for the Delaware River Basin (DRBC 2004). However, water quality benefits of such projects have not been measured, and are not generally considered within the context of Special Protection Waters objectives. We know that many projects have been successfully implemented, yet it would be better if we could quantify their success in meeting antidegradation objectives.
5. DRBC possesses extensive water quality information for public consumption, and should work toward improving the outreach and education components of our technical programs. Now that 57 tributary watersheds to the Delaware River have EWQ characterized at BCPs, the Basin community can use those targets to achieve watershed protection and restoration goals. DRBC staff are working on internet applications and interactive maps for exploration of our water quality data via maps and graphics; and creating presentations for scientific conferences, regional organizations, and watershed groups. However, we must be more effective at reaching wider audiences in a less technical manner.

6. Planning has begun for the next major assessment of measurable changes to EWQ. The assessment will be conducted from 2019 to 2021 for about 50 of these 85 sites, encompassing the entire Upper, Middle and Lower Delaware River. The 2009-2011 Lower Delaware assessment indicated some improvements since 2000-2004 in concentrations of nutrients; no degradation of most other parameters; and system-wide increases in chloride and specific conductance concentrations. The assessment was the first effort of its kind, and was demonstrated to be effective in achieving its objective: to determine whether or not water quality degradation occurred. The assessment revealed dozens of stories to be told about different watersheds and their water quality, and this document will provide the foundation for assessment of the whole Special Protection Waters region from Hancock to Trenton in the future.

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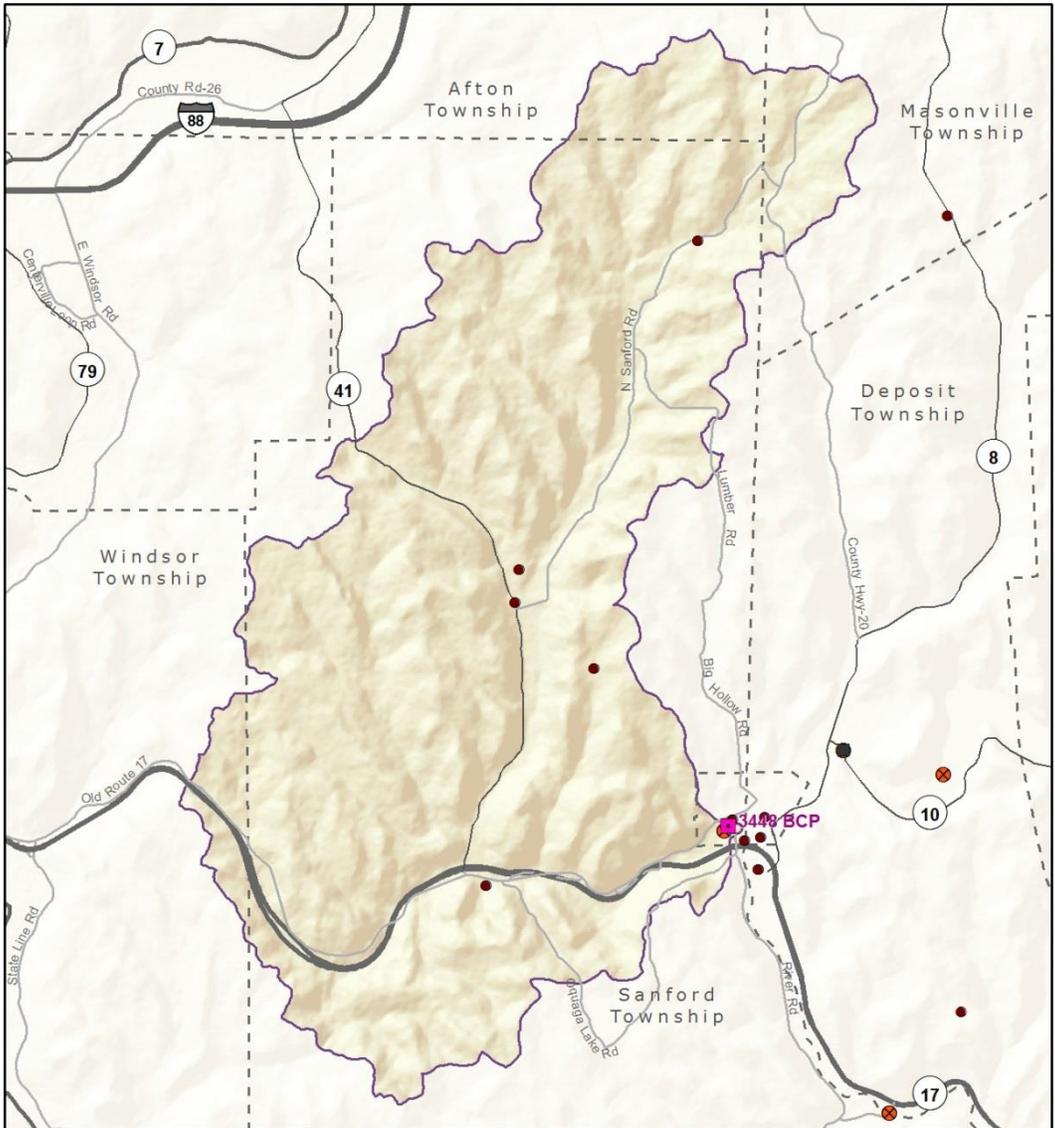
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West Branch Delaware River and Tributaries

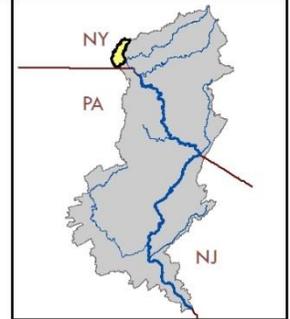
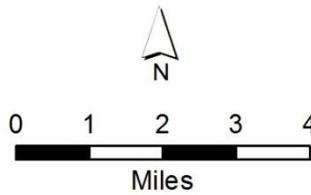
3448 BCP Oquaga Creek, NY



Oquaga Creek

Drainage Area = 67.47 mi²

- Sampling Location
- Other Sampling Location
- ⊗ Stream Gage
- NPDES
- Drainage Area



3448 BCP Oquaga Creek at Mill St., Deposit, NY

Broome County, NY. USGS Site No. 01426000.

Latitude 42.059381 Longitude -75.426851 by Map Interpolation NAD83 decimal degrees.

Population of Watershed: 2000: 1,346 2010: 1,303

Drainage Area: 67.94 square miles, tributary to West Branch Delaware River Zone W (West Branch)

EWQ definition currently underway by USGS/NPS, anticipated Completion by 2018

This tributary to the West Branch Delaware River was added to the list of control points because of necessity to establish baseline water quality conditions prior to potential natural gas development activities.

Nearest upstream Interstate Control Point: None; compare with West Branch Delaware River at Stilesville, which is sited just below Cannonsville Reservoir (NYSDEC has data for Cannonsville release water quality)

Nearest downstream receiving Interstate Control Point: West Branch Delaware River at Hale Eddy.

Known dischargers within watershed: Undefined

Watershed is 85.5 % forested; urban land cover is 0.8%. 100% glaciated. No carbonate rock. Mean annual precipitation 44.5 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics:

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
6,659.47	304.55	165.92	107.14	83.37	51.45	29.06	13.36	2.27

StreamStats Low-Flow Stream Statistics

M7D2Y (ft ³ /s)	11.5
M30D2Y (ft ³ /s)	15.2
M7D10Y (ft ³ /s)	5.51
M30D10Y (ft ³ /s)	7.26
M90D10Y (ft ³ /s)	11.1

StreamStats Mean/Baseflow Stream Statistics

QA (ft ³ /s)	124
QAH (ft ³ /s)	32.6
BF10YR (ft ³ /s)	50.1
BF25YR (ft ³ /s)	44.9
BF50YR (ft ³ /s)	41.9

StreamStats Peak-Flow Stream Statistics

PK2 (ft ³ /s)	2,590
PK5 (ft ³ /s)	4,320
PK10 (ft ³ /s)	5,700
PK50 (ft ³ /s)	9,330
PK100 (ft ³ /s)	11,100
PK500 (ft ³ /s)	16,100

Existing Water Quality: 3448 BCP Oquaga Creek, NY (Insufficient Data)

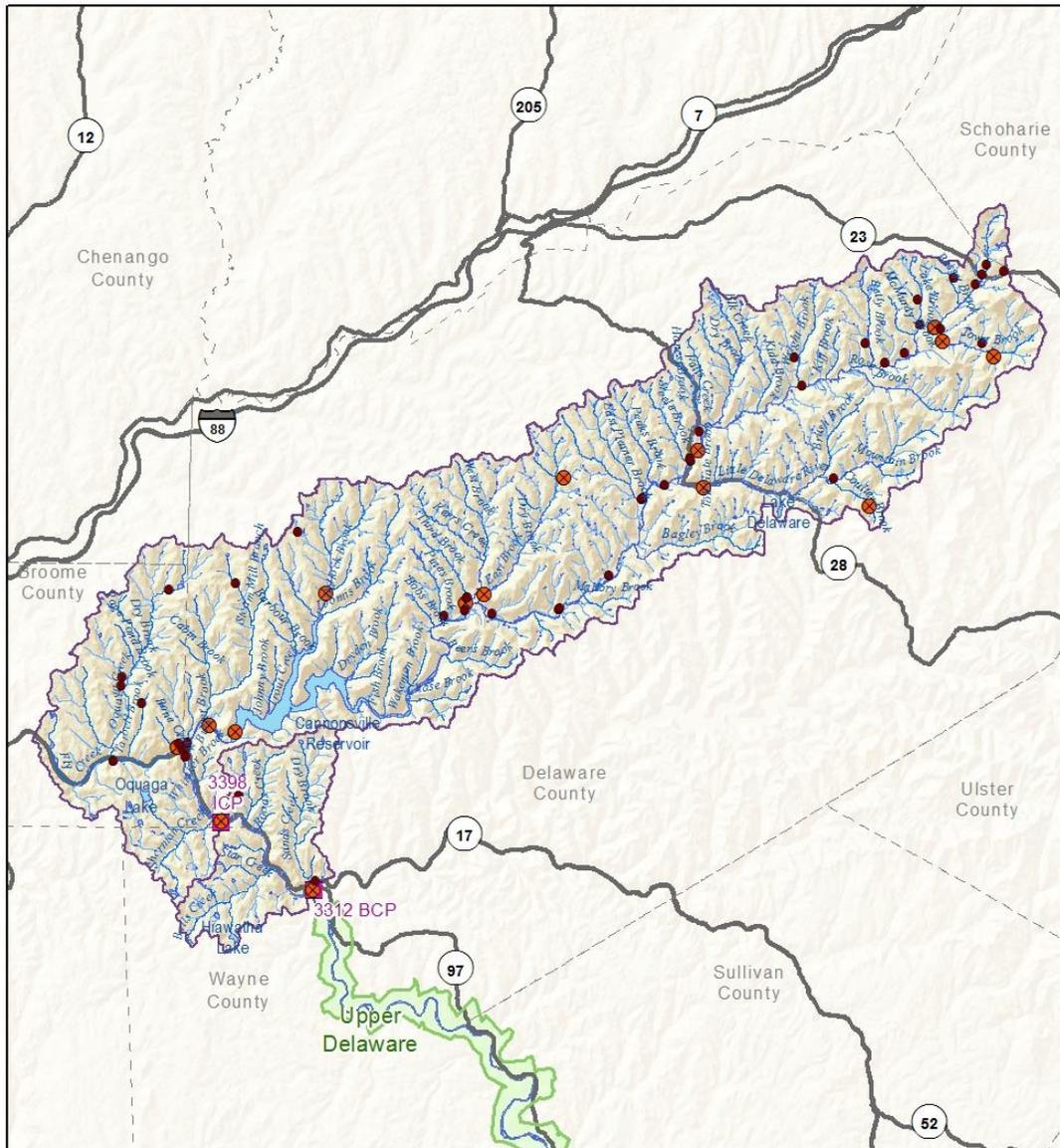
Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , mg/L, total	14	20.2	16.3	24.7	USGS 2013-2015
Ammonia as N, mg/L, total *	11	0.01	<0.01	0.01	USGS 2013-2015 (6/11 ND)
Barium, Dissolved mg/L	11	0.028	0.022	0.032	USGS 2013-2015
Boron, Dissolved µg/L	11	9.2	7.4	11.0	USGS 2013-2015
Bromide, Dissolve mg/L	9	0.03	0.01	0.03	USGS 2013-2015
Calcium, mg/L, dissolved	11	7.30	6.12	9.57	USGS 2013-2015
Carbon Dioxide, Total mg/L	11	2.0	1.6	2.9	USGS 2013-2015
Chloride, mg/L, dissolved	11	18.7	13.6	29.3	USGS 2013-2015
Dissolved Oxygen, mg/L *	11	9.9	9.6	11.0	USGS 2013-2015 mid-day
Dissolved Oxygen Saturation, %	11	105	100	106	USGS 2013-2015 mid-day
Fecal Coliform, #/100 ml *					No data available
Hardness as CaCo ₃ , mg/L, Total	11	26.6	22.8	35.8	USGS 2013-2015
Iron, Dissolved µg/L	11	34.7	29.1	80.2	USGS 2013-2015
Lithium, Dissolved µg/L	11	0.46	0.35	0.69	USGS 2013-2015 (1/11 ND)
Magnesium, Dissolved mg/L	11	2.12	1.79	2.85	USGS 2013-2015
Manganese, Dissolved µg/L	11	9.52	8.37	11.50	USGS 2013-2015
Nitrate as N, Dissolved mg/L	11	0.216	0.160	0.271	USGS 2013-2015
Nitrate + Nitrite as N, Dissolved, mg/L *	11	0.217	0.161	0.271	USGS 2013-2015
Nitrite as N, Dissolved mg/L	11	0.001	0.001	0.002	USGS 2013-2015 (3/11 ND)
Nitrogen as N, Organic, Total mg/L	11	0.13	0.09	0.24	USGS 2013-2015 (5/11 ND)
Nitrogen as N, Total, mg/L *	11	0.37	0.30	0.44	USGS 2013-2015
Nitrogen, Kjeldahl as N, Total mg/L	11	0.13	0.09	0.24	USGS 2013-2015
Organic Carbon, Dissolved, mg/L					No data available
Orthophosphate as P, Dissolved mg/L	11	<0.004	<0.004	<0.004	USGS 2013-2015 (10/11 ND)
pH *	11	7.3	7.2	7.4	USGS 2013-2015 mid-day
Phosphorus as P, Total mg/L *	11	<0.02	<0.02	<0.02	USGS 2013-2015 (11/11 ND)
Potassium, Dissolved mg/L	11	0.96	0.75	1.06	USGS 2013-2015
Silica, Dissolved mg/L	11	2.74	2.02	3.85	USGS 2013-2015
Sodium, Dissolved mg/L	11	11.6	8.33	16.5	USGS 2013-2015
Specific Conductance, µS/cm	11	110	95	161	USGS 2013-2015
Strontium, Dissolved mg/L	11	0.032	0.026	0.042	USGS 2013-2015
Sulfate, Dissolved mg/L	11	6.21	5.20	6.79	USGS 2013-2015
Temperature, Water, Degrees C	11	17.6	14.0	18.9	USGS 2013-2015 mid-day
Total Dissolved Solids, mg/L	11	77	61	97	USGS 2013-2015
Total Suspended Solids, mg/L *					No data available
Turbidity, NTU	11	0.9	0.6	2.4	USGS 2013-2015

The concentrations shown above are based upon seasonal May through September mid-day grab samples. Additional data are available for non-seasonal October through April targets. For parameters that vary throughout each day (CO₂, DO, DO%, pH, water temperature) these values best represent daily maximum concentrations.

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

It is recommended that two more years of monitoring are necessary for EWQ definition: samples should be taken bi-weekly (twice per month) during the May through September period, which would add 20 results to the N listed for each parameter.

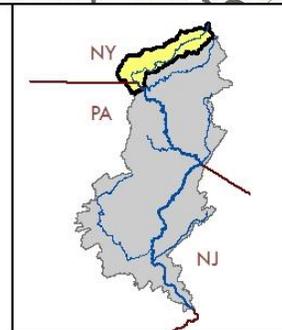
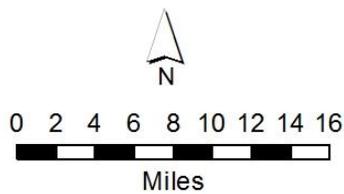
3398 ICP West Branch Delaware River at Hale Eddy



West Branch Delaware River at Hale Eddy and Hancock

Drainage Area = 650.38 mi²

- NPDES
- Stream Gauge
- Sampling Location
- NPS Boundary



3398 ICP West Branch Delaware River at Hale Eddy

USGS Site Number 01426500; Latitude 42.002798 Longitude -75.383867 by GPS NAD83 decimal degrees

Drainage Area: 595.6 square miles, Delaware River Zone W (West Branch)

Population of Watershed: 2000: 22,075 2010: 22,598 Change: -43 (-3.2%)

EWQ definition completed by USGS and DRBC/NPS 2011, EWQ contains USGS data

This site was added to the list of interstate control points because of necessity to establish baseline water quality conditions prior to potential natural gas development activities.

Nearest upstream Interstate Control Point: None

Nearest downstream receiving Interstate Control Point: 3312 ICP West Branch Delaware River at Hancock.

Tributaries to Upstream Reach: major tributary 3448 BCP Oquaga Creek, NY; Cannonsville Reservoir, NY; small tributaries 340.4 Hungry Hollow; Sherman Creek, NY/PA; Whitaker Brook, NY; Butler Brook, NY; Cold Spring Creek, NY.

Known upstream dischargers and sources of water quality change include: Cannonsville Reservoir; Town of Deposit.

Stream flow at this site is controlled and dominated by releases from Cannonsville.

Watershed is 79.2 % forested; urban land cover is 0.8%. 100% glaciated. No carbonate rock. Mean annual precipitation 42.7 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics:

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
35,200	2,150	1,150	720	545	412	251	129	18.0

StreamStats Low-Flow Stream Statistics

M7D2Y (ft³/s) 107

M30D2Y (ft³/s) 136

M7D10Y (ft³/s) 61.4

M30D10Y (ft³/s) 75.5

M90D10Y (ft³/s) 106

StreamStats Mean/Baseflow Stream Statistics

QA (ft³/s) 1,030

QAH (ft³/s) 274

BF10YR (ft³/s) 379

BF25YR (ft³/s) 338

BF50YR (ft³/s) 314

StreamStats Peak-Flow Stream Statistics

PK2 (ft³/s) 16,200

PK5 (ft³/s) 25,700

PK10 (ft³/s) 33,200

PK50 (ft³/s) 53,100

PK100 (ft³/s) 63,100

PK500 (ft³/s) 90,300

Existing Water Quality: 3398 ICP West Branch Delaware River at Hale Eddy

Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , mg/L, total	46	18.20	15.10	26.00	2006,2007,2010,2011 USGS/SRMP
Ammonia as N, mg/L, total *	45	0.03	0.02	0.03	2006,2007,2010,2011 USGS/SRMP
Calcium, mg/L, dissolved	24	6.40	6.02	6.72	2006,2007 USGS
Chloride, mg/L, dissolved	24	10.65	9.70	12.60	2006,2007 USGS
Chloride, mg/L, Total	23	11.37	10.67	12.23	2010,2011 SRMP
Dissolved Oxygen, mg/L *	20	11.05	10.30	11.30	2010,2011 SRMP (grab samples mid-day)
Dissolved Oxygen Saturation, %	20	98.00	97.00	99.00	2010,2011 SRMP (grab samples mid-day)
Fecal Coliform, #/100 ml *	23	14.00	6.00	26.00	2010,2011 SRMP (NPS UPDE Lab)
Hardness as CaCO ₃ , mg/L, Total	47	23.00	22.00	24.00	2006,2007,2010,2011 USGS/SRMP
Magnesium, mg/L, Dissolved	24	1.56	1.48	1.65	2006,2007 USGS
Nitrate as N, mg/L, Dissolved	24	0.48	0.35	0.63	2006,2007 USGS
Nitrate + Nitrite as N, Total, mg/L *	23	0.33	0.28	0.39	2010,2011 SRMP (ANSP Lab)
Nitrogen as N, Dissolved, mg/L	23	0.67	0.49	0.76	2006,2007 USGS
Nitrogen as N, Total, mg/L *	23	0.54	0.45	0.60	2010,2011 SRMP (ANSP Lab)
Nitrogen, Kjeldahl as N, mg/L	23	0.20	0.14	0.24	2010,2011 SRMP (ANSP Lab)
Organic Carbon, Dissolved, mg/L	24	1.85	1.70	2.50	2006,2007 USGS
pH, standard units *	20	7.61	7.45	7.82	2010,2011 SRMP (grab samples mid-day)
Phosphate as P, Total mg/L	23	0.0044	0.0037	0.0072	2010,2011 SRMP (ANSP Lab) MDL .002
Phosphorus as P, Total mg/L *	32	0.0091	0.0072	0.0124	2007,2010,2011 USGS/SRMP
Specific Conductance, µS/cm	20	77.00	71.00	90.00	2010,2011 SRMP (grab samples mid-day)
Sulfate as SO ₄ , Dissolved mg/L	24	7.05	6.30	7.80	2006,2007 USGS
Temperature, Water, Degrees C	48	10.70	9.90	12.20	2006,2007,2010,2011 USGS/SRMP grabs
Total Dissolved Solids, mg/L	23	47.15	46.55	48.95	2010,2011 SRMP (ANSP Lab)
Total Suspended Solids, mg/L *	23	2.00	1.55	3.20	2010,2011 SRMP (no stormwater samples)
Turbidity, NTU	42	1.63	1.44	5.10	2006,2007,2010,2011 USGS/SRMP

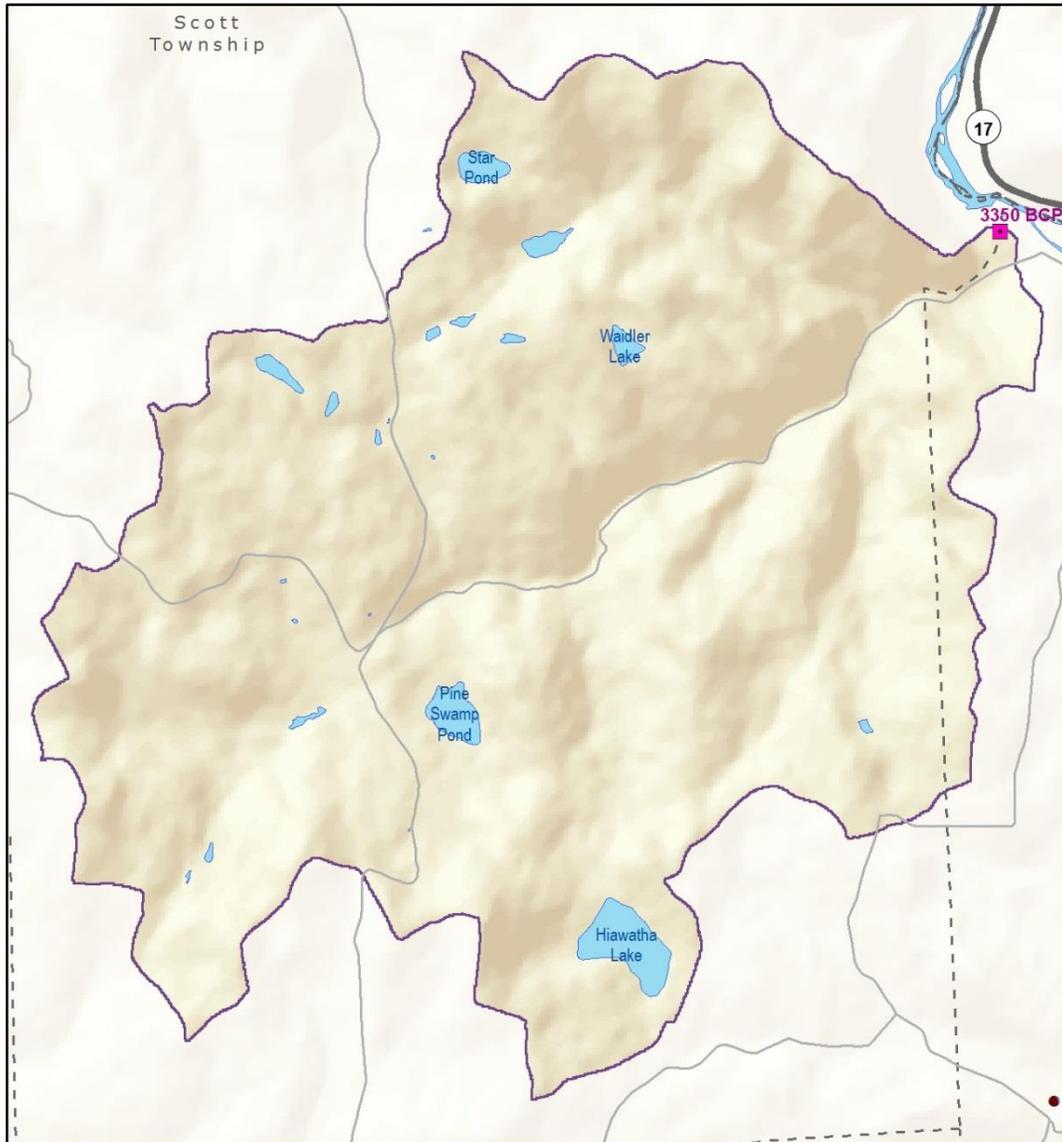
Two-tailed confidence limits were used for these EWQ targets.

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

USGS Site Number: 01426500

Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

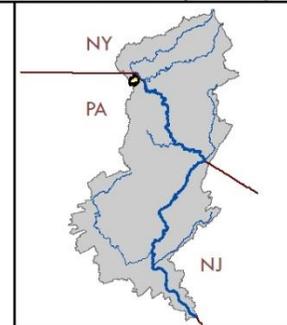
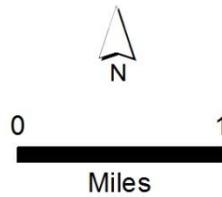
3350 BCP Balls Creek, PA



Balls Creek

Drainage Area = 15.37 mi²

- Sampling Location
- Other Sampling Location
- NPDES
- Drainage Area



3350 BCP Balls Creek at Penn-York Road, PA

Wayne County, Pennsylvania. Latitude 41.968210 Longitude -75.335956 NAD83 decimal degrees.

USGS Site No. 01426700

Watershed Population: 2000: 242 2010: 215 Change: -27 (-11.2%)

Drainage Area: 15.42 square miles, tributary to West Branch Delaware River Zone W (West Branch)

EWQ definition by USGS/NPS, partial data set only (n=11 May-September values)

This tributary to the West Branch Delaware River was added to the list of control points because of necessity to establish baseline water quality conditions prior to potential natural gas development activities.

Nearest upstream Interstate Control Point: 3398 ICP West Branch Delaware River at Hale Eddy

Nearest downstream receiving Interstate Control Point: 3312 ICP West Branch Delaware River at Hancock

Known dischargers within watershed: Undefined

Watershed is 86.9 % forested; urban land cover is 0.13%. 100% glaciated. No carbonate rock. Mean annual precipitation 44.1 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics (estimated using USGS BaSE Model):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
1,653.36	65.68	34.21	23.02	17.82	11.08	5.95	2.75	0.43

StreamStats Low-Flow Stream Statistics

M7D2Y (ft ³ /s)	2.01
M30D2Y (ft ³ /s)	2.80
M7D10Y (ft ³ /s)	0.81
M30D10Y (ft ³ /s)	1.15
M90D10Y (ft ³ /s)	1.89

StreamStats Mean/Baseflow Stream Statistics

QA (ft ³ /s)	27.30
QAH (ft ³ /s)	6.43
BF10YR (ft ³ /s)	11.20
BF25YR (ft ³ /s)	10.00
BF50YR (ft ³ /s)	9.35

StreamStats Peak-Flow Stream Statistics

PK2 (ft ³ /s)	681
PK5 (ft ³ /s)	1170
PK10 (ft ³ /s)	1570
PK50 (ft ³ /s)	2630
PK100 (ft ³ /s)	3170
PK500 (ft ³ /s)	4640

Existing Water Quality: 3350 BCP Balls Creek, PA (Insufficient Data)

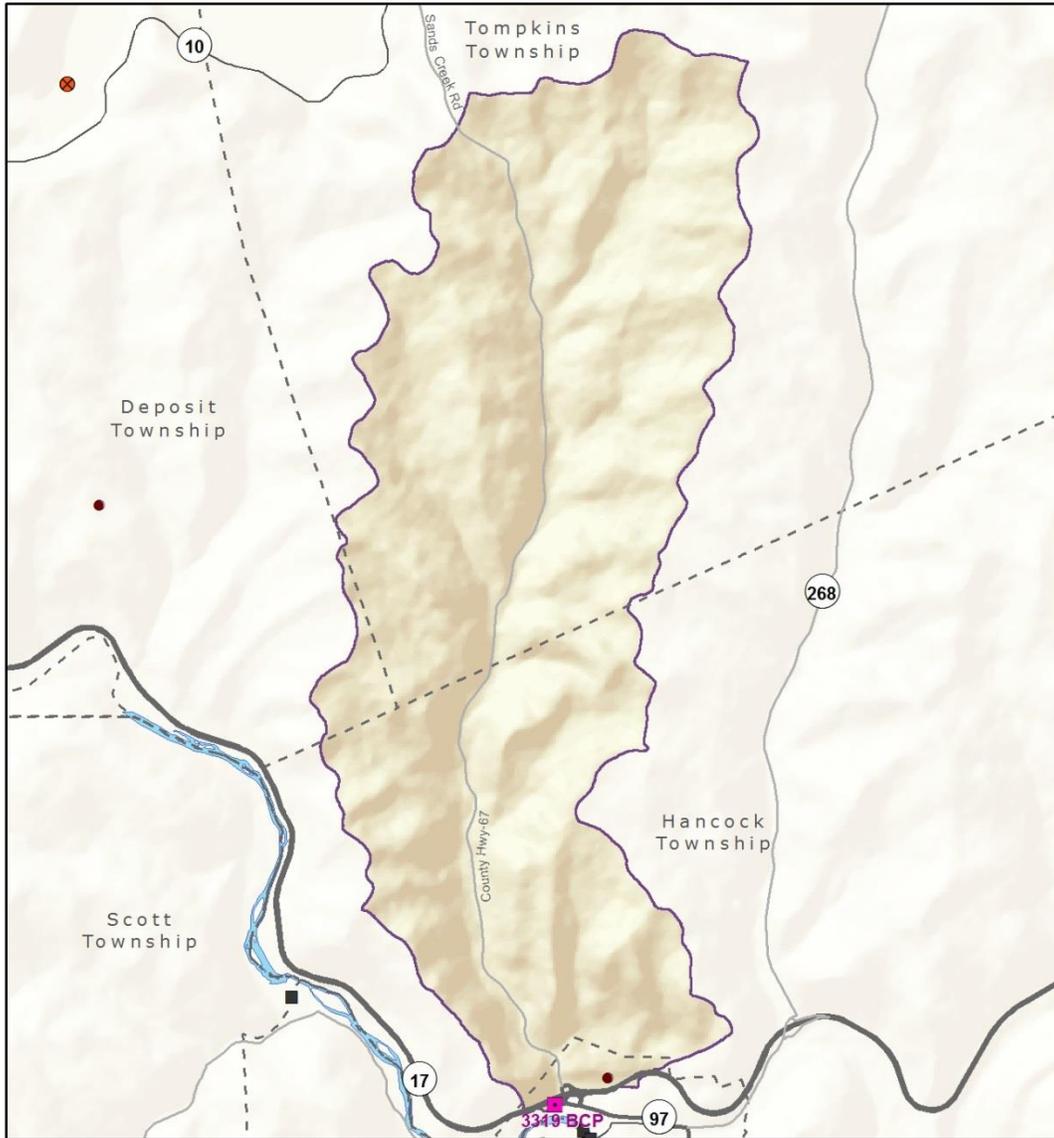
Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , mg/L, total	13	20	17.8	25.0	USGS 2012-2015
Ammonia as N, mg/L, dissolved *	11	<0.01	<0.01	<0.01	USGS 2012-2015 (7/11 non-detect)
Barium, Dissolved µg/L	11	25.2	21.0	27.0	USGS 2012-2015
Boron, Dissolved µg/L	11	6.0	4.9	6.4	USGS 2012-2015
Bromide, Dissolved mg/L	9	<0.03	<0.03	<0.03	USGS 2012-2015 (7/9 non-detect)
Calcium, mg/L, dissolved	11	7.4	6.06	8.22	USGS 2012-2015
Carbon Dioxide, Total mg/L	10	1.2	0.7	1.9	USGS 2012-2015 mid-day
Chloride, mg/L, dissolved	11	2.74	2.25	4.32	USGS 2012-2015
Dissolved Oxygen, mg/L *	11	9.3	9.0	10.4	USGS 2012-2015 mid-day
Dissolved Oxygen Saturation, %	11	100	97	102	USGS 2012-2015 mid-day
Fecal Coliform, #/100 ml *					No data
Fluoride, Dissolved mg/L	11	0.04	0.04	0.05	USGS 2012-2015
Hardness as CaCO ₃ , mg/L, Total	11	24.1	19.7	26.4	USGS 2012-2015
Iron, Dissolved µg/L	11	20.6	5.8	40.8	USGS 2012-2015
Lithium, Dissolved µg/L	11	0.61	0.26	0.79	USGS 2012-2015 (1/10 non-detect)
Magnesium, mg/L, Dissolved	11	1.36	1.10	1.45	USGS 2012-2015
Manganese, Dissolved µg/L	11	1.85	1.20	2.56	USGS 2012-2015
Nitrate as N, mg/L, Dissolved	11	0.196	0.141	0.228	USGS 2012-2015 by algorithm
Nitrate + Nitrite as N, Dissolved mg/L *	11	0.196	0.141	0.228	USGS 2012-2015
Nitrite as N, Dissolved mg/L	11	<0.001	<0.001	<0.001	USGS 2012-2015 (11/11 non-detect)
Nitrogen as N, Total, mg/L *	11	0.31	0.24	0.35	USGS 2012-2015 by algorithm
Nitrogen, Kjeldahl as N, Total mg/L	11	0.11	0.08	0.16	USGS 2012-2015
Nitrogen, Organic, Total mg/L	11	0.11	0.08	0.14	USGS 2012-2015 by algorithm
pH, standard units *	11	7.5	7.3	7.7	USGS 2012-2015 mid-day
Phosphate as P, Dissolved mg/L	11	0.007	0.005	0.009	USGS 2012-2015
Phosphorus as P, Total mg/L *	11	<0.02	<0.02	0.03	USGS 2012-2015 (7/11 non-detect)
Potassium, Dissolved mg/L	11	0.82	0.65	0.87	USGS 2012-2015
Silica, Dissolved mg/L	11	3.16	2.96	3.42	USGS 2012-2015
Sodium, Dissolved mg/L	11	2.94	2.50	3.51	USGS 2012-2015
Specific Conductance, µS/cm @25C	11	66	51	73	USGS 2012-2015
Strontium, Dissolved µg/L	11	26.1	21.3	29.6	USGS 2012-2015
Sulfate as SO ₄ , Dissolved mg/L	11	4.93	4.59	5.10	USGS 2012-2015
Temperature, Water, Degrees C	11	18.6	13.6	20.4	USGS 2012-2015 mid-day
Total Dissolved Solids, mg/L	11	41	33	53	USGS 2012-2015
Total Suspended Solids, mg/L *					No data
Turbidity, NTU	10	0.7	0.3	1.2	USGS 2012-2015

The concentrations shown above are based upon seasonal May through September mid-day grab samples. Additional data are available for non-seasonal October through April targets. For parameters that vary throughout each day (CO₂, DO, DO%, pH, water temperature) these values best represent daily maximum concentrations.

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

It is recommended that two more years of monitoring are necessary for full EWQ definition: samples should be taken bi-weekly (twice per month) during the May through September period, which would add 20 more results to the N listed for each parameter.

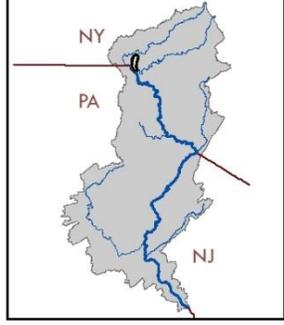
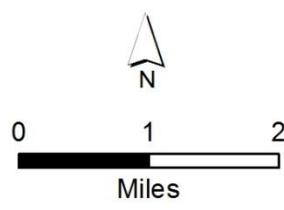
3319 BCP Sands Creek, NY



Sands Creek

Drainage Area = 18.14 mi²

- Sampling Location
- Other Sampling Location
- Stream Gage
- NPDES
- ⬮ Drainage Area



3319 BCP Sands Creek at Main St., Hancock, NY

Delaware County, New York. Latitude 41.956401 Longitude -75.296558 NAD83 decimal degrees.

USGS Site No. 01426997.

Watershed Population: 2000: 259 2010: 265 Change: +6 (+2.4%)

Drainage Area: 18.17 square miles, tributary to West Branch Delaware River Zone W (West Branch)

EWQ definition by USGS/NPS, partial data set only (n=11 May-September values)

This tributary to the West Branch Delaware River was added to the list of control points because of necessity to establish baseline water quality conditions prior to potential natural gas development activities.

Nearest upstream Interstate Control Point: 3398 ICP West Branch Delaware River at Hale Eddy

Nearest downstream receiving Interstate Control Point: 3312 ICP West Branch Delaware River at Hancock

Known dischargers within watershed: Undefined

Watershed is 89.5 % forested; urban land cover is 0.32%. 100% glaciated. No carbonate rock. Mean annual precipitation 42.8 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics (estimated using USGS BaSE Model):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
1,940.45	72.63	40.11	24.75	19.06	11.94	6.64	2.95	0.53

StreamStats Low-Flow Stream Statistics

M7D2Y (ft ³ /s)	2.22
M30D2Y (ft ³ /s)	3.09
M7D10Y (ft ³ /s)	0.90
M30D10Y (ft ³ /s)	1.26
M90D10Y (ft ³ /s)	2.08

StreamStats Mean/Baseflow Stream Statistics

QA (ft ³ /s)	30.60
QAH (ft ³ /s)	6.89
BF10YR (ft ³ /s)	12.50
BF25YR (ft ³ /s)	11.20
BF50YR (ft ³ /s)	10.40

StreamStats Peak-Flow Stream Statistics

PK2 (ft ³ /s)	834
PK5 (ft ³ /s)	1430
PK10 (ft ³ /s)	1910
PK50 (ft ³ /s)	3180
PK100 (ft ³ /s)	3820
PK500 (ft ³ /s)	5560

3319 BCP Sands Creek, NY (Insufficient Data)

Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , mg/L, total	13	17.3	14.5	22.2	USGS 2012-2015
Ammonia as N, mg/L, dissolved *	13	<0.01	<0.01	<0.01	USGS 2012-2015 (8/13 non-detect)
Barium, Dissolved µg/L	13	48.5	41.1	52.5	USGS 2012-2015
Boron, Dissolved µg/L	13	5.8	5.2	6.5	USGS 2012-2015
Bromide, Dissolved mg/L	11	0.03	0.011	0.03	USGS 2012-2015 (7/9 non-detect)
Calcium, mg/L, dissolved	13	5.93	4.83	7.09	USGS 2012-2015
Carbon Dioxide, Total mg/L	13	1.0	0.8	1.7	USGS 2012-2015 mid-day
Chloride, mg/L, dissolved	13	11.0	5.8	15.3	USGS 2012-2015
Dissolved Oxygen, mg/L *	13	9.6	9.5	10.3	USGS 2012-2015 mid-day
Dissolved Oxygen Saturation, %	13	102	99	103	USGS 2012-2015 mid-day
Fecal Coliform, #/100 ml *					No data
Fluoride, Dissolved mg/L	13	0.04	0.04	0.05	USGS 2012-2015
Hardness as CaCO ₃ , mg/L, Total	13	20.5	17.0	24.7	USGS 2012-2015
Iron, Dissolved µg/L	12	18.7	9.5	47.1	USGS 2012-2015
Lithium, Dissolved µg/L	13	0.37	0.26	0.51	USGS 2012-2015 (1/10 non-detect)
Magnesium, mg/L, Dissolved	13	1.36	1.18	1.63	USGS 2012-2015
Manganese, Dissolved µg/L	13	2.50	1.73	3.17	USGS 2012-2015
Nitrate as N, mg/L, Dissolved	13	0.099	0.079	0.137	USGS 2012-2015 by algorithm
Nitrate + Nitrite as N, Dissolved mg/L *	13	0.099	0.08	0.137	USGS 2012-2015
Nitrite as N, Dissolved mg/L	13	<0.001	<0.001	<0.001	USGS 2012-2015 (11/13 non-detect)
Nitrogen as N, Total, mg/L *	12	0.230	0.190	0.270	USGS 2012-2015 by algorithm
Nitrogen, Kjeldahl as N, Total mg/L	12	0.115	0.090	0.180	USGS 2012-2015
Nitrogen, Organic, Total mg/L	12	0.07	0.07	0.11	USGS 2012-2015 by algorithm
pH, standard units *	13	7.5	7.4	7.5	USGS 2012-2015 mid-day
Phosphate as P, Dissolved mg/L	13	0.004	<0.004	0.006	USGS 2012-2015 (5/13 non-detect)
Phosphorus as P, Total mg/L *	12	<0.02	<0.02	<0.02	USGS 2012-2015 (11/12 non-detect)
Potassium, Dissolved mg/L	13	0.62	0.56	0.70	USGS 2012-2015
Silica, Dissolved mg/L	13	3.35	2.89	3.50	USGS 2012-2015
Sodium, Dissolved mg/L	13	7.72	5.09	9.52	USGS 2012-2015
Specific Conductance, µS/cm @25C	13	80	66	103	USGS 2012-2015
Strontium, Dissolved µg/L	13	22.4	19.0	26.7	USGS 2012-2015
Sulfate as SO ₄ , Dissolved mg/L	13	5.04	4.11	5.52	USGS 2012-2015
Temperature, Water, Degrees C	13	17.1	14.8	18.9	USGS 2012-2015 mid-day
Total Dissolved Solids, mg/L	13	50	37	57	USGS 2012-2015
Total Suspended Solids, mg/L *					No data
Turbidity, NTU	11	0.7	0.2	1.0	USGS 2012-2015

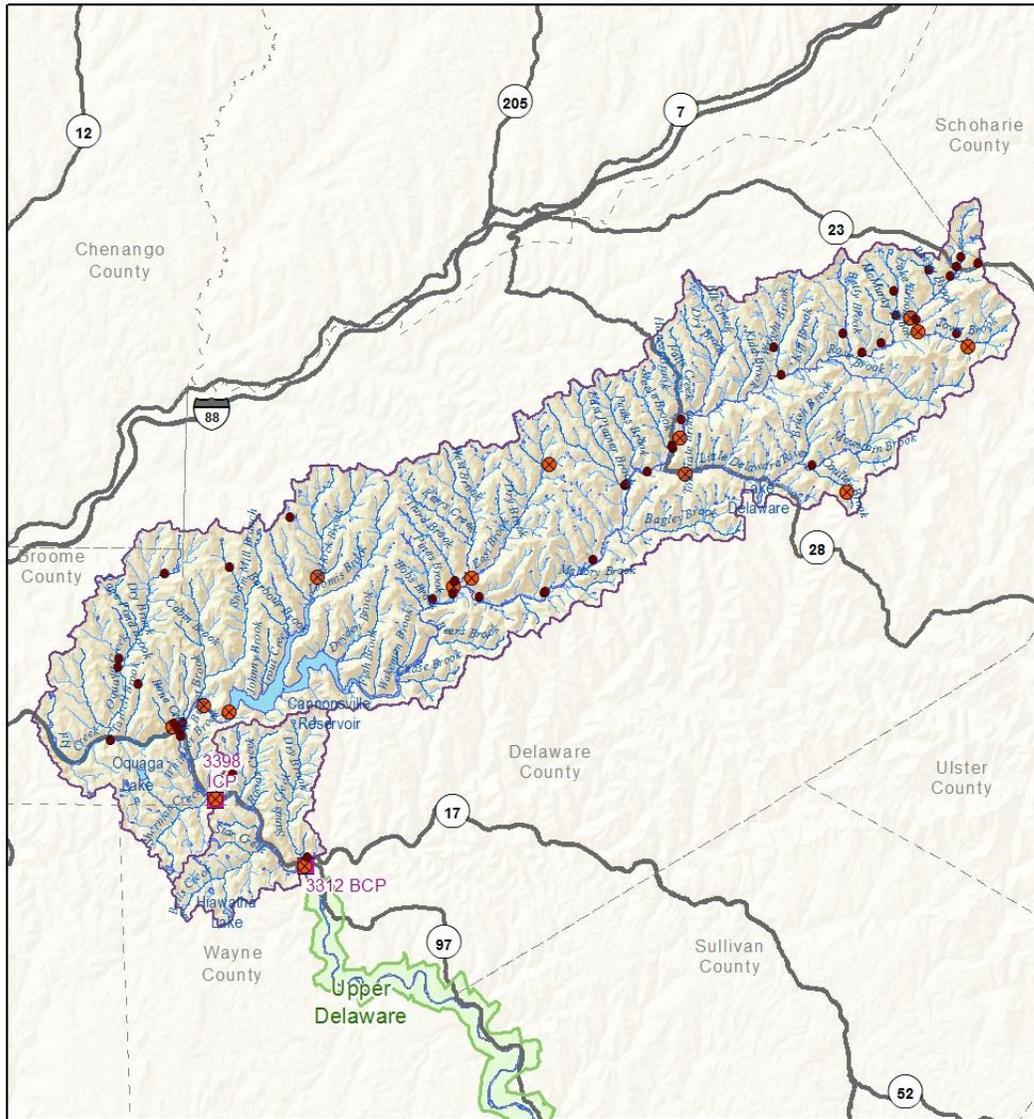
The concentrations shown above are based upon seasonal May through September mid-day grab samples. Additional data are available for non-seasonal October through April targets. For parameters that vary throughout each day (CO₂, DO, DO%, pH, water temperature) these values best represent daily maximum concentrations.

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

It is recommended that two more years of monitoring are necessary for full EWQ definition: samples should be taken bi-weekly (twice per month) during the May through September period, which would add 20 more results to the N listed for each parameter.

Upper Delaware Scenic and Recreational River: Outstanding Basin Waters

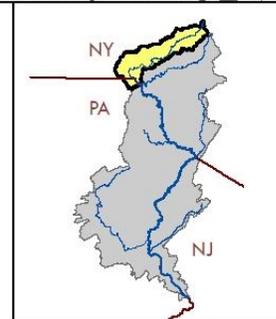
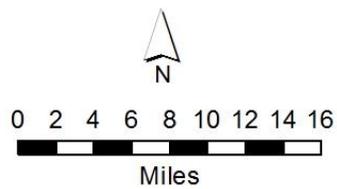
3312 ICP West Branch Delaware River at Rt. 191 Bridge, Hancock



West Branch Delaware River at Hale Eddy and Hancock

Drainage Area = 650.38 mi²

- NPDES
- Stream Gage
- Sampling Location
- NPS Boundary



3312 ICP West Branch Delaware River at Rt. 191 Bridge, Hancock

Latitude 41.952500 Longitude -75.291206 by GPS, NAD83 decimal degrees

USGS Site Number 01427000; PADEP Site Number WQN0104; NYSDEC Site Number 14041001

Watershed Population: 2000: 23,212 2010: 23,774 Change: +562 (+2.4%)

Drainage Area: 650 square miles, West Branch Delaware River DRBC Zone W (West Branch)

Site Specific EWQ defined 2006-2011

This site is located near the northern boundary of the Upper Delaware Scenic and Recreational River (UPDE)

Classified by DRBC as Outstanding Basin Waters

Nearest upstream Interstate Control Point: 3312 ICP West Branch Delaware River at Hale Eddy

Nearest downstream Interstate Control Point: 3216 ICP Delaware River at Lordville

Tributaries to Upstream Reach: 338.5 Roods Ck, NY; 337.1 Travis Brook, NY; 336.1 Faulkner Brook, PA; 3350 BCP Balls Creek, PA; 3319 BCP Sands Creek NY.

Known dischargers within watershed: Undefined

Watershed is 80 % forested; urban land cover is 0.82%. 100% glaciated. No carbonate rock. Mean annual precipitation 42.74 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics (calculated from Hale Eddy Gage):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
38,453.78	2,348.74	1,256.30	786.55	595.38	450.08	274.20	140.92	19.66

StreamStats Low-Flow Stream Statistics

M7D2Y (ft ³ /s)	121
M30D2Y (ft ³ /s)	153
M7D10Y (ft ³ /s)	70.4
M30D10Y (ft ³ /s)	85.9
M90D10Y (ft ³ /s)	120

StreamStats Mean/Baseflow Stream Statistics

QA (ft ³ /s)	1,120
QAH (ft ³ /s)	303
BF10YR (ft ³ /s)	418
BF25YR (ft ³ /s)	373
BF50YR (ft ³ /s)	346

StreamStats Peak-Flow Stream Statistics

PK2 (ft ³ /s)	17,500
PK5 (ft ³ /s)	27,700
PK10 (ft ³ /s)	35,800
PK50 (ft ³ /s)	57,300
PK100 (ft ³ /s)	68,000
PK500 (ft ³ /s)	97,100

Existing Water Quality: 3312 ICP West Branch Delaware River at Rt. 191 Bridge, Hancock

Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	61	15.00	14.30	15.60	1999-2011 SRMP, PADEP, NYSDEC
Aluminum, Dissolved mg/L	15	0.0020	0.0010	0.0044	2009,2010 SRMP
Ammonia-nitrogen as N, Total mg/L *	60	0.014	0.011	0.016	1999-2011 SRMP, PADEP, NYSDEC
Barium, Dissolved mg/L	15	0.019	0.016	0.022	2009,2010 SRMP
Calcium, Dissolved mg/L	42	6.34	6.06	6.63	1999-2010 PADEP, SRMP
Calcium, Total mg/L	34	6.64	6.40	6.95	1999-2009 PADEP, NYSDEC
Chloride, Total mg/L	50	12.45	11.80	12.70	2005-2011 SRMP, NYSDEC
Dissolved Oxygen mg/L mid-day*	57	10.20	9.99	10.60	1999-2011 SRMP, PADEP, NYSDEC, USGS
Dissolved Oxygen Saturation % mid-day	30	98.00	97.00	99.00	2009-2011 SRMP
Enterococcus #/100 ml	10	33.50	6.00	80.00	2008 SRMP (INSUFFICIENT DATA)
E. coli #/100 ml	10	24.00	4.00	60.00	2008 SRMP (INSUFFICIENT DATA)
Fecal Coliform #/100 ml *	47	30.00	20.00	52.00	1999-2011 SRMP, PADEP, NYSDEC
Hardness as CaCO ₃ , Total mg/L	61	23.58	22.60	24.40	1999-2011 SRMP, PADEP, NYSDEC
Iron, Dissolved µg/L	37	27.0	21.0	32.0	1999-2011 PADEP
Iron, Total µg/L	34	128.00	104.00	177.00	1999-2011 PADEP, NYSDEC
Magnesium, Dissolved mg/L	42	1.67	1.60	1.75	1999-2010 SRMP, PADEP
Magnesium, Total mg/L	34	1.73	1.63	1.81	1999-2009 PADEP, NYSDEC
Manganese, Dissolved µg/L	42	15.20	11.20	18.70	1999-2010 SRMP, PADEP
Manganese, Total µg/L	34	39.80	31.60	45.50	1999-2009 PADEP, NYSDEC
Nitrate as N, Total mg/L	31	0.11	0.08	0.34	1999-2008 PADEP, NYSDEC
Nitrate+Nitrite as N, Total mg/L *	53	0.36	0.32	0.42	2005-2011 SRMP, NYSDEC
Nitrogen as N, Total mg/L *	60	0.56	0.51	0.60	2004-2011 SRMP, PADEP
Nitrogen, Kjeldahl as N, Total mg/L	53	0.18	0.17	0.21	2005-2011 SRMP, NYSDEC
pH, units mid-day*	70	7.58	7.50	7.66	1999-2011 SRMP, NYSDEC, PADEP
Phosphate as P, Total mg/L	59	0.006	0.004	0.010	2002-2011 SRMP, PADEP
Phosphorus as P, Total mg/L *	66	0.010	0.009	0.012	1999-2011 SRMP, PADEP, NYSDEC
Potassium, Dissolved mg/L	15	0.88	0.73	0.95	2009-2010 SRMP
Sodium, Dissolved mg/L	15	6.89	6.10	7.63	2009-2010 SRMP
Specific Conductance µS/cm	70	89.40	86.00	92.30	1999-2011 SRMP, NYSDEC, PADEP
Strontium, Dissolved mg/L	15	0.019	0.018	0.022	2009-2010 SRMP
Sulfate, Total mg/L	15	6.04	5.38	6.16	2009-2010 SRMP
Temperature, Water Deg. C mid-day	63	13.30	12.50	14.60	1999-2011 SRMP, PADEP, NYSDEC
Total Dissolved Solids (TDS) mg/L	74	52.57	51.30	54.40	1999-2011 SRMP, PADEP, NYSDEC
Total Suspended Solids (TSS) mg/L *	61	2.10	2.00	2.95	1999-2011 SRMP, PADEP, NYSDEC
Turbidity NTU	40	1.61	1.11	2.73	2005-2011 SRMP, NYSDEC

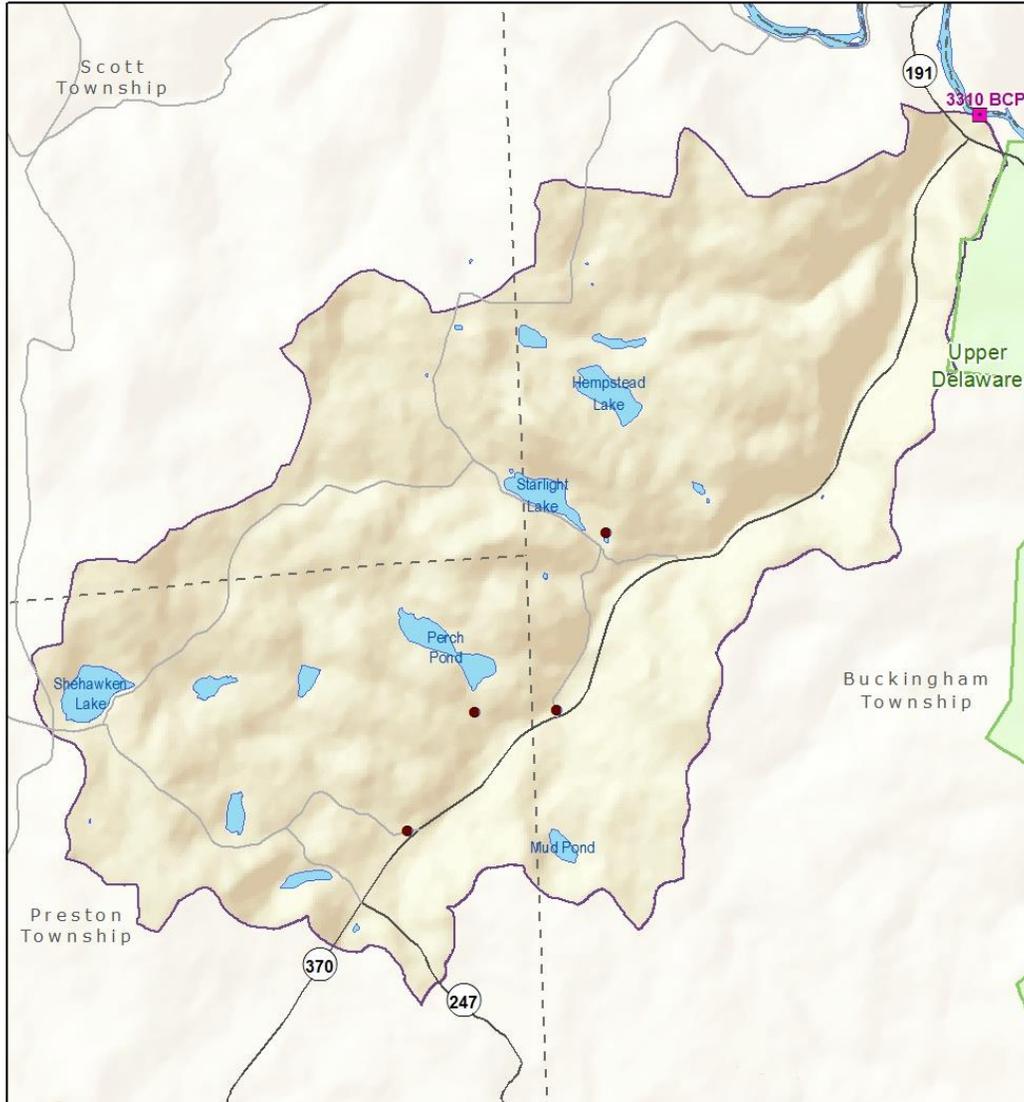
Two-tailed confidence limits were used for these EWQ targets.

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ.

Implementation guidance should be consulted for discharge evaluations.

Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

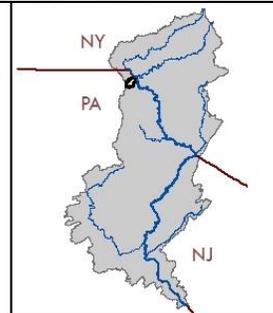
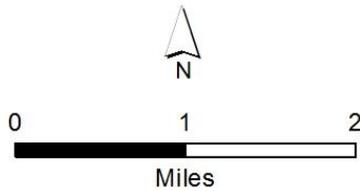
3310 BCP Shehawken Creek, PA



Shehawken Creek

Drainage Area = 15.99 mi²

- Sampling Location
- Other Sampling Location
- NPDES
- Drainage Area
- NPS Boundary



3310 BCP Shehawken Creek, PA

Wayne County, PA. Latitude 41.941995 Longitude -75.287805 by GPS NAD83 decimal degrees

USGS Site No. 01427110

Watershed Population: 2000: 290 2010: 290 Change: 0 (0.0%)

Drainage Area: 15.97 square miles, tributary to West Branch Delaware River Zone W (West Branch)

EWQ definition by USGS/NPS, partial data set only (n=11 May-September values)

This tributary to the West Branch Delaware River was added to the list of control points because of necessity to establish baseline water quality conditions prior to potential natural gas development activities.

Nearest upstream Interstate Control Point: 3312 ICP West Branch Delaware River at Hancock

Nearest downstream Interstate Control Point: 3216 ICP Delaware River at Lordville

Known dischargers within watershed: Undefined

Watershed is 82.4 % forested; urban land cover is 0.37%. 100% glaciated. No carbonate rock. Mean annual precipitation 44.1 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics (estimated using USGS BaSE Model):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
1,718.98	67.49	35.01	23.74	18.43	11.62	6.32	2.96	0.48

StreamStats Low-Flow Stream Statistics

M7D2Y (ft ³ /s)	1.94
M30D2Y (ft ³ /s)	2.72
M7D10Y (ft ³ /s)	0.78
M30D10Y (ft ³ /s)	1.11
M90D10Y (ft ³ /s)	1.84

StreamStats Mean/Baseflow Stream Statistics

QA (ft ³ /s)	28.0
QAH (ft ³ /s)	6.59
BF10YR (ft ³ /s)	11.3
BF25YR (ft ³ /s)	10.1
BF50YR (ft ³ /s)	9.37

StreamStats Peak-Flow Stream Statistics

PK2 (ft ³ /s)	677
PK5 (ft ³ /s)	1170
PK10 (ft ³ /s)	1560
PK50 (ft ³ /s)	2630
PK100 (ft ³ /s)	3160
PK500 (ft ³ /s)	4650

3310 BCP Shehawken Creek, PA (Insufficient Data)

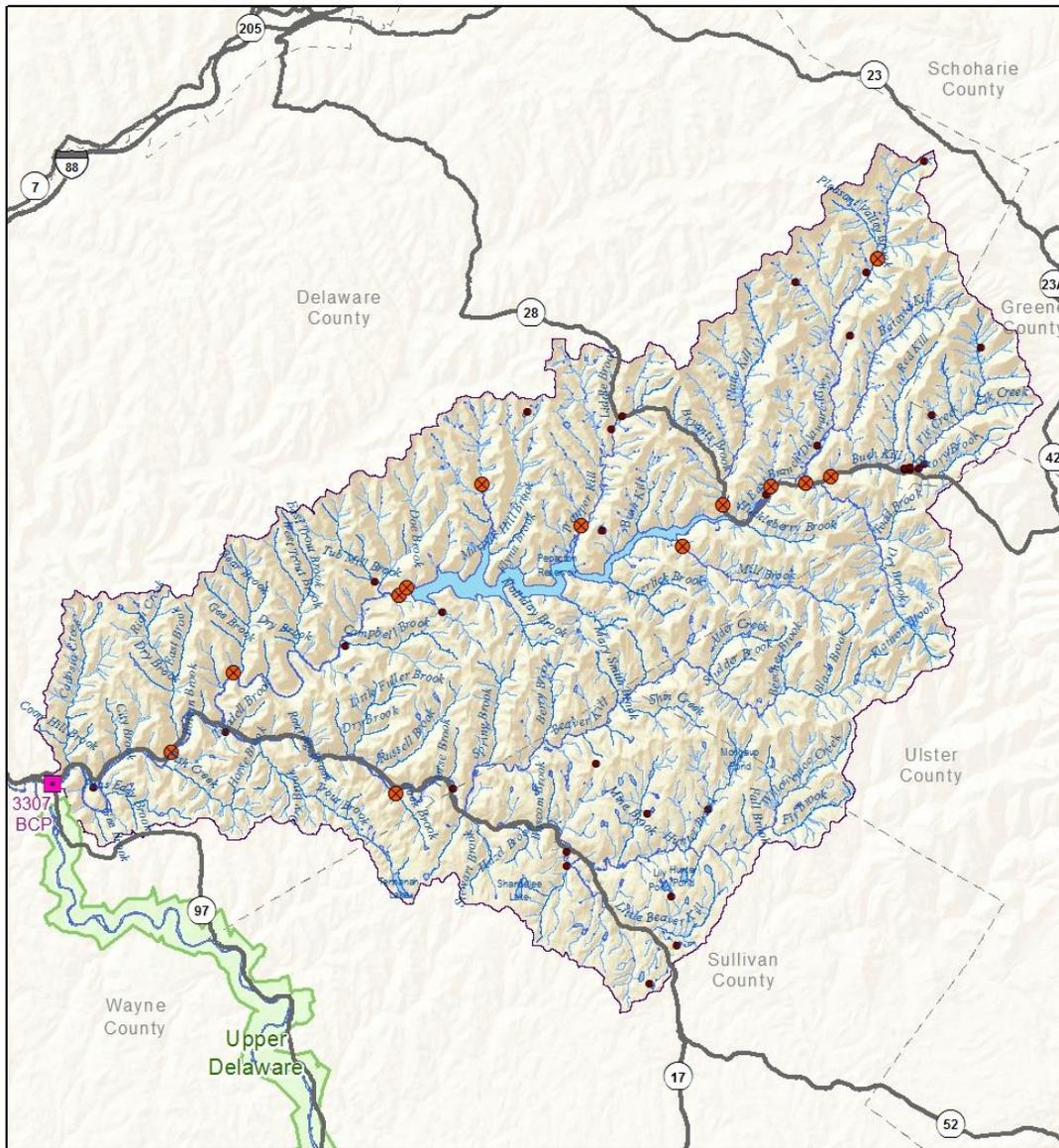
Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , mg/L, total	15	20	17.4	23.6	USGS 2012-2015
Ammonia as N, mg/L, dissolved *	12	<0.01	<0.01	0.01	USGS 2012-2015 (6/12 ND)
Barium, Dissolved µg/L	12	20.0	16.8	21.8	USGS 2012-2015
Boron, Dissolved µg/L	12	6.7	5.7	7.0	USGS 2012-2015
Bromide, Dissolved mg/L	10	<0.03	<0.015	0.03	USGS 2012-2015 (6/10 ND)
Calcium, mg/L, dissolved	12	7.79	6.52	8.33	USGS 2012-2015
Chloride, mg/L, dissolved	12	6.88	6.03	8.78	USGS 2012-2015
Dissolved Oxygen, mg/L mid-day *	12	9.6	9.4	10.3	USGS 2012-2015
Dissolved Oxygen Saturation, % mid-day	12	102.5	98	106	USGS 2012-2015
Fecal Coliform, #/100 ml *					No data
Fluoride, Dissolved mg/L	12	0.04	0.04	0.05	USGS 2012-2015
Hardness as CaCO ₃ , mg/L, Total		24.7	20.6	26.6	USGS 2012-2015
Iron, Dissolved µg/L	12	9.7	4.5	23.1	USGS 2012-2015 (1/12 ND)
Lithium, Dissolved µg/L	12	0.44	0.22	0.55	USGS 2012-2015 (1/12 ND)
Magnesium, mg/L, Dissolved	12	1.29	1.05	1.39	USGS 2012-2015
Manganese, Dissolved µg/L	12	1.72	1.6	2.11	USGS 2012-2015
Nitrate as N, mg/L, Dissolved	12	1.14	0.901	1.41	USGS 2012-2015 by algorithm
Nitrate + Nitrite as N, Dissolved mg/L *	12	0.259	0.203	0.319	USGS 2012-2015
Nitrite as N, Dissolved mg/L	12	<0.001	<0.001	<0.001	USGS 2012-2015 (12/12 ND)
Nitrogen as N, Total, mg/L *	12	0.39	0.32	0.46	USGS 2012-2015 by algorithm
Nitrogen, Kjeldahl as N, Total mg/L	12	0.13	0.10	0.18	USGS 2012-2015 (1/12 ND)
Nitrogen, Organic, Total mg/L	12	0.12	0.10	0.18	USGS 2012-2015 by algorithm
pH, standard units mid-day *	11	7.8	7.5	8.1	USGS 2012-2015
Phosphate as P, Dissolved mg/L	12	0.01	0.007	0.012	USGS 2012-2015
Phosphorus as P, Total mg/L *	12	<0.02	<0.02	<0.02	USGS 2012-2015 (9/12 ND)
Potassium, Dissolved mg/L	12	0.93	0.82	0.99	USGS 2012-2015
Silica, Dissolved mg/L	12	2.52	2.4	2.76	USGS 2012-2015
Sodium, Dissolved mg/L	12	5.28	4.54	5.87	USGS 2012-2015
Specific Conductance, µS/cm @25C	12	82	73	86	USGS 2012-2015
Strontium, Dissolved µg/L	12	27.9	23.8	31.6	USGS 2012-2015
Sulfate as SO ₄ , Dissolved mg/L	12	4.35	4.1	4.83	USGS 2012-2015
Temperature, Water, Degrees C mid-day	12	17.8	16.5	19.3	USGS 2012-2015
Total Dissolved Solids, mg/L	12	49	37	55	USGS 2012-2015
Total Suspended Solids, mg/L *					No data
Turbidity, NTU	12	0.6	0.2	0.9	USGS 2012-2015

The concentrations shown above are based upon seasonal May through September mid-day grab samples. Additional data are available for non-seasonal October through April targets. For parameters that vary throughout each day (CO₂, DO, DO%, pH, water temperature) these values best represent daily maximum concentrations.

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

It is recommended that two more years of monitoring are necessary for full EWQ definition: samples should be taken bi-weekly (twice per month) during the May through September period, which would add 20 more results to the N listed for each parameter.

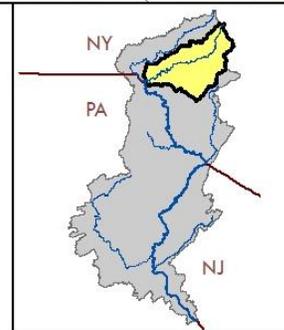
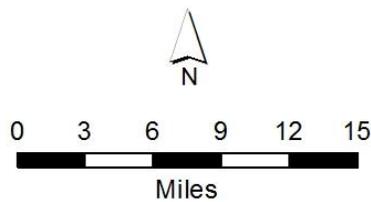
3307 BCP East Branch Delaware River at Rt. 97, Hancock



East Branch Delaware River

Drainage Area = 838.48 mi²

- Sampling Location
- Drainage Area
- NPDES
- Stream Gage
- NPS Boundary



3307 BCP East Branch Delaware River at Rt. 97, Hancock

Delaware County, New York. Latitude 41.952817 Longitude -75.277121 by GPS, NAD83 decimal degrees

USGS Site Number 01421500 (Fish Eddy Gage) NYSDEC Site Number 14031001

Watershed Population: 2000: 17,165 2010: 16537 Change: -628 (-3.7%)

Drainage Area: 856 square miles, tributary to Delaware River Zone 1A

Site Specific EWQ defined 2006-2011

This site is located near the northern boundary of the Upper Delaware Scenic and Recreational River (UPDE)

Classified by DRBC as Outstanding Basin Waters

Nearest upstream Interstate Control Point: 3312 ICP West Branch Delaware River at Hale Eddy

Nearest downstream Interstate Control Point: 3216 ICP Delaware River at Lordville

Known dischargers within watershed: Undefined

Watershed is 91.8% forested; urban land cover is 0.59%. 100% glaciated. No carbonate rock. Mean annual precipitation 43.9 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics (calculated from Fish Eddy Gage):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
55,700	3,110	1,600	974	756	598	400	241	68

StreamStats Low-Flow Stream Statistics

M7D2Y (ft ³ /s)	225
M30D2Y (ft ³ /s)	275
M7D10Y (ft ³ /s)	146
M30D10Y (ft ³ /s)	167
M90D10Y (ft ³ /s)	224

StreamStats Mean/Baseflow Stream Statistics

QA (ft ³ /s)	1,590
QAH (ft ³ /s)	466
BF10YR (ft ³ /s)	626
BF25YR (ft ³ /s)	563
BF50YR (ft ³ /s)	526

StreamStats Peak-Flow Stream Statistics

PK2 (ft ³ /s)	21,800
PK5 (ft ³ /s)	34,300
PK10 (ft ³ /s)	44,300
PK50 (ft ³ /s)	70,600
PK100 (ft ³ /s)	83,700
PK500 (ft ³ /s)	119,000

Existing Water Quality: 3307 BCP East Branch Delaware River at Rt. 97, Hancock

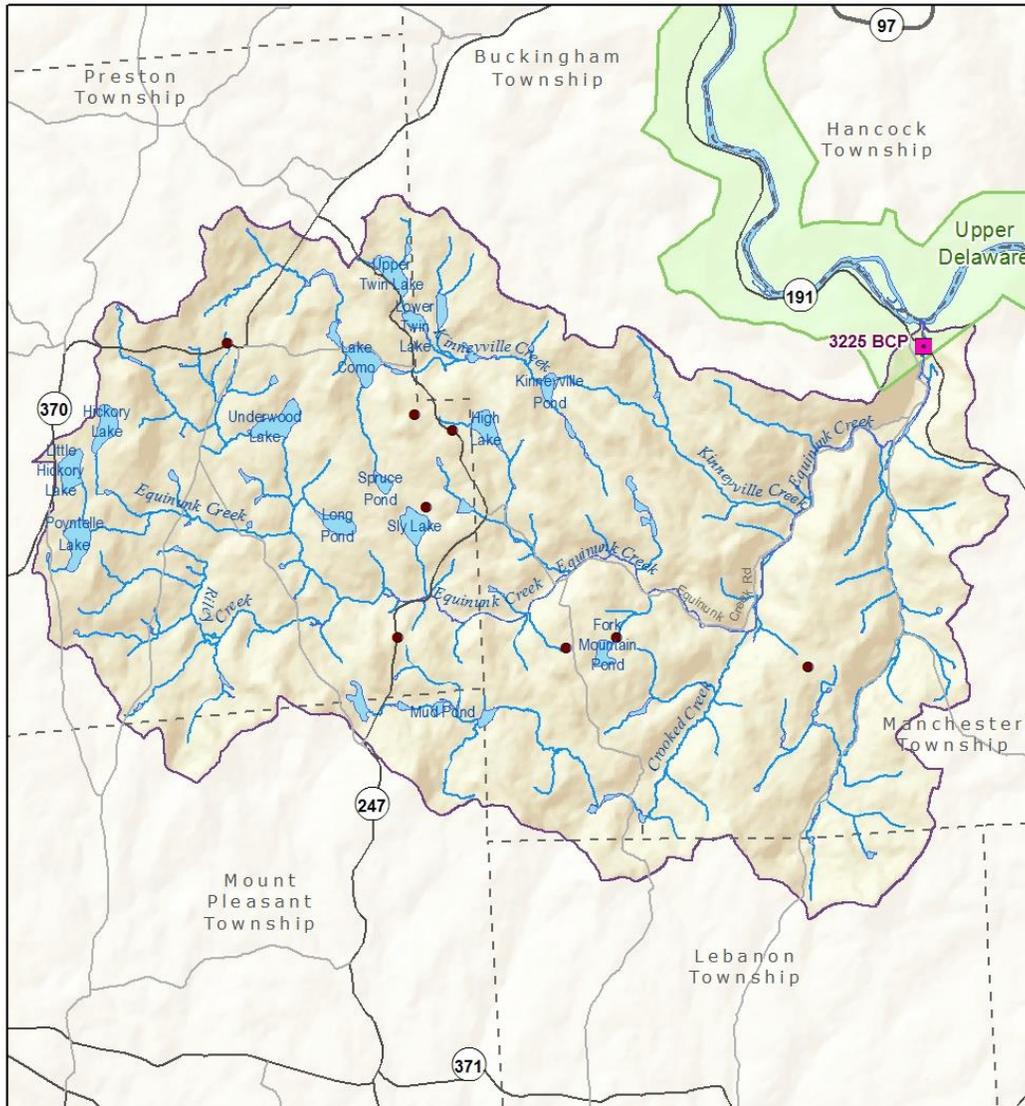
Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	80	13.6	12.6	15.0	2005-2011 SRMP, USGS, NYSDEC
Aluminum, Dissolved mg/L	15	0.003	0.002	0.005	2009-2010 SRMP
Ammonia-Nitrogen as N, Total mg/L *	79	0.016	0.011	0.020	2005-2011 SRMP, USGS, NYSDEC
Barium, Dissolved mg/L	15	0.019	0.018	0.023	2009-2010 SRMP archived samples
Calcium, Dissolved mg/L	45	5.54	5.26	5.90	2006-2010 SRMP, USGS
Chloride, Dissolved mg/L	30	6.65	5.30	7.50	2006-2007 USGS
Chloride, Total mg/L	50	8.73	7.80	9.50	2005-2011 SRMP, NYSDEC
Dissolved Oxygen (DO) mg/L mid-day*	44	9.20	8.90	9.70	2005-2011 SRMP, NYSDEC, USGS
Dissolved Oxygen Saturation % mid-day	30	98.0	96.0	98.0	2009-2011 SRMP
Enterococcus #/100ml	11	100	2	240	2008 SRMP (Insufficient N for EWQ)
Escherichia coli #/100ml	11	10	3	130	2008 SRMP (Insufficient N for EWQ)
Fecal coliform #/100ml *	38	18	12	30	2005,2009-2011 SRMP, NYSDEC
Hardness as CaCO ₃ , Total mg/L	80	20	18	21	2005-2011 SRMP, USGS, NYSDEC
Magnesium, Dissolved mg/L	45	1.08	1.02	1.15	2006-2010 SRMP, USGS
Manganese, Dissolved µg/L	15	8.3	5.6	10.3	2009-2010 SRMP archived samples
Nitrate as N, Dissolved mg/L	30	0.28	0.21	0.31	2006-2007 USGS
Nitrate+Nitrite as N, Total mg/L *	55	0.14	0.13	0.17	2005-2011 SRMP, NYSDEC
Nitrogen as N, Dissolved mg/L	29	0.39	0.25	0.48	2006-2007 USGS
Nitrogen as N, Total mg/L *	48	0.29	0.26	0.32	2007-2011 SRMP
Nitrogen, Kjeldahl as N, Total mg/L	55	0.16	0.14	0.17	2005-2011 SRMP, NYSDEC
Organic Carbon, Dissolved mg/L	30	1.9	1.5	2.6	2006-2007 USGS
pH, units mid-day*	42	7.61	7.55	7.70	2005, 2009-2011 SRMP, NYSDEC
Phosphate as P, Total mg/L	44	0.003	0.002	0.003	2008-2011 SRMP
Phosphorus as P, Total mg/L *	64	0.006	0.005	0.007	2005-2011 SRMP, USGS, NYSDEC
Potassium, Dissolved mg/L	15	0.57	0.46	0.63	2009-2010 SRMP archived samples
Sodium, Dissolved mg/L	15	5.17	4.24	5.97	2009-2010 SRMP archived samples
Specific Conductance µS/cm	42	70.4	65.0	76.0	2005, 2009-2011 SRMP, NYSDEC
Strontium, Dissolved mg/L	15	0.021	0.019	0.023	2009-2010 SRMP archived samples
Sulfate, Total mg/L	15	5.28	5.00	5.59	2009-2010 SRMP archived samples
Sulfate as SO ₄ , Dissolved mg/L	30	5.95	5.70	6.10	2006-2007 USGS
Temperature, Water degrees C mid-day	61	17.3	16.8	18.4	2005-2011 SRMP, USGS, NYSDEC
Total Dissolved Solids (TDS) mg/L	50	38.26	35.85	42.20	2005-2011 SRMP, NYSDEC
Total Suspended Solids (TSS) mg/L *	50	1.47	1.25	2.25	2005-2011 SRMP, NYSDEC
Turbidity NTU	64	2.34	1.20	5.54	2005-2011 SRMP, USGS, NYSDEC

Two-tailed confidence limits were used for these EWQ targets.

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

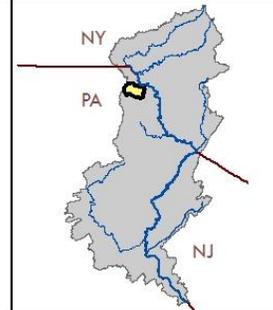
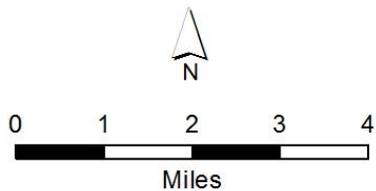
3225 BCP Equinunk Creek at Rt. 191



Equinunk Creek

Drainage Area = 57.56 mi²

- Sampling Location
- NPDES
- Drainage Area
- NPS Boundary



3225 BCP Equinunk Creek at Rt. 191

Wayne County, Pennsylvania. Latitude 41.853253 Longitude -75.224885 by GPS NAD83 decimal degrees.

USGS Site No. 01427203

Watershed Population: 2000: 1,136 2010: 1,002 Change: -134 (-11.8%)

Drainage Area: 57.7 square miles, tributary to Delaware River Zone 1A

Site Specific EWQ defined 2006-2011

This watershed is tributary to the Upper Delaware Scenic and Recreational River (UPDE)

Classified by DRBC as Outstanding Basin Waters

Nearest upstream Interstate Control Point: 3312 ICP West Branch Delaware River at Hancock

Nearest downstream Interstate Control Point: 3216 ICP Delaware River at Lordville

Known dischargers within watershed: Undefined

Watershed is 85% forested; urban land cover is 0.46%. 100% glaciated. No carbonate rock. Mean annual precipitation 44.2 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics (USGS BaSE Model):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
5,837	254.5	131.4	89.5	69.8	43.1	23.7	11.1	1.67

StreamStats Low-Flow Stream Statistics

M7D2Y (ft ³ /s)	9.14
M30D2Y (ft ³ /s)	12.2
M7D10Y (ft ³ /s)	4.28
M30D10Y (ft ³ /s)	5.70
M90D10Y (ft ³ /s)	8.80

StreamStats Mean/Baseflow Stream Statistics

QA (ft ³ /s)	103
QAH (ft ³ /s)	26.5
BF10YR (ft ³ /s)	41.7
BF25YR (ft ³ /s)	37.3
BF50YR (ft ³ /s)	34.8

StreamStats Peak-Flow Stream Statistics

PK2 (ft ³ /s)	2,050
PK5 (ft ³ /s)	3,440
PK10 (ft ³ /s)	4,560
PK50 (ft ³ /s)	7,530
PK100 (ft ³ /s)	9,030
PK500 (ft ³ /s)	13,200

Existing Water Quality: 3225 BCP Equinunk Creek at Rt. 191, PA

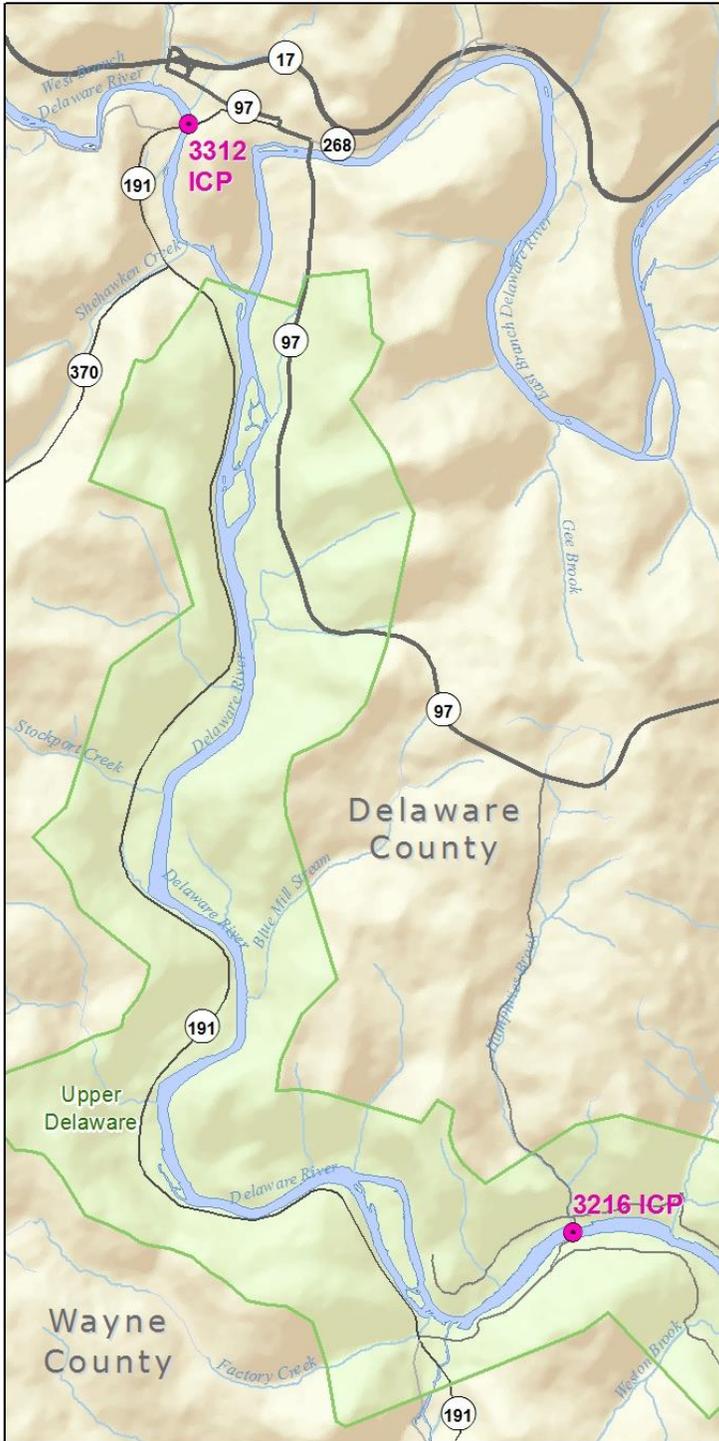
Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	54	17.25	14.90	19.40	2006-2011 SRMP
Aluminum, Dissolved, mg/L	15	0.0023	0.0014	0.0044	2009-2010 SRMP archived samples
Ammonia-Nitrogen as N, Total mg/L *	51	0.010	0.008	0.011	2006-2011 SRMP
Barium, Dissolved mg/L	15	0.017	0.016	0.019	2009-2010 SRMP archived samples
Calcium, Dissolved mg/L	15	6.35	5.71	7.51	2009-2010 SRMP archived samples
Chloride, Total mg/L	54	4.83	4.23	5.18	2006-2011 SRMP
Dissolved Oxygen (DO) mg/L *	52	9.25	9.00	9.50	2001-2011 SRMP, USGS
Dissolved Oxygen Saturation %	42	97	96	98	2001-2011 SRMP, USGS
Enterococcus #/100ml	12	21	8	32	2007 SRMP
Escherichia coli #/100ml	12	21	4	30	2007 SRMP
Fecal coliform #/100ml *	66	22	18	32	2006-2011 SRMP
Hardness as CaCO ₃ , Total mg/L	54	22.6	20.00	24.00	2006-2011 SRMP
Magnesium, Dissolved mg/L	15	0.94	0.79	1.02	2009-2010 SRMP archived samples
Manganese, Dissolved µg/L	15	8.20	4.90	10.10	2009-2010 SRMP archived samples
Nitrate+Nitrite as N, Total mg/L *	44	0.049	0.044	0.062	2007-2011 SRMP
Nitrogen as N, Total mg/L *	44	0.210	0.198	0.223	2007-2011 SRMP
Nitrogen, Kjeldahl as N, Total mg/L	44	0.157	0.140	0.173	2007-2011 SRMP
pH units *	52	7.54	7.48	7.59	2001-2011 SRMP, USGS
Phosphate as P, Total mg/L	44	0.004	0.004	0.005	2007-2011 SRMP
Phosphorus as P, Total mg/L *	44	0.008	0.007	0.009	2007-2011 SRMP
Potassium, Dissolved mg/L	15	0.67	0.54	0.85	2009-2010 SRMP archived samples
Sodium, Dissolved mg/L	15	2.87	2.55	3.40	2009-2010 SRMP archived samples
Specific Conductance µS/cm	52	66.5	62.0	71.0	2001-2011 SRMP, USGS
Strontium, Dissolved mg/L	15	0.020	0.018	0.025	2009-2010 SRMP archived samples
Sulfate, Total mg/L	15	4.87	4.26	4.97	2009-2010 SRMP archived samples
Temperature, Water, degrees C	52	17.75	16.70	18.60	2001-2011 SRMP, USGS
Total Dissolved Solids (TDS) mg/L	54	39.05	36.55	40.10	2006-2011 SRMP
Total Suspended Solids (TSS) mg/L *	48	1.05	0.75	1.45	2006-2011 SRMP
Turbidity NTU	53	1.42	0.85	5.00	2006-2011 SRMP

Two-tailed confidence limits were used for these EWQ targets.

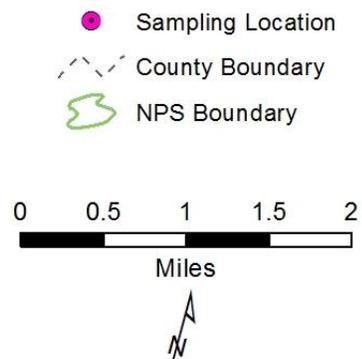
* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

3216 ICP Delaware River at Lordville



3216 ICP
Delaware River at Lordville Bridge



3216 ICP Delaware River at Lordville

USGS Site No. 01427207 – discharge and water temperature continuous monitor.

Latitude 41.867739 Longitude -75.213816 NAD83 decimal degrees

Watershed Population figures were not calculated for main-stem Delaware River sites.

Drainage Area: 1,590 square miles, Delaware River Zone 1A

Site Specific EWQ defined 2006-2011, DRBC/NPS Scenic Rivers Monitoring Program

This site is located in the Upper Delaware Scenic and Recreational River (UPDE)

Classified by DRBC as Outstanding Basin Waters

Nearest upstream Interstate Control Point: 3312 ICP West Branch Delaware River at Hancock

Nearest downstream Interstate Control Point: 3126 ICP Delaware River at Kellams Bridge

Known dischargers within watershed: Undefined

Tributaries to upstream reach: 3310 BCP Shehawken Creek, PA; 3307 BCP East Branch Delaware River, NY; 3225 BCP Equinunk Creek, PA; small tributary 322.0 Factory Creek, PA.

No Stream Stats web site data available (drainage area too large to calculate on web site).

Flow Statistics (2007-2014 gage record):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
126,000	6,490	3,510	2,410	1,940	1,570	1,190	927	391

Existing Water Quality: 3216 ICP Delaware River at Lordville

Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	62	13.85	13.20	14.40	2006-2011 SRMP
Aluminum, Dissolved mg/L	15	0.002	0.002	0.004	2009-2010 SRMP archived samples
Ammonia-Nitrogen as N, Total mg/L *	59	0.011	0.010	0.012	2006-2011 SRMP
Barium, Dissolved mg/L	15	0.019	0.017	0.022	2009-2010 SRMP archived samples
Calcium, Dissolved mg/L	15	5.57	5.23	6.02	2009-2010 SRMP archived samples
Chloride, Total mg/L	62	9.88	9.38	10.50	2006-2011 SRMP
Dissolved Oxygen (DO) mg/L *	58	9.40	9.20	9.50	2006-2011 SRMP
Dissolved Oxygen Saturation %	40	97	96	98	2007-2011 SRMP
Enterococcus #/100ml	21	10	4	19	2007-2008 SRMP
Escherichia coli #/100ml	21	6	4	11	2007-2008 SRMP
Fecal Coliform #/100ml *	66	12	10	19	2006-2011 SRMP
Hardness as CaCO ₃ , Total mg/L	62	21.10	20.20	23.00	2006-2011 SRMP
Magnesium, Dissolved mg/L	15	1.40	1.23	1.52	2009-2010 SRMP archived samples
Manganese, Dissolved µg/L	15	9.40	5.00	12.20	2009-2010 SRMP archived samples
Nitrate+Nitrite as N, Total mg/L *	52	0.22	0.19	0.26	2007-2011 SRMP
Nitrogen as N, Total mg/L *	52	0.41	0.37	0.45	2007-2011 SRMP
Nitrogen, Kjeldahl as N, Total (TKN) mg/L	52	0.18	0.16	0.19	2007-2011 SRMP
pH units *	50	7.61	7.57	7.69	2006-2011 SRMP
Phosphate as P, Total mg/L	52	0.0028	0.0024	0.0032	2007-2011 SRMP
Phosphorus as P, Total mg/L *	52	0.0070	0.0062	0.0080	2007-2011 SRMP
Potassium, Dissolved mg/L	15	0.72	0.58	0.81	2009-2010 SRMP archived samples
Sodium, Dissolved mg/L	15	6.19	5.09	6.26	2009-2010 SRMP archived samples
Specific Conductance µS/cm	50	76.5	71.0	78.0	2006-2011 SRMP
Strontium, Dissolved mg/L	15	0.019	0.018	0.021	2009-2010 SRMP archived samples
Sulfate, Total mg/L	15	5.39	5.30	5.87	2009-2010 SRMP archived samples
Temperature, Water degrees C	50	16.8	15.9	17.7	2006-2011 SRMP
Total Dissolved Solids (TDS) mg/L	62	43.95	42.20	45.80	2006-2011 SRMP
Total Suspended Solids (TSS) mg/L *	57	1.90	1.35	3.50	2006-2011 SRMP
Turbidity NTU	52	4.14	1.59	6.00	2006-2011 SRMP

Two-tailed confidence limits were used for EWQ targets.

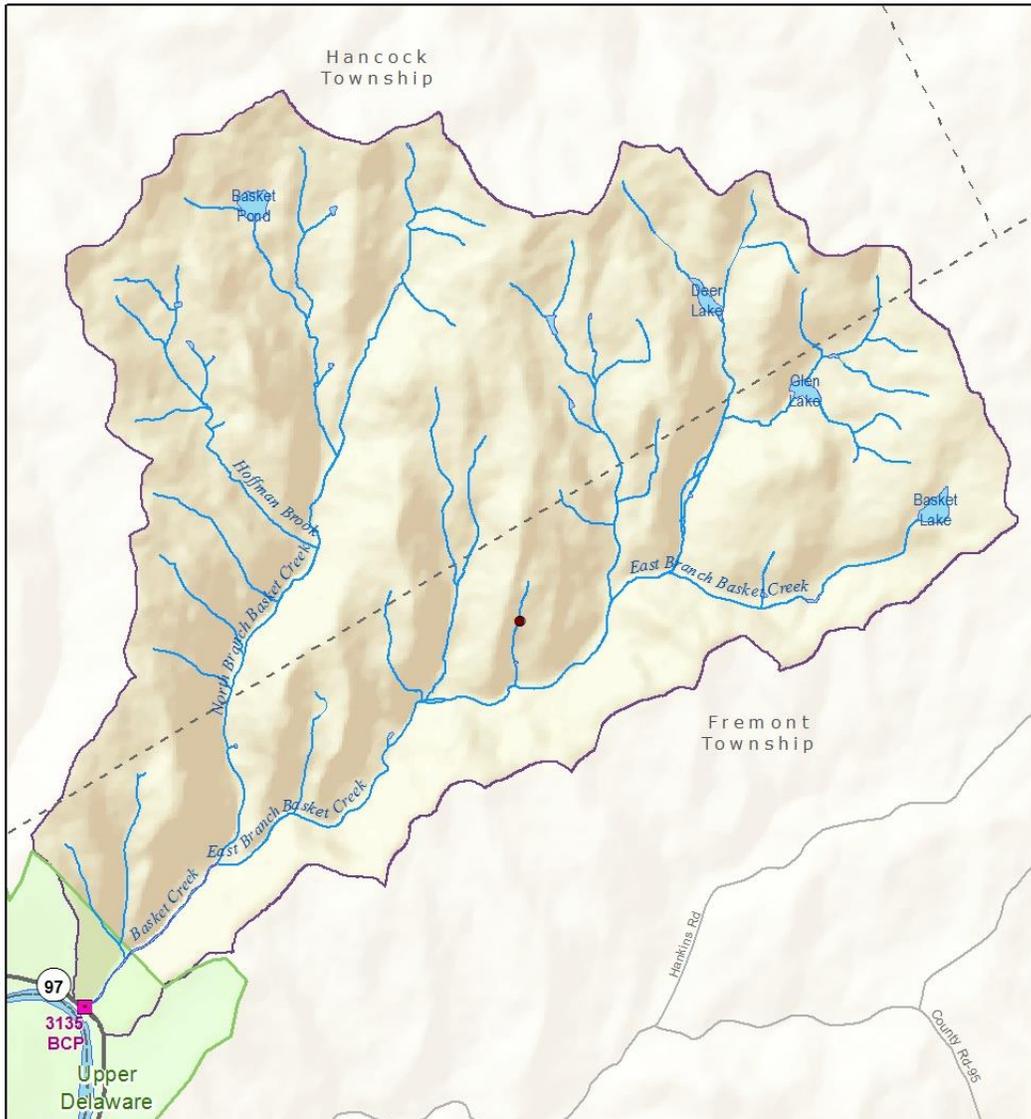
* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

Data Sources:

SRMP: DRBC/NPS Scenic Rivers Monitoring Program; USGS: U.S. Geological Survey; PADEP: Pennsylvania Department of Environmental Protection; NYSDEC: New York State Department of Environmental Control

Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

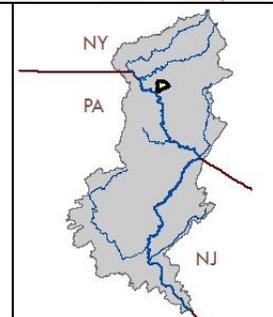
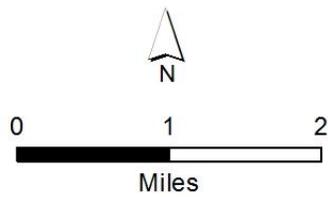
3135 BCP Basket Creek above Rt. 97, NY



Basket Creek

Drainage Area = 22.55 mi²

- Sampling Location
- Other Sampling Location
- NPDES
- Drainage Area
- NPS Boundary



3135 BCP Basket Creek above Rt. 97, NY

Sullivan County, New York. USGS Site No. 01427280, Latitude 41.844846 Longitude -75.113525 NAD83 decimal degrees

Watershed Population: 2000: 240 2010: 226 Change: -14 (-5.8%)

Drainage Area: 22.6 square miles, tributary to Delaware River Zone 1A

EWQ definition by USGS/NPS, partial data set only (n=11 May-September values)

This watershed is tributary to the Upper Delaware Scenic and Recreational River (UPDE)

Classified by DRBC as Outstanding Basin Waters

Nearest upstream Interstate Control Point: 3216 ICP Delaware River at Lordville

Nearest downstream Interstate Control Point: 3126 ICP Delaware River at Kellams Bridge

Known dischargers within watershed: Undefined

Watershed is 93.6% forested; urban land cover is 0.03%. 100% glaciated. No carbonate rock. Mean annual precipitation 44.5 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics (USGS BaSE Model):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
2,437	100.3	57.1	35.6	27.7	16.96	9.58	4.27	0.79

StreamStats Low-Flow Stream Statistics

M7D2Y (ft ³ /s)	3.66
M30D2Y (ft ³ /s)	4.97
M7D10Y (ft ³ /s)	1.61
M30D10Y (ft ³ /s)	2.16
M90D10Y (ft ³ /s)	3.46

StreamStats Mean/Baseflow Stream Statistics

QA (ft ³ /s)	41.6
QAH (ft ³ /s)	10.3
BF10YR (ft ³ /s)	17.6
BF25YR (ft ³ /s)	15.8
BF50YR (ft ³ /s)	14.8

StreamStats Peak-Flow Stream Statistics

PK2 (ft ³ /s)	988
PK5 (ft ³ /s)	1,690
PK10 (ft ³ /s)	2,250
PK50 (ft ³ /s)	3,740
PK100 (ft ³ /s)	4,439
PK500 (ft ³ /s)	6,530

Existing Water Quality: 3135 BCP Basket Creek, NY (Insufficient Data)

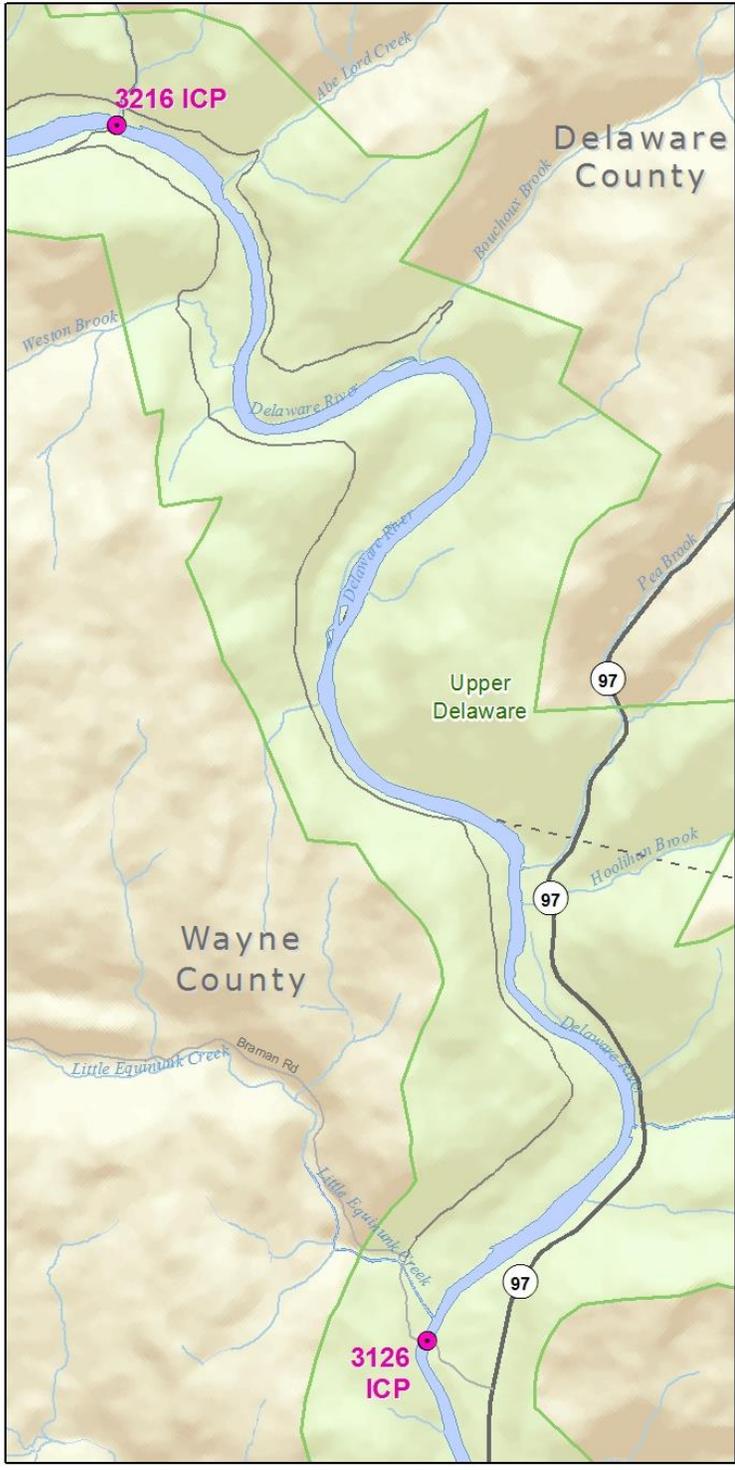
Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	15	19.1	16.2	20.3	USGS 2012-2015
Ammonia as N, Dissolved mg/L *	12	<0.01	<0.01	<0.01	USGS 2012-2015 (10/12 ND)
Barium, Dissolved µg/L	12	32.5	30.0	34.1	USGS 2012-2015
Boron, Dissolved µg/L	12	5.2	4.5	5.5	USGS 2012-2015
Bromide, Dissolved mg/L	10	<0.03	<0.01	<0.03	USGS 2012-2015 (9/10 ND)
Calcium, Dissolved mg/L	14	7.68	6.44	8.88	USGS 2012-2015
Carbon Dioxide, Total mg/L	12	0.9	0.7	1.0	USGS 2012-2015 mid-day
Chloride, Dissolved mg/L	14	5.05	3.80	7.38	USGS 2012-2015
Chloride, Total mg/L					No Data
Dissolved Oxygen, mg/L *	12	9.95	9.50	10.40	USGS 2012-2015 mid-day
Dissolved Oxygen Saturation, %	12	102	101	104	USGS 2012-2015 mid-day
Fecal Coliform, #/100 ml *					No Data
Fluoride, Dissolved mg/L	12	<0.04	<0.04	<0.04	USGS 2012-2015
Hardness as CaCo ₃ , Total mg/L	14	23.5	20.0	27.2	USGS 2012-2015
Iron, Dissolved µg/L	12	5.9	4.0	12.7	USGS 2012-2015
Lithium, Dissolved µg/L	12	0.58	0.42	0.70	USGS 2012-2015
Magnesium, Dissolved mg/L	14	1.045	0.907	1.210	USGS 2012-2015
Manganese, Dissolved µg/L	12	2.79	2.12	3.60	USGS 2012-2015
Nitrate as N, Dissolved mg/L	14	0.246	0.168	0.305	USGS 2012-2015 by algorithm
Nitrate + Nitrite as N, Dissolved mg/L *	12	0.246	0.201	0.278	USGS 2012-2015
Nitrogen as N, Total, mg/L *	12	0.350	0.300	0.390	USGS 2012-2015 by algorithm
Nitrogen, Kjeldahl as N, Total mg/L	12	0.095	0.07	0.12	USGS 2012-2015 (2/12 ND)
pH, standard units *	12	7.65	7.50	7.80	USGS 2012-2015 mid-day
Phosphate as P, Dissolved mg/L	12	0.005	0.004	0.007	USGS 2012-2015
Phosphorus as P, Total mg/L *	12	<0.02	<0.02	<0.02	USGS 2012-2015 (11/12 ND)
Potassium, Dissolved mg/L	14	0.61	0.53	0.69	USGS 2012-2015
Silica, Dissolved mg/L	14	2.56	2.05	2.78	USGS 2012-2015
Sodium, Dissolved mg/L	14	3.49	2.87	4.69	USGS 2012-2015
Specific Conductance, µS/cm	14	66	61	75	USGS 2012-2015
Strontium, Dissolved µg/L	12	28.7	25.7	33.8	USGS 2012-2015
Sulfate as SO ₄ , Dissolved mg/L	14	4.29	3.87	4.74	USGS 2012-2015
Temperature, Water, Degrees C	14	17.6	15.3	19.5	USGS 2012-2015 mid-day
Total Dissolved Solids, mg/L	12	38.5	34.0	45.0	USGS 2012-2015
Total Suspended Solids, mg/L *					No Data
Turbidity, NTU	12	0.55	0.20	1.00	USGS 2012-2015

The concentrations shown above are based upon seasonal May through September mid-day grab samples. Additional data are available for non-seasonal October through April targets. For parameters that vary throughout each day (CO₂, DO, DO%, pH, water temperature) these values best represent daily maximum concentrations.

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

This table will be updated by DRBC and NPS with two more years of monitoring necessary for full EWQ definition: samples will be taken bi-weekly (twice per month) during the May through September periods of 2016-2017, adding 20 more results to the N listed for each parameter.

3126 ICP Delaware River at Kellams Bridge



3126 ICP
Delaware River at Kellams Bridge



- Sampling Location
- - - County Boundary
- NPS Boundary

0 0.5 1 1.5
 Miles

3126 ICP Delaware River at Kellams Bridge

This location is also known as Little Equinunk Bridge.

No USGS or State monitoring sites. Latitude 41.823501 Longitude -75.113582 by GPS NAD83 decimal degrees.

Watershed Population figures were not calculated for main-stem Delaware River sites.

Drainage Area: 1,670 square miles, Delaware River Zone 1A

Site Specific EWQ defined 2007-2011, DRBC/NPS Scenic Rivers Monitoring Program

This site is located in the Upper Delaware Scenic and Recreational River (UPDE)

Classified by DRBC as Outstanding Basin Waters

Nearest upstream Interstate Control Point: 3216 ICP Delaware River at Lordville

Nearest downstream Interstate Control Point: 3037 ICP Delaware River at Callicoon

Known dischargers within watershed: Undefined

Tributaries to upstream reach: Small tributaries 321.0 Humphries Brook, NY; 320.4 Abe Lord Brook, NY; 319.5 Weston Brook, PA; 318.3 Bouchoux Brook, NY; 316.0 Pea Brook, NY; 314.3 Hoolihan Brook, NY; Major tributary 3135 BCP Basket Creek, NY..

No Stream Stats web site data available (drainage area too large to calculate on web site).

Flow Statistics (calculated):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
61,233	6,816	3,676	2,531	2,027	1,638	1,239	973	411

Existing Water Quality: 3126 ICP Delaware River at Kellams Bridge

Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	61	13.70	13.40	14.40	2006-2011 SRMP
Aluminum, Dissolved mg/L	15	0.003	0.002	0.005	2009-2010 SRMP archived samples
Ammonia-Nitrogen as N, Total mg/L *	60	0.011	0.010	0.013	2006-2011 SRMP
Barium, Dissolved mg/L	15	0.018	0.016	0.021	2009-2010 SRMP archived samples
Calcium, Dissolved mg/L	15	5.60	4.93	6.07	2009-2010 SRMP archived samples
Chloride, Total mg/L	61	9.65	9.30	10.40	2006-2011 SRMP
Dissolved Oxygen (DO) mg/L *	52	9.15	8.80	9.50	2006-2011 SRMP
Dissolved Oxygen Saturation %	40	98.00	97.00	98.00	2007-2011 SRMP
Enterococcus #/100ml	23	41	5	220	2007-2008 SRMP
Escherichia coli #/100ml	23	4	3	9	2007-2008 SRMP
Fecal Coliform #/100ml *	64	8	6	16	2006-2011 SRMP
Hardness as CaCO ₃ , Total mg/L	61	21.60	19.80	23.20	2006-2011 SRMP
Magnesium, Dissolved mg/L	15	1.34	1.19	1.48	2009-2010 SRMP archived samples
Manganese, Dissolved µg/L	15	5.70	3.40	9.60	2009-2010 SRMP archived samples
Nitrate+Nitrite as N, Total mg/L *	57	0.203	0.173	0.225	2007-2011 SRMP
Nitrogen as N, Total mg/L *	57	0.385	0.366	0.427	2007-2011 SRMP
Nitrogen, Kjeldahl as N, Total (TKN) mg/L	57	0.176	0.164	0.193	2007-2011 SRMP
Phosphate as P, Total mg/L	57	0.003	0.002	0.003	2007-2011 SRMP
pH units *	44	7.74	7.68	7.80	2006-2011 SRMP
Phosphorus as P, Total mg/L *	57	0.007	0.006	0.008	2007-2011 SRMP
Potassium, Dissolved mg/L	15	0.70	0.60	0.85	2009-2010 SRMP archived samples
Sodium, Dissolved mg/L	15	5.63	5.00	6.25	2009-2010 SRMP archived samples
Specific Conductance µS/cm	44	77	69	80	2006-2011 SRMP
Strontium, Dissolved mg/L	15	0.020	0.017	0.022	2009-2010 SRMP archived samples
Sulfate, Total mg/L	15	5.34	5.25	5.58	2009-2010 SRMP archived samples
Temperature degrees C	44	17.70	16.80	18.90	2006-2011 SRMP
Total Dissolved Solids (TDS) mg/L	61	42.98	42.20	44.00	2006-2011 SRMP
Total Suspended Solids (TSS) mg/L *	58	1.4	1.08	1.85	2006-2011 SRMP
Turbidity NTU	46	3.42	1.34	5.97	2006-2011 SRMP

Two-tailed confidence limits were used for EWQ targets.

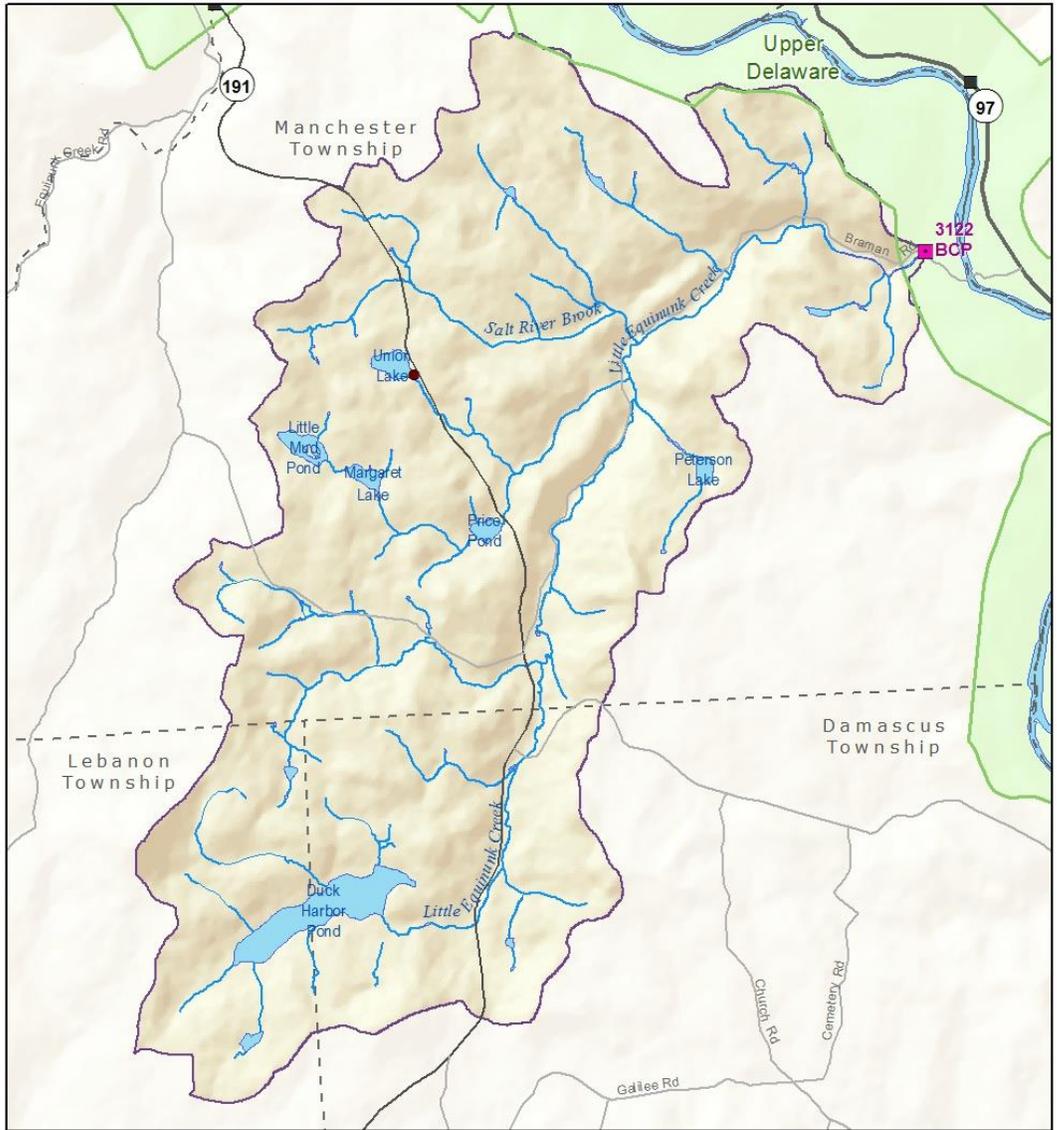
* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

Data Sources:

SRMP: DRBC/NPS Scenic Rivers Monitoring Program; USGS: U.S. Geological Survey; PADEP: Pennsylvania Department of Environmental Protection; NYSDEC: New York State Department of Environmental Control

Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

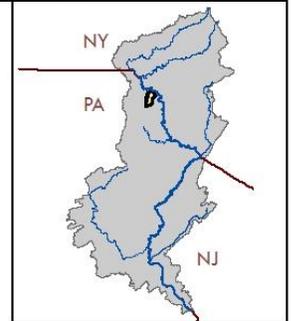
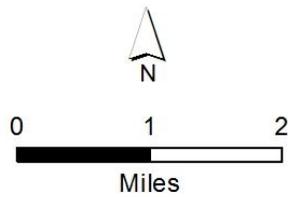
3122 BCP Little Equinunk Creek, PA



Little Equinunk Creek

Drainage Area = 25.02 mi²

- Sampling Location
- Other Sampling Location
- NPDES
- Drainage Area
- NPS Boundary



3122 BCP Little Equinunk Creek at CR1018, PA

Wayne County, PA. USGS Site No. 01427300, Latitude 41.826213 Longitude -75.120188 NAD83

Watershed Population: 2000: 640 2010: 613 Change: -27 (-4.2%)

Drainage Area: 24.6 square miles, tributary to Delaware River Zone 1A

EWQ definition by USGS/NPS, partial data set only (n=11 May-September values)

This watershed is tributary to the Upper Delaware Scenic and Recreational River (UPDE)

Classified by DRBC as Outstanding Basin Waters

Nearest upstream Interstate Control Point: 3126 ICP Delaware River at Kellams Bridge

Nearest downstream Interstate Control Point: 3037 ICP Delaware River at Callicoon

Known dischargers within watershed: Undefined

Watershed is 85.4% forested; urban land cover is 1.13%. 100% glaciated. No carbonate rock. Mean annual precipitation 42.9 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics (USGS BaSE Model):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
2,701.62	98.87	49.37	34.06	26.45	16.45	8.52	3.78	0.49

StreamStats Low-Flow Stream Statistics

M7D2Y (ft ³ /s)	3.06
M30D2Y (ft ³ /s)	4.23
M7D10Y (ft ³ /s)	1.27
M30D10Y (ft ³ /s)	1.77
M90D10Y (ft ³ /s)	2.89

StreamStats Mean/Baseflow Stream Statistics

QA (ft ³ /s)	41.9
QAH (ft ³ /s)	9.78
BF10YR (ft ³ /s)	17.0
BF25YR (ft ³ /s)	15.2
BF50YR (ft ³ /s)	14.1

StreamStats Peak-Flow Stream Statistics

PK2 (ft ³ /s)	1,010
PK5 (ft ³ /s)	1,720
PK10 (ft ³ /s)	2,300
PK50 (ft ³ /s)	3,840
PK100 (ft ³ /s)	4,610
PK500 (ft ³ /s)	6,750

Existing Water Quality: 3122 BCP Little Equinunk Creek, PA (Insufficient Data)

Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	10	18.2	16.0	22.2	USGS 2012-2015
Ammonia as N, Dissolved mg/L *	10	<0.01	<0.01	0.02	USGS 2012-2015 (5/10 ND)
Barium, Dissolved µg/L	10	25.6	23.1	26.9	USGS 2012-2015
Boron, Dissolved µg/L	10	5.7	5.2	6.5	USGS 2012-2015
Bromide, Dissolved mg/L	8	0.026	0.011	0.03	USGS 2012-2015 (4/8 ND)
Calcium, Dissolved mg/L	10	6.79	5.42	7.55	USGS 2012-2015
Carbon Dioxide, Total mg/L	10	0.9	0.8	1.0	USGS 2012-2015 mid-day
Chloride, Dissolved mg/L	10	3.88	3.12	4.66	USGS 2012-2015
Dissolved Oxygen, mg/L *	11	9.5	9.2	10.5	USGS 2012-2015 mid-day
Dissolved Oxygen Saturation, %	11	101	99	103	USGS 2012-2015 mid-day
Fecal Coliform, #/100 ml *					No Data
Fluoride, Dissolved mg/L	10	<0.04	<0.04	0.05	USGS 2012-2015
Hardness as CaCO ₃ , Total mg/L	10	21.2	16.8	23.6	USGS 2012-2015
Iron, Dissolved µg/L	10	20.2	13.0	50.9	USGS 2012-2015
Lithium, Dissolved µg/L	10	0.6	0.1	0.71	USGS 2012-2015 (2/10 ND)
Magnesium, Dissolved mg/L	10	1.003	0.794	1.14	USGS 2012-2015
Manganese, Dissolved µg/L	10	2.63	1.91	3.86	USGS 2012-2015
Nitrate as N, Dissolved mg/L	10	0.186	0.126	0.278	USGS 2012-2015 by algorithm
Nitrate + Nitrite as N, Dissolved mg/L *	10	0.187	0.126	0.278	USGS 2012-2015
Nitrite as N, Dissolved mg/L	10	<0.001	<0.001	0.002	USGS 2012-2015 (6/10 ND)
Nitrogen as N, Total, mg/L *	10	0.35	0.26	0.56	USGS 2012-2015 by algorithm
Nitrogen, Kjeldahl as N, Total mg/L	10	0.17	0.14	0.25	USGS 2012-2015 (2/12 ND)
Nitrogen, Organic, Total mg/L	10	0.16	0.14	0.25	USGS 2012-2015 by algorithm
pH, standard units *	11	7.6	7.5	7.6	USGS 2012-2015 mid-day
Phosphate as P, Dissolved mg/L	10	0.009	0.006	0.009	USGS 2012-2015
Phosphorus as P, Total mg/L *	10	<0.02	<0.02	0.03	USGS 2012-2015 (8/10 ND)
Potassium, Dissolved mg/L	10	0.8	0.66	0.86	USGS 2012-2015
Silica, Dissolved mg/L	10	2.05	1.62	2.18	USGS 2012-2015
Sodium, Dissolved mg/L	10	3.1	2.3	3.62	USGS 2012-2015
Specific Conductance, µS/cm	11	60	49	71	USGS 2012-2015
Strontium, Dissolved µg/L	10	28.8	22.8	29.8	USGS 2012-2015
Sulfate as SO ₄ , Dissolved mg/L	10	3.66	3.33	4.17	USGS 2012-2015
Temperature, Water, Degrees C	11	17.9	13.9	19.7	USGS 2012-2015 mid-day
Total Dissolved Solids, mg/L	10	38	32	55	USGS 2012-2015
Total Suspended Solids, mg/L *					No Data
Turbidity, NTU	10	0.75	0.2	1.8	USGS 2012-2015

The concentrations shown above are based upon seasonal May through September mid-day grab samples. Additional data are available for non-seasonal October through April targets. For parameters that vary throughout each day (CO₂, DO, DO%, pH, water temperature) these values best represent daily maximum concentrations.

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

This table will be updated by DRBC and NPS with two more years of monitoring necessary for full EWQ definition: samples will be taken bi-weekly (twice per month) during the May through September periods of 2016-2017, adding 20 more results to the N listed for each parameter.

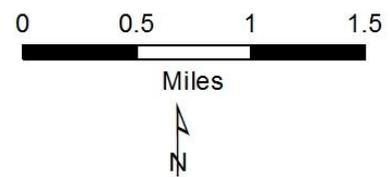
3037 ICP Delaware River at Callicoon Bridge



3037 ICP
Delaware River at Callicoon Bridge



- Sampling Location
- - - County Boundary
- ⬮ NPS Boundary



3037 ICP Delaware River at Callicoon Bridge

USGS Site No. 01427510. Latitude 41.764722 Longitude -75.061667 by GPS NAD83 decimal degrees

PADEP Site No. WQN 0185. NYSDEC Site No. 14010053.

Watershed Population figures were not calculated for main-stem Delaware River sites.

Drainage Area: 1,710 square miles, Delaware River Zone 1A

Site Specific EWQ defined 1999-2011 with DRBC/NPS SRMP, PADEP, NYSDEC & USGS Data.

This site is located in the Upper Delaware Scenic and Recreational River (UPDE)

Classified by DRBC as Outstanding Basin Waters

Nearest upstream Interstate Control Point: 3126 ICP Delaware River at Kellams Bridge

Nearest downstream Interstate Control Point: 2984 ICP Delaware River at Damascus/Cochecton Bridge

Known dischargers within watershed: Undefined

Tributaries to upstream reach: Major tributary 3122 BCP Little Equinunk Creek, PA; small tributaries 311.1 Cooley Creek, PA; 310.6 Hankins Creek, NY; 304.7 Hollister Creek, PA.

No Stream Stats web site data available (drainage area too large to calculate on web site).

Flow Statistics (1975-2014) Delaware River at Callicoon gage data:

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
127,000	6,470	3,320	2,030	1,570	1,340	1,100	843	312

Existing Water Quality: 3037 ICP Delaware River at Callicoon Bridge

Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	70	14.75	14.00	15.00	1999-2011 SRMP, PADEP, NYSDEC
Aluminum, Dissolved mg/L	15	0.003	0.002	0.005	2009-2010 SRMP archived samples
Ammonia-Nitrogen as N, Total mg/L *	69	0.014	0.010	0.016	1999-2011 SRMP, PADEP, NYSDEC
Barium, Dissolved mg/L	14	0.021	0.018	0.030	2009-2010 SRMP archived samples
Calcium, Dissolved mg/L	42	6.23	5.91	6.55	2009-2010 SRMP archived samples
Calcium, Total mg/L	34	6.59	6.31	6.77	1999-2009 PADEP, NYSDEC
Chloride, Total mg/L	60	10.40	9.70	10.90	2005-2011 SRMP, PADEP, NYSDEC
Dissolved Oxygen (DO) mg/L *	52	9.10	9.00	9.40	2005-2011 SRMP, NYSDEC
Dissolved Oxygen Saturation %	33	97.0	97.0	98.0	2007-2011 SRMP
Enterococcus #/100ml	34	11.5	7	50	2008, 2010, 2011 SRMP
Escherichia coli #/100ml	34	7.5	5	11	2007-2008 SRMP
Fecal Coliform #/100ml *	53	16	8	20	1999-2011 SRMP, PADEP, NYSDEC
Hardness as CaCO ₃ , Total mg/L	71	22.43	21.10	23.80	1999-2011 SRMP, PADEP, NYSDEC
Iron, Dissolved µg/L	28	25	21	29	1999-2009 PADEP, NYSDEC
Iron, Total µg/L	34	72.5	61.0	121.0	1999-2009 PADEP, NYSDEC
Magnesium, Dissolved mg/L	42	1.38	1.30	1.46	1999-2010 SRMP archived samples
Magnesium, Total mg/L	34	1.45	1.37	1.51	1999-2009 PADEP, NYSDEC
Manganese, Dissolved µg/L	42	8.95	7.60	10.90	1999-2010 SRMP, PADEP, NYSDEC
Manganese, Total µg/L	34	21.64	17.50	29.00	1999-2009 PADEP, NYSDEC
Nitrate as N, Total mg/L	31	0.065	0.054	0.180	1999-2008 PADEP, NYSDEC
Nitrate+Nitrite as N, Total mg/L *	55	0.217	0.202	0.250	2005-2011 SRMP, NYSDEC
Nitrogen as N, Total mg/L *	63	0.395	0.365	0.430	2005-2011 SRMP, PADEP
Nitrogen, Kjeldahl as N, Total (TKN) mg/L	55	0.189	0.173	0.211	2005-2011 SRMP, NYSDEC
pH units *	78	7.66	7.59	7.75	1999-2011 SRMP, PADEP, NYSDEC
Phosphate as P, Total mg/L	64	0.008	0.005	0.010	2002-2011 SRMP, PADEP
Phosphorus as P, Total mg/L *	78	0.013	0.009	0.016	1999-2011 SRMP, NYSDEC, PADEP, USGS
Potassium, Dissolved mg/L	14	0.80	0.61	1.02	2009-2010 SRMP archived samples
Sodium, Dissolved mg/L	14	6.38	4.82	7.37	2009-2010 SRMP archived samples
Specific Conductance µS/cm	78	78	76	83	1999-2011 SRMP, NYSDEC, PADEP
Strontium, Dissolved mg/L	14	0.024	0.017	0.030	2009-2010 SRMP archived samples
Sulfate, Total mg/L	14	5.60	5.24	5.88	2009-2010 SRMP archived samples
Temperature, Water Degrees C	81	18.5	17.8	19.7	1999-2011 SRMP, NYSDEC, PADEP
Total Dissolved Solids (TDS) mg/L	84	47.13	45.47	50.00	1999-2011 SRMP, NYSDEC, PADEP
Total Suspended Solids (TSS) mg/L *	67	2.00	1.80	2.80	1999-2011 SRMP, NYSDEC, PADEP
Turbidity NTU	48	1.87	1.34	4.00	2005-2011 SRMP, NYSDEC

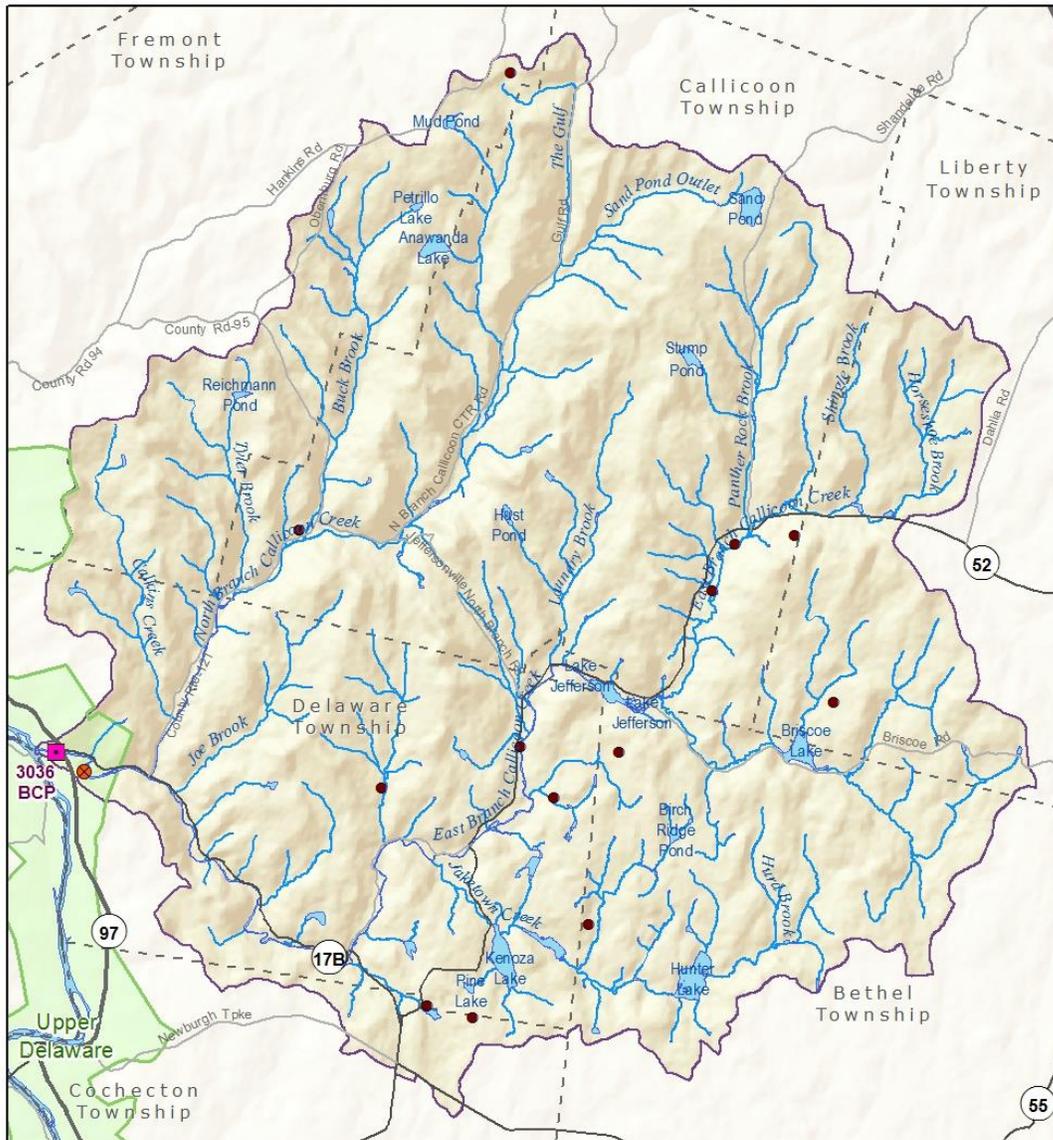
Two-tailed confidence limits were used for EWQ targets.

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

Data Sources: SRMP: DRBC/NPS Scenic Rivers Monitoring Program; USGS: U.S. Geological Survey ; PADEP: Pennsylvania Department of Environmental Protection; NYSDEC: New York State Department of Environmental Control

Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

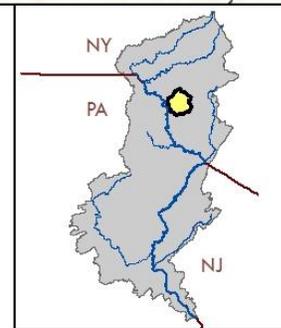
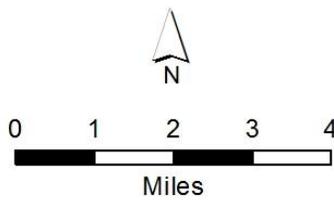
3036 BCP Callicoon Creek at Creamery Rd



Callicoon Creek

Drainage Area = 111.13 mi²

- Sampling Location
- NPDES
- Stream Gage
- Drainage Area
- NPS Boundary



3036 BCP Callicoon Creek at Creamery Rd

Sullivan County, NY. Latitude 41.764454 Longitude -75.055499 by GPS NAD83 decimal degrees.

USGS Site No. 01427500; NYSDEC Site No. 14011301.

Watershed Population: 2000: 6,512 2010: 6,448 Change: -64 (-1.0%)

Drainage Area: 111 square miles, tributary to Delaware River Zone 1A

Site Specific EWQ defined 2001-2011 with DRBC/NPS SRMP, NYSDEC & USGS Data.

This watershed is tributary to the Upper Delaware Scenic and Recreational River (UPDE)

Classified by DRBC as Outstanding Basin Waters.

Portions of the Callicoon Creek watershed are classified as Impaired by NYSDEC (2012 Integrated List).

Nearest upstream Interstate Control Point: 3037 ICP Delaware River at Callicoon

Nearest downstream Interstate Control Point: 2984 ICP Delaware River at Damascus/Cochecton Bridge

Known dischargers within watershed: Undefined

Watershed is 72% forested; urban land cover is 1.65%. 100% glaciated. No carbonate rock. Mean annual precipitation 44.8 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics (USGS BaSE Model):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
11,104	495	269	178	140	90.8	54.1	25.9	4.88

StreamStats Low-Flow Stream Statistics

M7D2Y (ft³/s) 16.4

M30D2Y (ft³/s) 21.8

M7D10Y (ft³/s) 7.86

M30D10Y (ft³/s) 10.7

M90D10Y (ft³/s) 16.1

StreamStats Mean/Baseflow Stream Statistics

QA (ft³/s) 197

QAH (ft³/s) 53.7

BF10YR (ft³/s) 75.6

BF25YR (ft³/s) 67.4

BF50YR (ft³/s) 62.6

StreamStats Peak-Flow Stream Statistics

PK2 (ft³/s) 3,770

PK5 (ft³/s) 6,230

PK10 (ft³/s) 8,180

PK50 (ft³/s) 13,400

PK100 (ft³/s) 16,000

PK500 (ft³/s) 23,100

Existing Water Quality: 3036 BCP Callicoon Creek at Creamery Rd

Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	55	19.32	17.60	22.40	2005-2011 SRMP, NYSDEC
Aluminum, Dissolved, mg/L	15	0.005	0.002	0.006	2009-2010 SRMP archived samples
Ammonia-Nitrogen as N, Total mg/L *	54	0.018	0.014	0.020	2005-2011 SRMP, NYSDEC, USGS
Barium, Dissolved mg/L	15	0.040	0.033	0.046	2009-2010 SRMP archived samples
Calcium, Dissolved mg/L	24	8.18	7.01	9.91	2001,2007 USGS,2009-2010 SRMP archv
Chloride, Total mg/L	46	17.25	15.20	18.90	2005-2011 SRMP, NYSDEC
Dissolved Oxygen (DO) mg/L *	46	9.30	9.00	9.80	2001-2011 SRMP,NYSDEC, USGS
Dissolved Oxygen Saturation %	32	98	96	100	2001-2011 SRMP, USGS
Enterococcus #/100ml	34	46	16	120	2008, 2010, 2011 SRMP
Escherichia coli #/100ml	34	41	24	70	2008, 2010, 2011 SRMP
Fecal coliform #/100ml *	38	94	60	140	2005 NYSDEC, 2008-2011 SRMP
Hardness as CaCO ₃ , Total mg/L	57	28.2	26.0	32.2	2001-2011 SRMP, NYSDEC
Magnesium, Dissolved mg/L	15	1.66	1.33	1.91	2009-2010 SRMP archived samples
Manganese, Dissolved µg/L	15	4.3	3.4	9.2	2009-2010 SRMP archived samples
Nitrate+Nitrite as N, Total mg/L *	48	0.346	0.279	0.387	2005-2011 SRMP, NYSDEC
Nitrogen as N, Total mg/L *	44	0.646	0.590	0.690	2001-2011 SRMP, USGS
Nitrogen, Kjeldahl as N, Total mg/L	50	0.279	0.242	0.309	2001-2011 SRMP, NYSDEC, USGS
pH units *	44	7.94	7.81	8.14	2001-2011 SRMP, NYSDEC,USGS
Phosphate as P, Total mg/L	42	0.023	0.019	0.028	2008-2011 SRMP
Phosphorus as P, Total mg/L *	59	0.034	0.024	0.036	2001-2011 SRMP, NYSDEC, USGS
Potassium, Dissolved mg/L	15	1.40	1.23	1.69	2009-2010 SRMP archived samples
Sodium, Dissolved mg/L	15	10.03	8.78	11.91	2009-2010 SRMP archived samples
Specific Conductance µS/cm	44	113.5	106.0	128.0	2001-2011 SRMP, NYSDEC, USGS
Strontium, Dissolved mg/L	15	0.043	0.034	0.048	2009-2010 SRMP archived samples
Sulfate, Total mg/L	21	6.50	5.90	7.13	2005 NYSDEC, 2009-2010 SRMP archived
Temperature, Water, degrees C	47	18.2	17.1	19.4	2001-2011 SRMP,NYSDEC, USGS
Total Dissolved Solids (TDS) mg/L	50	64.07	60.82	68.98	2001-2011 SRMP,NYSDEC, USGS
Total Suspended Solids (TSS) mg/L *	57	1.85	1.45	2.00	2005-2011 SRMP, NYSDEC, USGS
Turbidity NTU	45	1.22	0.88	2.00	2001-2011 SRMP,NYSDEC, USGS

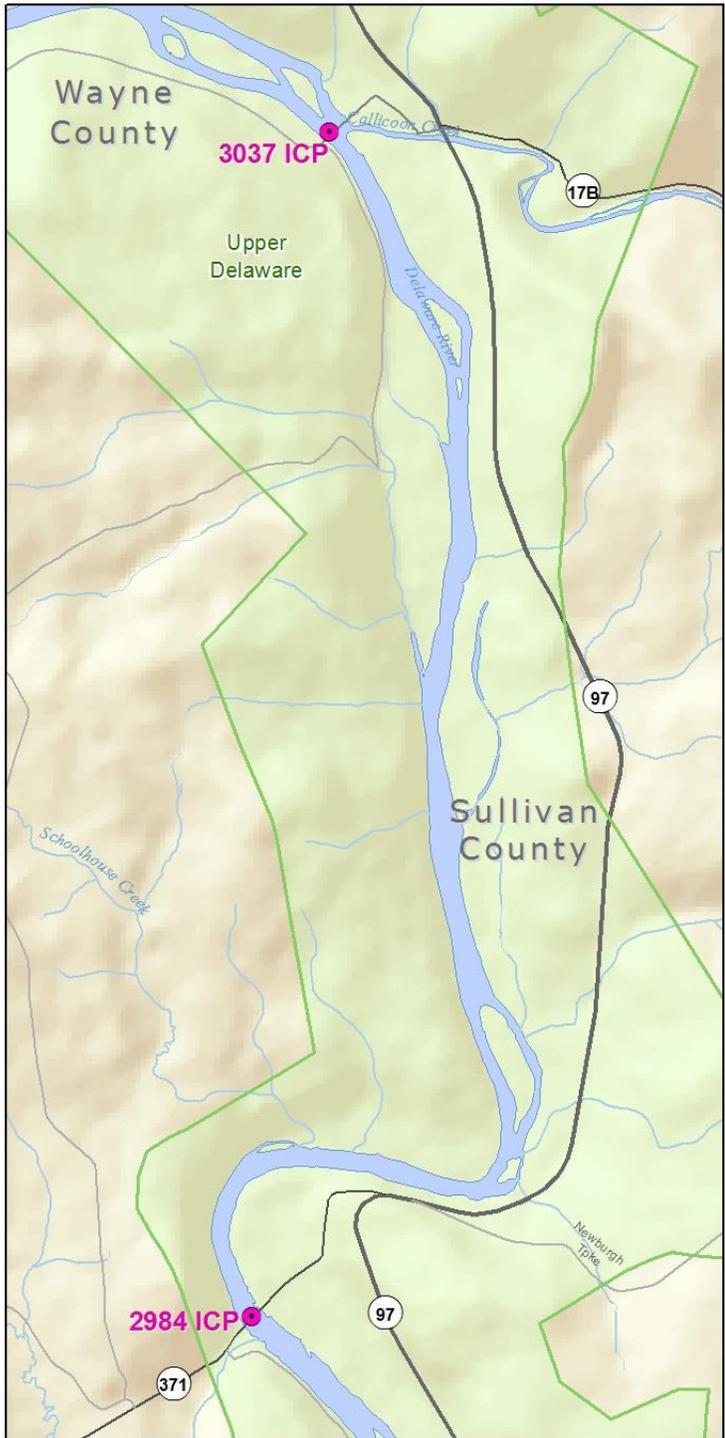
Two-tailed confidence limits were used for these EWQ targets.

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

Data Sources: SRMP: DRBC/NPS Scenic Rivers Monitoring Program; USGS: U.S. Geological Survey; PADEP: Pennsylvania Department of Environmental Protection; NYSDEC: New York State Department of Environmental Control

Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

2984 ICP Delaware River at Damascus/Cochecton Bridge



2984 ICP
Delaware River at Damascus/Cochecton Bridge



- Sampling Location
- County Boundary
- NPS Boundary

0 0.5 1

Miles

N

2984 ICP Delaware River at Damascus/Cochecton Bridge

Latitude 41.704993 Longitude -75.066787 by GPS NAD83 decimal degrees.

No other agencies monitor this site

Watershed Population figures were not calculated for main-stem Delaware River sites.

Drainage Area: 1,840 square miles, Delaware River Zone 1A

Site Specific EWQ defined 2006-2011 by the DRBC/NPS Scenic Rivers Monitoring Program.

This site is located in the Upper Delaware Scenic and Recreational River (UPDE)

Classified by DRBC as Outstanding Basin Waters

Nearest upstream Interstate Control Point: 3037 ICP Delaware River at Callicoon

Nearest downstream Interstate Control Point: 2899 ICP Delaware River at Narrowsburg

Known dischargers within watershed: Undefined

Tributaries to upstream reach: Major tributary 3036 BCP Callicoon Creek, NY; small tributary 299.0 Schoolhouse Creek, PA.

No Stream Stats web site data available (drainage area too large to calculate on web site).

Flow Statistics (Calculated):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
128,396	6,551	3,356	2,052	1,597	1,365	1,122	852	315

Existing Water Quality: 2984 ICP Delaware River at Damascus/Cochection Bridge

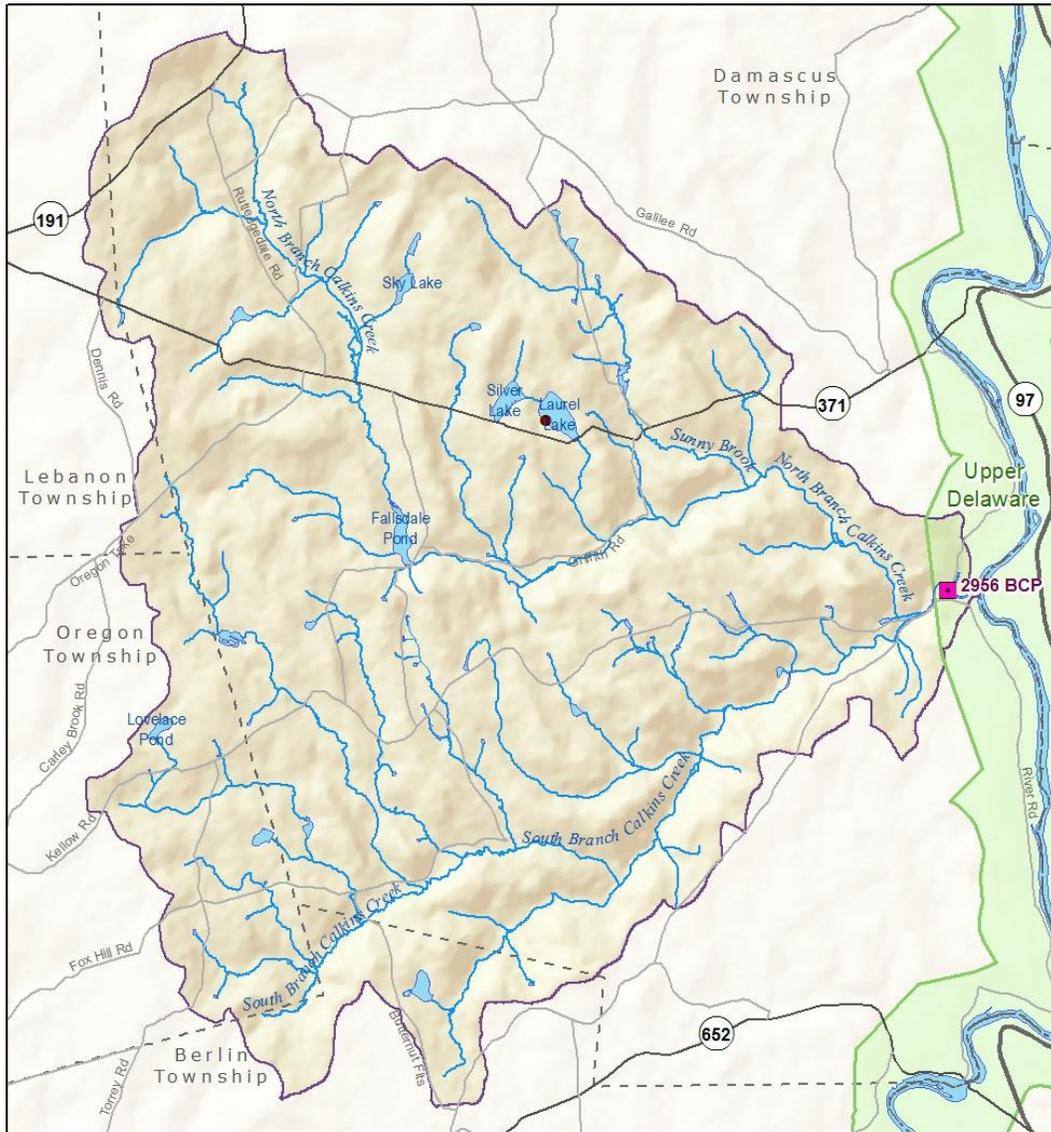
Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	62	14.55	13.90	14.80	2006-2011 SRMP
Aluminum, Dissolved, mg/L	15	0.004	0.003	0.005	2009-2010 SRMP archived samples
Ammonia-Nitrogen as N, Total mg/L *	60	0.011	0.009	0.013	2006-2011 SRMP
Barium, Dissolved mg/L	15	0.020	0.018	0.025	2009-2010 SRMP archived samples
Calcium, Dissolved mg/L	15	5.70	5.05	6.32	2009-2010 SRMP archived samples
Chloride, Total mg/L	63	10.07	9.50	10.70	2006-2011 SRMP
Dissolved Oxygen (DO) mg/L *	58	9.01	8.50	9.20	2006-2011 SRMP
Dissolved Oxygen Saturation %	40	97	96	98	2006-2011 SRMP
Enterococcus #/100ml	43	13	8	21	2007-2011 SRMP
Escherichia coli #/100ml	43	10	4	12	2007-2011 SRMP
Fecal coliform #/100ml *	65	12	10	18	2006-2011 SRMP
Hardness as CaCO ₃ , Total mg/L	63	21.8	20.6	23.6	2006-2011 SRMP
Magnesium, Dissolved mg/L	15	1.41	1.22	1.48	2009-2010 SRMP archived samples
Manganese, Dissolved µg/L	15	5.10	4.00	8.10	2009-2010 SRMP archived samples
Nitrate+Nitrite as N, Total mg/L *	53	0.192	0.185	0.232	2007-2011 SRMP
Nitrogen as N, Total mg/L *	53	0.391	0.368	0.418	2007-2011 SRMP
Nitrogen, Kjeldahl as N, Total mg/L	53	0.189	0.168	0.207	2007-2011 SRMP
pH units *	50	7.70	7.62	7.80	2006-2011 SRMP
Phosphate as P, Total mg/L	53	0.004	0.003	0.004	2007-2011 SRMP
Phosphorus as P, Total mg/L *	53	0.009	0.007	0.010	2007-2011 SRMP
Potassium, Dissolved mg/L	15	0.79	0.72	0.84	2009-2010 SRMP archived samples
Sodium, Dissolved mg/L	15	5.93	5.65	6.46	2009-2010 SRMP archived samples
Specific Conductance µS/cm	50	78.0	74.0	83.0	2006-2011 SRMP
Strontium, Dissolved mg/L	15	0.022	0.020	0.023	2009-2010 SRMP archived samples
Sulfate, Total mg/L	15	5.48	5.32	5.65	2009-2010 SRMP archived samples
Temperature, Water, degrees C	50	18.50	17.30	19.80	2006-2011 SRMP
Total Dissolved Solids (TDS) mg/L	62	44.53	43.00	46.10	2006-2011 SRMP
Total Suspended Solids (TSS) mg/L *	55	1.70	1.40	2.45	2006-2011 SRMP
Turbidity NTU	54	2.76	1.92	7.00	2006-2011 SRMP

Two-tailed confidence limits were used for these EWQ targets.

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

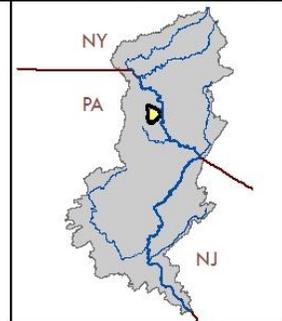
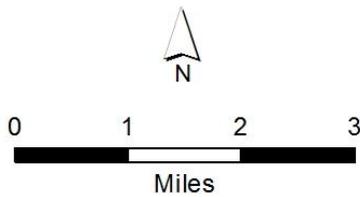
2956 BCP Calkins Creek at Rt. 1004



Calkins Creek

Drainage Area = 44.18 mi²

- Sampling Location
- NPDES
- Drainage Area
- NPS Boundary



2956 BCP Calkins Creek at Rt. 1004

Wayne County, PA. Latitude 41.672618 Longitude -75.064856 by GPS NAD83 decimal degrees.

USGS Site No. 01427700.

Watershed Population: 2000: 1,707 2010: 1,631 Change: -76 (-4.4%)

Drainage Area: 44 square miles, tributary to Delaware River Zone 1A

Site Specific EWQ defined 2009-2011 by DRBC/NPS Scenic Rivers Monitoring Program & USGS Data.

This watershed is tributary to the Upper Delaware Scenic and Recreational River (UPDE)

Classified by DRBC as Outstanding Basin Waters.

Nearest upstream Interstate Control Point: 2984 ICP Delaware River at Damascus/Cochecton Bridge

Nearest downstream Interstate Control Point: 2899 ICP Delaware River at Narrowsburg

Known dischargers within watershed: Undefined

Watershed is 76.4% forested; urban land cover is 0.15%. 100% glaciated. No carbonate rock. Mean annual precipitation 44.1 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics (USGS BaSE Model):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
4,638	169	82.9	57.4	44.6	28.5	15.1	6.82	0.92

StreamStats Low-Flow Stream Statistics

M7D2Y (ft ³ /s)	4.71
M30D2Y (ft ³ /s)	6.51
M7D10Y (ft ³ /s)	1.96
M30D10Y (ft ³ /s)	2.77
M90D10Y (ft ³ /s)	4.49

StreamStats Mean/Baseflow Stream Statistics

QA (ft ³ /s)	69.5
QAH (ft ³ /s)	16.0
BF10YR (ft ³ /s)	26.8
BF25YR (ft ³ /s)	23.8
BF50YR (ft ³ /s)	22.0

StreamStats Peak-Flow Stream Statistics

PK2 (ft ³ /s)	1,750
PK5 (ft ³ /s)	2,950
PK10 (ft ³ /s)	3,910
PK50 (ft ³ /s)	6,440
PK100 (ft ³ /s)	7,710
PK500 (ft ³ /s)	11,200

Existing Water Quality: 2956 BCP Calkins Creek at Rt. 1004

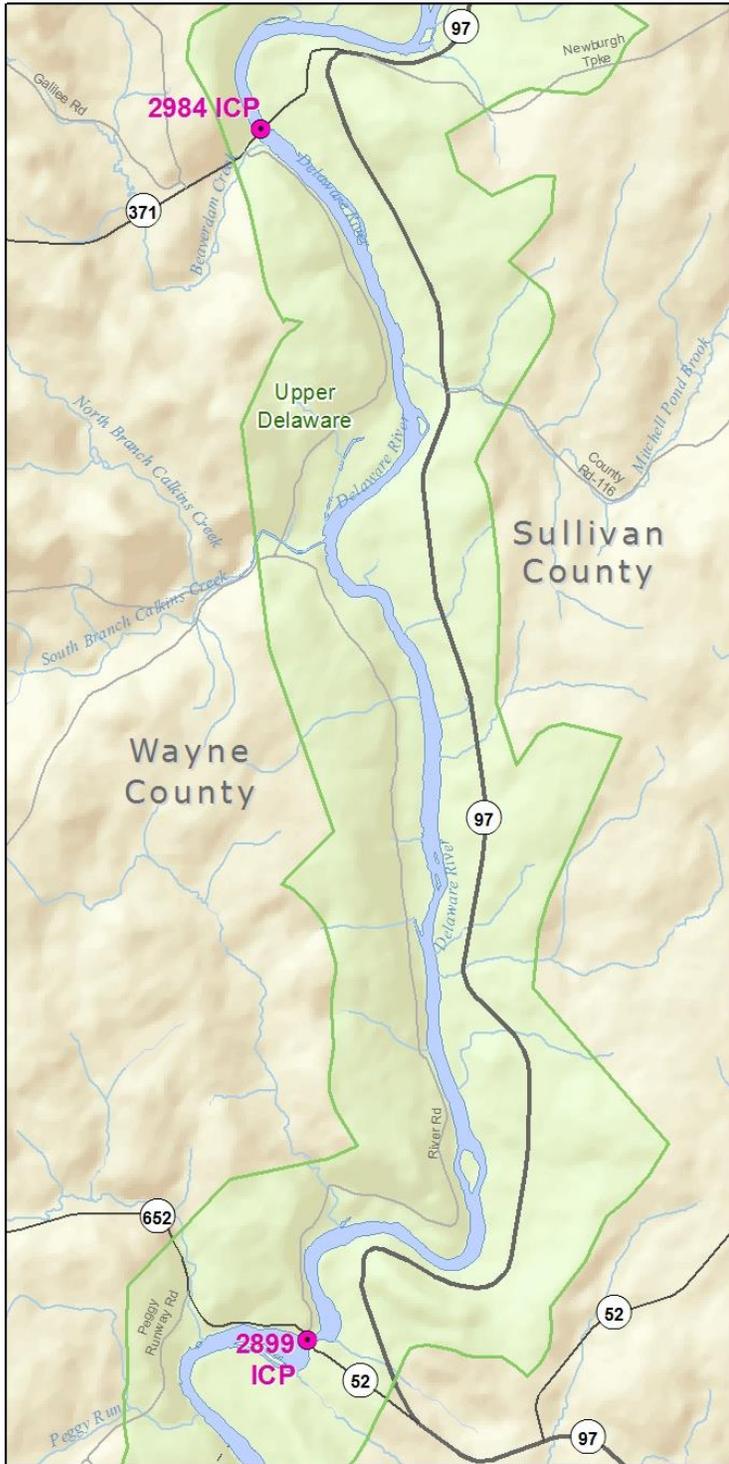
Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	31	22.7	17.7	24.7	2009-2011 SRMP
Aluminum, Dissolved, mg/L	15	0.004	0.003	0.005	2009-2010 SRMP archived samples
Ammonia-Nitrogen as N, Total mg/L *	30	0.010	0.009	0.013	2009-2011 SRMP
Barium, Dissolved mg/L	15	0.027	0.025	0.029	2009-2010 SRMP archived samples
Calcium, Dissolved mg/L	15	7.00	6.33	7.30	2009-2010 SRMP archived samples
Chloride, Total mg/L	31	5.57	4.87	6.03	2009-2011 SRMP
Dissolved Oxygen (DO) mg/L *	30	9.45	9.10	9.80	2009-2011 SRMP
Dissolved Oxygen Saturation %	30	97.5	95.0	98.0	2009-2011 SRMP
Enterococcus #/100ml	20	40	14	170	2010-2011 SRMP
Escherichia coli #/100ml	20	26	17	50	2010-2011 SRMP
Fecal coliform #/100ml *	32	49	26	66	2009-2011 SRMP
Hardness as CaCO ₃ , Total mg/L	31	26.2	22.8	28.8	2009-2011 SRMP
Magnesium, Dissolved mg/L	15	1.35	1.09	1.51	2009-2010 SRMP archived samples
Manganese, Dissolved µg/L	15	2.90	1.60	4.30	2009-2010 SRMP archived samples
Nitrate+Nitrite as N, Total mg/L *	31	0.163	0.145	0.182	2009-2011 SRMP
Nitrogen as N, Total mg/L *	31	0.392	0.362	0.449	2009-2011 SRMP
Nitrogen, Kjeldahl as N, Total mg/L	31	0.245	0.207	0.270	2009-2011 SRMP
pH units *	30	7.77	7.70	7.84	2009-2011 SRMP
Phosphate as P, Total mg/L	31	0.021	0.018	0.022	2009-2011 SRMP
Phosphorus as P, Total mg/L *	39	0.028	0.024	0.031	2007-2011 SRMP, USGS
Potassium, Dissolved mg/L	15	1.07	0.87	1.17	2009-2010 SRMP archived samples
Sodium, Dissolved mg/L	15	3.73	3.16	4.24	2009-2010 SRMP archived samples
Specific Conductance µS/cm	30	74.5	69.0	80.0	2009-2011 SRMP
Strontium, Dissolved mg/L	15	0.032	0.029	0.035	2009-2010 SRMP archived samples
Sulfate, Total mg/L	15	4.97	4.58	5.26	2009-2010 SRMP archived samples
Temperature, Water, degrees C	37	17.2	15.5	18.5	2007-2011 SRMP, USGS
Total Dissolved Solids (TDS) mg/L	31	46.47	44.05	49.17	2009-2011 SRMP
Total Suspended Solids (TSS) mg/L *	31	1.90	1.25	2.80	2009-2011 SRMP
Turbidity NTU	32	0.98	0.80	1.38	2009-2011 SRMP

Two-tailed confidence limits were used for these EWQ targets.

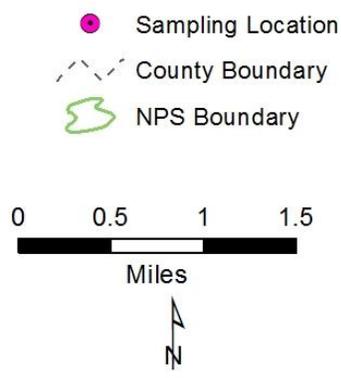
* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

2899 ICP Delaware River at Narrowsburg



2899 ICP
Delaware River at Narrowsburg Bridge



2899 ICP Delaware River at Narrowsburg

Latitude 41.609682 Longitude -75.061835 by GPS NAD83 decimal degrees.

USGS Site No. 01427750

Watershed Population figures were not calculated for main-stem Delaware River sites.

Drainage Area: 1,910 square miles, Delaware River Zone 1B

Site Specific EWQ defined 2006-2011 by the DRBC/NPS Scenic Rivers Monitoring Program.

This site is located in the Upper Delaware Scenic and Recreational River (UPDE)

Classified by DRBC as Outstanding Basin Waters

Nearest upstream Interstate Control Point: 2984 ICP Delaware River at Damascus/Cochecton Bridge

Nearest downstream Interstate Control Point: 2792 ICP Delaware River at USGS Barryville Gage 01428500

Known dischargers within watershed: Undefined

Tributaries to upstream reach: Major tributary 2956 BCP Calkins Creek, PA; small tributaries 298.2 Beaverdam Creek, PA; 296.8 Mitchell Pond Brook, NY.

No Stream Stats web site data available (drainage area too large to calculate on web site).

Flow Statistics (Calculated):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
133,280	6,790	3,484	2,130	1,648	1,406	1,154	885	327

Existing Water Quality: 2899 ICP Delaware River at Narrowsburg

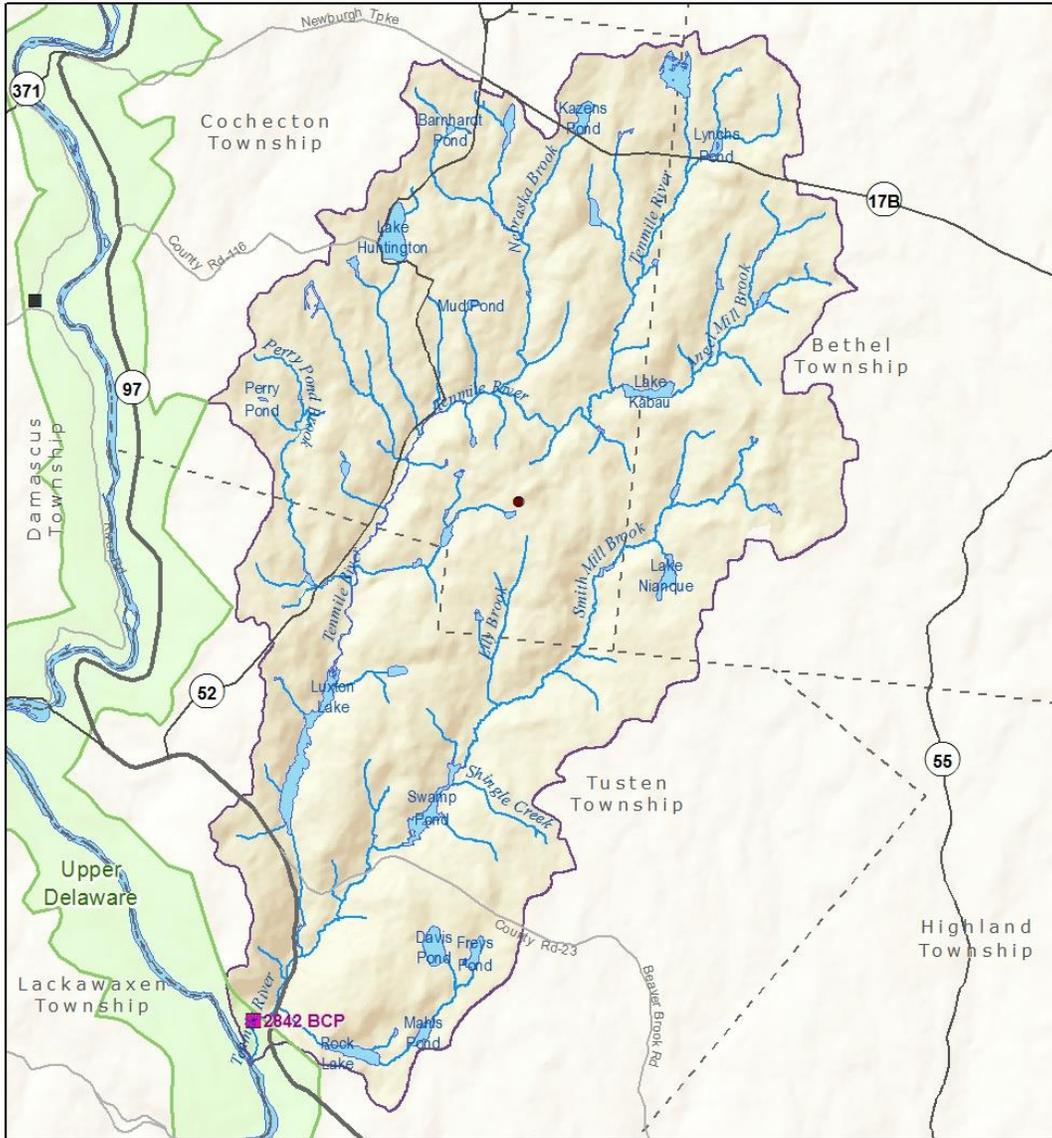
Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	67	14.2	13.7	14.4	2006-2011 SRMP
Aluminum, Dissolved, mg/L	15	0.004	0.003	0.006	2009-2010 SRMP archived samples
Ammonia-Nitrogen as N, Total mg/L *	64	0.014	0.011	0.016	2006-2011 SRMP
Barium, Dissolved mg/L	15	0.021	0.020	0.024	2009-2010 SRMP archived samples
Calcium, Dissolved mg/L	15	6.12	5.77	6.28	2009-2010 SRMP archived samples
Chloride, Total mg/L	67	10.0	9.5	10.6	2006-2011 SRMP
Dissolved Oxygen (DO) mg/L *	58	8.91	8.70	9.40	2006-2011 SRMP
Dissolved Oxygen Saturation %	40	97	96	98	2007-2011 SRMP
Enterococcus #/100ml	44	12	7	35	2007-2011 SRMP
Escherichia coli #/100ml	44	11	6	20	2007-2011 SRMP
Fecal coliform #/100ml *	62	14	10	24	2006-2011 SRMP
Hardness as CaCO ₃ , Total mg/L	67	21.6	20.6	22.2	2006-2011 SRMP
Magnesium, Dissolved mg/L	15	1.36	1.29	1.51	2009-2010 SRMP archived samples
Manganese, Dissolved µg/L	15	8.00	5.20	12.50	2009-2010 SRMP archived samples
Nitrate+Nitrite as N, Total mg/L *	56	0.177	0.157	0.210	2007-2011 SRMP
Nitrogen as N, Total mg/L *	57	0.374	0.349	0.395	2007-2011 SRMP
Nitrogen, Kjeldahl as N, Total mg/L	57	0.200	0.185	0.217	2007-2011 SRMP
pH units *	50	7.68	7.58	7.73	2006-2011 SRMP
Phosphate as P, Total mg/L	56	0.004	0.003	0.005	2007-2011 SRMP
Phosphorus as P, Total mg/L *	57	0.008	0.007	0.010	2007-2011 SRMP
Potassium, Dissolved mg/L	15	0.79	0.64	0.87	2009-2010 SRMP archived samples
Sodium, Dissolved mg/L	15	6.04	5.16	6.48	2009-2010 SRMP archived samples
Specific Conductance µS/cm	50	79.0	72.0	83.0	2006-2011 SRMP
Strontium, Dissolved mg/L	15	0.022	0.020	0.024	2009-2010 SRMP archived samples
Sulfate, Total mg/L	14	5.59	5.36	5.83	2009-2010 SRMP archived samples
Temperature, Water, degrees C	50	18.65	17.30	20.70	2005-2011 SRMP
Total Dissolved Solids (TDS) mg/L	67	44.45	43.10	45.30	2006-2011 SRMP
Total Suspended Solids (TSS) mg/L *	59	1.90	1.50	2.32	2006-2011 SRMP
Turbidity NTU	53	3.49	1.81	7.00	2006-2011 SRMP

Two-tailed confidence limits were used for these EWQ targets.

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

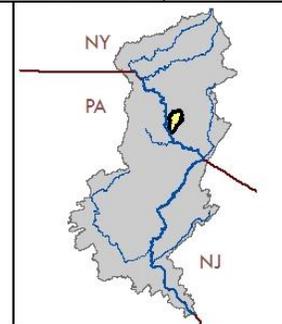
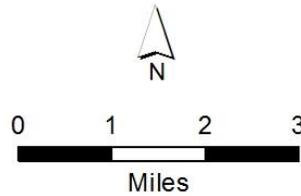
2842 BCP Tenmile River at Tenmile River Rd.



Tenmile River

Drainage Area = 48.87 mi²

- Sampling Location
- Other Sampling Location
- NPDES
- Drainage Area
- NPS Boundary



2842 BCP Tenmile River at Tenmile River Rd.

Sullivan County, NY. Latitude 41.560683 Longitude -75.019399 by GPS NAD83 decimal degrees.

USGS Site No. 01428000.

Watershed Population: 2000: 1,191 2010: 1,310 Change: +119 (+10.0%)

Drainage Area: 48.8 square miles, tributary to Delaware River Zone 1B

Site Specific EWQ defined 2006-2011 by DRBC/NPS Scenic Rivers Monitoring Program.

This watershed is tributary to the Upper Delaware Scenic and Recreational River (UPDE)

Classified by DRBC as Outstanding Basin Waters.

Nearest upstream Interstate Control Point: 2899 ICP Delaware River at Narrowsburg

Nearest downstream Interstate Control Point: 2792 ICP Delaware River at USGS Barryville Gage 01428500

Known dischargers within watershed: Undefined

Watershed is 84.6% forested; urban land cover is 0.52%. 100% glaciated. No carbonate rock. Mean annual precipitation 42.1 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics (USGS BaSE Model):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
5,115	183	92.7	62.2	48.4	31.1	16.8	7.42	1.06

StreamStats Low-Flow Stream Statistics

M7D2Y (ft ³ /s)	6.03
M30D2Y (ft ³ /s)	8.22
M7D10Y (ft ³ /s)	2.63
M30D10Y (ft ³ /s)	3.58
M90D10Y (ft ³ /s)	5.73

StreamStats Mean/Baseflow Stream Statistics

QA (ft ³ /s)	77.1
QAH (ft ³ /s)	18.3
BF10YR (ft ³ /s)	31.2
BF25YR (ft ³ /s)	27.8
BF50YR (ft ³ /s)	25.9

StreamStats Peak-Flow Stream Statistics

PK2 (ft ³ /s)	1,690
PK5 (ft ³ /s)	2,840
PK10 (ft ³ /s)	3,770
PK50 (ft ³ /s)	6,270
PK100 (ft ³ /s)	7,530
PK500 (ft ³ /s)	11,000

Existing Water Quality: 2842 BCP Tenmile River at Tenmile River Rd.

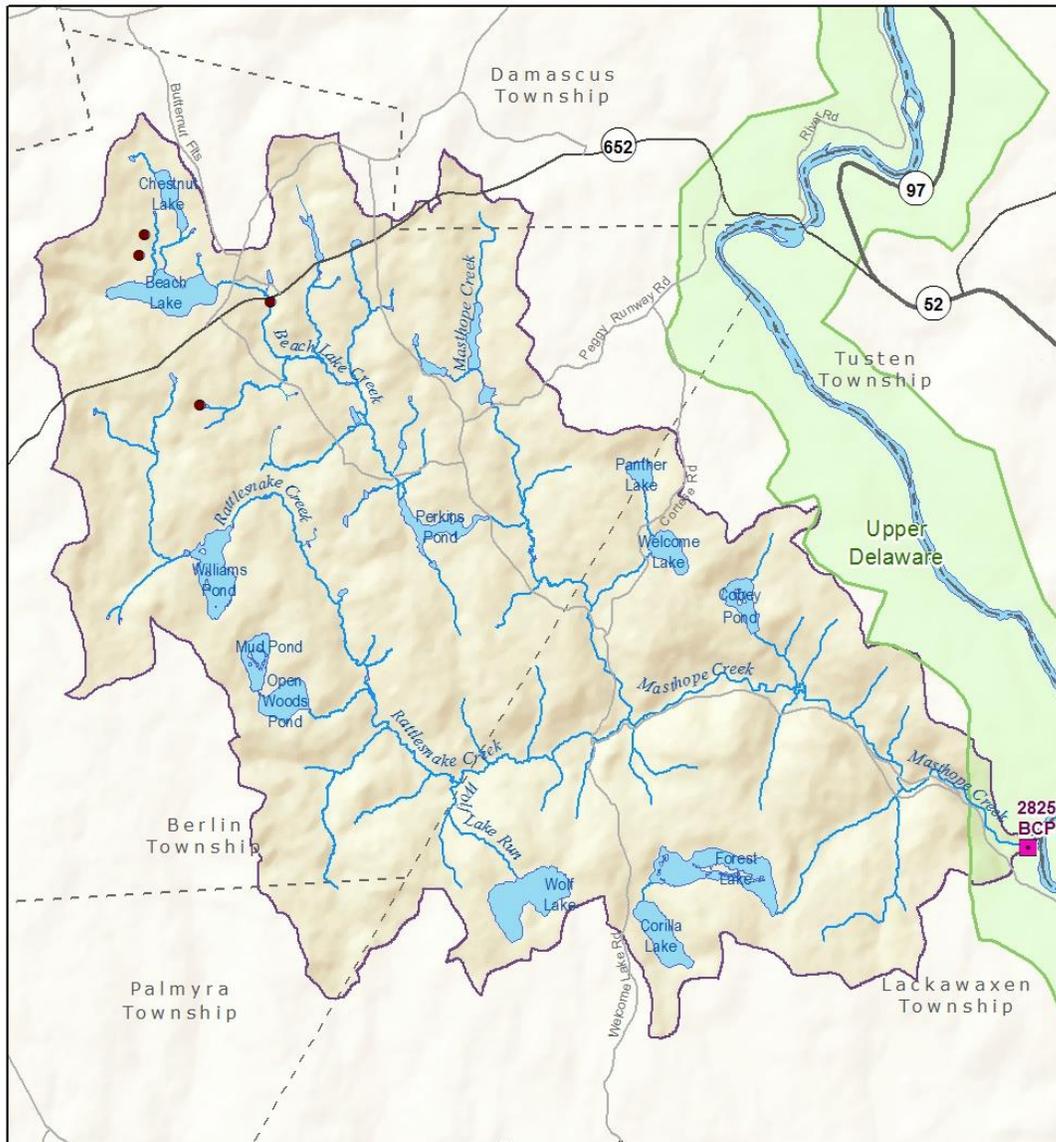
Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	54	9.95	8.60	10.70	2006-2011 SRMP
Aluminum, Dissolved, mg/L	15	0.003	0.002	0.005	2009-2010 SRMP archived samples
Ammonia-Nitrogen as N, Total mg/L *	54	0.010	0.009	0.011	2006-2011 SRMP
Barium, Dissolved mg/L	15	0.038	0.037	0.044	2009-2010 SRMP archived samples
Calcium, Dissolved mg/L	15	5.10	4.10	5.90	2009-2010 SRMP archived samples
Chloride, Total mg/L	54	12.33	11.60	13.70	2006-2011 SRMP
Dissolved Oxygen (DO) mg/L *	50	9.15	8.80	9.50	2006-2011 SRMP
Dissolved Oxygen Saturation %	40	97	96	97	2007-2011 SRMP
Enterococcus #/100ml	32	28	12	70	2007, 2010-2011 SRMP
Escherichia coli #/100ml	33	9	4	19	2007, 2010-2011 SRMP
Fecal coliform #/100ml *	63	15	9	18	2006-2011 SRMP
Hardness as CaCO ₃ , Total mg/L	54	18.1	17.2	20.0	2006-2011 SRMP
Magnesium, Dissolved mg/L	15	1.59	1.21	1.79	2009-2010 SRMP archived samples
Manganese, Dissolved µg/L	15	7.6	5.7	16.2	2009-2010 SRMP archived samples
Nitrate+Nitrite as N, Total mg/L *	44	0.061	0.052	0.068	2007-2011 SRMP
Nitrogen as N, Total mg/L *	44	0.297	0.250	0.321	2007-2011 SRMP
Nitrogen, Kjeldahl as N, Total mg/L	44	0.208	0.192	0.247	2007-2011 SRMP
pH units *	50	7.55	7.48	7.59	2006-2011 SRMP
Phosphate as P, Total mg/L	44	0.013	0.010	0.014	2007-2011 SRMP
Phosphorus as P, Total mg/L *	44	0.019	0.017	0.021	2007-2011 SRMP
Potassium, Dissolved mg/L	15	0.78	0.65	0.92	2009-2010 SRMP archived samples
Sodium, Dissolved mg/L	15	8.07	6.76	9.08	2009-2010 SRMP archived samples
Specific Conductance µS/cm	50	77.5	69.0	84.0	2006-2011 SRMP
Strontium, Dissolved mg/L	15	0.042	0.030	0.049	2009-2010 SRMP archived samples
Sulfate, Total mg/L	15	5.56	5.41	5.80	2009-2010 SRMP archived samples
Temperature, Water, degrees C	50	18.15	16.60	19.00	2006-2011 SRMP
Total Dissolved Solids (TDS) mg/L	54	47.90	46.65	49.70	2006-2011 SRMP
Total Suspended Solids (TSS) mg/L *	48	1.22	0.85	1.80	2006-2011 SRMP
Turbidity NTU	52	1.70	1.00	6.00	2006-2011 SRMP

Two-tailed confidence limits were used for these EWQ targets.

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

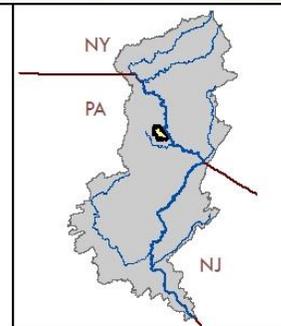
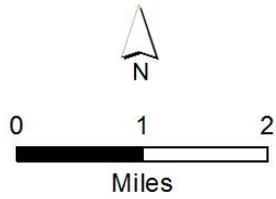
2825 BCP Masthope Creek at RR Bridge near Mouth



Masthope Creek

Drainage Area = 31.47 mi²

- Sampling Location
- NPDES
- Drainage Area
- NPS Boundary



2825 BCP Masthope Creek at RR Bridge near Mouth

Pike County, PA. Latitude 41.537679 Longitude -75.027055 by GPS NAD83 decimal degrees.

No known USGS or State sites nearby.

Watershed Population: 2000: 1,253 2010: 1,434 Change: +181 (+14.5%)

Drainage Area: 32.0 square miles, tributary to Delaware River Zone 1B

Site Specific EWQ defined 2006-2011 by DRBC/NPS Scenic Rivers Monitoring Program.

This watershed is tributary to the Upper Delaware Scenic and Recreational River (UPDE)

Classified by DRBC as Outstanding Basin Waters.

Nearest upstream Interstate Control Point: 2899 ICP Delaware River at Narrowsburg

Nearest downstream Interstate Control Point: 2792 ICP Delaware River at USGS Barryville Gage 01428500

Known dischargers within watershed: Undefined

Watershed is 79.6% forested; urban land cover is 2.47%. 100% glaciated. No carbonate rock. Mean annual precipitation 41 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics (USGS BaSE Model):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
3,378	111	53.4	36.9	28.5	18.5	9.73	4.39	0.59

StreamStats Low-Flow Stream Statistics

M7D2Y (ft ³ /s)	2.95
M30D2Y (ft ³ /s)	4.13
M7D10Y (ft ³ /s)	1.17
M30D10Y (ft ³ /s)	1.67
M90D10Y (ft ³ /s)	2.78

StreamStats Mean/Baseflow Stream Statistics

QA (ft ³ /s)	47.3
QAH (ft ³ /s)	10.3
BF10YR (ft ³ /s)	18.4
BF25YR (ft ³ /s)	16.3
BF50YR (ft ³ /s)	15.1

StreamStats Peak-Flow Stream Statistics

PK2 (ft ³ /s)	1,040
PK5 (ft ³ /s)	1,760
PK10 (ft ³ /s)	2,360
PK50 (ft ³ /s)	3,970
PK100 (ft ³ /s)	4,800
PK500 (ft ³ /s)	7,120

Existing Water Quality: 2825 BCP Masthope Creek at RR Bridge near Mouth

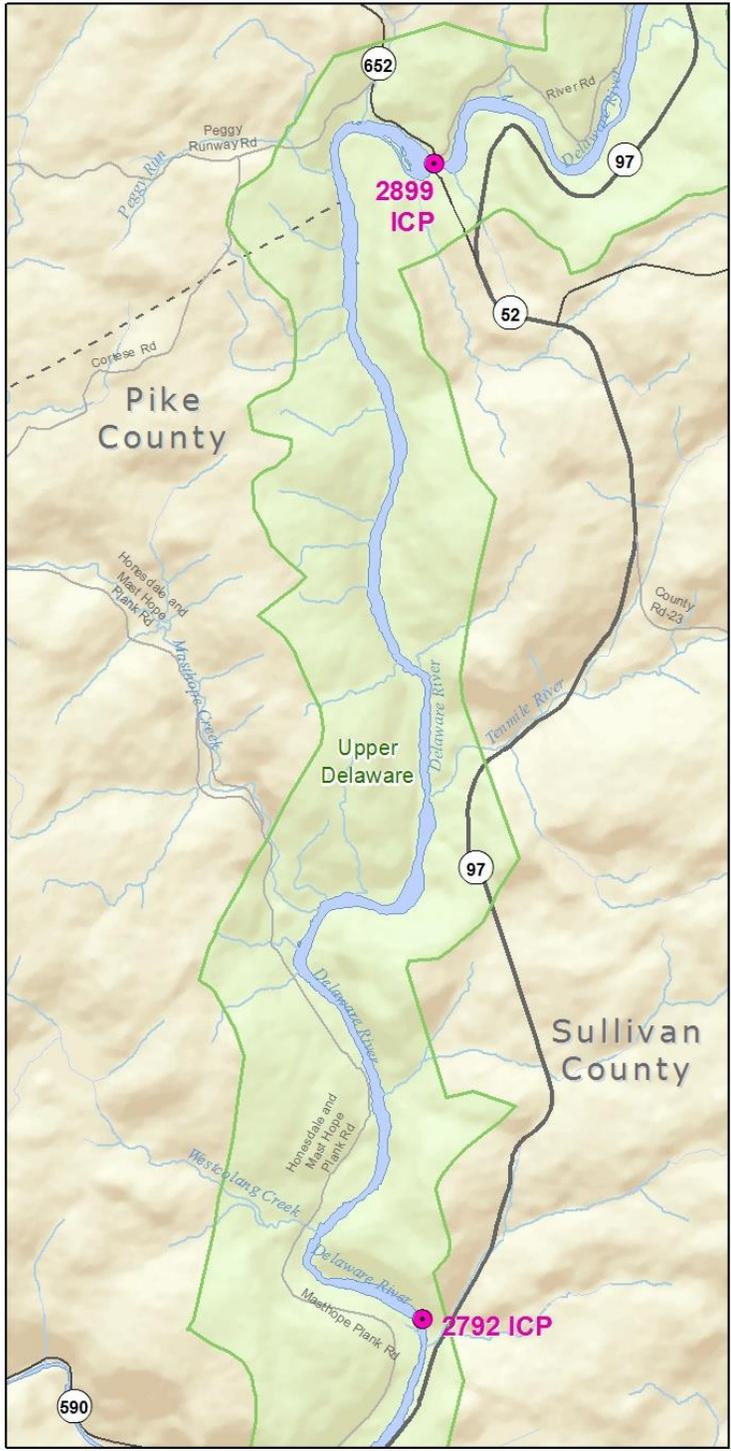
Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	54	10.8	9.4	12.2	2006-2011 SRMP
Aluminum, Dissolved, mg/L	15	0.003	0.001	0.005	2009-2010 SRMP archived samples
Ammonia-Nitrogen as N, Total mg/L *	53	0.007	0.006	0.010	2006-2011 SRMP
Barium, Dissolved mg/L	15	0.021	0.018	0.023	2009-2010 SRMP archived samples
Calcium, Dissolved mg/L	15	4.08	3.25	4.43	2009-2010 SRMP archived samples
Chloride, Total mg/L	54	5.38	4.73	5.90	2006-2011 SRMP
Dissolved Oxygen (DO) mg/L *	50	9.15	9.00	9.50	2006-2011 SRMP
Dissolved Oxygen Saturation %	40	97	97	98	2007-2011 SRMP
Enterococcus #/100ml	43	26	15	34	2007, 2010-2011 SRMP
Escherichia coli #/100ml	43	17	12	23	2007, 2010-2011 SRMP
Fecal coliform #/100ml *	64	19	14	30	2006-2011 SRMP
Hardness as CaCO ₃ , Total mg/L	54	15.4	14.0	16.6	2006-2011 SRMP
Magnesium, Dissolved mg/L	15	1.26	0.98	1.51	2009-2010 SRMP archived samples
Manganese, Dissolved µg/L	15	4.50	2.30	7.50	2009-2010 SRMP archived samples
Nitrate+Nitrite as N, Total mg/L *	43	0.036	0.030	0.051	2007-2011 SRMP
Nitrogen as N, Total mg/L *	44	0.239	0.228	0.279	2007-2011 SRMP
Nitrogen, Kjeldahl as N, Total mg/L	44	0.201	0.163	0.207	2007-2011 SRMP
pH units *	50	7.44	7.38	7.53	2006-2011 SRMP
Phosphate as P, Total mg/L	44	0.012	0.011	0.013	2007-2011 SRMP
Phosphorus as P, Total mg/L *	44	0.019	0.017	0.020	2007-2011 SRMP
Potassium, Dissolved mg/L	15	0.59	0.48	0.66	2009-2010 SRMP archived samples
Sodium, Dissolved mg/L	15	3.99	3.22	4.24	2009-2010 SRMP archived samples
Specific Conductance µS/cm	50	54.0	50.0	60.0	2006-2011 SRMP
Strontium, Dissolved mg/L	15	0.027	0.020	0.029	2009-2010 SRMP archived samples
Sulfate, Total mg/L	15	4.83	4.56	5.24	2009-2010 SRMP archived samples
Temperature, Water, degrees C	50	18.0	16.1	19.4	2006-2011 SRMP
Total Dissolved Solids (TDS) mg/L	54	34.05	33.23	35.13	2006-2011 SRMP
Total Suspended Solids (TSS) mg/L *	45	1.10	0.90	1.60	2006-2011 SRMP
Turbidity NTU	51	1.49	0.84	6.00	2006-2011 SRMP

Two-tailed confidence limits were used for these EWQ targets.

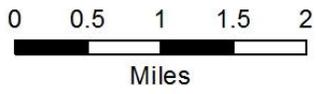
* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

2792 ICP Delaware River above Lackawaxen River USGS Gage 01428500



- Sampling Location
- County Boundary
- NPS Boundary



2792 ICP
 Delaware River at above Lacawaxen River, USGS 01428500

2792 ICP Delaware River above Lackawaxen River USGS Gage 01428500

Latitude 41.508890 Longitude -74.986110 by GPS NAD83 decimal degrees.

USGS Site No. 01428500

Watershed Population figures were not calculated for main-stem Delaware River sites.

Drainage Area: 2,020 square miles, Delaware River Zone 1B

Site Specific EWQ defined 2008-2011 by the DRBC/NPS Scenic Rivers Monitoring Program.

The National Park Service maintains a continuous water quality meter to supplement USGS flow and temperature data at this site.

This site is located in the Upper Delaware Scenic and Recreational River (UPDE)

Classified by DRBC as Outstanding Basin Waters

Nearest upstream Interstate Control Point: 2899 ICP Delaware River at Narrowsburg

Nearest downstream Interstate Control Point: 2735 ICP Delaware River at Barryville

Known dischargers within watershed: Undefined

Tributaries to upstream reach: Major tributary 2842 BCP Tenmile River, NY; 2825 BCP Masthope Creek, PA; small tributaries 289.0 Peggy Run, PA; 281.4 Grassy Swamp Brook, NY; 280.2 Westcolang Creek, NY.

No Stream Stats web site data available (drainage area too large to calculate on web site).

Flow Statistics (Calculated):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
140,000	7,310	3,760	2,310	1,780	1,480	1,210	957	355

Existing Water Quality: 2792 ICP Delaware River at USGS Gage 01428500

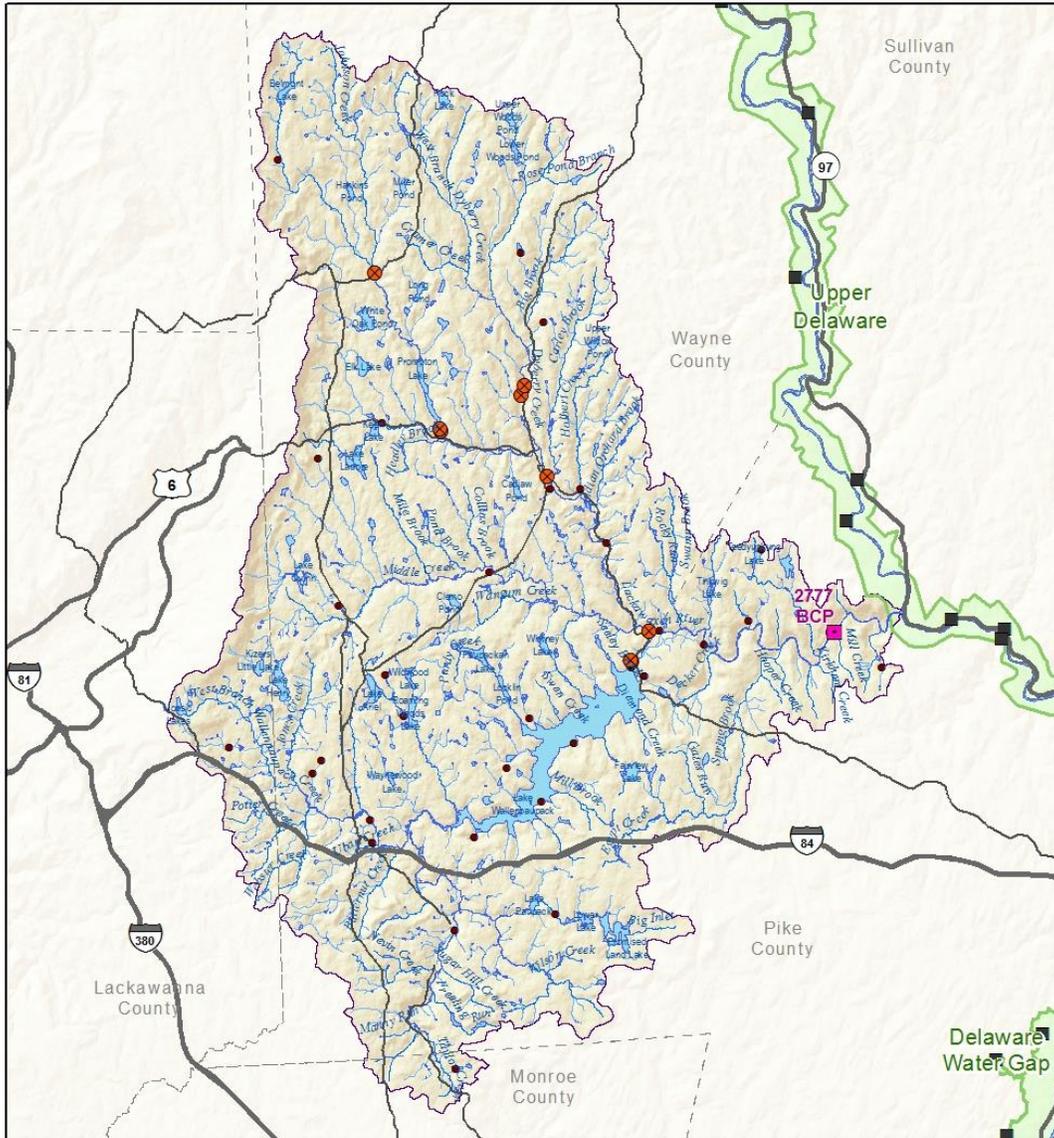
Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	41	13.7	12.8	14.5	2008-2011 SRMP
Aluminum, Dissolved, mg/L	15	0.004	0.003	0.005	2009-2010 SRMP archived samples
Ammonia-Nitrogen as N, Total mg/L *	40	0.013	0.009	0.015	2008-2011 SRMP
Barium, Dissolved mg/L	15	0.017	0.016	0.019	2009-2010 SRMP archived samples
Calcium, Dissolved mg/L	15	5.38	4.70	5.83	2009-2010 SRMP archived samples
Chloride, Total mg/L	41	10.20	9.17	10.90	2008-2011 SRMP
Dissolved Oxygen (DO) mg/L *	38	8.90	8.50	9.10	2008-2011 SRMP
Dissolved Oxygen Saturation %	30	96.5	96.0	98.0	2009-2011 SRMP
Enterococcus #/100ml	30	28	13	140	2008, 2010-2011 SRMP
Escherichia coli #/100ml	30	11	5	19	2008, 2010-2011 SRMP
Fecal coliform #/100ml *	32	21	16	62	2009-2011 SRMP
Hardness as CaCO ₃ , Total mg/L	41	21.4	19.2	23.0	2008-2011 SRMP
Magnesium, Dissolved mg/L	15	1.18	1.04	1.34	2009-2010 SRMP archived samples
Manganese, Dissolved µg/L	15	7.5	4.0	16.3	2009-2010 SRMP archived samples
Nitrate+Nitrite as N, Total mg/L *	41	0.145	0.131	0.166	2008-2011 SRMP
Nitrogen as N, Total mg/L *	41	0.323	0.306	0.380	2008-2011 SRMP
Nitrogen, Kjeldahl as N, Total mg/L	41	0.191	0.162	0.220	2008-2011 SRMP
pH units *	30	7.78	7.64	7.98	2009-2011 SRMP
Phosphate as P, Total mg/L	41	0.005	0.003	0.006	2008-2011 SRMP
Phosphorus as P, Total mg/L *	50	0.011	0.009	0.012	2007 USGS, 2008-2011 SRMP
Potassium, Dissolved mg/L	15	0.64	0.47	0.70	2009-2010 SRMP archived samples
Sodium, Dissolved mg/L	15	5.05	4.07	5.75	2009-2010 SRMP archived samples
Specific Conductance µS/cm	30	78	71	83	2009-2011 SRMP
Strontium, Dissolved mg/L	15	0.020	0.018	0.022	2009-2010 SRMP archived samples
Sulfate, Total mg/L	14	4.87	3.94	5.59	2009-2010 SRMP archived samples
Temperature, Water, degrees C	39	19.7	18.5	22.9	2007 USGS, 2009-2011 SRMP
Total Dissolved Solids (TDS) mg/L	41	43.92	40.57	45.55	2008-2011 SRMP
Total Suspended Solids (TSS) mg/L *	41	1.67	0.95	2.70	2008-2011 SRMP
Turbidity NTU	32	1.08	0.77	2.26	2009-2011 SRMP

Two-tailed confidence limits were used for these EWQ targets.

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

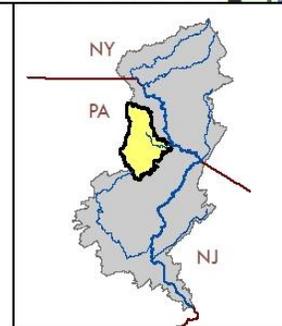
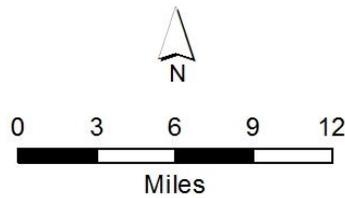
2777 BCP Lackawaxen River at Rowlands



Lackawaxen River

Drainage Area = 597.44 mi²

- Sampling Location
- Other Sampling Location
- NPDES
- Stream Gage
- Drainage Area
- NPS Boundary



2777 BCP Lackawaxen River at Rowlands

Pike County, PA. Latitude 41.475367 Longitude -75.035771 by GPS NAD83 decimal degrees.

USGS Gage 01432110; PADEP Site WQN0147

Watershed Population: 2000: 49,519 2010: 57,006 Change: +7,487 (+15.1%)

Drainage Area: 597 square miles, tributary to Delaware River Zone 1B

Site Specific EWQ defined 2006-2011 by DRBC/NPS Scenic Rivers Monitoring Program and 1999-2011 PADEP.

This watershed is tributary to the Upper Delaware Scenic and Recreational River (UPDE)

Classified by DRBC as Outstanding Basin Waters.

Nearest upstream Interstate Control Point: 2792 ICP Delaware River at USGS Barryville Gage 01428500

Nearest downstream Interstate Control Point: 2735 ICP Delaware River at Barryville

Known dischargers within watershed: Numerous, undefined at present. Flow is partially controlled by hydropower operations at Lake Wallenpaupack.

Watershed is 76.7% forested; urban land cover is 2.83%. 100% glaciated. No carbonate rock. Mean annual precipitation 43 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics (USGS BaSE Model):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
55,077	2639	1339	905	710	464	291	151	29.1

StreamStats Low-Flow Stream Statistics

M7D2Y (ft ³ /s)	106
M30D2Y (ft ³ /s)	134
M7D10Y (ft ³ /s)	60.3
M30D10Y (ft ³ /s)	74.9
M90D10Y (ft ³ /s)	105

StreamStats Mean/Baseflow Stream Statistics

QA (ft ³ /s)	1,020
QAH (ft ³ /s)	286
BF10YR (ft ³ /s)	383
BF25YR (ft ³ /s)	342
BF50YR (ft ³ /s)	318

StreamStats Peak-Flow Stream Statistics

PK2 (ft ³ /s)	13,300
PK5 (ft ³ /s)	21,100
PK10 (ft ³ /s)	27,500
PK50 (ft ³ /s)	44,800
PK100 (ft ³ /s)	53,500
PK500 (ft ³ /s)	77,900

Existing Water Quality: 2777 BCP Lackawaxen River at Rowlands

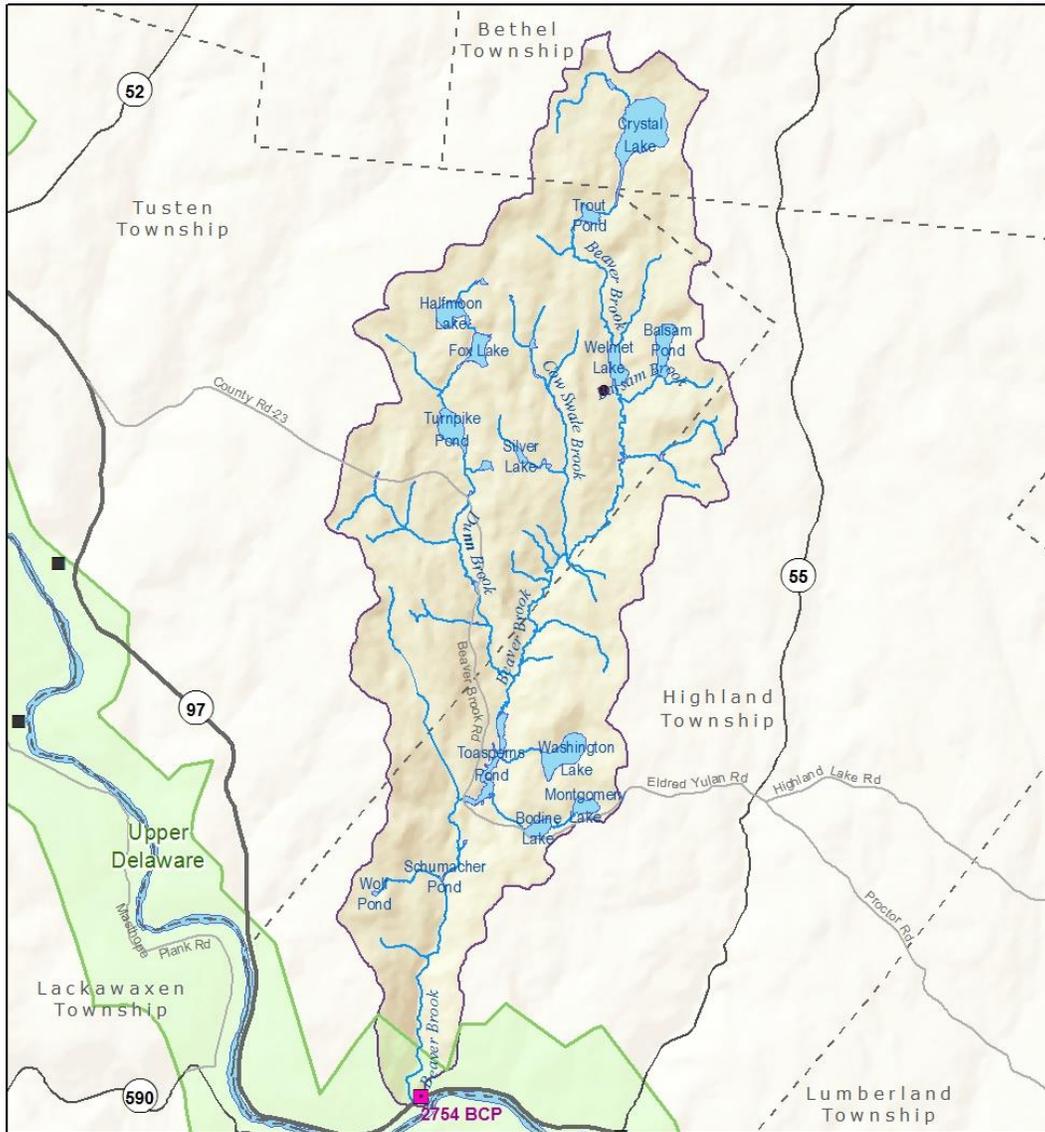
Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	79	15.00	14.00	15.80	1999-2011 SRMP, PADEP
Aluminum, Dissolved, mg/L	15	0.002	0.001	0.005	2009-2010 SRMP archived samples
Ammonia-Nitrogen as N, Total mg/L *	78	0.016	0.015	0.016	1999-2011 SRMP, PADEP
Barium, Dissolved mg/L	15	0.017	0.017	0.020	2009-2010 SRMP archived samples
Calcium, Dissolved mg/L	15	6.98	6.42	7.80	2009-2010 SRMP archived samples
Chloride, Total mg/L	68	10.90	10.20	11.60	2006-2011 SRMP, PADEP
Dissolved Oxygen (DO) mg/L *	72	9.00	8.90	9.40	1999-2011 SRMP, PADEP
Dissolved Oxygen Saturation %	40	96	96	98	2007-2011 SRMP
Enterococcus #/100ml	45	14	9	21	2007-2011 SRMP
Escherichia coli #/100ml	45	9	5	16	2007-2011 SRMP
Fecal coliform #/100ml *	73	18	11	30	1999-2011 SRMP, PADEP
Hardness as CaCO ₃ , Total mg/L	79	23.0	22.2	24	1999-2011 SRMP, PADEP
Magnesium, Dissolved mg/L	15	1.08	1.01	1.16	2009-2010 SRMP archived samples
Manganese, Dissolved µg/L	15	6.40	4.40	12.10	2009-2010 SRMP archived samples
Nitrate+Nitrite as N, Total mg/L *	55	0.100	0.086	0.111	2007-2011 SRMP
Nitrogen as N, Total mg/L *	65	0.366	0.341	0.393	2004-2011 SRMP, PADEP
Nitrogen, Kjeldahl as N, Total mg/L	55	0.257	0.248	0.290	2007-2011 SRMP
Organic Carbon, Total mg/L	14	3.75	3.10	4.40	1999-2004 PADEP
pH units *	78	7.69	7.61	7.75	1999-2011 SRMP, PADEP
Phosphate as P, Total mg/L	98	0.013	0.011	0.015	2002-2011 SRMP, PADEP
Phosphorus as P, Total mg/L *	94	0.020	0.019	0.023	1998-2011 SRMP, PADEP
Potassium, Dissolved mg/L	15	0.746	0.726	0.861	2009-2010 SRMP archived samples
Sodium, Dissolved mg/L	15	7.24	5.55	7.61	2009-2010 SRMP archived samples
Specific Conductance µS/cm	78	84.5	82.4	88.0	1998-2011 SRMP, PADEP
Strontium, Dissolved mg/L	15	0.026	0.024	0.028	2009-2010 SRMP archived samples
Sulfate, Total mg/L	37	6.32	6.11	6.58	2009-2010 SRMP archived samples
Temperature, Water, degrees C	78	18.8	17.8	19.7	1999-2011 SRMP, PADEP
Total Dissolved Solids (TDS) mg/L	92	51.5	50.0	52.8	1999-2011 SRMP, PADEP
Total Suspended Solids (TSS) mg/L *	73	2.45	2.00	3.10	1999-2011 SRMP, PADEP
Turbidity NTU	54	2.78	1.91	7.25	2006-2011 SRMP

Two-tailed confidence limits were used for these EWQ targets.

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

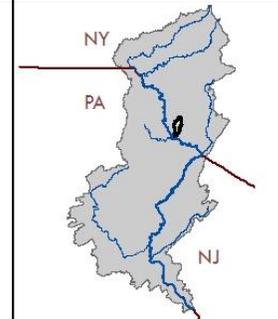
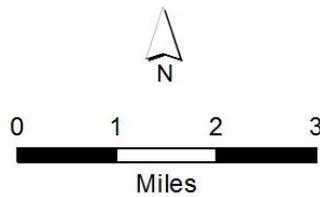
2754 BCP Beaver Brook at Rt. 97



Beaver Brook

Drainage Area = 23.52 mi²

- Sampling Location
- Other Sampling Location
- NPDES
- Drainage Area
- NPS Boundary



2754 BCP Beaver Brook at Rt. 97

Sullivan County, NY. Latitude 41.482890 Longitude -74.949175 by GPS NAD83 decimal degrees.

Watershed Population: 2000: 697 2010: 778 Change: +81 (+11.6%)

Drainage Area: 23.7 square miles, tributary to Delaware River Zone 1B

Site Specific EWQ monitoring began 2013 by DRBC/NPS Scenic Rivers Monitoring Program.

This watershed is tributary to the Upper Delaware Scenic and Recreational River (UPDE)

Classified by DRBC as Outstanding Basin Waters.

Nearest upstream Interstate Control Point: 2792 ICP Delaware River above Lackawaxen River USGS Gage 01428500

Nearest downstream Interstate Control Point: 2735 ICP Delaware River at Barryville

Known dischargers within watershed: Undefined at present.

Watershed is 89.6% forested; urban land cover is 1.16%. 100% glaciated. No carbonate rock. Mean annual precipitation 42.2 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics (USGS BaSE Model):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
2,603	85.9	43.1	29.5	23.0	15.1	8.06	3.59	0.52

StreamStats Low-Flow Stream Statistics

M7D2Y (ft ³ /s)	2.87
M30D2Y (ft ³ /s)	3.96
M7D10Y (ft ³ /s)	1.18
M30D10Y (ft ³ /s)	1.63
M90D10Y (ft ³ /s)	2.69

StreamStats Mean/Baseflow Stream Statistics

QA (ft ³ /s)	37.9
QAH (ft ³ /s)	8.78
BF10YR (ft ³ /s)	15.8
BF25YR (ft ³ /s)	14.2
BF50YR (ft ³ /s)	13.2

StreamStats Peak-Flow Stream Statistics

PK2 (ft ³ /s)	844
PK5 (ft ³ /s)	1,440
PK10 (ft ³ /s)	1,930
PK50 (ft ³ /s)	3,260
PK100 (ft ³ /s)	3,940
PK500 (ft ³ /s)	5,830

Existing Water Quality: 2754 BCP Beaver Brook at Rt. 97 (Insufficient Data)

Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , mg/L, total	22	7.5	5.0	9.0	SRMP 2014-2015
Ammonia as N, mg/L, total *	22	0.0063	0.0043	0.01	SRMP 2014-2015
Chloride, mg/L, Total	22	20.0	16.0	22.3	SRMP 2014-2015
Dissolved Oxygen, mg/L *	20	9.0	8.6	9.4	SRMP 2014-2015
Dissolved Oxygen Saturation, %	20	99.7	99.0	100.3	SRMP 2014-2015
Fecal Coliform, #/100 ml *	18	18	10	53	SRMP 2014-2015
Hardness as CaCO ₃ , mg/L, Total	22	17.1	13.7	18.8	SRMP 2014-2015
Nitrate + Nitrite as N, Total, mg/L *	22	0.077	0.047	0.135	SRMP 2014-2015
Nitrogen as N, Total, mg/L *	22	0.337	0.290	0.404	SRMP 2014-2015
Nitrogen, Kjeldahl as N, mg/L	22	0.226	0.186	0.289	SRMP 2014-2015
pH, standard units *	20	7.0	6.9	7.1	SRMP 2014-2015
Phosphate as P, Total mg/L	22	0.015	0.013	0.017	SRMP 2014-2015
Phosphorus as P, Total mg/L *	22	0.028	0.024	0.036	SRMP 2014-2015
Specific Conductance, µS/cm	19	99.6	78.7	107.6	SRMP 2014-2015
Temperature, Water, Degrees C	20	19.4	17.8	21.2	SRMP 2014-2015
Total Dissolved Solids, mg/L	22	62	57	71	SRMP 2014-2015
Total Suspended Solids, mg/L *	22	3.0	1.0	4.0	SRMP 2014-2015
Turbidity, NTU	11	0.72	0.48	2.84	SRMP 2015

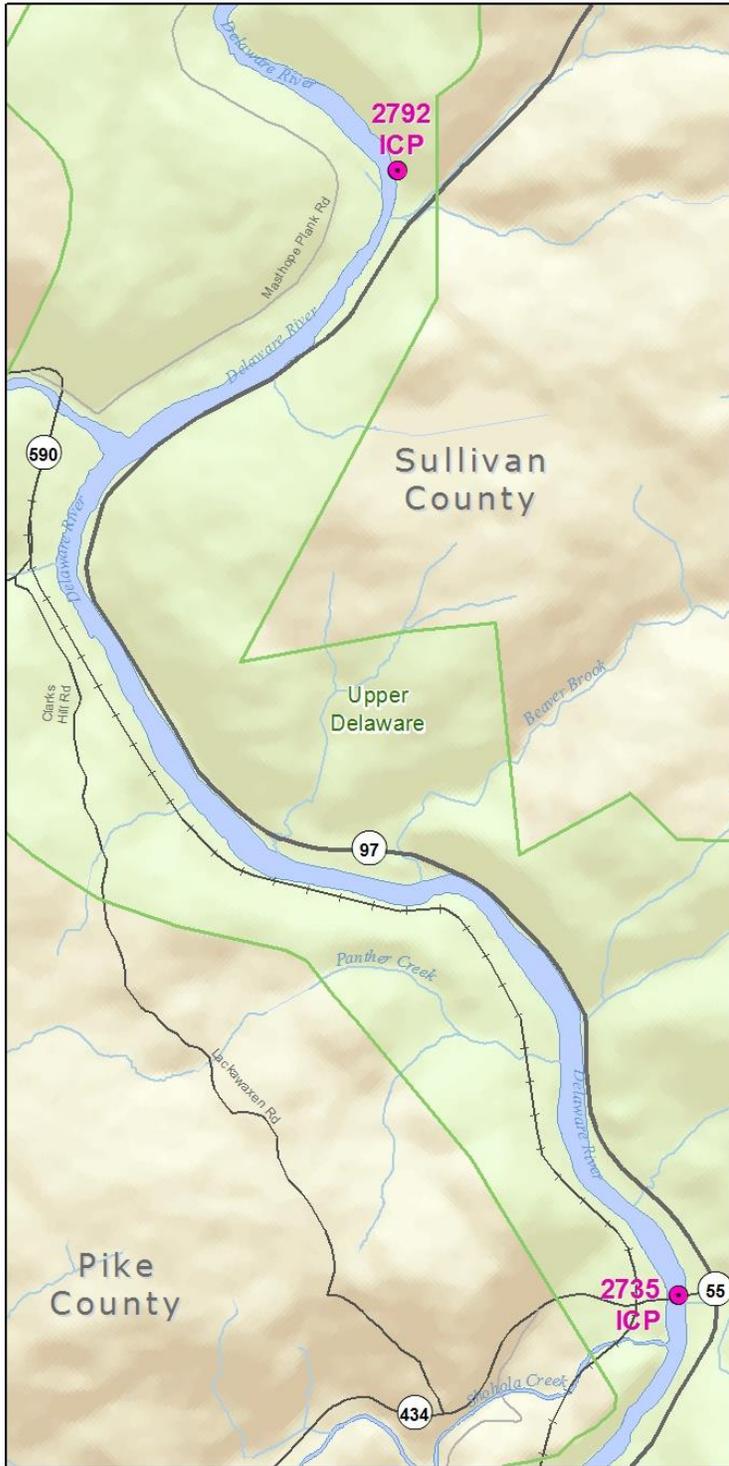
Two-tailed confidence limits were used for these EWQ targets.

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

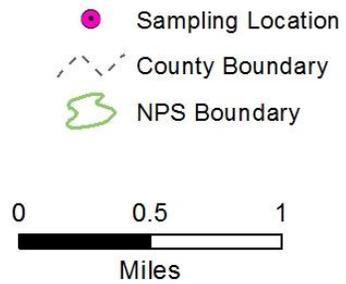
Note: All data are May to September season.

This table will be updated after one more year of DRBC and NPS sampling in 2016, adding 10 samples to this data set.

2735 ICP Delaware River at Barryville



2735 ICP
Delaware River at Barryville/Shohola Bridge



2735 ICP Delaware River at Barryville

Latitude 41.475712 Longitude -74.912752 by GPS NAD83 decimal degrees.

No USGS or State monitoring at this location.

Watershed Population figures were not calculated for main-stem Delaware River sites.

Drainage Area: 2,660 square miles, Delaware River Zone 1B

Site Specific EWQ defined 2006-2011 by the DRBC/NPS Scenic Rivers Monitoring Program.

This site is located in the Upper Delaware Scenic and Recreational River (UPDE)

Classified by DRBC as Outstanding Basin Waters

Nearest upstream Interstate Control Point: 2792 ICP Delaware River above Lackawaxen River

Nearest downstream Interstate Control Point: 2655 ICP Delaware River at Pond Eddy

Known dischargers within watershed: Undefined

Tributaries to upstream reach: Major tributary 2777 BCP Lackawaxen River, PA; 2754 BCP Beaver Brook, NY; small tributaries 279.0 Narrow Falls Brook, NY; 274.5 Panther Creek, PA.

No Stream Stats web site data available (drainage area too large to calculate on web site).

Flow Statistics (Calculated):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
184,356	9,618	5,070	3,241	2,515	2,027	1,594	1,314	467

Existing Water Quality: 2735 ICP Delaware River at Barryville

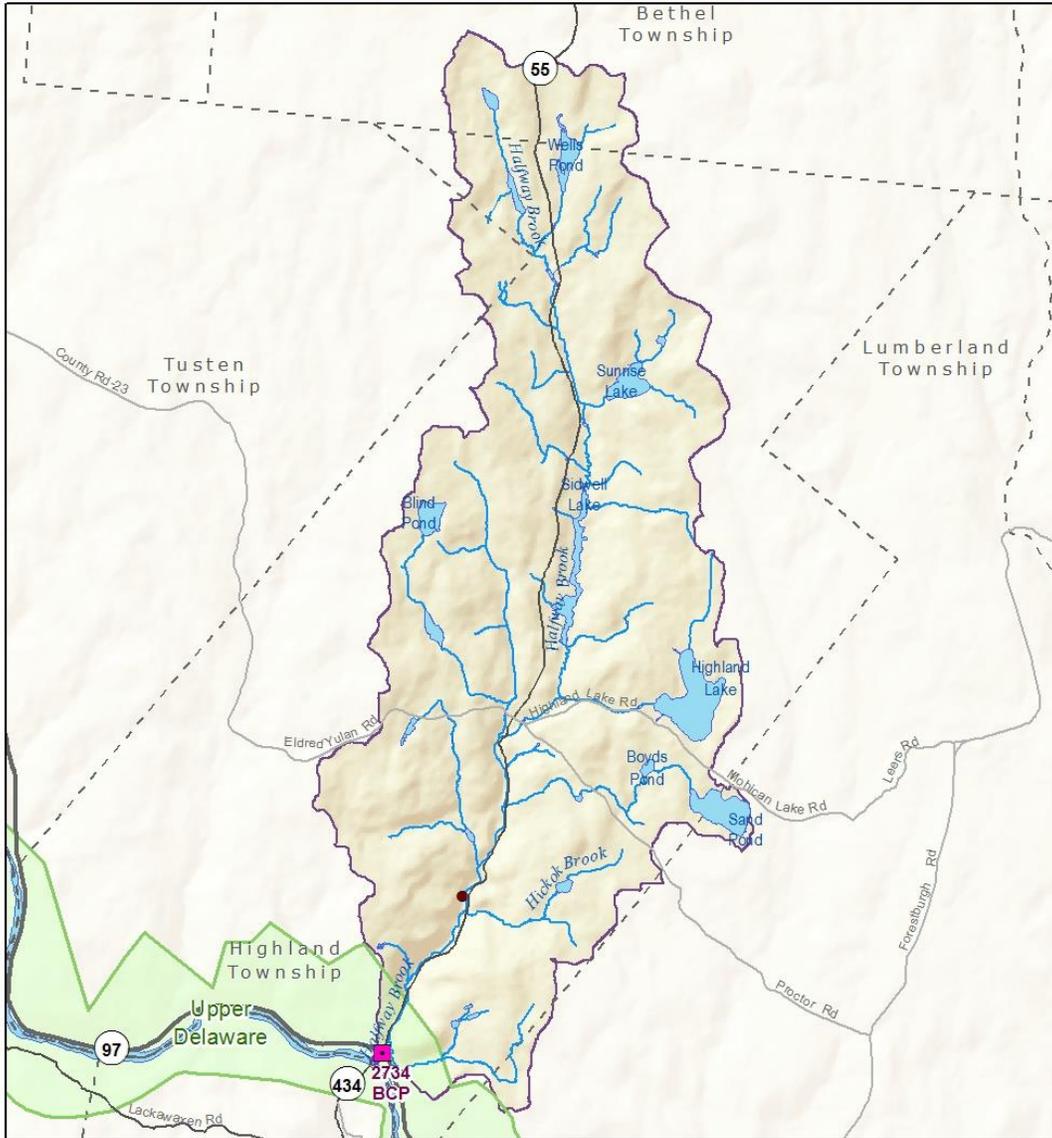
Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	61	13.6	12.9	14.1	2006-2011 SRMP
Aluminum, Dissolved mg/L	15	0.003	0.003	0.004	2009-2010 SRMP archived samples
Ammonia-Nitrogen as N, Total mg/L *	60	0.012	0.010	0.014	2006-2011 SRMP
Barium, Dissolved mg/L	15	0.020	0.018	0.024	2009-2010 SRMP archived samples
Calcium, Dissolved mg/L	15	5.93	5.66	6.50	2009-2010 SRMP archived samples
Chloride, Total mg/L	61	10.34	10.10	10.99	2006-2011 SRMP
Dissolved Oxygen (DO) mg/L *	58	9.00	8.70	9.20	2006-2011 SRMP
Dissolved Oxygen Saturation %	40	98.0	97.0	99.0	2007-2011 SRMP
Enterococcus #/100ml	53	18	9	29	2007-2011 SRMP
Escherichia coli #/100ml	53	10	5	16	2007-2011 SRMP
Fecal coliform #/100ml *	67	14	10	21	2006-2011 SRMP
Hardness as CaCO ₃ , Total mg/L	61	21.2	20.2	22.0	2006-2011 SRMP
Magnesium, Dissolved mg/L	15	1.32	1.21	1.42	2009-2010 SRMP archived samples
Manganese, Dissolved µg/L	15	5.60	4.00	8.80	2009-2010 SRMP archived samples
Nitrate+Nitrite as N, Total mg/L *	51	0.144	0.127	0.168	2007-2011 SRMP
Nitrogen as N, Total mg/L *	51	0.352	0.331	0.379	2007-2011 SRMP
Nitrogen, Kjeldahl as N, Total mg/L	51	0.205	0.186	0.216	2007-2011 SRMP
pH units *	49	7.74	7.66	7.81	2006-2011 SRMP
Phosphate as P, Total mg/L	51	0.005	0.004	0.005	2007-2011 SRMP
Phosphorus as P, Total mg/L *	51	0.011	0.010	0.013	2007-2011 SRMP
Potassium, Dissolved mg/L	15	0.759	0.656	0.846	2009-2010 SRMP archived samples
Sodium, Dissolved mg/L	15	6.32	5.49	6.83	2009-2010 SRMP archived samples
Specific Conductance µS/cm	49	79	75	83	2006-2011 SRMP
Strontium, Dissolved mg/L	15	0.023	0.022	0.026	2009-2010 SRMP archived samples
Sulfate, Total mg/L	15	5.64	5.43	5.77	2009-2010 SRMP archived samples
Temperature, Water, degrees C	50	19.1	17.6	21.1	2006-2011 SRMP
Total Dissolved Solids (TDS) mg/L	61	45.55	43.50	46.85	2006-2011 SRMP
Total Suspended Solids (TSS) mg/L *	55	1.60	1.30	2.65	2006-2011 SRMP, PADEP
Turbidity NTU	52	3.2	1.4	8.0	2006-2011 SRMP

Two-tailed confidence limits were used for these EWQ targets

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

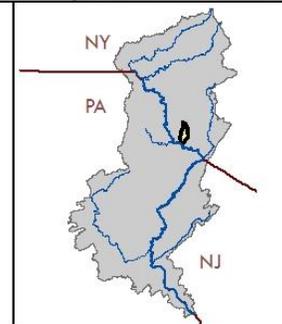
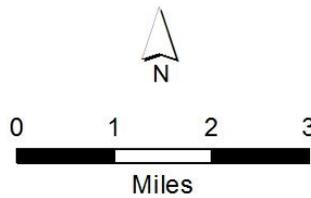
2734 BCP Halfway Brook at Rt. 97



Halfway Brook

Drainage Area = 28.2 mi²

- Sampling Location
- NPDES
- Drainage Area
- NPS Boundary



2734 BCP Halfway Brook at Rt. 97

Sullivan County, NY. Latitude 41.477102 Longitude -74.910376 by GPS NAD83 decimal degrees.

USGS Site No. 01432180

Watershed Population: 2000: 1,210 2010: 1,327 Change: +117 (+9.6%)

Drainage Area: 28.3 square miles, tributary to Delaware River Zone 1B

Site Specific EWQ monitoring began 2013 by DRBC/NPS Scenic Rivers Monitoring Program.

This watershed is tributary to the Upper Delaware Scenic and Recreational River (UPDE)

Classified by DRBC as Outstanding Basin Waters.

Nearest upstream Interstate Control Point: 2735 ICP Delaware River at Barryville

Nearest downstream Interstate Control Point: 2655 ICP Delaware River at Pond Eddy

Known dischargers within watershed: Undefined at present.

Watershed is 91.4% forested; urban land cover is 1.89%. 100% glaciated. No carbonate rock. Mean annual precipitation 43 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics (USGS BaSE Model):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
1,669	105	53.4	31.8	22.4	13.6	5.77	2.29	0.27

StreamStats Low-Flow Stream Statistics

M7D2Y (ft ³ /s)	3.93
M30D2Y (ft ³ /s)	5.36
M7D10Y (ft ³ /s)	1.69
M30D10Y (ft ³ /s)	2.29
M90D10Y (ft ³ /s)	3.70

StreamStats Mean/Baseflow Stream Statistics

QA (ft ³ /s)	47.0
QAH (ft ³ /s)	11.6
BF10YR (ft ³ /s)	20.1
BF25YR (ft ³ /s)	18.0
BF50YR (ft ³ /s)	16.8

StreamStats Peak-Flow Stream Statistics

PK2 (ft ³ /s)	1,020
PK5 (ft ³ /s)	1,730
PK10 (ft ³ /s)	2,310
PK50 (ft ³ /s)	3,890
PK100 (ft ³ /s)	4,690
PK500 (ft ³ /s)	6,910

Existing Water Quality: 2734 BCP Halfway Brook at Rt. 97

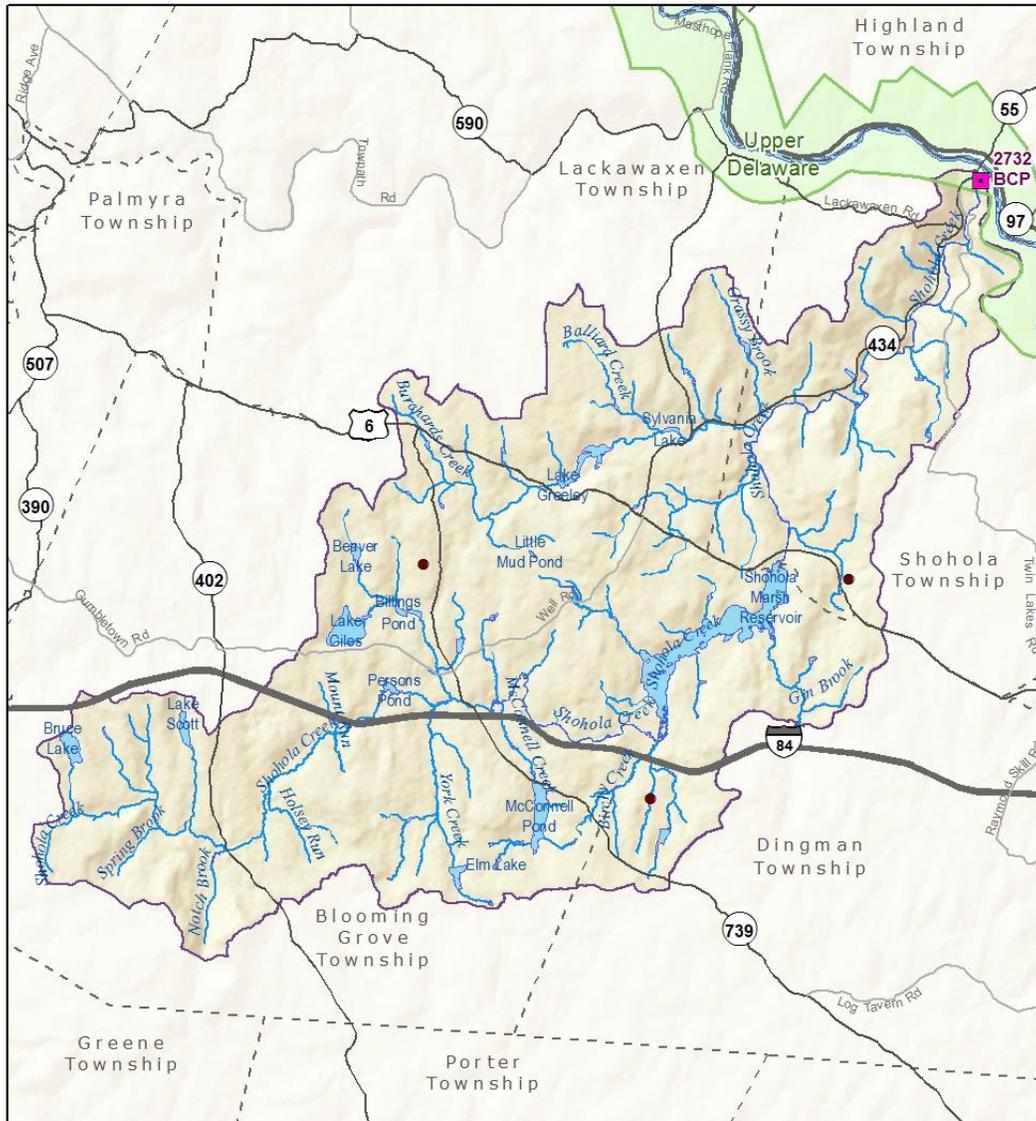
Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , mg/L, total	43	9.0	6.7	12.0	SRMP 2012-2015; USGS 2001
Ammonia as N, mg/L, total *	41	0.007	0.006	0.009	SRMP 2012-2015
Chloride, mg/L, Total	41	28.3	25.7	33.0	SRMP 2012-2015
Dissolved Oxygen, mg/L *	40	9.1	8.9	9.6	SRMP 2012-2015
Dissolved Oxygen Saturation, %	40	100.1	99.1	100.4	SRMP 2012-2015
Fecal Coliform, #/100 ml *	42	14	11	17	SRMP 2012-2015
Hardness as CaCO ₃ , mg/L, Total	41	20.6	17.2	22.9	SRMP 2012-2015
Nitrate + Nitrite as N, Total, mg/L *	41	0.134	0.103	0.180	SRMP 2012-2015
Nitrogen as N, Total, mg/L *	39	0.355	0.310	0.387	SRMP 2012-2015
Nitrogen, Kjeldahl as N, mg/L	43	0.187	0.175	0.239	SRMP 2012-2015; USGS 2001
pH, standard units *	42	7.28	7.18	7.43	SRMP 2012-2015
Phosphate as P, Total mg/L	45	0.010	0.009	0.012	SRMP 2012-2015; USGS 2001
Phosphorus as P, Total mg/L *	56	0.022	0.018	0.023	SRMP 2012-2015; USGS 2001, 2007
Specific Conductance, µS/cm	40	127	115	147	SRMP 2012-2015; USGS 2001
Temperature, Water, Degrees C	55	18.4	17.3	19.7	SRMP 2012-2015; USGS 2001, 2007
Total Dissolved Solids, mg/L	43	78	70	93	SRMP 2012-2015: USGS 2001
Total Suspended Solids, mg/L *	41	2.0	1.0	3.0	SRMP 2012-2015
Turbidity, NTU	34	0.37	0.32	0.69	SRMP 2012-2013, 2015

Two-tailed confidence limits were used for these EWQ targets

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

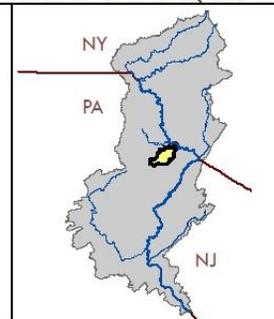
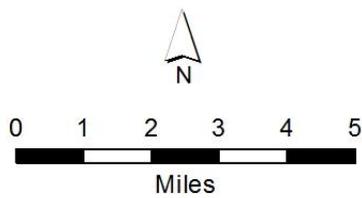
2732 BCP Shohola Creek at RR Bridge off Rt. 434



Shohola Creek

Drainage Area = 76.93 mi²

- Sampling Location
- NPDES
- Drainage Area
- NPS Boundary



2732 BCP Shohola Creek at RR Bridge off Rt. 434

Pike County, PA. Latitude 41.472170 Longitude -74.912811 by GPS NAD83 decimal degrees.

No USGS or PADEP sites nearby

Watershed Population: 2000: 3,545 2010: 4,322 Change: +777 (+21.9%)

Drainage Area: 85.2 square miles, tributary to Delaware River Zone 1B

Site Specific EWQ established 2006-2011 by DRBC/NPS Scenic Rivers Monitoring Program.

This watershed is tributary to the Upper Delaware Scenic and Recreational River (UPDE)

Classified by DRBC as Outstanding Basin Waters.

Nearest upstream Interstate Control Point: 2735 ICP Delaware River at Barryville

Nearest downstream Interstate Control Point: 2655 ICP Delaware River at Pond Eddy

Known dischargers within watershed: Undefined at present.

Watershed is 82.8% forested; urban land cover is 4.84%. 100% glaciated. No carbonate rock. Mean annual precipitation 42.4 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics (USGS BaSE Model):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
7,985	299	151	102	80.1	60.0	40.1	22.9	6.64

StreamStats Low-Flow Stream Statistics

M7D2Y (ft ³ /s)	10.2
M30D2Y (ft ³ /s)	13.8
M7D10Y (ft ³ /s)	4.70
M30D10Y (ft ³ /s)	6.30
M90D10Y (ft ³ /s)	9.83

StreamStats Mean/Baseflow Stream Statistics

QA (ft ³ /s)	127
QAH (ft ³ /s)	31.9
BF10YR (ft ³ /s)	50.5
BF25YR (ft ³ /s)	45.1
BF50YR (ft ³ /s)	42.0

StreamStats Peak-Flow Stream Statistics

PK2 (ft ³ /s)	2,110
PK5 (ft ³ /s)	3,500
PK10 (ft ³ /s)	4,660
PK50 (ft ³ /s)	7,820
PK100 (ft ³ /s)	9,440
PK500 (ft ³ /s)	14,000

Existing Water Quality: 2732 BCP Shohola Creek at RR Bridge off Rt. 434

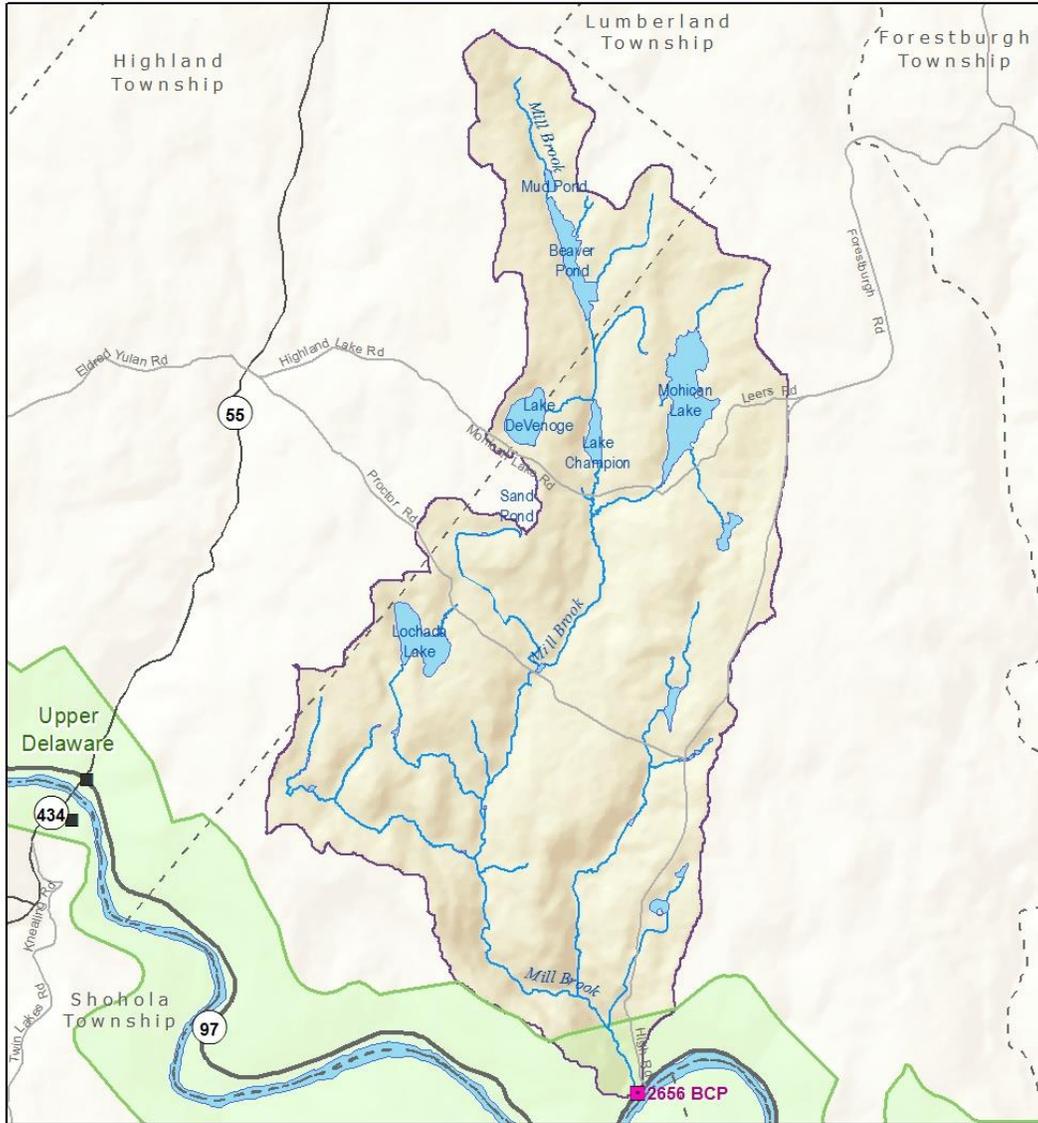
Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	55	6.30	5.80	7.20	2006-2011 SRMP
Aluminum, Dissolved mg/L	14	0.003	0.002	0.004	2009-2010 SRMP archived samples
Ammonia-Nitrogen as N, Total mg/L *	54	0.009	0.007	0.011	2006-2011 SRMP
Barium, Dissolved mg/L	14	0.015	0.010	0.019	2009-2010 SRMP archived samples
Calcium, Dissolved mg/L	14	3.46	2.48	3.73	2009-2010 SRMP archived samples
Chloride, Total mg/L	55	13.20	11.40	14.30	2006-2011 SRMP
Dissolved Oxygen (DO) mg/L *	51	9.10	8.80	9.50	2001-2011 SRMP, USGS
Dissolved Oxygen Saturation %	39	97	97	98	2007-2011 SRMP
Enterococcus #/100ml	43	40	25	90	2007-2011 SRMP
Escherichia coli #/100ml	43	18	11	23	2007-2011 SRMP
Fecal coliform #/100ml *	63	22	16	29	2006-2011 SRMP
Hardness as CaCO ₃ , Total mg/L	55	14.4	13.0	16.0	2006-2011 SRMP
Magnesium, Dissolved mg/L	14	1.39	0.97	1.57	2009-2010 SRMP archived samples
Manganese, Dissolved µg/L	14	7.8	4.9	16.5	2009-2010 SRMP archived samples
Nitrate+Nitrite as N, Total mg/L *	45	0.038	0.032	0.050	2007-2011 SRMP
Nitrogen as N, Total mg/L *	45	0.300	0.264	0.332	2007-2011 SRMP
Nitrogen, Kjeldahl as N, Total mg/L	45	0.257	0.229	0.273	2007-2011 SRMP
pH units *	49	7.46	7.38	7.54	2006-2011 SRMP
Phosphate as P, Total mg/L	45	0.007	0.006	0.007	2007-2011 SRMP
Phosphorus as P, Total mg/L *	45	0.015	0.013	0.017	2007-2011 SRMP
Potassium, Dissolved mg/L	14	0.47	0.34	0.68	2009-2010 SRMP archived samples
Sodium, Dissolved mg/L	14	8.14	6.36	8.95	2009-2010 SRMP archived samples
Specific Conductance µS/cm	49	72.0	69.0	76.0	2006-2011 SRMP
Strontium, Dissolved mg/L	14	0.021	0.015	0.023	2009-2010 SRMP archived samples
Sulfate, Total mg/L	14	4.75	4.15	5.32	2009-2010 SRMP archived samples
Temperature, Water, degrees C	49	18.0	16.5	20.2	2006-2011 SRMP
Total Dissolved Solids (TDS) mg/L	55	44.0	42.2	45.5	2006-2011 SRMP
Total Suspended Solids (TSS) mg/L *	49	1.35	1.10	1.75	2006-2011 SRMP, PADEP
Turbidity NTU	51	0.89	0.56	5.00	2006-2011 SRMP

Two-tailed confidence limits were used for these EWQ targets

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

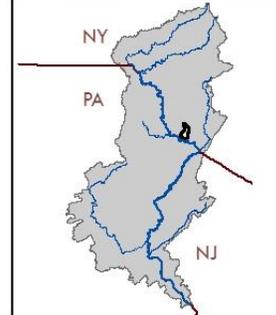
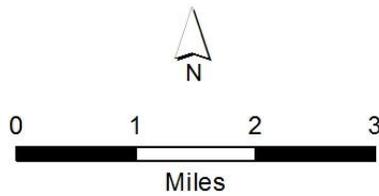
2656 BCP Mill Brook at Rt. 97



Mill Brook

Drainage Area = 19.59 mi²

- Sampling Location
- Other Sampling Location
- Drainage Area
- NPS Boundary



2656 BCP Mill Brook at Rt. 97

Sullivan County, NY. Latitude 41.438890 Longitude -74.821670 by GPS NAD83 decimal degrees.

No USGS or NYSDEC sites nearby.

Watershed Population: 2000: 983 2010: 1,234 Change: +251 (+25.6%)

Drainage Area: 19.6 square miles, tributary to Delaware River Zone 1B

Site Specific EWQ monitoring began 2013 by DRBC/NPS Scenic Rivers Monitoring Program.

This watershed is tributary to the Upper Delaware Scenic and Recreational River (UPDE)

Classified by DRBC as Outstanding Basin Waters.

Nearest upstream Interstate Control Point: 2735 ICP Delaware River at Barryville

Nearest downstream Interstate Control Point: 2655 ICP Delaware River at Pond Eddy

Known dischargers within watershed: Undefined at present.

Watershed is 86.5% forested; urban land cover is 4.64%. 100% glaciated. No carbonate rock. Mean annual precipitation 43.3 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics (USGS BaSE Model):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
2,212	73.2	37.1	25.9	20.4	13.7	7.41	3.37	0.50

StreamStats Low-Flow Stream Statistics

M7D2Y (ft ³ /s)	2.43
M30D2Y (ft ³ /s)	3.38
M7D10Y (ft ³ /s)	0.99
M30D10Y (ft ³ /s)	1.39
M90D10Y (ft ³ /s)	2.29

StreamStats Mean/Baseflow Stream Statistics

QA (ft ³ /s)	33.1
QAH (ft ³ /s)	8.14
BF10YR (ft ³ /s)	13.9
BF25YR (ft ³ /s)	12.4
BF50YR (ft ³ /s)	11.6

StreamStats Peak-Flow Stream Statistics

PK2 (ft ³ /s)	712
PK5 (ft ³ /s)	1,220
PK10 (ft ³ /s)	1,640
PK50 (ft ³ /s)	2,780
PK100 (ft ³ /s)	3,360
PK500 (ft ³ /s)	4,980

Existing Water Quality: 2656 BCP Mill Brook at Rt. 97, NY

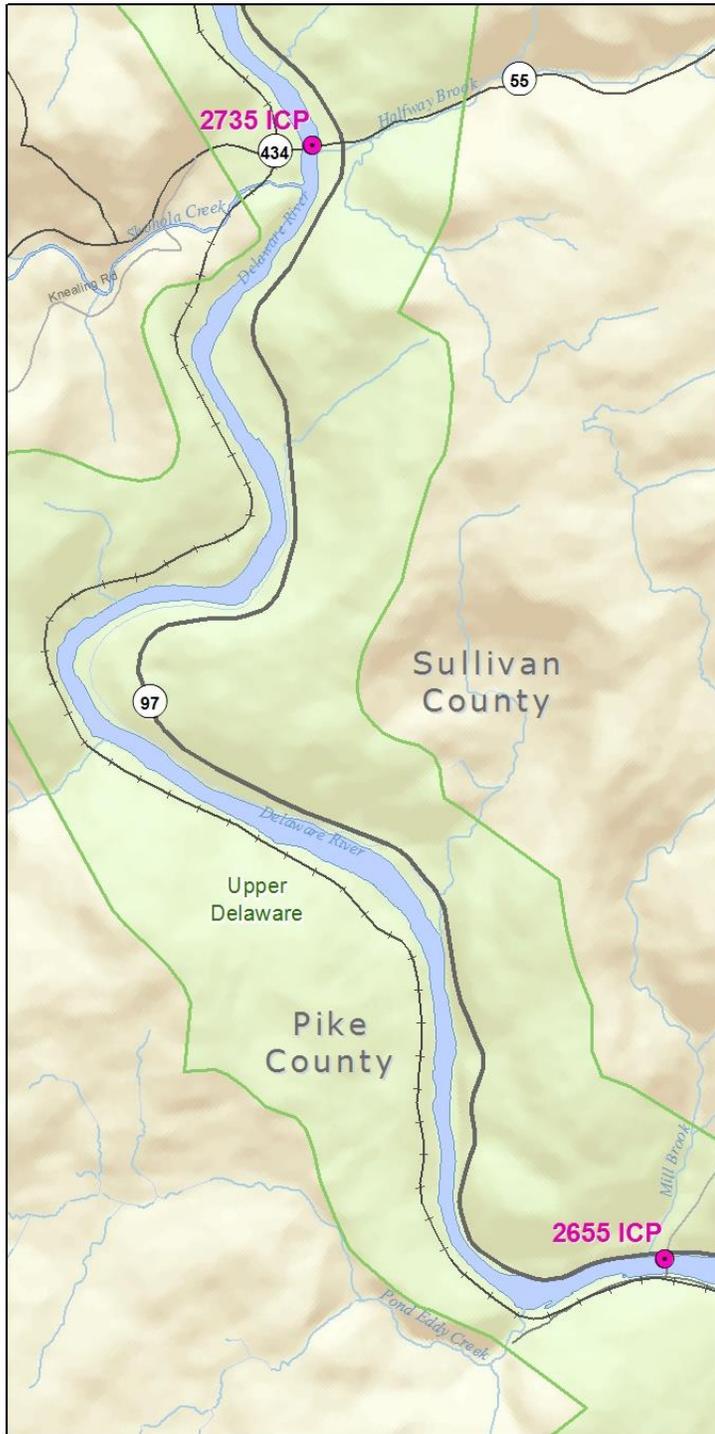
Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , mg/L, total	41	11.0	9.0	13.1	SRMP 2012-2015
Ammonia as N, mg/L, total *	41	0.007	0.006	0.009	SRMP 2012-2015
Chloride, mg/L, Total	41	27.8	25.7	30.0	SRMP 2012-2015
Dissolved Oxygen, mg/L *	40	9.3	9.1	9.6	SRMP 2012-2015
Dissolved Oxygen Saturation, %	40	99.6	99.2	100.1	SRMP 2012-2015
Fecal Coliform, #/100 ml *	40	17	12	26	SRMP 2012-2015
Hardness as CaCO ₃ , mg/L, Total	41	24.6	22.6	26.8	SRMP 2012-2015
Nitrate + Nitrite as N, Total, mg/L *	41	0.171	0.135	0.200	SRMP 2012-2015
Nitrogen as N, Total, mg/L *	36	0.374	0.319	0.406	SRMP 2012-2015
Nitrogen, Kjeldahl as N, mg/L	42	0.193	0.163	0.222	SRMP 2012-2015
pH, standard units *	40	7.48	7.33	7.53	SRMP 2012-2015
Phosphate as P, Total mg/L	47	0.011	0.010	0.011	SRMP 2012-2015
Phosphorus as P, Total mg/L *	41	0.019	0.017	0.022	SRMP 2012-2015
Specific Conductance, µS/cm	40	135	125	143	SRMP 2012-2015
Temperature, Water, Degrees C	40	17.8	14.7	19.8	SRMP 2012-2015
Total Dissolved Solids, mg/L	41	83	79	90	SRMP 2012-2015
Total Suspended Solids, mg/L *	41	1.8	1.0	3.0	SRMP 2012-2015
Turbidity, NTU	33	0.32	0.26	0.61	SRMP 2012-2013, 2015

Two-tailed confidence limits were used for these EWQ targets

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

2655 ICP Delaware River at Pond Eddy



2655 ICP
Delaware River at Pond Eddy Bridge



- Sampling Location
- County Boundary
- NPS Boundary

0 0.5 1 1.5

Miles

2655 ICP Delaware River at Pond Eddy

Latitude 41.439444 Longitude -74.820278 by GPS NAD83 decimal degrees.

USGS Site No. 01432805 (very little water quality data, not used to define EWQ)

Watershed Population figures were not calculated for main-stem Delaware River sites.

Drainage Area: 2,820 square miles, Delaware River Zone 1B

Site Specific EWQ defined 2006-2011 by the DRBC/NPS Scenic Rivers Monitoring Program.

This site is located in the Upper Delaware Scenic and Recreational River (UPDE)

Classified by DRBC as Outstanding Basin Waters

Nearest upstream Interstate Control Point: 2735 ICP Delaware River at Barryville

Nearest downstream Interstate Control Point: 2584 ICP Delaware River at Millrift

Known dischargers within watershed: Undefined

Tributaries to upstream reach: Major tributary 2734 BCP Halfway Brook, NY; 2732 BCP Shohola Creek, PA; 2656 BCP Mill Brook, NY; small tributaries 269.9 Twin Lakes Creek, PA; 266.3 Pond Eddy Creek, PA.

No Stream Stats web site data available (drainage area too large to calculate on web site).

Flow Statistics (Calculated):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
146,971	10,196	5,511	3,638	2,848	2,296	1,699	1,433	612

Existing Water Quality: 2655 ICP Delaware River at Pond Eddy

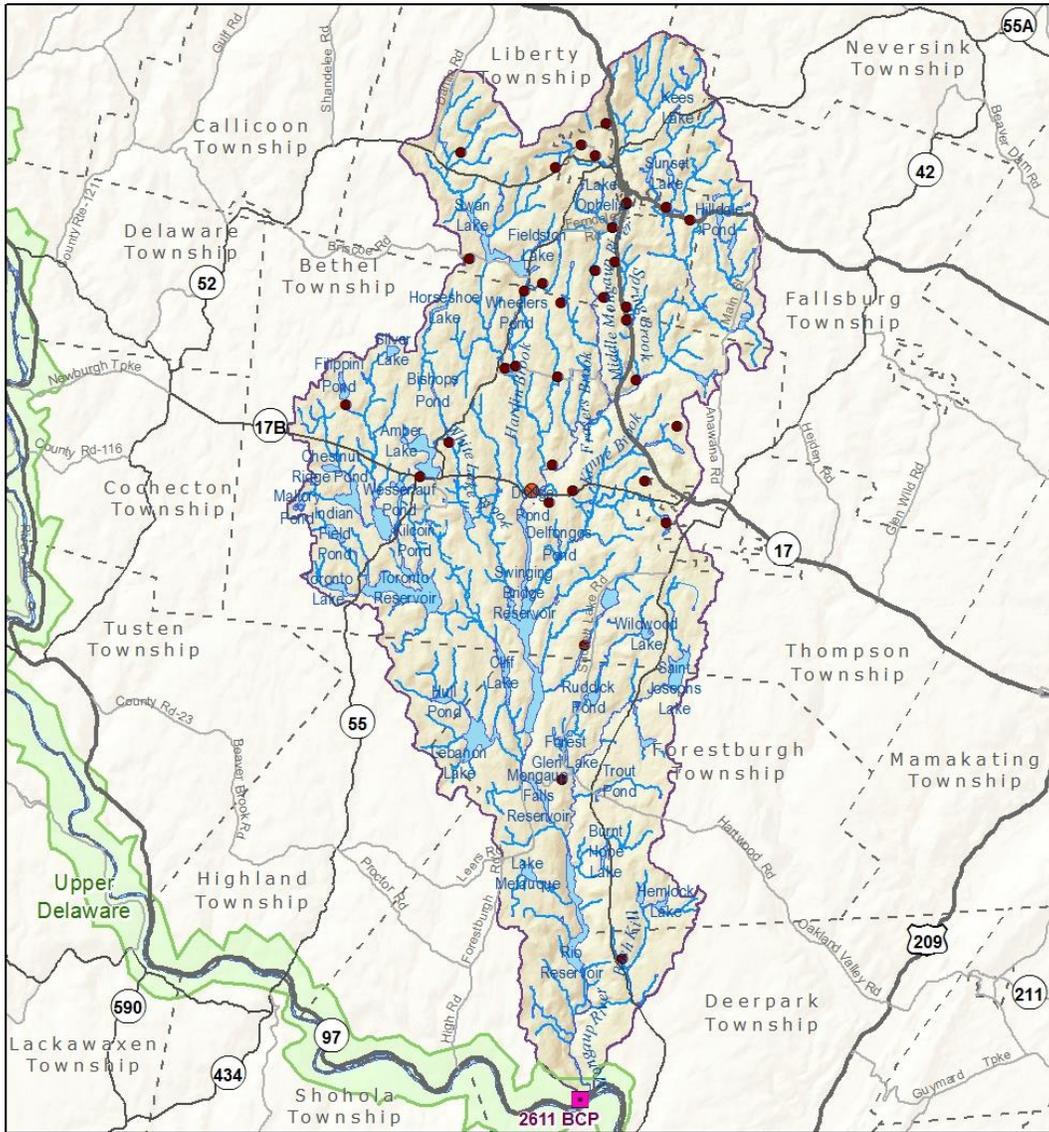
Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	63	13.5	13.0	14.1	2006-2011 SRMP
Aluminum, Dissolved mg/L	15	0.004	0.002	0.005	2009-2010 SRMP archived samples
Ammonia-Nitrogen as N, Total mg/L*	61	0.014	0.011	0.016	2006-2011 SRMP
Barium, Dissolved mg/L	15	0.021	0.020	0.025	2009-2010 SRMP archived samples
Calcium, Dissolved mg/L	15	6.22	5.60	6.51	2009-2010 SRMP archived samples
Chloride, Total mg/L	63	10.68	10.40	11.43	2006-2011 SRMP
Dissolved Oxygen (DO) mg/L *	57	8.80	8.60	9.20	2001-2011 SRMP
Dissolved Oxygen Saturation %	40	97	96	98	2007-2011 SRMP
Enterococcus #/100ml	53	24	11	48	2007-2011 SRMP
Escherichia coli #/100ml	53	10	7	15	2007-2011 SRMP
Fecal coliform #/100ml *	62	15	10	24	2006-2011 SRMP
Hardness as CaCO ₃ , Total mg/L	63	21.2	19.8	22.4	2006-2011 SRMP
Magnesium, Dissolved mg/L	15	1.31	1.22	1.43	2009-2010 SRMP archived samples
Manganese, Dissolved µg/L	15	8.10	5.10	10.60	2009-2010 SRMP archived samples
Nitrate+Nitrite as N, Total mg/L *	53	0.127	0.107	0.149	2007-2011 SRMP
Nitrogen as N, Total mg/L *	53	0.348	0.321	0.376	2007-2011 SRMP
Nitrogen, Kjeldahl as N, Total mg/L	53	0.221	0.204	0.237	2007-2011 SRMP
pH units *	50	7.63	7.58	7.70	2006-2011 SRMP
Phosphate as P, Total mg/L	52	0.005	0.005	0.007	2007-2011 SRMP
Phosphorus as P, Total mg/L *	53	0.012	0.011	0.014	2007-2011 SRMP
Potassium, Dissolved mg/L	15	0.73	0.65	0.82	2009-2010 SRMP archived samples
Sodium, Dissolved mg/L	15	7.05	5.58	7.24	2009-2010 SRMP archived samples
Specific Conductance µS/cm	50	78.5	73.0	82.0	2006-2011 SRMP
Strontium, Dissolved mg/L	15	0.025	0.023	0.025	2009-2010 SRMP archived samples
Sulfate, Total mg/L	15	5.68	5.59	5.79	2009-2010 SRMP archived samples
Temperature, Water, degrees C	50	18.8	17.8	20.2	2006-2011 SRMP
Total Dissolved Solids (TDS) mg/L	63	45.29	43.80	47.45	2006-2011 SRMP
Total Suspended Solids (TSS) mg/L *	56	2.13	1.47	2.65	2006-2011 SRMP
Turbidity NTU	53	2.67	1.50	7.00	2006-2011 SRMP

Two-tailed confidence limits were used for these EWQ targets

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

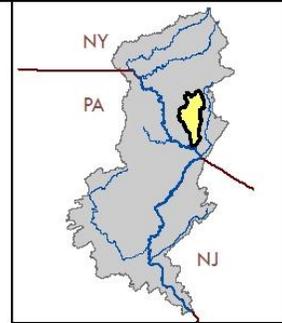
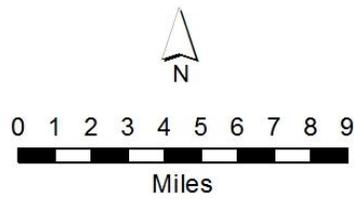
2611 BCP Mongaup River at Rt. 97



Mongaup River

Drainage Area = 208.26 mi²

- Sampling Location
- NPDES
- Stream Gage
- Drainage Area
- NPS Boundary



2611 BCP Mongaup River at Rt. 97

Sullivan County, NY. Latitude 41.426944 Longitude -74.756111 by GPS NAD83 decimal degrees.

USGS Gage Upstream 01433500; No nearby NYSDEC sites. USGS Gage includes continuous water quality measures.

Watershed Population: 2000: 19,151 2010: 19,570 Change: +419 (+2.2%)

Drainage Area: 207 square miles, tributary to Delaware River Zone 1B

Site Specific EWQ monitoring was completed 2011 by DRBC/NPS Scenic Rivers Monitoring Program.

This watershed is tributary to the Upper Delaware Scenic and Recreational River (UPDE)

Classified by DRBC as Outstanding Basin Waters.

Nearest upstream Interstate Control Point: 2655 ICP Delaware River at Pond Eddy

Nearest downstream Interstate Control Point: 2584 ICP Delaware River at Mill Rift

Known dischargers within watershed: Many, undefined at present; hydropower releases affect flow and water quality.

Watershed is 80.3% forested; urban land cover is 5.33%. 100% glaciated. No carbonate rock. Mean annual precipitation 45.5 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics (USGS BaSE Model):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
20,905	941	494	347	278	183	110	53.9	9.05

StreamStats Low-Flow Stream Statistics

M7D2Y (ft ³ /s)	42.7
M30D2Y (ft ³ /s)	54.9
M7D10Y (ft ³ /s)	23.3
M30D10Y (ft ³ /s)	29.6
M90D10Y (ft ³ /s)	42.3

StreamStats Mean/Baseflow Stream Statistics

QA (ft ³ /s)	393
QAH (ft ³ /s)	122
BF10YR (ft ³ /s)	160
BF25YR (ft ³ /s)	144
BF50YR (ft ³ /s)	135

StreamStats Peak-Flow Stream Statistics

PK2 (ft ³ /s)	5,460
PK5 (ft ³ /s)	8,880
PK10 (ft ³ /s)	11,700
PK50 (ft ³ /s)	19,200
PK100 (ft ³ /s)	23,000
PK500 (ft ³ /s)	33,700

Existing Water Quality: 2611 BCP Mongaup River at Rt. 97

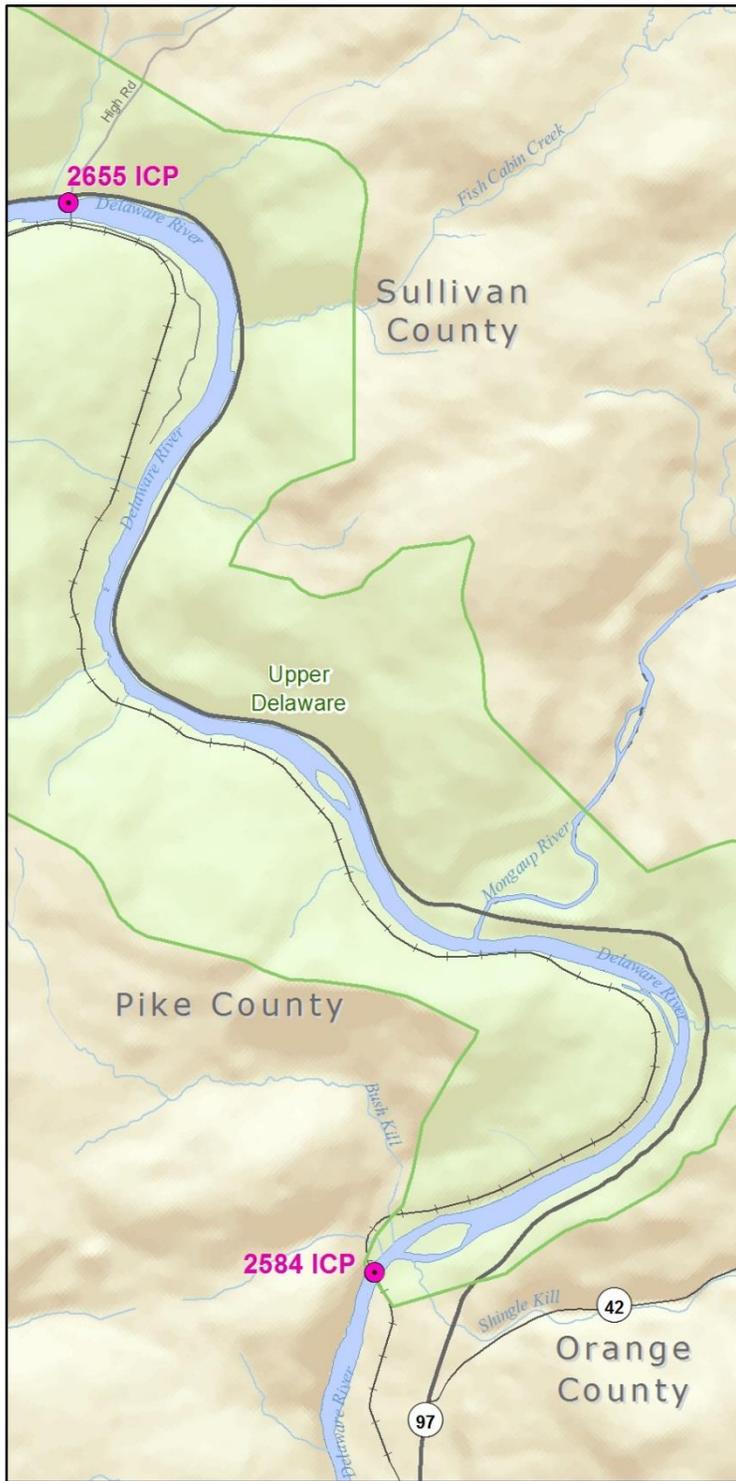
Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	61	8.5	7.7	9.0	2006-2011 SRMP
Aluminum, Dissolved mg/L	15	0.004	0.002	0.005	2009-2010 SRMP archived samples
Ammonia-Nitrogen as N, Total mg/L *	61	0.011	0.009	0.014	2006-2011 SRMP
Barium, Dissolved mg/L	15	0.042	0.040	0.045	2009-2010 SRMP archived samples
Calcium, Dissolved mg/L	15	5.76	5.24	6.01	2009-2010 SRMP archived samples
Chloride, Total mg/L	61	20.00	17.91	21.03	2006-2011 SRMP
Dissolved Oxygen (DO) mg/L *	58	9.35	9.20	9.70	2006-2011 SRMP
Dissolved Oxygen Saturation %	40	98	97	99	2007-2011 SRMP
Enterococcus #/100ml	51	16	7	27	2007-2011 SRMP
Escherichia coli #/100ml	51	5	3	8	2007-2011 SRMP
Fecal coliform #/100ml *	63	5	4	8	2006-2011 SRMP
Hardness as CaCO ₃ , Total mg/L	61	18.0	16.4	19.6	2006-2011 SRMP
Magnesium, Dissolved mg/L	15	1.12	1.05	1.24	2009-2010 SRMP archived samples
Manganese, Dissolved µg/L	15	5.9	4.8	13.0	2009-2010 SRMP archived samples
Nitrate+Nitrite as N, Total mg/L *	51	0.129	0.111	0.140	2007-2011 SRMP
Nitrogen as N, Total mg/L *	51	0.363	0.335	0.386	2007-2011 SRMP
Nitrogen, Kjeldahl as N, Total mg/L	51	0.246	0.215	0.277	2007-2011 SRMP
pH units *	49	7.50	7.46	7.57	2006-2011 SRMP
Phosphate as P, Total mg/L	51	0.005	0.005	0.006	2007-2011 SRMP
Phosphorus as P, Total mg/L *	51	0.012	0.009	0.013	2007-2011 SRMP
Potassium, Dissolved mg/L	15	0.76	0.70	0.79	2009-2010 SRMP archived samples
Sodium, Dissolved mg/L	15	12.07	11.02	13.64	2009-2010 SRMP archived samples
Specific Conductance µS/cm	50	92.9	82.0	104.0	2006-2011 SRMP
Strontium, Dissolved mg/L	15	0.037	0.034	0.040	2009-2010 SRMP archived samples
Sulfate, Total mg/L	15	5.58	5.31	5.66	2009-2010 SRMP archived samples
Temperature, Water, degrees C	50	17.95	16.9	19.1	2006-2011 SRMP
Total Dissolved Solids (TDS) mg/L	61	60.0	56.27	61.25	2006-2011 SRMP
Total Suspended Solids (TSS) mg/L *	52	1.18	1.00	1.60	2006-2011 SRMP
Turbidity NTU	52	1.41	1.05	4.00	2006-2011 SRMP

Two-tailed confidence limits were used for these EWQ targets

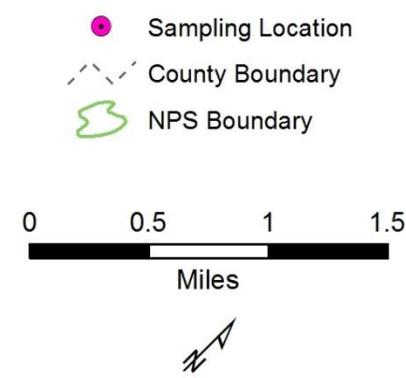
* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

2584 ICP Delaware River at Mill Rift



2584 ICP
Delaware River at Mill Rift, Erie RR Bridge



2584 ICP Delaware River at Mill Rift

Latitude 41.406462 Longitude -74.741772 by GPS NAD83 decimal degrees.

No USGS or State sites nearby

Watershed Population figures were not calculated for main-stem Delaware River sites.

Drainage Area: 3,045 square miles, Delaware River Zone 1B

Site Specific EWQ defined 2006-2011 by the DRBC/NPS Scenic Rivers Monitoring Program.

This site is located at the Upper Delaware Scenic and Recreational River (UPDE) Downstream Terminus

Classified by DRBC as Outstanding Basin Waters

Nearest upstream Interstate Control Point: 2655 ICP Delaware River at Pond Eddy

Nearest downstream Interstate Control Point: 2547 ICP Delaware River at Port Jervis

Known dischargers within watershed: Undefined

Tributaries to upstream reach: Major tributary 2611 BCP Mongaup River, NY; small tributaries 264.7 Fish Cabin Creek, NY; 258.5 Shingle Kill, NY; 258.4 Bushkill Creek, PA (Pike County).

No Stream Stats web site data available (drainage area too large to calculate on web site).

Flow Statistics (Calculated):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
158,697	11,010	5,951	3,928	3,075	2,480	1,835	1,547	661

Existing Water Quality: 2584 ICP Delaware River at Mill Rift

Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	64	13.80	12.10	14.00	2006-2011 SRMP
Aluminum, Dissolved mg/L	14	0.004	0.002	0.005	2009-2010 SRMP archived samples
Ammonia-Nitrogen as N, Total mg/L *	62	0.011	0.010	0.014	2006-2011 SRMP
Barium, Dissolved mg/L	14	0.019	0.014	0.024	2009-2010 SRMP archived samples
Calcium, Dissolved mg/L	14	5.81	4.89	6.21	2009-2010 SRMP archived samples
Chloride, Total mg/L	64	11.8	11.06	12.50	2006-2011 SRMP
Dissolved Oxygen (DO) mg/L *	57	8.9	8.6	9.3	2006-2011 SRMP
Dissolved Oxygen Saturation %	40	98	97	100	2007-2011 SRMP
Enterococcus #/100ml	54	20	10	42	2007-2011 SRMP
Escherichia coli #/100ml	54	7	5	13	2007-2011 SRMP
Fecal coliform #/100ml *	64	12.5	7	19	2006-2011 SRMP
Hardness as CaCO ₃ , Total mg/L	64	20.5	19.6	22.0	2006-2011 SRMP
Magnesium, Dissolved mg/L	14	1.23	1.16	1.44	2009-2010 SRMP archived samples
Manganese, Dissolved µg/L	14	5.8	2.7	10.4	2009-2010 SRMP archived samples
Nitrate+Nitrite as N, Total mg/L *	54	0.115	0.100	0.125	2007-2011 SRMP
Nitrogen as N, Total mg/L *	54	0.323	0.300	0.357	2007-2011 SRMP
Nitrogen, Kjeldahl as N, Total mg/L	54	0.214	0.186	0.228	2007-2011 SRMP
pH units *	50	7.79	7.58	7.82	2006-2011 SRMP
Phosphate as P, Total mg/L	54	0.005	0.004	0.006	2007-2011 SRMP
Phosphorus as P, Total mg/L *	54	0.012	0.010	0.013	2007-2011 SRMP
Potassium, Dissolved mg/L	14	0.67	0.58	0.72	2009-2010 SRMP archived samples
Sodium, Dissolved mg/L	14	6.75	5.76	7.50	2009-2010 SRMP archived samples
Specific Conductance µS/cm	50	81.5	78.0	84.0	2006-2011 SRMP
Strontium, Dissolved mg/L	14	0.024	0.019	0.025	2009-2010 SRMP archived samples
Sulfate, Total mg/L	14	5.41	5.10	5.69	2009-2010 SRMP archived samples
Temperature, Water, degrees C	50	19.35	18.3	21.1	2006-2011 SRMP
Total Dissolved Solids (TDS) mg/L	64	46.65	45.63	47.60	2006-2011 SRMP
Total Suspended Solids (TSS) mg/L *	54	1.62	0.95	2.40	2007-2011 SRMP
Turbidity NTU	53	2.38	1.2	7.0	2006-2011 SRMP

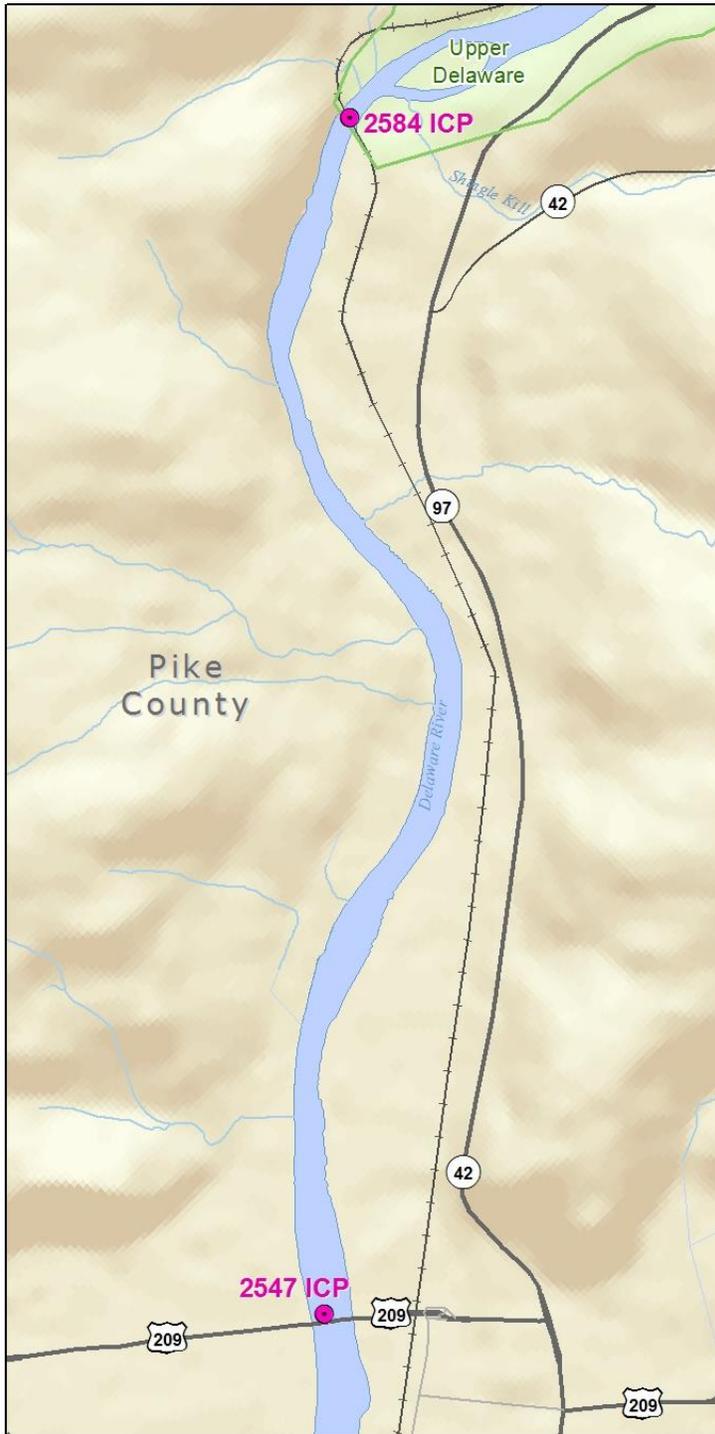
Two-tailed confidence limits were used for these EWQ targets

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

Upper Delaware to Middle Delaware Transition: Significant Resource Waters

2547 ICP Delaware River at Port Jervis Rt. 6/209 Bridge



2547 ICP
Delaware River at Port Jervis Rt. 6/206 Bridge



- Sampling Location
- County Boundary
- NPS Boundary



2547 ICP Delaware River at Port Jervis Rt. 6/209 Bridge

Latitude 41.371667 Longitude -74.697778 by GPS NAD83 decimal degrees.

USGS Site No. 01434000; PADEP Site No. WQN 0103; NYSDEC Site No. 14010001

Watershed Population figures were not calculated for main-stem Delaware River sites.

Drainage Area: 3,070 square miles, Delaware River (southern end of Zone 1B)

Site Specific EWQ defined 2006-2011 by the DRBC/NPS Scenic Rivers Monitoring Program.

This site is located within the Upper to Middle Delaware Transition Zone

Classified by DRBC as Significant Resource Waters

Nearest upstream Interstate Control Point: 2584 ICP Delaware River at Mill Rift

Nearest downstream Interstate Control Point: 2502 ICP Delaware River at Delaware Water Gap NRA Northern Boundary

Known dischargers within watershed: Undefined

Tributaries to upstream reach: None, direct drainage only.

No Stream Stats web site data available (drainage area too large to calculate on web site).

Flow Statistics (USGS Gage 1975-2014 data, calculated using BaSE):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
160,000	11,100	6,000	3,960	3,100	2,500	1,850	1,560	666

Existing Water Quality: 2547 ICP Delaware River at Port Jervis Rt. 6/209 Bridge

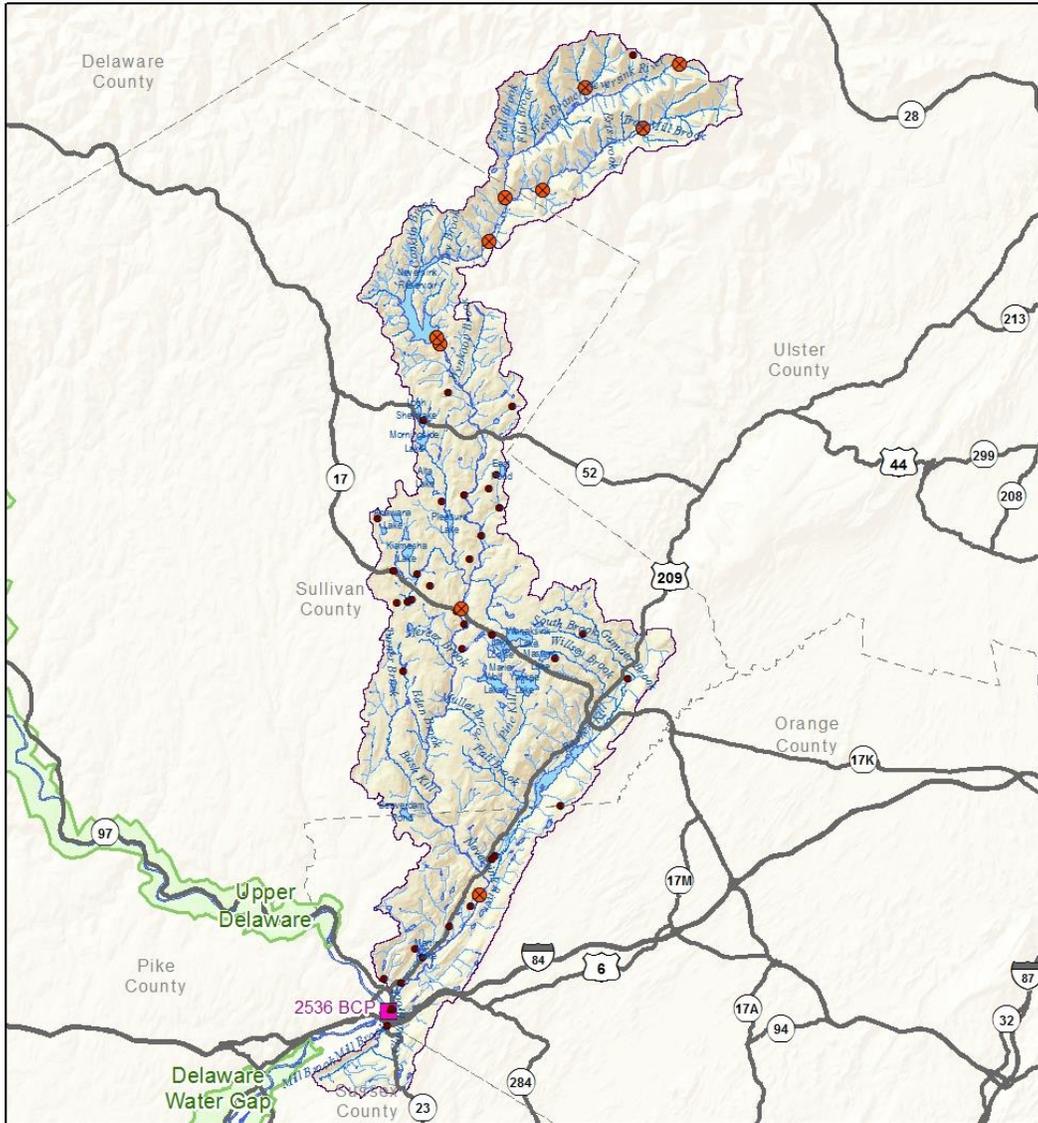
Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	70	14.0	12.9	15.0	1988-2009 SRMP, USGS, PADEP, NYSDEC
Aluminum, Dissolved mg/L (mean)	5	0.003	0.002	0.007	2009 SRMP archived samples
Ammonia-Nitrogen as N, Total mg/L *	75	0.015	0.012	0.016	1987-2009 SRMP, USGS, PADEP, NYSDEC
Barium, Dissolved mg/L (mean)	5	0.022	0.019	0.024	2009 SRMP archived samples
Calcium, Dissolved mg/L	30	6.59	6.12	7.13	USGS 1987-2001, 2009 SRMP archived
Calcium, Total mg/L	43	6.75	6.49	7.05	1999-2009 NYSDEC, PADEP
Chloride, Total mg/L	48	11.35	10.8	11.8	2001-2009 NYSDEC, SRMP, PADEP
Dissolved Oxygen (DO) mg/L *	91	8.80	8.50	9.10	1987-2009 SRMP, USGS, PADEP, NYSDEC
Dissolved Oxygen Saturation %	44	97.8	95.6	100.0	1988-2009 SRMP, USGS, PADEP, NYSDEC
Enterococcus #/100ml	20	70	20	310	2008-2009 SRMP
Escherichia coli #/100ml	20	21	7	31	2008-2009 SRMP
Fecal coliform #/100ml *	40	35	19	39	1987-2009 SRMP, USGS, PADEP, NYSDEC
Hardness as CaCO ₃ , Total mg/L	84	22.1	21.8	23.8	1987-2009 SRMP, USGS, PADEP, NYSDEC
Iron, Dissolved µg/L	16	40.5	29.0	58.0	1988-2001 USGS
Iron, Total µg/L	43	121	95	138	1999-2009 NYSDEC, PADEP
Magnesium, Dissolved mg/L	30	1.33	1.23	1.50	1987-2001 USGS, 2009 SRMP archived
Magnesium, Total mg/L	43	1.40	1.35	1.47	1999-2009 NYSDEC, PADEP
Manganese, Dissolved µg/L	20	8.95	7.2	11.5	1988-2000 USGS, 2009 SRMP archived
Manganese, Total µg/L	43	35.2	30.4	47.0	1999-2009 NYSDEC, PADEP
Nitrate as N, Total mg/L	44	0.038	0.033	0.048	1988-2007 USGS, NYSDEC, PADEP
Nitrate+Nitrite as N, Total mg/L *	65	0.160	0.132	0.177	1987-2009 USGS, NYSDEC, SRMP
Nitrogen as N, Total mg/L *	56	0.377	0.340	0.414	1987-2009 USGS, NYSDEC, SRMP, PADEP
Nitrogen, Kjeldahl as N, Total mg/L	79	0.218	0.206	0.230	1987-2009 USGS, NYSDEC, SRMP
Organic Carbon, Dissolved mg/L	17	2.34	2.10	2.90	1999-2007 USGS, NYSDEC
Organic Carbon, Total mg/L	17	2.70	2.38	3.15	1999-2007 NYSDEC, PADEP
pH units *	121	7.33	7.30	7.40	1987-2009 USGS, NYSDEC, PADEP, SRMP
Phosphate as P, Dissolved mg/L	38	0.007	0.006	0.010	1987-2007 USGS, NYSDEC
Phosphate as P, Total mg/L	26	0.005	0.004	0.010	2002-2009 SRMP, PADEP
Phosphorus as P, Total mg/L *	100	0.014	0.012	0.017	1987-2009 SRMP, USGS, NYSDEC, PADEP
Potassium, Dissolved mg/L	5	0.59	0.51	0.77	2009 SRMP archived samples (mean CL)
Sodium, Dissolved mg/L	5	6.14	5.52	6.90	2009 SRMP archived samples (mean CL)
Specific Conductance µS/cm	119	83	81	87	1988-2009 SRMP, USGS, NYSDEC, PADEP
Strontium, Dissolved mg/L	5	0.023	0.020	0.026	2009 SRMP archived samples (mean CL)
Sulfate, Total mg/L	47	6.60	6.25	7.06	1999-2009 NYSDEC, PADEP, SRMP archived
Temperature, Water, degrees C	104	20.4	19.4	21.8	1987-2009 SRMP, USGS, NYSDEC, PADEP
Total Dissolved Solids (TDS) mg/L	90	51.3	49.0	55.0	1987-2009 SRMP, USGS, NYSDEC, PADEP
Total Suspended Solids (TSS) mg/L *	60	2.0	2.0	2.5	1991-2009 SRMP, USGS, NYSDEC, PADEP
Turbidity NTU	71	2.0	1.7	2.6	1987-2009 SRMP, USGS, NYSDEC, PADEP

Two-tailed confidence limits were used for these EWQ targets

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

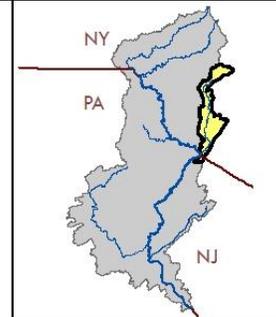
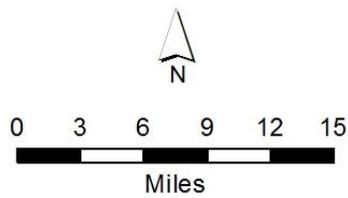
2536 BCP Neversink River at Rt. 6



Neversink River

Drainage Area = 349.94 mi²

- Sampling Location
- Drainage Area
- NPDES
- Stream Gage
- NPS Boundary



2536 BCP Neversink River at Rt. 6

Orange County, NY. Latitude 41.361111 Longitude -74.685556 by GPS NAD83 decimal degrees.

USGS Site No 01438000; NYSDEC Site No. 14021001.

Watershed Population: 2000: 35,783 2010: 37,668 Change: +1,885 (+5.3%)

Drainage Area: 349 square miles, tributary to Delaware River Zone 1C

Site Specific EWQ monitoring was completed 2011 by DRBC/NPS Scenic Rivers Monitoring Program.

This watershed is tributary to the reach just north of the Delaware Water Gap National Recreation Area (DEWA)
Classified by DRBC as Significant Resource Waters.

Nearest upstream Interstate Control Point: 2547 ICP Delaware River at Port Jervis

Nearest downstream Interstate Control Point: 2502 ICP Delaware River at DWGNRA Northern Boundary

Known dischargers within watershed: Many, undefined. Neversink Reservoir releases affect flow and water quality.

Watershed is 87.1% forested; urban land cover is 4.74%. 100% glaciated. 4.9% carbonate bedrock. Mean annual precipitation 47.9 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics (USGS BaSE Model):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
32,717	1,724	1,013	409	331	271	214	98.8	16.6

StreamStats Low-Flow Stream Statistics

M7D2Y (ft ³ /s)	110
M30D2Y (ft ³ /s)	136
M7D10Y (ft ³ /s)	69.4
M30D10Y (ft ³ /s)	82.4
M90D10Y (ft ³ /s)	111

StreamStats Mean/Baseflow Stream Statistics

QA (ft ³ /s)	746
QAH (ft ³ /s)	295
BF10YR (ft ³ /s)	334
BF25YR (ft ³ /s)	303
BF50YR (ft ³ /s)	285

StreamStats Peak-Flow Stream Statistics

PK2 (ft ³ /s)	9,250
PK5 (ft ³ /s)	14,900
PK10 (ft ³ /s)	19,400
PK50 (ft ³ /s)	31,500
PK100 (ft ³ /s)	37,600
PK500 (ft ³ /s)	54,400

Existing Water Quality: 2536 BCP Neversink River at Rt. 6

Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	51	15.1	14.6	16.2	SRMP 2008-13, NYSDEC 2005, USGS 2000
Aluminum, Dissolved mg/L (mean)	5	0.005	0.002	0.008	SRMP 2009 archived samples
Ammonia-Nitrogen as N, Total mg/L *	47	0.027	0.022	0.033	SRMP 2008-13, NYSDEC 2005, USGS 1997
Barium, Dissolved mg/L (mean)	5	0.036	0.032	0.037	SRMP 2009 archived samples
Calcium, Dissolved mg/L	10	7.54	6.27	7.90	NYSDEC 2000, SRMP 2009 archived
Chloride, Total mg/L	46	16.7	15.8	18.5	SRMP 2008-13; NYSDEC 2005
Dissolved Oxygen (DO) mg/L *	33	7.8	7.6	8.7	SRMP 2008-12; NYSDEC 2005
Dissolved Oxygen Saturation %	28	86.3	81.4	88.2	SRMP 2008-12
Enterococcus #/100ml	20	130	80	220	SRMP 2008-2009
Escherichia coli #/100ml	20	54	31	600	SRMP 2008-2009
Fecal coliform #/100ml *	27	98	60	190	SRMP 2008-12; NYSDEC 2005
Hardness as CaCO ₃ , Total mg/L	51	25.0	24.6	26.0	SRMP 2008-13; NYSDEC 2005; USGS 2000
Magnesium, Dissolved mg/L	10	1.36	1.19	1.68	USGS 2000, SRMP 2009 archived
Manganese, Dissolved µg/L	5	18.3	12.1	24.5	SRMP 2009 archived samples
Nitrate+Nitrite as N, Total mg/L *	46	0.365	0.336	0.424	SRMP 2008-13; NYSDEC 2005
Nitrogen as N, Total mg/L *	45	0.615	0.563	0.680	SRMP 2008-13; USGS 2000
Nitrogen, Kjeldahl as N, Total mg/L	51	0.279	0.262	0.294	SRMP 2008-13; NYSDEC 2005; USGS 2000
pH units *	36	6.88	6.74	6.97	NYSDEC 2005, SRMP 2008-12
Phosphate as P, Total mg/L	40	0.043	0.038	0.053	SRMP 2008-13
Phosphorus as P, Total mg/L *	51	0.056	0.049	0.063	USGS 2000; NYSDEC 2005; SRMP 2008-13
Potassium, Dissolved mg/L	5	0.60	0.46	0.81	SRMP 2009 archived samples
Sodium, Dissolved mg/L	5	9.53	7.74	11.29	SRMP 2009 archived samples
Specific Conductance µS/cm	38	106	103	114	NYSDEC 2005; SRMP 2008-12
Strontium, Dissolved mg/L	5	0.042	0.032	0.046	SRMP 2009 archived samples
Sulfate, Total mg/L	10	6.45	5.31	7.38	NYSDEC 2005; SRMP 2009 archived
Temperature, Water, degrees C	33	18.9	17.5	21.5	NYSDEC 2005, SRMP 2008-12
Total Dissolved Solids (TDS) mg/L	51	62.5	60.0	64.8	USGS 2000; NYSDEC 2005, SRMP 2008-13
Total Suspended Solids (TSS) mg/L *	46	2.0	1.5	2.35	NYSDEC 2005; SRMP 2008-13
Turbidity NTU	34	2.22	1.82	3.08	NYSDEC 2005; SRMP 2008-12

Two-tailed confidence limits were used for these EWQ targets

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

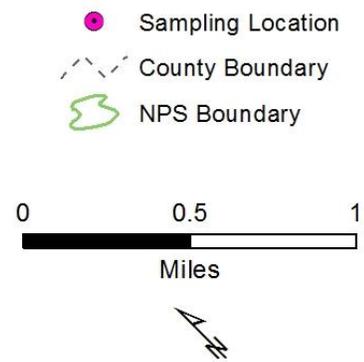
Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

Delaware Water Gap National Recreation Area: Outstanding Basin Waters

2502 ICP Delaware River at DWGNRA Northern Boundary



2502 ICP
Delaware River at DWGNRA Northern Boundary



2502 ICP Delaware River at DWGNRA Northern Boundary

Latitude 41.343611 Longitude -74.757778 by GPS NAD83 decimal degrees.

No nearby USGS or State monitoring sites

Watershed Population figures were not calculated for main-stem Delaware River sites.

Drainage Area: 3,420 square miles, Delaware River Zone 1C

Site Specific EWQ defined 2006-2011 by the DRBC/NPS Scenic Rivers Monitoring Program.

This site is located at the Delaware Water Gap National Recreation Area northern boundary

Classified by DRBC as Significant Resource Waters (Outstanding Basin Waters downstream of this location)

Nearest upstream Interstate Control Point: 2547 ICP Delaware River at Port Jervis

Nearest downstream Interstate Control Point: 2464 ICP Delaware River at Montague

Known dischargers within watershed: Undefined

Tributaries to upstream reach: Major tributary 2536 BCP Neversink River, NY; small tributary 250.8 Rosetown Creek, PA.

No Stream Stats web site data available (drainage area too large to calculate on web site).

Flow Statistics (calculated by drainage area weighting from Port Jervis USGS gage data):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
172,966	12,088	6,752	4,531	3,587	2,860	2,074	1,720	884

Existing Water Quality: 2502 ICP Delaware River at DWGNRA Northern Boundary

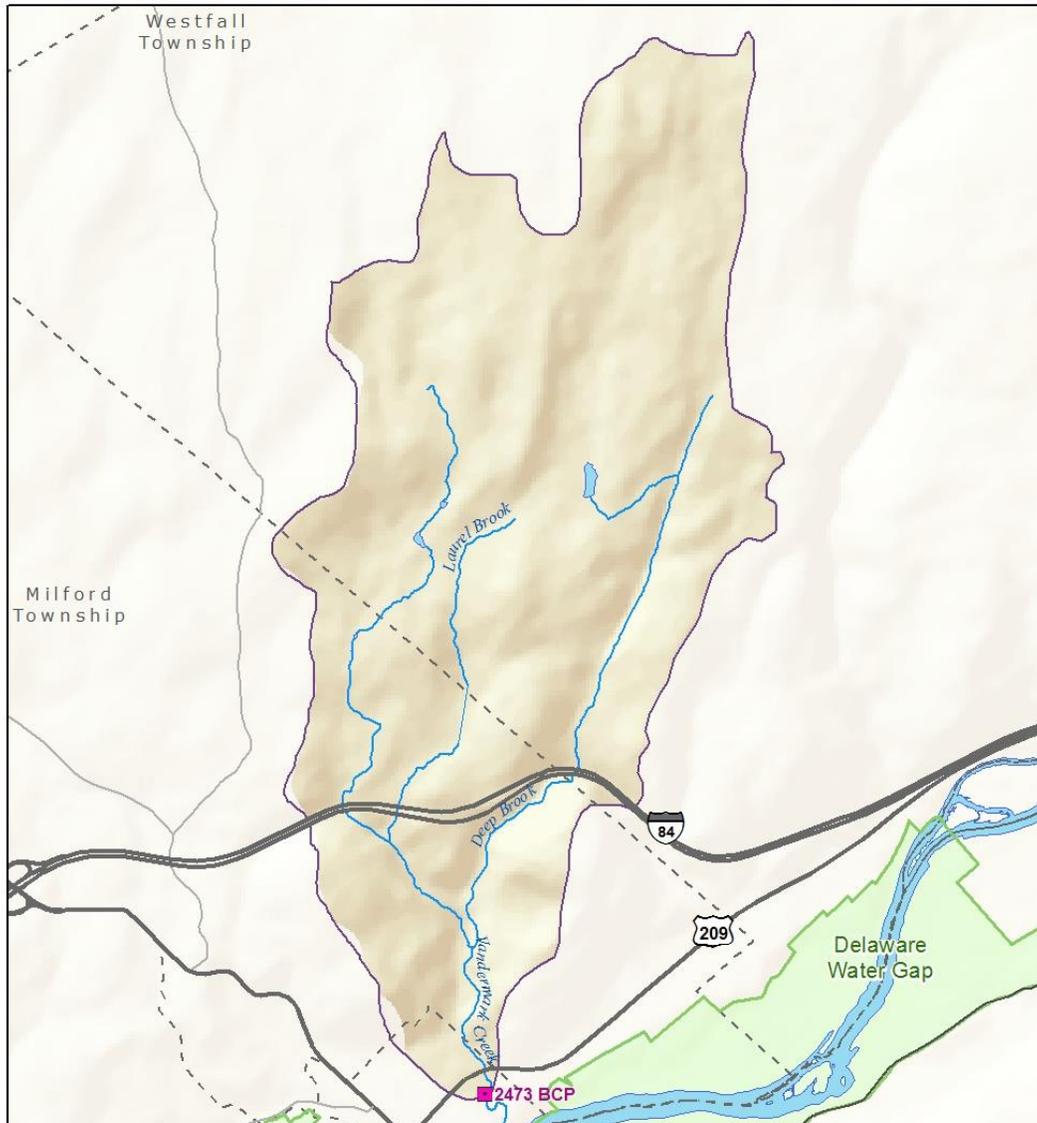
Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	63	13.8	13.3	14.2	2006-2011 SRMP
Aluminum, Dissolved mg/L	15	0.004	0.003	0.004	2009-2010 SRMP archived samples
Ammonia-Nitrogen as N, Total mg/L *	61	0.009	0.008	0.010	2006-2011 SRMP
Barium, Dissolved mg/L	15	0.021	0.019	0.026	2009-2010 SRMP archived samples
Calcium, Dissolved mg/L	15	6.44	5.73	6.57	2009-2010 SRMP archived samples
Chloride, Total mg/L	63	11.6	11.2	12.2	2006-2011 SRMP
Dissolved Oxygen (DO) mg/L *	58	9.49	9.12	10.00	2006-2011 SRMP
Dissolved Oxygen Saturation %	38	106.7	103.7	110.0	2008-2011 SRMP
Enterococcus #/100ml	48	24	10	42	2007-2011 SRMP
Escherichia coli #/100ml	48	19	12	24	2007-2011 SRMP
Fecal coliform #/100ml *	66	22	16	38	2006-2011 SRMP
Hardness as CaCO ₃ , Total mg/L	63	22.4	21.2	23.2	2006-2011 SRMP
Magnesium, Dissolved mg/L	15	1.31	1.23	1.44	2009-2010 SRMP archived samples
Manganese, Dissolved µg/L	15	6.7	4.6	16.3	2009-2010 SRMP archived samples
Nitrate+Nitrite as N, Total mg/L *	53	0.117	0.105	0.141	2007-2011 SRMP
Nitrogen as N, Total mg/L *	53	0.299	0.289	0.319	2007-2011 SRMP
Nitrogen, Kjeldahl as N, Total mg/L	53	0.184	0.173	0.194	2007-2011 SRMP
pH units *	57	7.48	7.38	7.66	2006-2011 SRMP
Phosphate as P, Total mg/L	53	0.005	0.005	0.006	2007-2011 SRMP
Phosphorus as P, Total mg/L *	53	0.012	0.011	0.013	2007-2011 SRMP
Potassium, Dissolved mg/L	15	0.73	0.65	0.80	2009-2010 SRMP archived samples
Sodium, Dissolved mg/L	15	6.85	5.83	7.75	2009-2010 SRMP archived samples
Specific Conductance µS/cm	58	83.5	78.8	86.2	2006-2011 SRMP
Strontium, Dissolved mg/L	15	0.026	0.024	0.027	2009-2010 SRMP archived samples
Sulfate, Total mg/L	13	5.74	5.41	6.00	2009-2010 SRMP archived samples
Temperature, Water, degrees C	58	20.2	19.1	21.3	2006-2011 SRMP
Total Dissolved Solids (TDS) mg/L	63	47.6	46.2	48.9	2006-2011 SRMP
Total Suspended Solids (TSS) mg/L *	55	1.7	1.2	2.4	2006-2011 SRMP
Turbidity NTU	50	2.01	1.82	2.22	2007-2011 SRMP

Two-tailed confidence limits were used for these EWQ targets

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

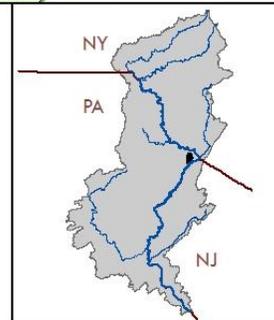
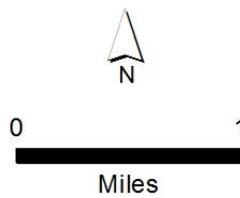
2473 BCP Vandermark Creek by 4th St.



Vandermark Creek

Drainage Area = 6.21 mi²

- Sampling Location
- Other Sampling Location
- Drainage Area
- NPS Boundary



2473 BCP Vandermark Creek by 4th St.

Milford, Pike County, PA. Latitude 41.325000 Longitude -74.796944 by GPS NAD83 decimal degrees.

USGS Site No 01438302

Watershed Population: 2000: 771 2010: 815 Change: +44 (+5.7%)

Drainage Area: 5.19 square miles, tributary to Delaware River Zone 1C

Site Specific EWQ monitoring is incomplete: Some monitoring was completed 2008 by DRBC/NPS Scenic Rivers Monitoring Program; along with 2001 USGS data.

This watershed is tributary to the Delaware Water Gap National Recreation Area (DEWA)

Classified by DRBC as Outstanding Basin Waters.

Nearest upstream Interstate Control Point: 2502 ICP Delaware River at DWGNRA Northern Boundary

Nearest downstream Interstate Control Point: 2464 ICP Delaware River at Montague

Known dischargers within watershed: Undefined.

Watershed is 91.3% forested; urban land cover is 6.34%. 100% glaciated. No carbonate bedrock. Mean annual precipitation 43.7 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics (USGS BaSE Model):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
351	17.8	9.51	5.57	3.98	3.05	1.64	0.82	0.23

StreamStats Low-Flow Stream Statistics

M7D2Y (ft³/s) 0.59

M30D2Y (ft³/s) 0.85

M7D10Y (ft³/s) 0.21

M30D10Y (ft³/s) 0.31

M90D10Y (ft³/s) 0.55

StreamStats Mean/Baseflow Stream Statistics

QA (ft³/s) 8.86

QAH (ft³/s) 2.14

BF10YR (ft³/s) 3.95

BF25YR (ft³/s) 3.56

BF50YR (ft³/s) 3.33

StreamStats Peak-Flow Stream Statistics

PK2 (ft³/s) 281

PK5 (ft³/s) 496

PK10 (ft³/s) 670

PK50 (ft³/s) 1,130

PK100 (ft³/s) 1,370

PK500 (ft³/s) 2,010

Existing Water Quality: 2473 BCP Vandermark Creek by 4th St.

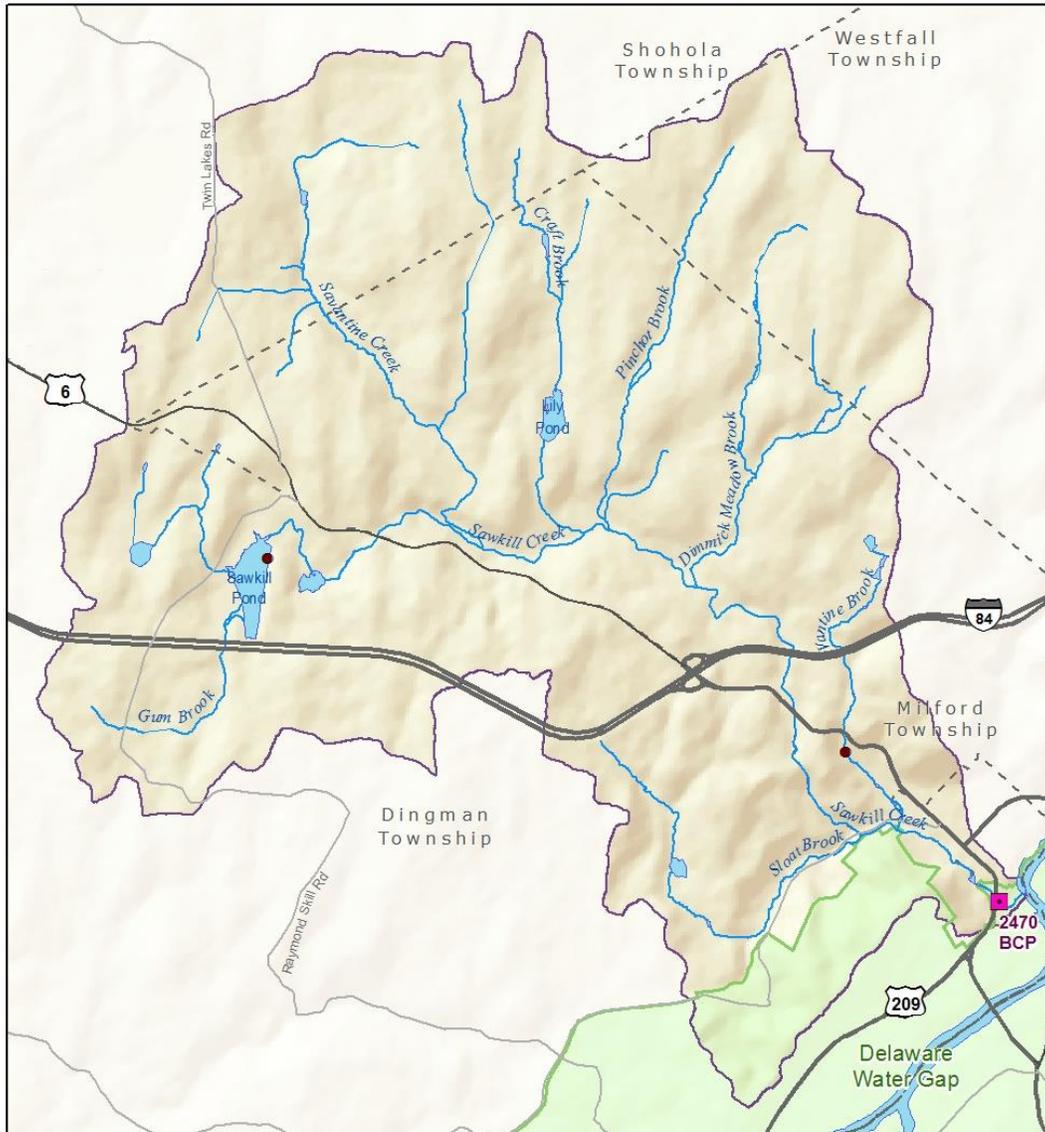
Parameter	N	Median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	23	10.2	9.0	12.0	USGS 2002-2004; SRMP 2008
Aluminum, Dissolved mg/L	7	<0.002	<0.001	<0.002	USGS 2002 (50% non-detects)
Ammonia-Nitrogen as N, Dissolved mg/L *	33	<0.015	<0.010	<0.015	USGS 2002-2004 (28 non-detects)
Boron, Dissolved µg/L	13	8.0	7.0	9.0	USGS 2002-2004
Calcium, Dissolved mg/L	13	6.18	4.44	6.80	USGS 2002-2004
Chloride, Dissolved mg/L	13	13.9	8.6	17.5	USGS 2002-2004
Chloride, Total mg/L	10	19.5	13.0	21.8	SRMP 2008
Dissolved Oxygen (DO) mg/L *	43	10.5	10.2	11.2	USGS 2001-2004; SRMP 2008
Dissolved Oxygen Saturation %	42	98	96	100	USGS 2001-2004; SRMP 2008
Enterococcus #/100ml	10	220	47	420	SRMP 2008
Escherichia coli #/100ml	10	18	4	49	SRMP 2008
Fecal coliform #/100ml *	9	16	15	63	SRMP 2008
Hardness as CaCO ₃ , Total mg/L					No Data
Magnesium, Dissolved mg/L	13	2.26	1.76	2.74	USGS 2002-2004
Nitrate+Nitrite as N, Dissolved mg/L *	33	0.40	0.36	0.48	USGS 2002-2004
Nitrate+Nitrite as N, Total mg/L	10	0.503	0.307	0.565	SRMP 2008
Nitrogen as N, Total mg/L *	33	0.53	0.49	0.58	USGS 2002-2004; SRMP 2008
Nitrogen, Kjeldahl as N, Total mg/L	33	0.100	0.096	0.140	USGS 2002-2003; SRMP 2008
pH units *	42	7.1	7.0	7.3	USGS 2001-2004; SRMP 2008
Phosphate as P, Dissolved mg/L	33	0.016	0.013	0.020	USGS 2002-2004
Phosphorus as P, Total mg/L *	45	0.023	0.020	0.025	USGS 2001-2004; SRMP 2008
Potassium, Dissolved mg/L	13	0.63	0.50	0.83	USGS 2002-2004
Silica, Dissolved mg/L	13	6.5	5.7	6.9	USGS 2002-2004
Sodium, Dissolved mg/L	13	7.56	5.25	8.81	USGS 2002-2004
Specific Conductance µS/cm	43	95	87	109	USGS 2001-2004; SRMP 2008
Sulfate, Total mg/L	13	7.82	7.27	9.04	USGS 2002-2004
Temperature, Water, degrees C	42	14.5	13.1	15.0	USGS 2001-2004; SRMP 2008
Total Dissolved Solids (TDS) mg/L	25	56	48	62	USGS 2002-2004
Total Suspended Solids (TSS) mg/L *	18	1.0	0.4	2.0	USGS 2002-2004; SRMP 2008
Turbidity NTU	10	1.20	0.99	1.36	SRMP 2008

Two-tailed confidence limits were used for these EWQ targets

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

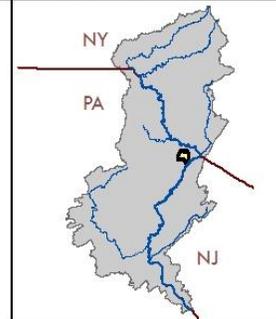
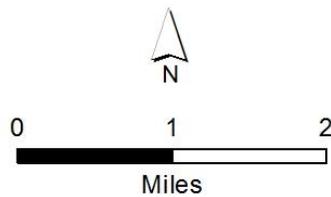
2470 BCP Sawkill Creek at DWGNRA Boundary



Sawkill Creek

Drainage Area = 24.68 mi²

- Sampling Location
- NPDES
- Drainage Area
- NPS Boundary



2470 BCP Sawkill Creek at DWGNRA Boundary

Pike County, PA. Latitude 41.316859 Longitude -74.799220 by GPS NAD83 decimal degrees.

USGS Site No 01438396

Watershed Population: 2000: 2,644 2010: 3,085 Change: 441 (+16.7%)

Drainage Area: 24.7 square miles, tributary to Delaware River Zone 1C

Site Specific EWQ monitoring was completed 2004 by USGS/NPS Delaware Water Gap Study: Hickman R.E., and Fischer J.M. 2008. Water quality of streams in and near the Delaware Water Gap National Recreation Area, Pennsylvania and New Jersey, 2002-04: U.S. Geological Survey Scientific Investigations Report 2007-5290, 65 p.

Additional monitoring was completed 2008 by DRBC/NPS Scenic Rivers Monitoring Program.

This watershed is tributary to the Delaware Water Gap National Recreation Area (DEWA)

Classified by DRBC as Outstanding Basin Waters.

Nearest upstream Interstate Control Point: 2502 ICP Delaware River at DWGNRA Northern Boundary

Nearest downstream Interstate Control Point: 2464 ICP Delaware River at Montague

Known dischargers within watershed: Undefined.

Watershed is 88.4% forested; urban land cover is 4.84%. 100% glaciated. No carbonate bedrock. Mean annual precipitation 43.8 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics (USGS BaSE Model):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
2,761	92.2	46.2	33.1	26.3	20.0	12.8	7.08	1.69

StreamStats Low-Flow Stream Statistics

M7D2Y (ft ³ /s)	3.48
M30D2Y (ft ³ /s)	4.76
M7D10Y (ft ³ /s)	1.49
M30D10Y (ft ³ /s)	2.04
M90D10Y (ft ³ /s)	3.29

StreamStats Mean/Baseflow Stream Statistics

QA (ft ³ /s)	42.7
QAH (ft ³ /s)	11.1
BF10YR (ft ³ /s)	18.3
BF25YR (ft ³ /s)	16.4
BF50YR (ft ³ /s)	15.4

StreamStats Peak-Flow Stream Statistics

PK2 (ft ³ /s)	906
PK5 (ft ³ /s)	1,550
PK10 (ft ³ /s)	2,070
PK50 (ft ³ /s)	3,480
PK100 (ft ³ /s)	4,200
PK500 (ft ³ /s)	6,200

Existing Water Quality: 2470 BCP Sawkill Creek at DWGNRA Boundary

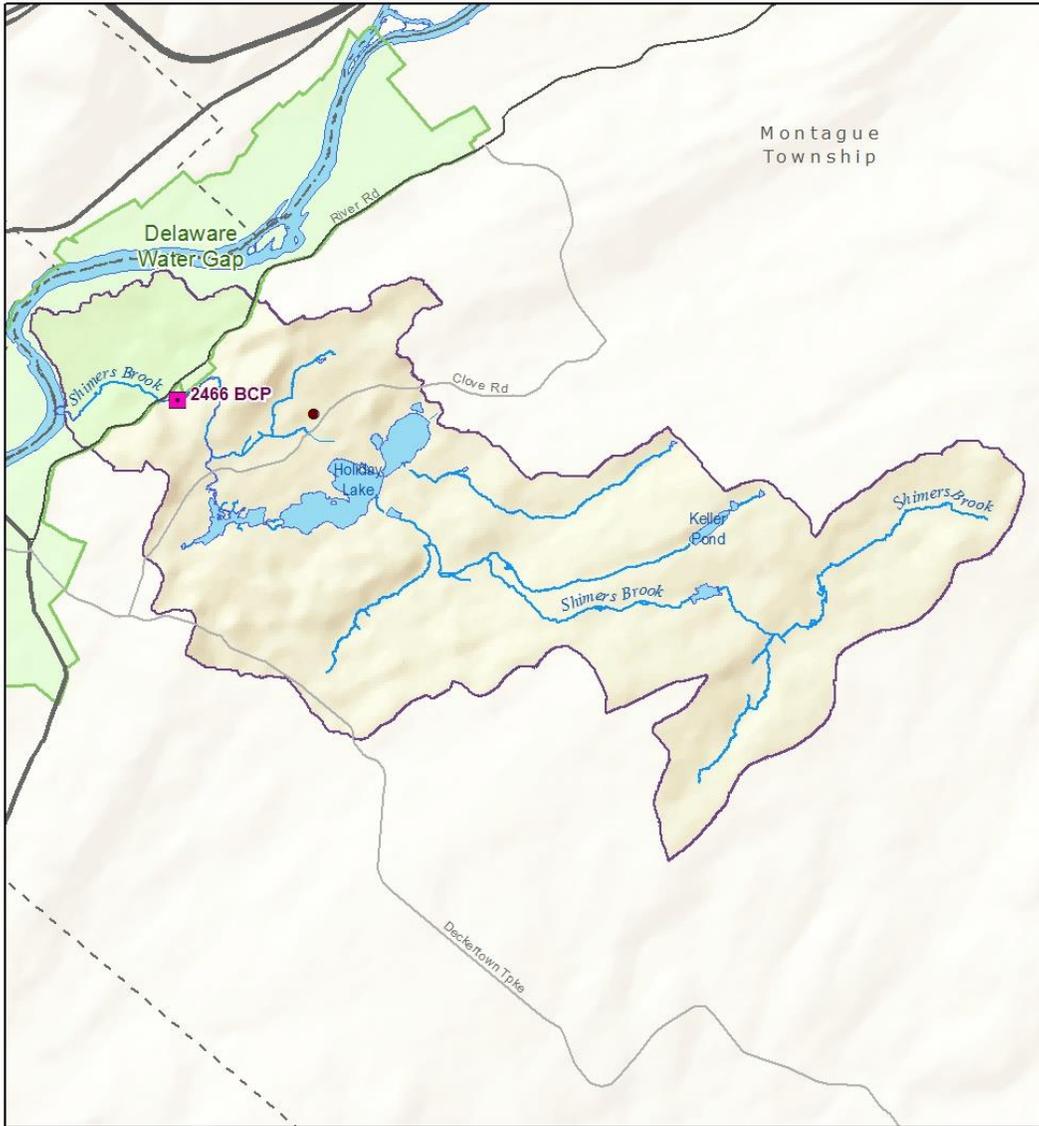
Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	23	14.0	12.0	15.1	2002-2004 USGS, 2008 SRMP
Ammonia-Nitrogen as N, Total mg/L *	33	0.015	0.010	0.015	2001-2004 USGS
Calcium, Dissolved mg/L	15	7.36	6.10	9.75	2001-2004 USGS
Chloride, Dissolved mg/L	15	23.1	21.0	30.3	2001-2004 USGS
Chloride, Total mg/L	10	27.7	22.2	31.2	2008 SRMP
Dissolved Oxygen (DO) mg/L *	43	9.60	9.30	10.10	2001-2004 USGS, 2008 SRMP
Dissolved Oxygen Saturation %	43	100.0	99.0	101.7	2001-2004 USGS, 2008 SRMP
Enterococcus #/100ml	10	210	12	600	2008 SRMP
Escherichia coli #/100ml	10	8	3	21	2008 SRMP
Fecal coliform #/100ml *	9	11	5	47	2008 SRMP
Hardness as CaCO ₃ , Total mg/L	15	26.0	23.0	36.0	2001-2004 USGS
Magnesium, Dissolved mg/L	15	2.00	1.78	2.77	2001-2004 USGS
Nitrate+Nitrite as N, Dissolved mg/L *	33	0.290	0.250	0.400	2001-2004 USGS
Nitrate+Nitrite as N, Total mg/L	10	0.452	0.245	0.601	2008 SRMP
Nitrogen as N, Total mg/L *	43	0.460	0.420	0.572	2001-2004 USGS, 2008 SRMP
Nitrogen, Kjeldahl as N, Total mg/L	40	0.112	0.100	0.150	2001-2004 USGS, 2008 SRMP
pH units *	43	7.21	7.01	7.40	2001-2004 USGS, 2008 SRMP
Phosphate as P, Dissolved mg/L	33	0.010	0.010	0.020	2001-2004 USGS
Phosphorus as P, Total mg/L *	43	0.030	0.015	0.040	2001-2004 USGS, 2008 SRMP
Specific Conductance μ S/cm	43	137	121	144	2001-2004 USGS, 2008 SRMP
Sulfate, Dissolved mg/L	15	8.34	7.21	9.43	2001-2004 USGS
Temperature, Water, degrees C	43	16.2	15.0	17.5	2001-2004 USGS, 2008 SRMP
Total Dissolved Solids (TDS) mg/L	15	85	73	95	2001-2004 USGS
Total Suspended Solids (TSS) mg/L *	10	0.85	0.45	1.05	2008 SRMP
Turbidity NTU	43	6.0	4.0	8.0	2001-2004 USGS, 2008 SRMP

Two-tailed confidence limits were used for these EWQ targets

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

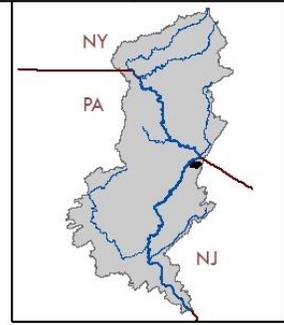
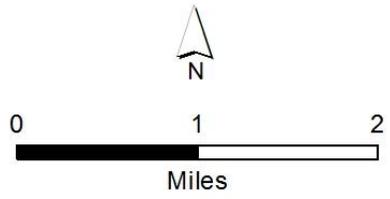
2466 BCP Shimers Brook at DWGNRA Boundary



Shimers Brook

Drainage Area = 7.68 mi²

- Sampling Location
- NPDES
- Drainage Area
- NPS Boundary



2466 BCP Shimers Brook at DWGNRA Boundary

Pike County, PA. Latitude 41.312972 Longitude -74.778750 by GPS NAD83 decimal degrees.

USGS Site No 01438399

Watershed Population: 2000: 1,659 2010: 1,804 Change: 145 (+8.8%)

Drainage Area: 7.5 square miles, tributary to Delaware River Zone 1C

Site Specific EWQ monitoring was completed 2004 by USGS/NPS Delaware Water Gap Study: Hickman R.E., and Fischer J.M. 2008. Water quality of streams in and near the Delaware Water Gap National Recreation Area, Pennsylvania and New Jersey, 2002-04: U.S. Geological Survey Scientific Investigations Report 2007-5290, 65 p.

Additional monitoring was completed 2008 by DRBC/NPS Scenic Rivers Monitoring Program.

This watershed is tributary to the Delaware Water Gap National Recreation Area (DEWA)

Classified by DRBC as Outstanding Basin Waters.

Nearest upstream Interstate Control Point: 2502 ICP Delaware River at DWGNRA Northern Boundary

Nearest downstream Interstate Control Point: 2464 ICP Delaware River at Montague

Known dischargers within watershed: Undefined.

Watershed is 72.2% forested; urban land cover is 7.20%. 100% glaciated. 16.4% carbonate bedrock. Mean annual precipitation 43.0 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics (USGS BaSE Model):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
779	22.6	11.9	8.70	6.91	5.48	3.19	1.60	0.32

StreamStats Low-Flow Stream Statistics

M7D2Y (ft ³ /s)	0.61
M30D2Y (ft ³ /s)	0.89
M7D10Y (ft ³ /s)	0.21
M30D10Y (ft ³ /s)	0.32
M90D10Y (ft ³ /s)	0.57

StreamStats Mean/Baseflow Stream Statistics

QA (ft ³ /s)	11.9
QAH (ft ³ /s)	3.89
BF10YR (ft ³ /s)	5.58
BF25YR (ft ³ /s)	4.98
BF50YR (ft ³ /s)	4.63

StreamStats Peak-Flow Stream Statistics

PK2 (ft ³ /s)	307
PK5 (ft ³ /s)	539
PK10 (ft ³ /s)	731
PK50 (ft ³ /s)	1,250
PK100 (ft ³ /s)	1,520
PK500 (ft ³ /s)	2,280

Existing Water Quality: 2466 BCP Shimers Brook at DWGNRA Boundary

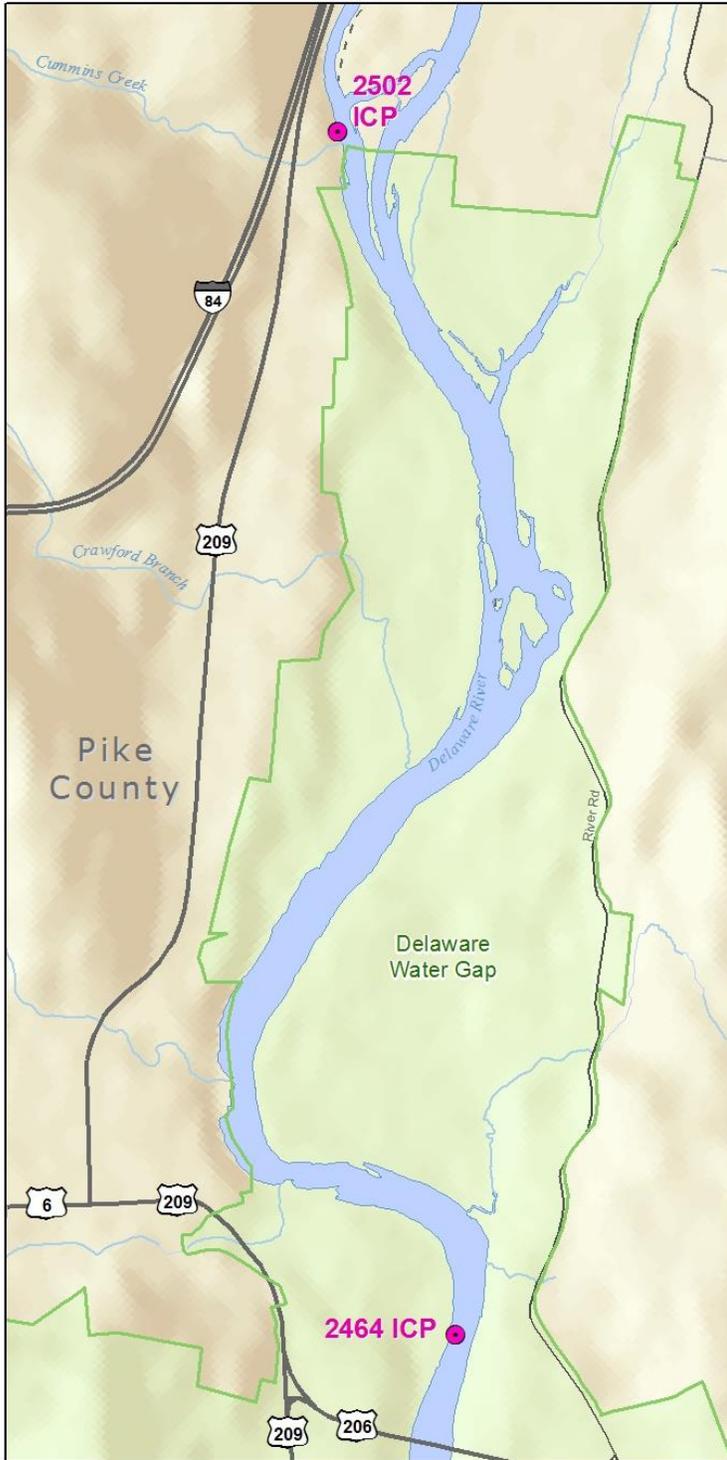
Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	22	143.4	84.1	155.9	2002-2004 USGS, 2008 SRMP
Ammonia-Nitrogen as N, Dissolved mg/L *	33	0.015	0.010	0.015	2001-2004 USGS
Calcium, Dissolved mg/L	14	40.7	25.9	52.8	2001-2004 USGS
Chloride, Dissolved mg/L	14	29.5	16.1	38.0	2001-2004 USGS
Chloride, Total mg/L	10	33.8	26.4	39.6	2008 SRMP
Dissolved Oxygen (DO) mg/L *	43	9.0	8.6	9.3	2001-2004 USGS, 2008 SRMP
Dissolved Oxygen Saturation %	42	98.3	97.0	99.0	2001-2004 USGS, 2008 SRMP
Enterococcus #/100ml	10	250	110	340	2008 SRMP
Escherichia coli #/100ml	10	7	1	13	2008 SRMP
Fecal coliform #/100ml *	10	17	4	23	2008 SRMP
Hardness as CaCO ₃ , Total mg/L	14	140	86	190	2001-2004 USGS
Magnesium, Dissolved mg/L	14	9.12	5.11	13.60	2001-2004 USGS
Nitrate+Nitrite as N, Dissolved mg/L *	33	0.180	0.130	0.200	2001-2004 USGS
Nitrate+Nitrite as N, Total mg/L	10	0.144	0.125	0.188	2008 SRMP
Nitrogen as N, Total mg/L *	43	0.470	0.400	0.500	2001-2004 USGS, 2008 SRMP
Nitrogen, Kjeldahl as N, Total mg/L	42	0.295	0.250	0.340	2001-2004 USGS, 2008 SRMP
pH units *	44	8.20	8.10	8.20	2001-2004 USGS, 2008 SRMP
Phosphate as P, Dissolved mg/L	33	0.020	0.010	0.020	2001-2004 USGS
Phosphorus as P, Total mg/L *	43	0.019	0.015	0.022	2001-2004 USGS, 2008 SRMP
Specific Conductance μ S/cm	45	353	297	376	2001-2004 USGS, 2008 SRMP
Sulfate, Dissolved mg/L	14	12.95	8.3	14.5	2001-2004 USGS
Temperature, Water, degrees C	44	19.0	18.0	21.0	2001-2004 USGS, 2008 SRMP
Total Dissolved Solids (TDS) mg/L	14	197.5	135.0	254.0	2001-2004 USGS
Total Suspended Solids (TSS) mg/L *	10	1.88	0.90	3.60	2008 SRMP
Turbidity NTU	10	1.49	1.26	2.02	2008 SRMP

Two-tailed confidence limits were used for these EWQ targets

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

2464 ICP Delaware River at Montague



2464 ICP
Delaware River at Milford Beach (Montague)



- Sampling Location
- County Boundary
- NPS Boundary

0 0.5

Miles

2464 ICP Delaware River at Montague

Latitude 41.309167 Longitude -74.795556 by GPS NAD83 decimal degrees.

USGS Gage 01438500; NJDEP Site No. 01438500

Watershed Population figures were not calculated for main-stem Delaware River sites.

Drainage Area: 3,480 square miles, Delaware River Zone 1C

Site Specific EWQ defined 2006-2011 by the DRBC/NPS Scenic Rivers Monitoring Program; supplemented by existing USGS/NJDEP data.

This site is located in the Delaware Water Gap National Recreation Area.

Classified by DRBC as Outstanding Basin Waters

Nearest upstream Interstate Control Point: 2502 ICP Delaware River at DWGNRA Northern Boundary

Nearest downstream Interstate Control Point: 2387 ICP Delaware River at Dingmans Access

Known dischargers within watershed: Undefined

Tributaries to upstream reach: Major tributary 2470 BCP Sawkill Creek, PA; small tributaries 250.1 Cummins Creek, PA; 248.3 Crawford Branch, PA; 2473 BCP Vandermark Creek, PA; 2466 BCP Shimers Brook, NJ.

No Stream Stats web site data available (drainage area too large to calculate on web site).

Flow Statistics (calculated by drainage area weighting from Montague USGS gage data):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
176,000	12,300	6,870	4,600	3,650	2,900	2,100	1,740	900

Stream flow at this site is controlled by the Delaware River Master.

Existing Water Quality: 2464 ICP Delaware River at Montague

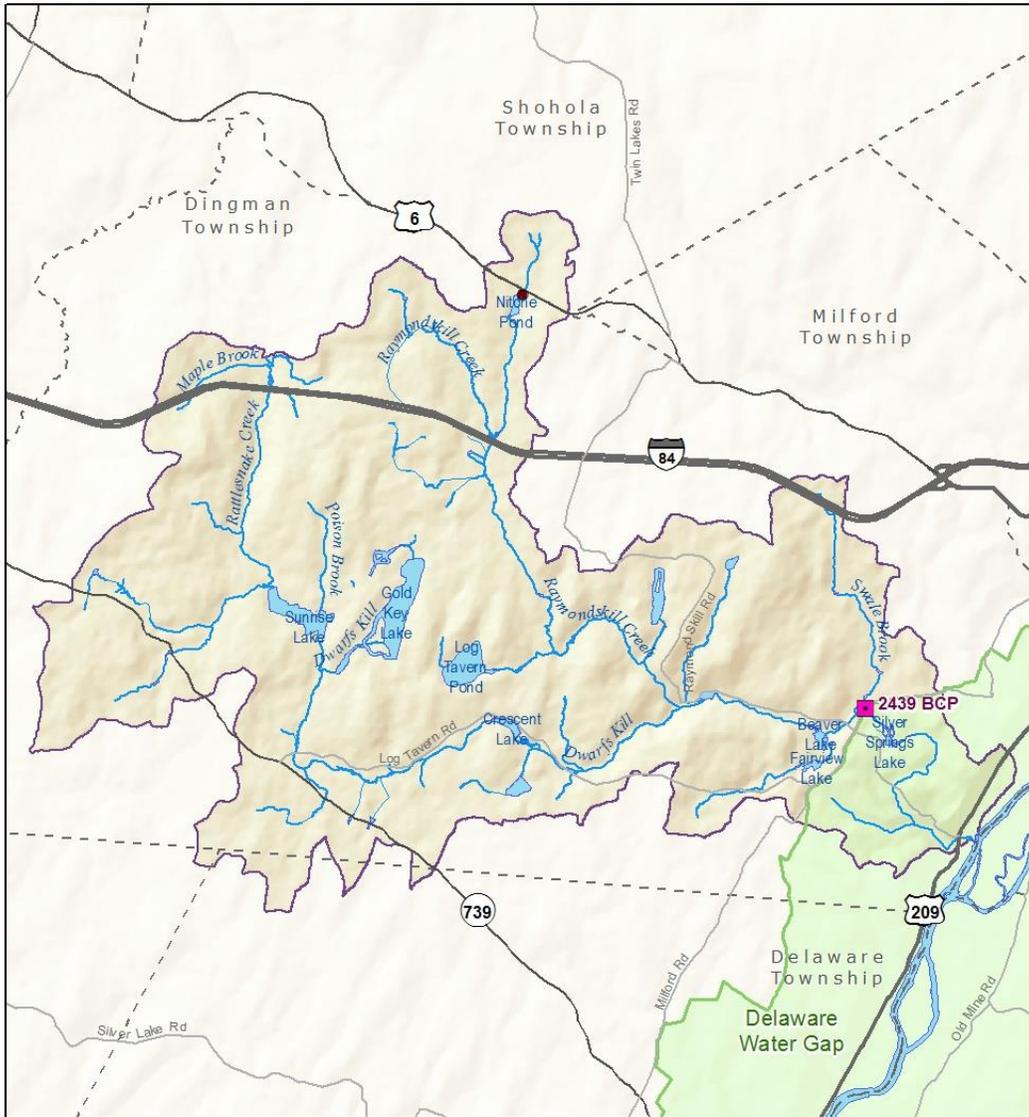
Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	104	14.4	14.0	15.0	1991-2011 SRMP, USGS
Aluminum, Dissolved mg/L	14	0.005	0.004	0.006	2009-2010 SRMP archived
Ammonia-Nitrogen as N, Total mg/L *	66	0.012	0.011	0.014	2006-2011 SRMP
Barium, Dissolved mg/L	15	0.025	0.022	0.027	2009-2010 SRMP archived
Calcium, Dissolved mg/L	52	6.80	6.52	7.04	1991-2008 USGS, 2009-2010 SRMP archived
Chloride, Dissolved mg/L	37	10.0	9.1	11.1	1991-2009 USGS
Chloride, Total mg/L	67	12.7	12.2	13.6	2006-2011 SRMP
Dissolved Oxygen (DO) mg/L *	97	8.5	8.2	8.7	1991-2011 USGS, SRMP
Dissolved Oxygen Saturation %	76	92.2	88.0	95.6	1991-2011 USGS, SRMP
Enterococcus #/100ml	103	40	23	57	1991-2006 USGS, 2007-2011 SRMP
Escherichia coli #/100ml	95	34	20	90	2000-2008 USGS/NJDEP, 2007-2011 SRMP
Fecal coliform #/100ml *	64	27	20	32	2006-2011 SRMP
Hardness as CaCO ₃ , Total mg/L	104	23.0	22.0	23.2	1991-2009 USGS, 2006-2011 SRMP
Magnesium, Dissolved mg/L	52	1.40	1.33	1.46	1991-2009 USGS, 2009-2010 SRMP archived
Manganese, Dissolved µg/L	15	10.6	5.0	19.1	2009-2010 SRMP archived
Nitrate as N, Dissolved mg/L	20	0.215	0.190	0.340	1991-2005 USGS
Nitrate+Nitrite as N, Dissolved mg/L	37	0.200	0.170	0.240	1991-2009 USGS
Nitrate+Nitrite as N, Total mg/L *	64	0.145	0.128	0.180	2007-2011 SRMP, 1991-1994 USGS
Nitrogen as N, Dissolved mg/L	35	0.39	0.36	0.48	1991-2009 USGS
Nitrogen as N, Total mg/L *	91	0.383	0.349	0.410	1991-2009 USGS, 2007-2011 SRMP
Nitrogen, Kjeldahl as N, Total mg/L	78	0.204	0.197	0.213	1991-2001 USGS, 2007-2011 SRMP
Organic Carbon, Dissolved mg/L	37	2.5	2.2	2.6	1991-2009 USGS/NJDEP
pH units *	97	7.38	7.30	7.40	1991-2009 USGS/NJDEP, 2006-2011 SRMP
Phosphate as P, Total mg/L	57	0.007	0.006	0.007	2007-2011 SRMP
Phosphorus as P, Total mg/L *	94	0.015	0.014	0.018	1991-2009 USGS/NJDEP, 2007-2011 SRMP
Potassium, Dissolved mg/L	15	0.74	0.64	0.79	2009-2010 SRMP archived
Sodium, Dissolved mg/L	15	7.68	6.28	8.27	2009-2010 SRMP archived
Specific Conductance µS/cm	97	88	87	89	1991-2009 USGS/NJDEP, 2006-2011 SRMP
Strontium, Dissolved mg/L	15	0.030	0.027	0.031	2009-2010 SRMP archived
Sulfate, Dissolved mg/L	37	6.81	6.51	7.40	1991-2009 USGS/NJDEP
Sulfate, Total mg/L	13	5.92	5.70	6.04	2009-2010 SRMP archived
Temperature, Water, degrees C	120	19.65	18.6	20.9	1991-2009 USGS/NJDEP, 2006-2011 SRMP
Total Dissolved Solids (TDS) mg/L	104	50.2	49.0	51.6	1991-2009 USGS/NJDEP, 2006-2011 SRMP
Total Suspended Solids (TSS) mg/L *	88	2.15	1.35	3.55	1995-2009 USGS/NJDEP, 2006-2011 SRMP
Turbidity NTU	51	2.22	1.97	2.53	2007-2011 SRMP

Two-tailed confidence limits were used for these EWQ targets

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

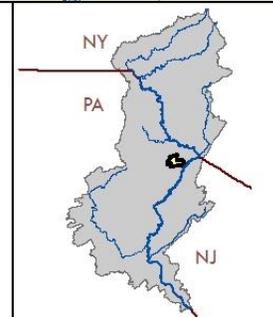
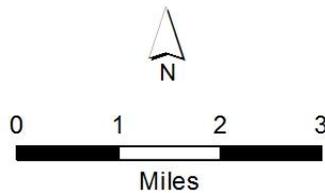
2439 BCP Raymondskill Creek at DWGNRA Boundary



Raymondskill Creek

Drainage Area = 32.51 mi²

- Sampling Location
- NPDES
- Drainage Area
- NPS Boundary



2439 BCP Raymondskill Creek at DWGNRA Boundary

Pike County, PA. Latitude 41.305771 Longitude -74.851508 by GPS NAD83 decimal degrees.

USGS Site No 01438700

Watershed Population: 2000: 6,461 2010: 8,924 Change: +2,463 (+38.1%)

Drainage Area: 24.3 square miles, tributary to Delaware River Zone 1C

Site Specific EWQ monitoring was completed 2004 by USGS/NPS Delaware Water Gap Study: Hickman R.E., and Fischer J.M. 2008. Water quality of streams in and near the Delaware Water Gap National Recreation Area, Pennsylvania and New Jersey, 2002-04: U.S. Geological Survey Scientific Investigations Report 2007-5290, 65 p.

Additional monitoring was completed 2008 by DRBC/NPS Scenic Rivers Monitoring Program.

This watershed is tributary to the Delaware Water Gap National Recreation Area (DEWA)

Classified by DRBC as Outstanding Basin Waters.

Nearest upstream Interstate Control Point: 2464 ICP Delaware River at Montague

Nearest downstream Interstate Control Point: 2387 ICP Delaware River at Dingmans Access

Known dischargers within watershed: Undefined.

Watershed is 79.2% forested; urban land cover is 7.38%. 100% glaciated. No carbonate bedrock. Mean annual precipitation 43.0 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics (USGS BaSE Model):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
3,568	122	61.2	42.8	33.7	25.4	16.5	9.25	2.40

StreamStats Low-Flow Stream Statistics

M7D2Y (ft ³ /s)	3.74
M30D2Y (ft ³ /s)	5.17
M7D10Y (ft ³ /s)	1.55
M30D10Y (ft ³ /s)	2.19
M90D10Y (ft ³ /s)	3.56

StreamStats Mean/Baseflow Stream Statistics

QA (ft ³ /s)	54.4
QAH (ft ³ /s)	13.6
BF10YR (ft ³ /s)	21.7
BF25YR (ft ³ /s)	19.4
BF50YR (ft ³ /s)	18.1

StreamStats Peak-Flow Stream Statistics

PK2 (ft ³ /s)	965
PK5 (ft ³ /s)	1,640
PK10 (ft ³ /s)	2,200
PK50 (ft ³ /s)	3,740
PK100 (ft ³ /s)	4,530
PK500 (ft ³ /s)	6,780

Existing Water Quality: 2439 BCP Raymondskill Creek at DWGNRA Boundary

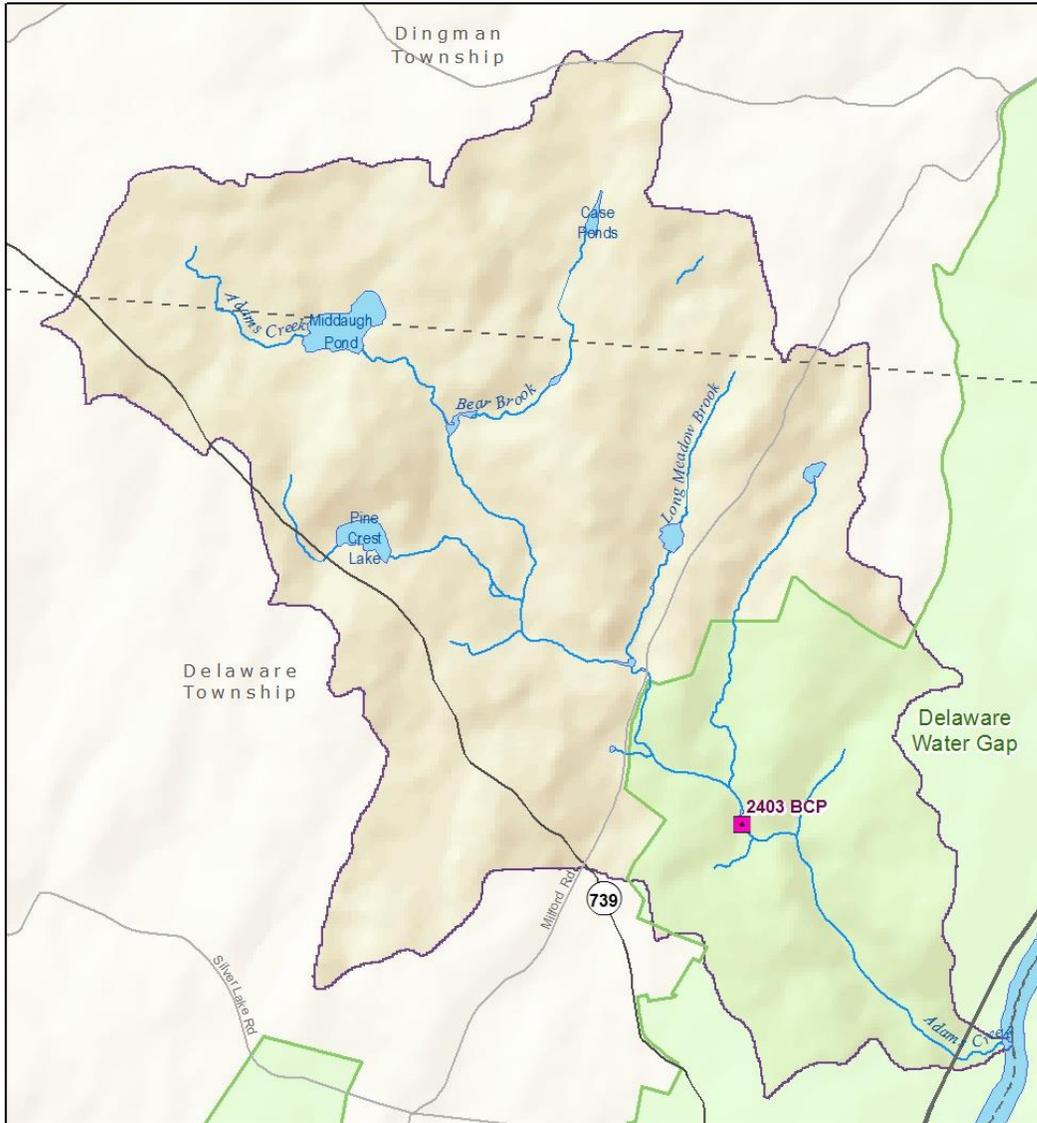
Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	22	9.55	7.80	12.00	2002-2004 USGS, 2008 SRMP
Ammonia-Nitrogen as N, Dissolved mg/L *	32	0.015	0.011	0.015	2002-2004 USGS
Calcium, Dissolved mg/L	12	5.58	4.35	5.90	2002-2004 USGS
Chloride, Dissolved mg/L	12	18.8	17.7	21.7	2002-2004 USGS
Chloride, Total mg/L	10	25.4	22.8	26.2	2008 SRMP
Dissolved Oxygen (DO) mg/L *	42	8.57	8.0	9.2	2002-2004 USGS, 2008 SRMP
Dissolved Oxygen Saturation %	42	94	90	98	2002-2004 USGS, 2008 SRMP
Enterococcus #/100ml	10	117	13	430	2008 SRMP
Escherichia coli #/100ml	10	7	2	160	2008 SRMP
Fecal coliform #/100ml *	9	5	2	28	2008 SRMP
Hardness as CaCO ₃ , Total mg/L	12	21.5	17.0	24.0	2002-2004 USGS
Magnesium, Dissolved mg/L	12	1.93	1.49	2.20	2002-2004 USGS
Nitrate+Nitrite as N, Dissolved mg/L *	32	0.060	0.040	0.060	1991-2009 USGS
Nitrate+Nitrite as N, Total mg/L	10	0.049	0.037	0.089	2008 SRMP
Nitrogen as N, Total mg/L *	37	0.310	0.290	0.341	2002-2004 USGS, 2008 SRMP
Nitrogen, Kjeldahl as N, Total mg/L	32	0.260	0.230	0.290	2002-2003 USGS, 2008 SRMP
Nitrogen, Organic as N, Total mg/L	19	0.230	0.210	0.280	2002-2004 USGS
pH units *	42	6.79	6.67	6.90	2002-2004 USGS, 2008 SRMP
Phosphate as P, Dissolved mg/L	32	0.020	0.007	0.020	2002-2004 USGS
Phosphorus as P, Total mg/L *	42	0.018	0.014	0.020	2002-2004 USGS, 2008 SRMP
Specific Conductance μ S/cm	42	103.5	101.0	105.0	2002-2004 USGS, 2008 SRMP
Sulfate, Dissolved mg/L	12	5.06	4.90	5.72	2002-2004 USGS
Temperature, Water, degrees C	42	19.0	17.0	20.5	2002-2004 USGS, 2008 SRMP
Total Dissolved Solids (TDS) mg/L	12	68	65	70	2002-2004 USGS
Total Suspended Solids (TSS) mg/L *	10	0.68	0.35	1.30	2008 SRMP
Turbidity NTU	40	10	8	16	2002-2004 USGS, 2008 SRMP

Two-tailed confidence limits were used for these EWQ targets

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

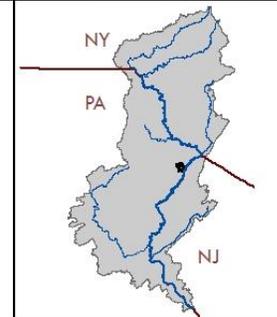
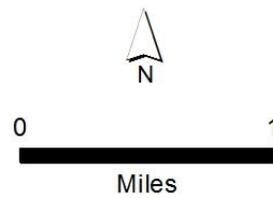
2403 BCP Adams Creek at DWGNRA Boundary



Adams Creek

Drainage Area = 8.05 mi²

- Sampling Location
- Drainage Area
- NPS Boundary



2403 BCP Adams Creek at DWGNRA Boundary

Pike County, PA. Latitude 41.252500 Longitude -74.882500 by GPS NAD83 decimal degrees.

USGS Site No 01438760; PADEP Site WQN0192

Watershed Population: 2000: 1,337 2010: 1,615 Change: +278 (+20.8%)

Drainage Area: 8.0 square miles, tributary to Delaware River Zone 1C

Site Specific EWQ monitoring was completed 2004 by USGS/NPS Delaware Water Gap Study: Hickman R.E., and Fischer J.M. 2008. Water quality of streams in and near the Delaware Water Gap National Recreation Area, Pennsylvania and New Jersey, 2002-04: U.S. Geological Survey Scientific Investigations Report 2007-5290, 65 p.

Additional monitoring was completed 2008 by DRBC/NPS Scenic Rivers Monitoring Program; supplemented by quarterly PADEP Water Quality Network data 2001-2011.

This watershed is tributary to the Delaware Water Gap National Recreation Area (DEWA)

Classified by DRBC as Outstanding Basin Waters.

Nearest upstream Interstate Control Point: 2464 ICP Delaware River at Montague

Nearest downstream Interstate Control Point: 2387 ICP Delaware River at Dingmans Access

Known dischargers within watershed: Undefined.

Watershed is 84.6% forested; urban land cover is 9.06%. 100% glaciated. No carbonate bedrock. Mean annual precipitation 43.0 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics (USGS BaSE Model):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
499	26.9	14.2	8.19	5.78	4.38	2.29	1.12	0.30

StreamStats Low-Flow Stream Statistics

M7D2Y (ft ³ /s)	0.81
M30D2Y (ft ³ /s)	1.16
M7D10Y (ft ³ /s)	0.29
M30D10Y (ft ³ /s)	0.43
M90D10Y (ft ³ /s)	0.75

StreamStats Mean/Baseflow Stream Statistics

QA (ft ³ /s)	13.3
QAH (ft ³ /s)	3.19
BF10YR (ft ³ /s)	5.64
BF25YR (ft ³ /s)	5.06
BF50YR (ft ³ /s)	4.73

StreamStats Peak-Flow Stream Statistics

PK2 (ft ³ /s)	348
PK5 (ft ³ /s)	609
PK10 (ft ³ /s)	823
PK50 (ft ³ /s)	1,400
PK100 (ft ³ /s)	1,700
PK500 (ft ³ /s)	2,520

Existing Water Quality: 2403 BCP Adams Creek at DWGNRA Boundary

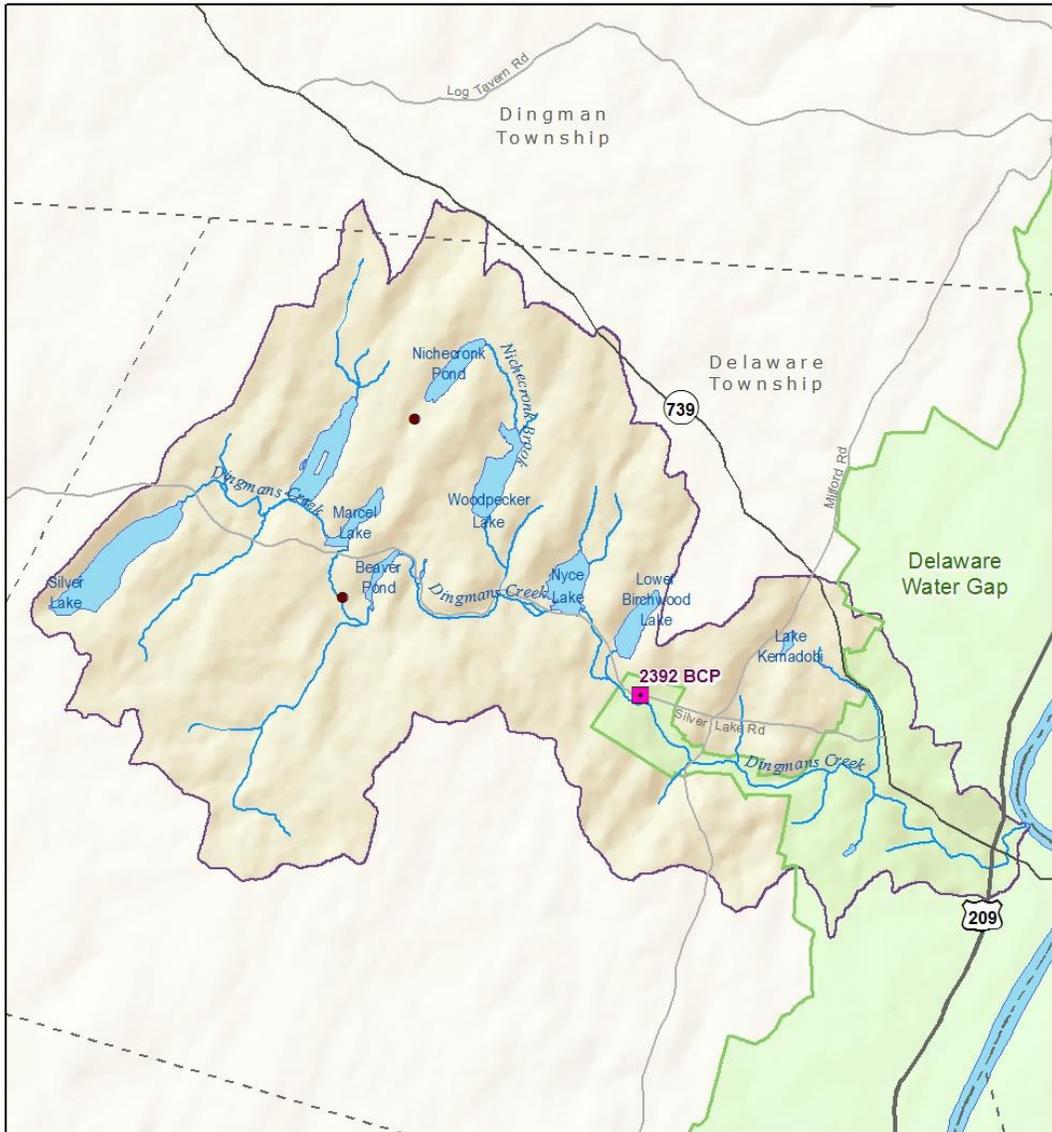
Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	54	9.0	8.0	10.0	2001-2004 PADEP, USGS; 2008 SRMP
Ammonia-Nitrogen as N, Dissolved mg/L	31	0.015	0.012	0.015	2002-2004 USGS
Ammonia-Nitrogen as N, Total mg/L *	19	0.020	0.016	0.020	2001-2004 PADEP, USGS
Calcium, Dissolved mg/L	18	4.23	3.82	4.55	2001-2004 PADEP, USGS
Calcium, Total mg/L	20	4.75	4.32	5.26	2001-2004 PADEP
Chloride, Dissolved mg/L	27	10.90	9.45	12.40	2002-2004 USGS
Chloride, Total mg/L	30	13.40	12.30	14.37	2001-2004 PADEP, 2008 SRMP
Dissolved Oxygen (DO) mg/L *	61	9.10	8.80	9.50	2001-2004 PADEP, 2008 SRMP
Dissolved Oxygen Saturation %	41	95	91	97	2002-2004 USGS, 2008 SRMP
Enterococcus #/100ml	10	100	14	230	2008 SRMP
Escherichia coli #/100ml	10	12	4	90	2008 SRMP
Fecal coliform #/100ml *	30	20	20	22	2001-2004 PADEP, 2008 SRMP
Hardness as CaCO ₃ , Total mg/L	32	18.0	17.0	19.1	2001-2004 PADEP
Iron, Dissolved µg/L	20	36	20	48	2001-2004 PADEP
Iron, Total µg/L	20	85	32	130	2001-2004 PADEP
Magnesium, Dissolved mg/L	18	1.56	1.41	1.63	2001-2004 PADEP
Magnesium, Total mg/L	20	1.69	1.57	1.84	2001-2004 PADEP
Manganese, Dissolved µg/L	20	<2	<2	<2	2001-2004 PADEP (16/20 Non-Detect)
Manganese, Total µg/L	20	9.65	4.2	17.0	2001-2004 PADEP
Nitrate as N, Total mg/L	20	0.090	0.045	0.160	2001-2004 PADEP
Nitrate+Nitrite as N, Dissolved mg/L *	31	0.100	0.060	0.120	2002-2004 USGS
Nitrate+Nitrite as N, Total mg/L	10	0.093	0.054	0.158	2008 SRMP
Nitrogen as N, Total mg/L *	54	0.260	0.230	0.310	2002-2004 USGS, 2008 SRMP
Nitrogen, Kjeldahl as N, Total mg/L	31	0.180	0.153	0.210	2002-2003 USGS, 2008 SRMP
Nitrogen, Organic as N, Total mg/L	25	0.170	0.160	0.250	2002-2004 USGS, PADEP
pH units *	60	6.8	6.7	7.0	2001-2004 PADEP, USGS; 2008 SRMP
Phosphate as P, Dissolved mg/L	31	0.020	0.006	0.020	2002-2004 USGS (13/31 Non-detects)
Phosphorus as P, Total mg/L *	60	0.014	0.010	0.016	2001-2004 PADEP, USGS; 2008 SRMP
Specific Conductance µS/cm	61	73	71	76	2001-2004 PADEP, USGS; 2008 SRMP
Sulfate, Dissolved mg/L	27	6.50	6.07	7.01	2002-2004 USGS
Sulfate, Total mg/L	20	6.82	6.55	7.21	2001-2004 PADEP
Temperature, Water, degrees C	61	17.0	17.0	17.9	2001-2004 PADEP, USGS; 2008 SRMP
Total Dissolved Solids (TDS) mg/L	32	50.5	45.0	58.0	2001-2004 PADEP, USGS
Total Suspended Solids (TSS) mg/L *	30	2	2	2	2001-2004 PADEP, USGS; 2008 SRMP
Turbidity NTU	41	7.0	6.0	8.0	2002-2004 USGS, 2008 SRMP

Two-tailed confidence limits were used for these EWQ targets

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

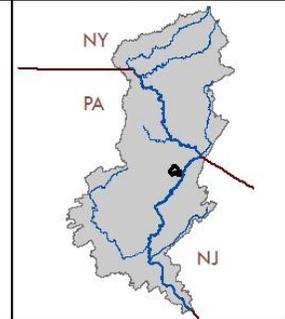
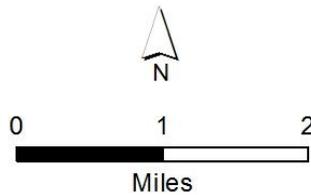
2392 BCP Dingmans Creek at DWGNRA Boundary



Dingmans Creek

Drainage Area = 16.53 mi²

- Sampling Location
- NPDES
- Drainage Area
- NPS Boundary



2392 BCP Dingmans Creek at DWGNRA Boundary

Pike County, PA. Latitude 41.238222 Longitude -74.917200 by GPS NAD83 decimal degrees.

USGS Site No 01438890

Watershed Population: 2000: 2,563 2010: 3,032 Change: +469 (+18.3%)

Drainage Area: 16.5 square miles, tributary to Delaware River Zone 1C

Site Specific EWQ monitoring was completed 2004 by USGS/NPS Delaware Water Gap Study: Hickman R.E., and Fischer J.M. 2008. Water quality of streams in and near the Delaware Water Gap National Recreation Area, Pennsylvania and New Jersey, 2002-04: U.S. Geological Survey Scientific Investigations Report 2007-5290, 65 p.

Additional monitoring was completed 2008 by DRBC/NPS Scenic Rivers Monitoring Program.

This watershed is tributary to the Delaware Water Gap National Recreation Area (DEWA)

Classified by DRBC as Outstanding Basin Waters.

Nearest upstream Interstate Control Point: 2464 ICP Delaware River at Montague

Nearest downstream Interstate Control Point: 2387 ICP Delaware River at Dingmans Access

Known dischargers within watershed: Undefined.

Watershed is 80.8% forested; urban land cover is 7.90%. 100% glaciated. No carbonate bedrock. Mean annual precipitation 43.0 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics (USGS BaSE Model):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
1,873	59.2	29.5	20.8	16.4	12.5	7.84	4.31	1.01

StreamStats Low-Flow Stream Statistics

M7D2Y (ft ³ /s)	1.75
M30D2Y (ft ³ /s)	2.47
M7D10Y (ft ³ /s)	0.68
M30D10Y (ft ³ /s)	0.98
M90D10Y (ft ³ /s)	1.65

StreamStats Mean/Baseflow Stream Statistics

QA (ft ³ /s)	27.3
QAH (ft ³ /s)	6.67
BF10YR (ft ³ /s)	11.2
BF25YR (ft ³ /s)	10.0
BF50YR (ft ³ /s)	9.36

StreamStats Peak-Flow Stream Statistics

PK2 (ft ³ /s)	560
PK5 (ft ³ /s)	965
PK10 (ft ³ /s)	1,300
PK50 (ft ³ /s)	2,220
PK100 (ft ³ /s)	2,700
PK500 (ft ³ /s)	4,040

Existing Water Quality: 2392 BCP Dingmans Creek at DWGNRA Boundary

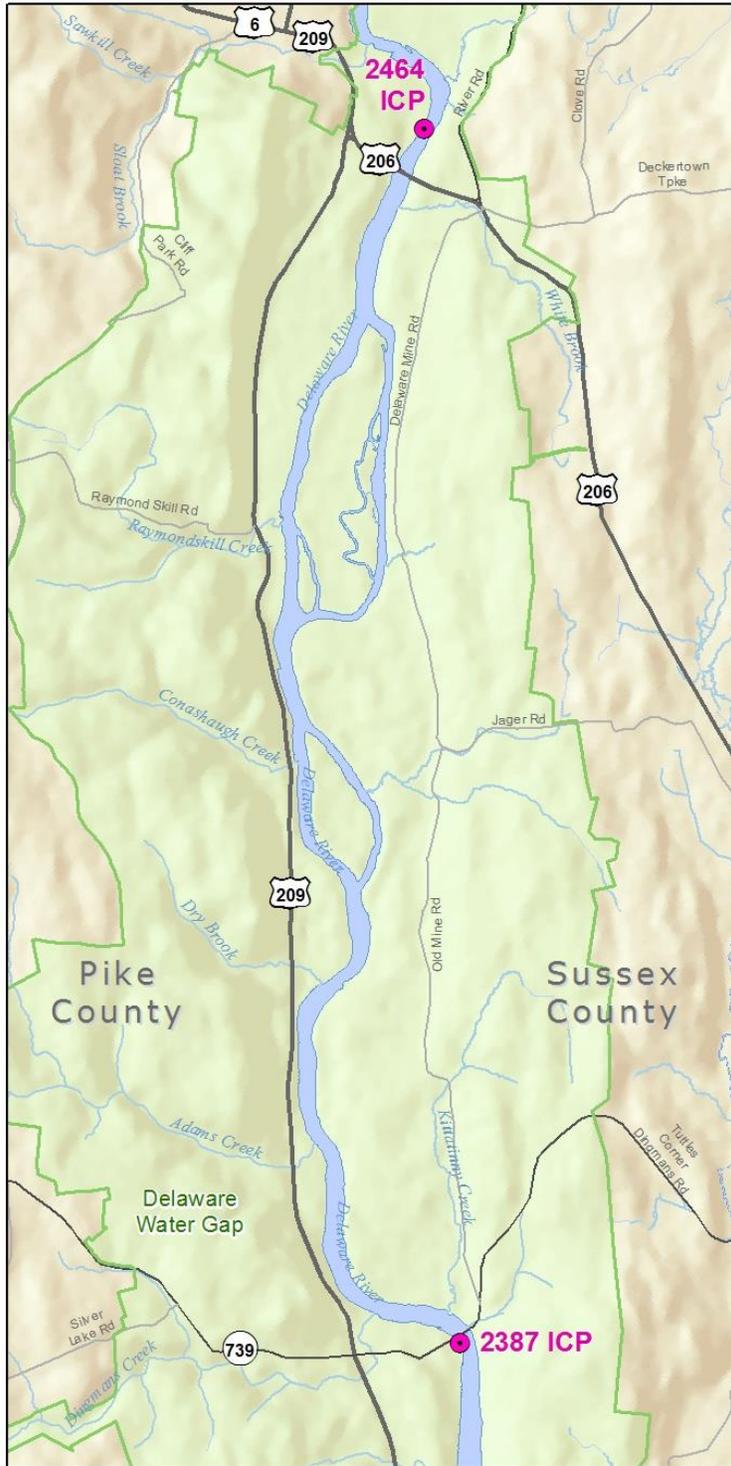
Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	22	9.0	8.0	12.3	2002-2004 USGS; 2008 SRMP
Ammonia-Nitrogen as N, Dissolved mg/L *	33	<0.015	<0.015	<0.015	2002-2004 USGS (27/33 non-detect)
Ammonia-Nitrogen as N, Total mg/L	5	<0.005	<0.005	<0.005	2008 SRMP (all non-detects)
Calcium, Dissolved mg/L	14	4.48	3.87	6.20	2001-2004 USGS
Chloride, Dissolved mg/L	14	12.9	9.05	14.4	2001-2004 USGS
Chloride, Total mg/L	10	16.35	13.21	17.6	2008 SRMP
Dissolved Oxygen (DO) mg/L *	43	9.2	8.8	9.5	2001-2004 USGS, 2008 SRMP
Dissolved Oxygen Saturation %	43	97	95	99	2001-2004 USGS, 2008 SRMP
Enterococcus #/100ml	10	70	29	250	2008 SRMP
Escherichia coli #/100ml	10	4	1	190	2008 SRMP
Fecal coliform #/100ml *	11	10	2	62	2008 SRMP
Hardness as CaCO ₃ , Total mg/L	14	17	15	24	2001-2004 USGS
Magnesium, Dissolved mg/L	14	1.49	1.23	2.00	2001-2004 USGS
Nitrate+Nitrite as N, Dissolved mg/L *	33	0.10	0.07	0.17	2001-2004 USGS
Nitrate+Nitrite as N, Total mg/L	10	0.109	0.060	0.218	2008 SRMP
Nitrogen as N, Total mg/L *	43	0.340	0.330	0.363	2001-2004 USGS, 2008 SRMP
Nitrogen, Kjeldahl as N, Total mg/L	33	0.220	0.171	0.280	2001-2003 USGS, 2008 SRMP
Nitrogen, Organic as N, Total mg/L	9	0.200	0.120	0.220	2002, 2004 USGS
pH units *	43	6.9	6.8	7.1	2001-2004 USGS; 2008 SRMP
Phosphate as P, Dissolved mg/L	33	0.02	0.01	0.02	2001-2004 USGS (14/33 non-detects)
Phosphate as P, Total mg/L	5	<0.003	<0.003	<0.003	2008 SRMP
Phosphorus as P, Total mg/L *	43	0.014	0.011	0.021	2001-2004 USGS; 2008 SRMP
Specific Conductance μ S/cm	43	81	75	90	2001-2004 USGS; 2008 SRMP
Sulfate, Dissolved mg/L	14	5.72	4.69	6.36	2001-2004 USGS
Temperature, Water, degrees C	43	17.5	16.5	18.0	2001-2004 USGS; 2008 SRMP
Total Dissolved Solids (TDS) mg/L	14	49.5	43.0	62.0	2001-2004 USGS
Total Suspended Solids (TSS) mg/L *	10	1.67	0.50	1.85	2008 SRMP
Turbidity NTU	43	8	5	11	2001-2004 USGS, 2008 SRMP

Two-tailed confidence limits were used for these EWQ targets

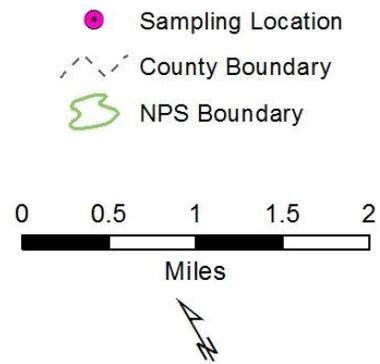
* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

2387 ICP Delaware River at Dingmans Access



2387 ICP
Delaware River at Dingmans Access



2387 ICP Delaware River at Dingmans Access

Latitude 41.219426 Longitude -74.859879 by GPS NAD83 decimal degrees.

No USGS or State monitoring sites nearby.

Watershed Population figures were not calculated for main-stem Delaware River sites.

Drainage Area: 3,542 square miles, Delaware River Zone 1C

Site Specific EWQ defined 2006-2011 by the DRBC/NPS Scenic Rivers Monitoring Program; supplemented by some older data collected by the USGS in the 1980's.

This site is located in the Delaware Water Gap National Recreation Area.

Classified by DRBC as Outstanding Basin Waters

Nearest upstream Interstate Control Point: 2464 ICP Delaware River at Montague

Nearest downstream Interstate Control Point: 2281 ICP Delaware River at Bushkill Access

Known dischargers within watershed: Undefined

Tributaries to upstream reach: Major tributaries 2439 BCP Raymondskill Creek, PA; 2392 BCP Dingmans Creek, PA; small tributaries 246.0 White Brook, NJ; 242.6 Conashaugh Creek, PA; 241.1 Dry Brook, PA; 2403 BCP Adams Creek, PA; 238.8 Kittatinny Creek, NJ.

No Stream Stats web site data available (drainage area too large to calculate on web site).

Flow Statistics (calculated by drainage area weighting from Montague USGS gage data):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
163,900	12,500	6,990	4,680	3,720	2,950	2,140	1,770	920

2387 ICP Delaware River at Dingmans Access

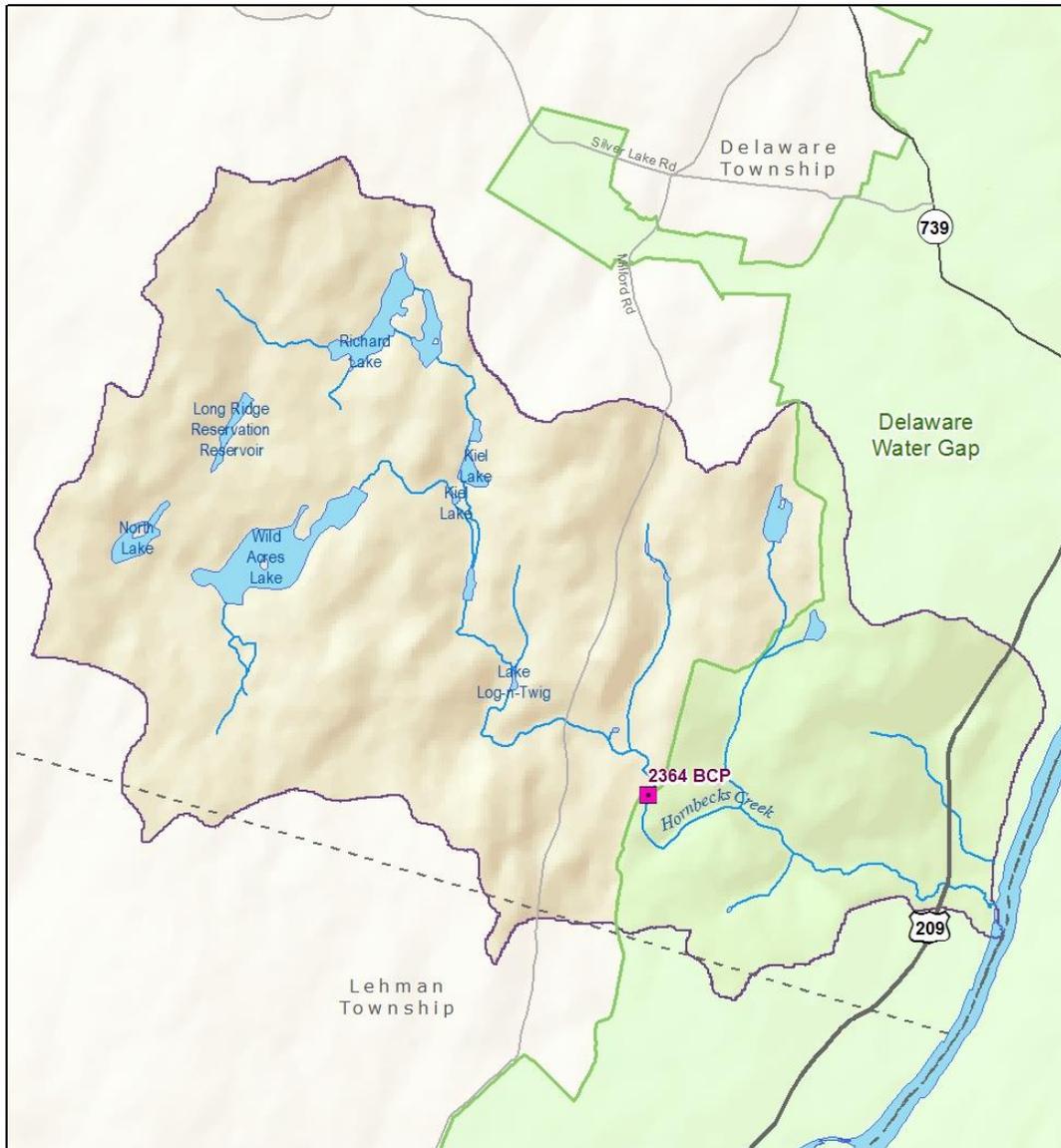
Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	72	14.3	13.6	15.1	1983-1984 USGS, 2006-2011 SRMP
Aluminum, Dissolved mg/L	14	0.004	0.002	0.007	2009-2010 SRMP archived
Ammonia-Nitrogen as N, Total mg/L *	64	0.013	0.010	0.016	2006-2011 SRMP
Barium, Dissolved mg/L	14	0.021	0.017	0.027	2009-2010 SRMP archived
Calcium, Dissolved mg/L	21	6.50	5.68	7.70	1983-1984 USGS; 2009-2010 SRMP
Chloride, Total mg/L	65	12.7	12.16	13.37	2006-2011 SRMP
Dissolved Oxygen (DO) mg/L *	66	8.54	8.3	8.9	1983-1984 USGS; 2006-2011 SRMP
Dissolved Oxygen Saturation %	41	94	92	98	1984 USGS; 2008-2011 SRMP
Enterococcus #/100ml	48	44	18	120	2007-2011 SRMP
Escherichia coli #/100ml	48	13	10	19	2007-2011 SRMP
Fecal coliform #/100ml *	62	22	13	36	2006-2011 SRMP
Hardness as CaCO ₃ , Total mg/L	72	23.7	22.4	24.4	1983-1984 USGS, 2006-2011 SRMP
Magnesium, Dissolved mg/L	21	1.40	1.21	1.59	1983-1984 USGS; 2009-2010 SRMP
Manganese, Dissolved µg/L	18	9.4	3.3	20.0	1983-1984 USGS; 2009-2010 SRMP
Nitrate+Nitrite as N, Total mg/L *	55	0.133	0.118	0.156	2007-2011 SRMP
Nitrogen as N, Total mg/L *	55	0.322	0.303	0.376	2007-2011 SRMP
Nitrogen, Kjeldahl as N, Total mg/L	55	0.194	0.182	0.204	2007-2011 SRMP
pH units *	65	7.29	7.18	7.40	1983-1984 USGS; 2006-2011 SRMP
Phosphate as P, Total mg/L	55	0.006	0.006	0.008	2007-2011 SRMP
Phosphorus as P, Total mg/L *	55	0.014	0.013	0.015	2007-2011 SRMP
Potassium, Dissolved mg/L	14	0.682	0.552	0.782	2009-2010 SRMP archived
Sodium, Dissolved mg/L	14	7.36	6.10	8.39	2009-2010 SRMP archived
Specific Conductance µS/cm	66	85	80	89	1983-1984 USGS; 2006-2011 SRMP
Strontium, Dissolved mg/L	14	0.027	0.025	0.032	2009-2010 SRMP archived
Sulfate, Total mg/L	13	5.91	5.51	6.11	2009-2010 SRMP archived
Temperature, Water, degrees C	66	19.9	18.8	21.6	1983-1984 USGS; 2006-2011 SRMP
Total Dissolved Solids (TDS) mg/L	72	50.3	48.9	51.9	1983-1984 USGS; 2006-2011 SRMP
Total Suspended Solids (TSS) mg/L *	58	2.08	1.45	2.70	2006-2011 SRMP
Turbidity NTU	51	2.11	1.84	2.47	2007-2011 SRMP

Two-tailed confidence limits were used for these EWQ targets

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

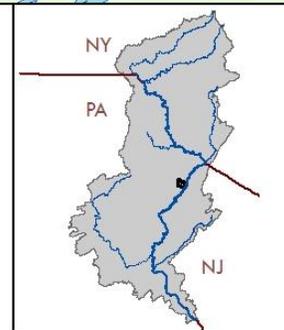
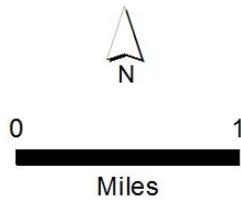
2364 BCP Hornbecks Creek at DWGNRA Boundary



Hornbecks Creek

Drainage Area = 9.47 mi²

-  Sampling Location
-  Drainage Area
-  NPS Boundary



2364 BCP Hornbecks Creek at DWGNRA Boundary

Pike County, PA. Latitude 41.196053 Longitude -74.909046 by GPS NAD83 decimal degrees.

USGS Site No 01439092

Watershed Population: 2000: 1,927 2010: 2,264 Change: +337 (+17.5%)

Drainage Area: 9.5 square miles, tributary to Delaware River Zone 1C

Site Specific EWQ monitoring was completed 2004 by USGS/NPS Delaware Water Gap Study: Hickman R.E., and Fischer J.M. 2008. Water quality of streams in and near the Delaware Water Gap National Recreation Area, Pennsylvania and New Jersey, 2002-04: U.S. Geological Survey Scientific Investigations Report 2007-5290, 65 p.

Additional monitoring was completed 2008 by DRBC/NPS Scenic Rivers Monitoring Program.

This watershed is tributary to the Delaware Water Gap National Recreation Area (DEWA)

Classified by DRBC as Outstanding Basin Waters.

Nearest upstream Interstate Control Point: 2387 ICP Delaware River at Dingmans Access

Nearest downstream Interstate Control Point: 2281 ICP Delaware River at Bushkill Access

Known dischargers within watershed: Undefined.

Watershed is 77.1% forested; urban land cover is 10.09%. 100% glaciated. No carbonate bedrock. Mean annual precipitation 43.0 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics (USGS BaSE Model):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
1,103	31.5	15.6	11.2	8.82	7.03	4.32	2.29	0.55

StreamStats Low-Flow Stream Statistics

M7D2Y (ft³/s) 0.85

M30D2Y (ft³/s) 1.23

M7D10Y (ft³/s) 0.30

M30D10Y (ft³/s) 0.46

M90D10Y (ft³/s) 0.80

StreamStats Mean/Baseflow Stream Statistics

QA (ft³/s) 15.2

QAH (ft³/s) 3.70

BF10YR (ft³/s) 6.30

BF25YR (ft³/s) 5.63

BF50YR (ft³/s) 5.25

StreamStats Peak-Flow Stream Statistics

PK2 (ft³/s) 363

PK5 (ft³/s) 633

PK10 (ft³/s) 857

PK50 (ft³/s) 1,470

PK100 (ft³/s) 1,780

PK500 (ft³/s) 2,670

Existing Water Quality: 2364 BCP Hornbecks Creek at DWGNRA Boundary

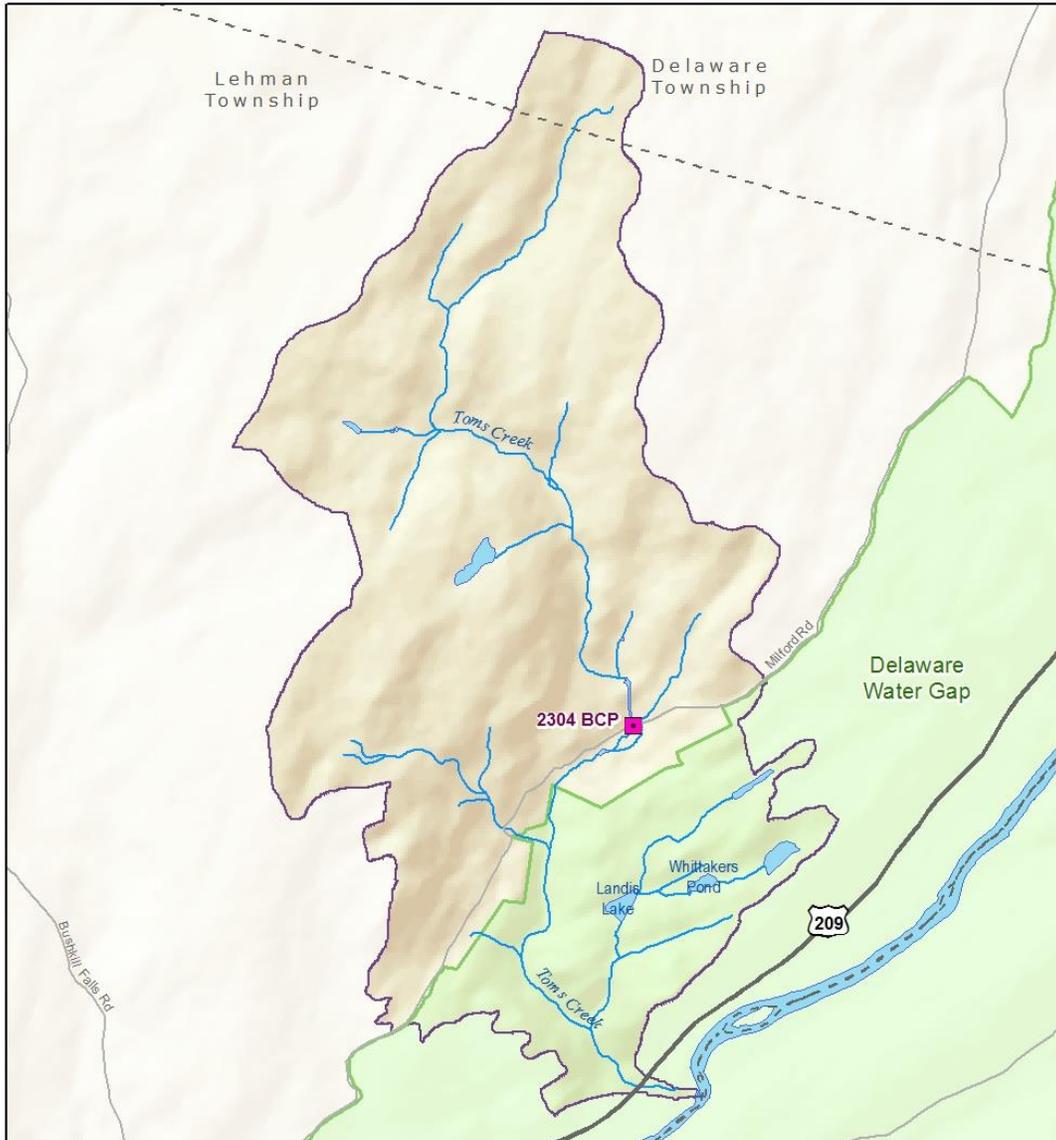
Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	22	11.0	10.0	12.3	2002-2004 USGS, 2008 SRMP
Ammonia-Nitrogen as N, Dissolved mg/L *	31	0.015	0.012	0.018	2002-2004 USGS
Ammonia-Nitrogen as N, Total mg/L	10	<0.005	<0.005	<0.005	2008 SRMP (all 10 samples non-detects)
Calcium, Dissolved mg/L	12	6.45	5.48	8.22	2002-2004 USGS
Chloride, Dissolved mg/L	12	21.4	16.7	39.5	2002-2004 USGS
Chloride, Total mg/L	10	30.6	23.8	36.8	2008 SRMP
Dissolved Oxygen (DO) mg/L *	41	8.4	7.7	9.1	2002-2004 USGS, 2008 SRMP
Dissolved Oxygen Saturation %	41	93	85	95	2002-2004 USGS, 2008 SRMP
Enterococcus #/100ml	10	175	27	600	2008 SRMP
Escherichia coli #/100ml	10	35	10	300	2008 SRMP
Fecal coliform #/100ml *	9	57	20	180	2008 SRMP
Hardness as CaCO ₃ , Total mg/L	12	25.0	22.0	32.0	2002-2004 USGS
Magnesium, Dissolved mg/L	12	2.19	1.94	2.63	2002-2004 USGS
Nitrate+Nitrite as N, Dissolved mg/L *	31	0.080	0.070	0.110	2002-2004 USGS
Nitrate+Nitrite as N, Total mg/L	10	0.093	0.056	0.137	2008 SRMP
Nitrogen as N, Total mg/L *	38	0.315	0.282	0.350	2002-2004 USGS, 2008 SRMP
Nitrogen, Kjeldahl as N, Total mg/L	31	0.228	0.179	0.250	2002-2003 USGS, 2008 SRMP
Nitrogen, Organic as N, Total mg/L	21	0.200	0.160	0.240	2002-2004 USGS
pH units *	41	6.7	6.4	6.8	2002-2004 USGS, 2008 SRMP
Phosphate as P, Dissolved mg/L	31	0.020	0.006	0.020	2002-2004 USGS (25/31 non-detects)
Phosphate as P, Total mg/L	10	<0.003	<0.003	<0.003	2008 SRMP (all 10 samples non-detects)
Phosphorus as P, Total mg/L *	41	0.015	0.010	0.040	2002-2004 USGS, 2008 SRMP
Specific Conductance μ S/cm	41	128	112	155	2002-2004 USGS, 2008 SRMP
Sulfate, Dissolved mg/L	12	7.81	7.12	10.30	2002-2004 USGS
Temperature, Water, degrees C	41	17.0	17.0	19.3	2002-2004 USGS, 2008 SRMP
Total Dissolved Solids (TDS) mg/L	12	68	61	99	2002-2004 USGS
Total Suspended Solids (TSS) mg/L *	10	1.33	0.80	1.95	2008 SRMP
Turbidity NTU	41	9.0	7.0	11.0	2002-2004 USGS, 2008 SRMP

Two-tailed confidence limits were used for these EWQ targets

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

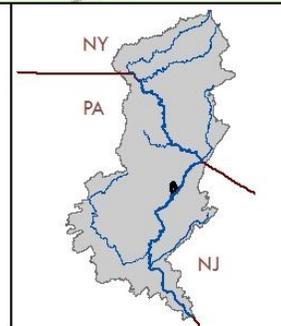
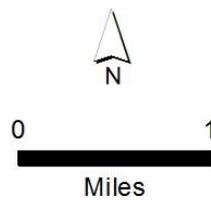
2304 BCP Toms Creek at DWGNRA Boundary



Toms Creek

Drainage Area = 9.36 mi²

-  Sampling Location
-  Drainage Area
-  NPS Boundary



2304 BCP Toms Creek at DWGNRA Boundary

Pike County, PA. Latitude 41.152203 Longitude -74.954079 by GPS NAD83 decimal degrees.

USGS Site No 01439400

Watershed Population: 2000: 2,074 2010: 2,299 Change: +225 (+10.9%)

Drainage Area: 9.4 square miles, tributary to Delaware River Zone 1C

Site Specific EWQ monitoring was completed 2004 by USGS/NPS Delaware Water Gap Study: Hickman R.E., and Fischer J.M. 2008. Water quality of streams in and near the Delaware Water Gap National Recreation Area, Pennsylvania and New Jersey, 2002-04: U.S. Geological Survey Scientific Investigations Report 2007-5290, 65 p.

Additional monitoring was completed 2008 by DRBC/NPS Scenic Rivers Monitoring Program.

This watershed is tributary to the Delaware Water Gap National Recreation Area (DEWA)

Classified by DRBC as Outstanding Basin Waters.

Nearest upstream Interstate Control Point: 2387 ICP Delaware River at Dingmans Access

Nearest downstream Interstate Control Point: 2281 ICP Delaware River at Bushkill Access

Known dischargers within watershed: Undefined.

Watershed is 72.1% forested; urban land cover is 24.5%. 100% glaciated. No carbonate bedrock. Mean annual precipitation 43.0 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics (USGS BaSE Model):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
1,082	32.1	16.5	11.3	8.90	7.14	4.61	2.53	0.75

StreamStats Low-Flow Stream Statistics

M7D2Y (ft³/s) 0.77

M30D2Y (ft³/s) 1.12

M7D10Y (ft³/s) 0.27

M30D10Y (ft³/s) 0.41

M90D10Y (ft³/s) 0.72

StreamStats Mean/Baseflow Stream Statistics

QA (ft³/s) 15.7

QAH (ft³/s) 2.14

BF10YR (ft³/s) 6.36

BF25YR (ft³/s) 5.73

BF50YR (ft³/s) 5.36

StreamStats Peak-Flow Stream Statistics

PK2 (ft³/s) 429

PK5 (ft³/s) 750

PK10 (ft³/s) 1,010

PK50 (ft³/s) 1,700

PK100 (ft³/s) 2,060

PK500 (ft³/s) 3,030

Existing Water Quality: 2304 BCP Toms Creek at DWGNRA Boundary

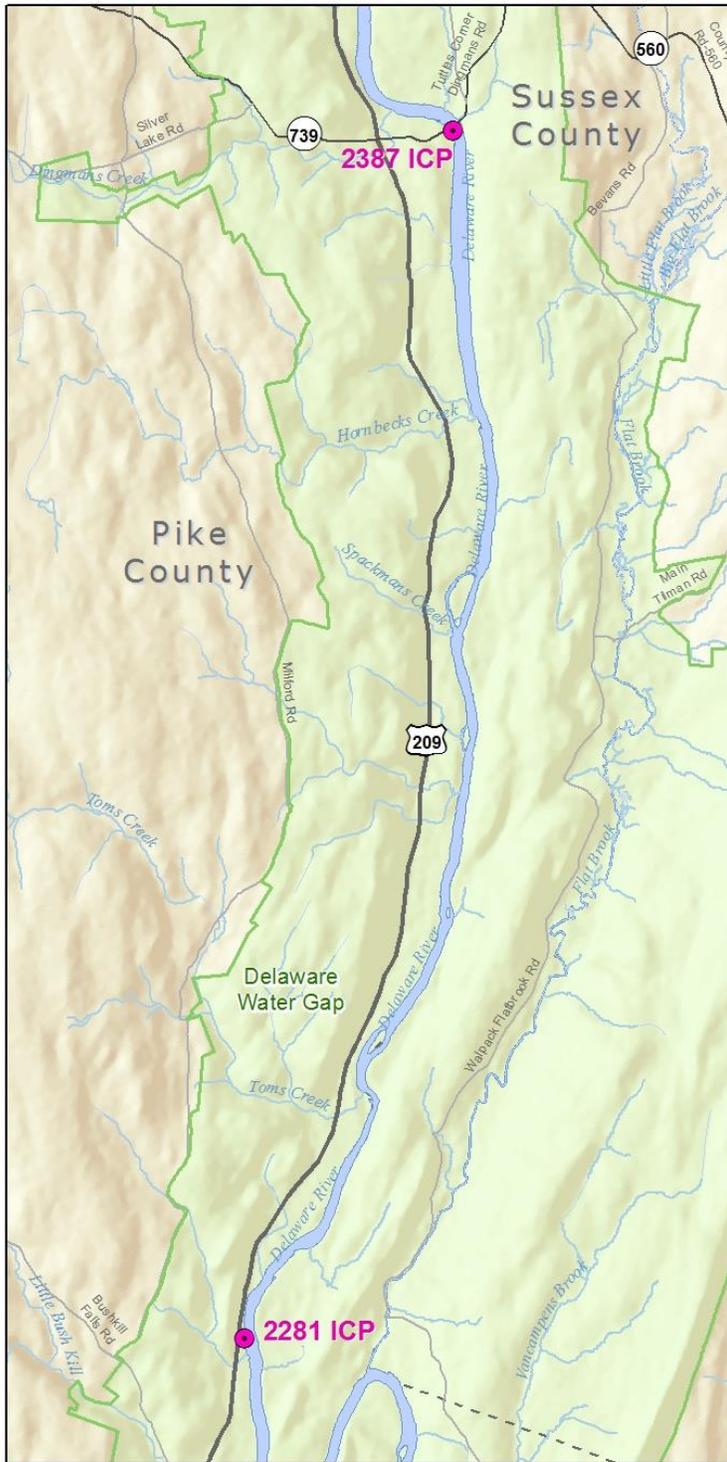
Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	23	13.5	12.0	14.9	2002-2004 USGS, 2008 SRMP
Ammonia-Nitrogen as N, Dissolved mg/L *	34	<0.015	<0.015	<0.015	2002-2004 USGS, all non-detects
Ammonia-Nitrogen as N, Total mg/L	10	<0.005	<0.005	<0.005	2008 SRMP (all 10 samples non-detects)
Calcium, Dissolved mg/L	15	6.26	5.87	6.58	2001-2004 USGS
Chloride, Dissolved mg/L	15	10.5	9.6	11.3	2001-2004 USGS
Chloride, Total mg/L	10	13.8	13.4	14.9	2008 SRMP
Dissolved Oxygen (DO) mg/L *	44	9.7	9.4	10.1	2001-2004 USGS, 2008 SRMP
Dissolved Oxygen Saturation %	44	98	97	99	2001-2004 USGS, 2008 SRMP
Enterococcus #/100ml	10	135	8	600	2008 SRMP
Escherichia coli #/100ml	10	6	2	130	2008 SRMP
Fecal coliform #/100ml *	9	10	3	15	2008 SRMP
Hardness as CaCO ₃ , Total mg/L	15	25.0	23.0	26.0	2001-2004 USGS
Magnesium, Dissolved mg/L	15	2.22	2.01	2.43	2001-2004 USGS
Nitrate+Nitrite as N, Dissolved mg/L *	34	0.155	0.140	0.220	2001-2004 USGS
Nitrate+Nitrite as N, Total mg/L	10	0.196	0.091	0.279	2008 SRMP
Nitrogen as N, Total mg/L *	39	0.251	0.220	0.270	2001-2004 USGS, 2008 SRMP
Nitrogen, Kjeldahl as N, Total mg/L	34	0.070	0.060	0.100	2001-2003 USGS, 2008 SRMP
pH units	45	7.1	6.9	7.3	2001-2004 USGS, 2008 SRMP
Phosphate as P, Dissolved mg/L	34	<0.01	<0.01	<0.01	2001-2004 USGS (24/34 non-detects)
Phosphate as P, Total mg/L	10	<0.003	<0.003	<0.003	2008 SRMP (all 10 samples non-detects)
Phosphorus as P, Total mg/L *	44	0.012	0.010	0.013	2001-2004 USGS, 2008 SRMP
Specific Conductance μ S/cm	45	90	86	91	2001-2004 USGS, 2008 SRMP
Sulfate, Dissolved mg/L	15	8.82	8.41	9.23	2001-2004 USGS
Temperature, Water, degrees C	44	15.1	14.0	16.2	2001-2004 USGS, 2008 SRMP
Total Dissolved Solids (TDS) mg/L	15	56	51	57	2001-2004 USGS
Total Suspended Solids (TSS) mg/L *	10	0.42	0.20	2.00	2008 SRMP
Turbidity NTU	43	4.0	3.0	5.0	2001-2004 USGS, 2008 SRMP

Two-tailed confidence limits were used for these EWQ targets

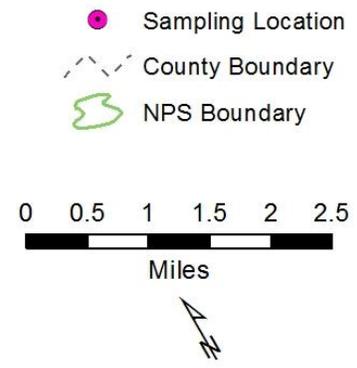
* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

Note: All data are May to September season. Additional data are available for the October to April "non-seasonal" period, but data are insufficient in number for establishment of site-specific existing water quality targets.

2281 ICP Delaware River at Bushkill Access



2281 ICP
Delaware River at Bushkill Access



2281 ICP Delaware River at Bushkill Access

Latitude 41.107497 Longitude -74.983409 by GPS NAD83 decimal degrees.

No USGS or State monitoring sites nearby.

Watershed Population figures were not calculated for main-stem Delaware River sites.

Drainage Area: 3,625 square miles, Delaware River Zone 1C

Site Specific EWQ defined 2006-2011 by the DRBC/NPS Scenic Rivers Monitoring Program.

This site is located in the Delaware Water Gap National Recreation Area.

Classified by DRBC as Outstanding Basin Waters

Nearest upstream Interstate Control Point: 2387 ICP Delaware River at Dingmans Access

Nearest downstream Interstate Control Point: 2184 ICP Delaware River at Smithfield Access

Known dischargers within watershed: Undefined

Tributaries to upstream reach: Major tributaries NONE; small tributaries 2364 BCP Hornbecks Creek, PA; 234.4 Spackmans Creek, PA; 2304 BCP Toms Creek, PA.

No Stream Stats web site data available (drainage area too large to calculate on web site).

Flow Statistics Associated with Water Quality Samples (calculated by drainage area weighting from Montague USGS gage data):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
167,700	12,800	7,160	4,790	3,800	3,020	2,190	1,810	940

Existing Water Quality: 2281 ICP Delaware River at Bushkill Access

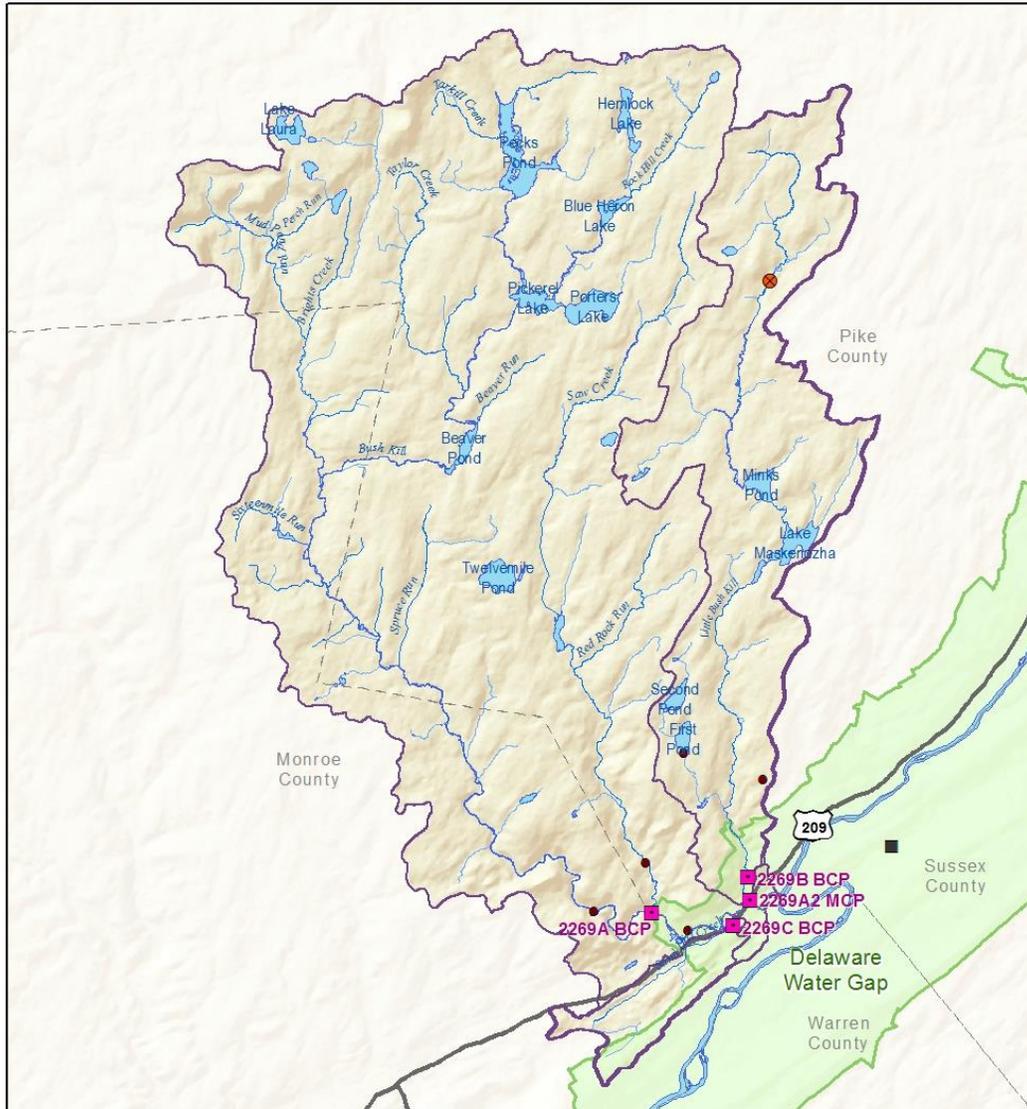
Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	64	15.0	14.2	15.9	2006-2011 SRMP
Aluminum, Dissolved mg/L	15	0.004	0.003	0.005	2009-2010 SRMP archived
Ammonia-Nitrogen as N, Total mg/L *	63	0.011	0.010	0.012	2006-2011 SRMP
Barium, Dissolved mg/L	15	0.022	0.019	0.025	2009-2010 SRMP archived
Calcium, Dissolved mg/L	15	6.49	6.17	7.07	2009-2010 SRMP archived
Chloride, Total mg/L	64	12.83	12.00	13.60	2006-2011 SRMP
Dissolved Oxygen (DO) mg/L *	59	8.35	8.05	8.87	2006-2011 SRMP
Dissolved Oxygen Saturation %	39	94.8	92.6	97.9	2008-2011 SRMP
Enterococcus #/100ml	49	27	17	45	2007-2011 SRMP
Escherichia coli #/100ml	49	10	6	16	2007-2011 SRMP
Fecal coliform #/100ml *	67	11	8	17	2006-2011 SRMP
Hardness as CaCO ₃ , Total mg/L	64	24.0	23.2	25.2	2006-2011 SRMP
Magnesium, Dissolved mg/L	15	1.39	1.30	1.51	2009-2010 SRMP archived
Manganese, Dissolved µg/L	15	8.2	2.9	12.3	2009-2010 SRMP archived
Nitrate+Nitrite as N, Total mg/L *	57	0.123	0.103	0.140	2007-2011 SRMP
Nitrogen as N, Total mg/L *	57	0.305	0.295	0.352	2007-2011 SRMP
Nitrogen, Kjeldahl as N, Total mg/L	57	0.194	0.184	0.203	2007-2011 SRMP
pH units *	59	7.40	7.28	7.56	2006-2011 SRMP
Phosphate as P, Total mg/L	54	0.005	0.004	0.006	2007-2011 SRMP
Phosphorus as P, Total mg/L *	57	0.012	0.011	0.015	2007-2011 SRMP
Potassium, Dissolved mg/L	15	0.73	0.61	0.80	2009-2010 SRMP archived
Sodium, Dissolved mg/L	15	7.30	6.60	7.89	2009-2010 SRMP archived
Specific Conductance µS/cm	59	89.5	86.3	94.0	2006-2011 SRMP
Strontium, Dissolved mg/L	15	0.028	0.027	0.031	2009-2010 SRMP archived
Sulfate, Total mg/L	13	5.74	5.34	6.23	2009-2010 SRMP archived
Temperature, Water, degrees C	59	20.4	19.5	22.9	2006-2011 SRMP
Total Dissolved Solids (TDS) mg/L	64	51.7	49.7	528	2006-2011 SRMP
Total Suspended Solids (TSS) mg/L *	57	1.7	1.1	2.4	2008 SRMP
Turbidity NTU	50	2.17	1.79	2.60	2007-2011 SRMP

Two-tailed confidence limits were used for these EWQ targets

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

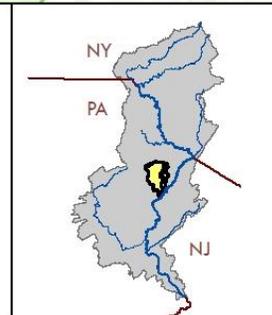
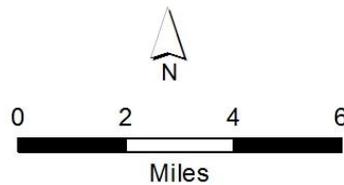
2269A BCP Bushkill, 2269B BCP Little Bushkill, and 2269C BCP Sand Hill Creek



Bush Kill Creek, Little Bushkill Creek, and Sandhill Creek

Drainage Area = 157.46 mi²

- Sampling Location
- NPDES
- Stream Gage
- ▭ NPS Boundary
- ▭ Drainage Area



2269C BCP Sand Hill Creek at DWGNRA Boundary

Pike County, PA. Latitude 41.084850 Longitude -75.008890 by GPS NAD83 decimal degrees.

USGS Site No 01439570

Watershed Population: 2000: 452 2010: 729 Change: +277 (+61.2%)

Drainage Area: 3.5 square miles, tributary to Bushkill Creek to Delaware River Zone 1C

Site Specific EWQ monitoring was completed 2004 by USGS/NPS Delaware Water Gap Study: Hickman R.E., and Fischer J.M. 2008. Water quality of streams in and near the Delaware Water Gap National Recreation Area, Pennsylvania and New Jersey, 2002-04: U.S. Geological Survey Scientific Investigations Report 2007-5290, 65 p.

This watershed is tributary to the Delaware Water Gap National Recreation Area (DEWA)

Classified by DRBC as Outstanding Basin Waters.

Nearest upstream Interstate Control Point: 2281 ICP Delaware River at Bushkill Access

Nearest downstream Interstate Control Point: 2184 ICP Delaware River at Smithfield Access

Known dischargers within watershed: Undefined.

Watershed is 77.0% forested; urban land cover is 8.00%. 100% glaciated. 24% carbonate bedrock. Mean annual precipitation 45.0 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics (USGS BaSE Model):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
338	9.91	5.86	4.14	3.33	2.91	2.11	1.32	0.36

StreamStats Low-Flow Stream Statistics

M7D2Y (ft³/s) 0.33

M30D2Y (ft³/s) 0.48

M7D10Y (ft³/s) 0.11

M30D10Y (ft³/s) 0.17

M90D10Y (ft³/s) 0.31

StreamStats Mean/Baseflow Stream Statistics

QA (ft³/s) 5.64

QAH (ft³/s) 2.40

BF10YR (ft³/s) 3.15

BF25YR (ft³/s) 2.83

BF50YR (ft³/s) 2.65

StreamStats Peak-Flow Stream Statistics

PK2 (ft³/s) 154

PK5 (ft³/s) 275

PK10 (ft³/s) 376

PK50 (ft³/s) 652

PK100 (ft³/s) 795

PK500 (ft³/s) 1,200

Existing Water Quality: 2269C BCP Sand Hill Creek at DWGNRA Boundary

Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	10	107	93	126	2002-2004 USGS
Ammonia-Nitrogen as N, Dissolved mg/L *	27	0.013	0.010	0.015	2002-2004 USGS
Calcium, Dissolved mg/L	10	46.3	41.3	60.0	2002-2004 USGS
Chloride, Dissolved mg/L	10	23.5	14.6	50.4	2002-2004 USGS
Dissolved Oxygen (DO) mg/L *	28	8.4	8.0	9.1	2002-2004 USGS
Dissolved Oxygen Saturation %	26	91.5	85	96	2002-2004 USGS
Hardness as CaCO ₃ , Total mg/L	10	125	110	160	2002-2004 USGS
Magnesium, Dissolved mg/L	10	2.22	2.03	2.80	2002-2004 USGS
Nitrate as N, Dissolved mg/L	6	0.23	0.16	0.36	2002-2004 USGS
Nitrate+Nitrite as N, Dissolved mg/L *	27	0.27	0.15	0.33	2002-2004 USGS
Nitrogen as N, Total mg/L *	28	0.57	0.55	0.64	2002-2004 USGS
Nitrogen, Kjeldahl as N, Total mg/L	19	0.35	0.24	0.43	2002-2003 USGS
Nitrogen, Organic as N, Total mg/L	17	0.33	0.27	0.38	2002-2004 USGS
pH units *	28	7.8	7.7	7.9	2002-2004 USGS
Phosphate as P, Dissolved mg/L	27	0.016	0.010	0.020	2002-2004 USGS
Phosphorus as P, Total mg/L *	28	0.019	0.010	0.038	2002-2004 USGS
Specific Conductance μ S/cm	26	293	270	318	2002-2004 USGS
Sulfate, Dissolved mg/L	10	14.9	12.7	22.1	2002-2004 USGS
Temperature, Water, degrees C	28	17.3	15.5	18.0	2002-2004 USGS
Total Dissolved Solids (TDS) mg/L	10	183	167	249	2002-2004 USGS
Total Suspended Solids (TSS) mg/L *	0				No data
Turbidity NTU	28	11	8	12	2002-2004 USGS

Two-tailed confidence limits were used for these EWQ targets

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

2269B BCP Little Bushkill Creek at DWGNRA Boundary

Pike County, PA. Latitude 41.097731 Longitude -75.003818 by GPS NAD83 decimal degrees.

USGS Site No 01439680

Watershed Population: 2000: 2,398 2010: 3,452 Change: +1,054 (+44.0%)

Drainage Area: 32.9 square miles, tributary to Bushkill Creek to Delaware River Zone 1C

Site Specific EWQ monitoring was completed 2004 by USGS/NPS Delaware Water Gap Study: Hickman R.E., and Fischer J.M. 2008. Water quality of streams in and near the Delaware Water Gap National Recreation Area, Pennsylvania and New Jersey, 2002-04: U.S. Geological Survey Scientific Investigations Report 2007-5290, 65 p.

Additional monitoring was completed by DRBC/NPS Scenic Rivers Monitoring Program 2008-2011.

This watershed is tributary to the Delaware Water Gap National Recreation Area (DEWA)

Classified by DRBC as Outstanding Basin Waters.

Nearest upstream Interstate Control Point: 2281 ICP Delaware River at Bushkill Access

Nearest downstream Interstate Control Point: 2184 ICP Delaware River at Smithfield Access

Known dischargers within watershed: Undefined.

Watershed is 77.6% forested; urban land cover is 5.5%. Watershed was 100% glaciated. No carbonate bedrock. Mean annual precipitation 43.0 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics (USGS BaSE Model):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
3,530	124	62.1	43.3	33.9	25.5	16.2	8.93	2.32

StreamStats Low-Flow Stream Statistics

M7D2Y (ft ³ /s)	3.68
M30D2Y (ft ³ /s)	5.10
M7D10Y (ft ³ /s)	1.52
M30D10Y (ft ³ /s)	2.15
M90D10Y (ft ³ /s)	3.51

StreamStats Mean/Baseflow Stream Statistics

QA (ft ³ /s)	53.7
QAH (ft ³ /s)	12.9
BF10YR (ft ³ /s)	21.2
BF25YR (ft ³ /s)	18.9
BF50YR (ft ³ /s)	17.6

StreamStats Peak-Flow Stream Statistics

PK2 (ft ³ /s)	860
PK5 (ft ³ /s)	1,460
PK10 (ft ³ /s)	1,970
PK50 (ft ³ /s)	3,380
PK100 (ft ³ /s)	4,120
PK500 (ft ³ /s)	6,220

Existing Water Quality: 2269B BCP Little Bushkill Creek at DWGNRA Boundary

Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	54	5.95	5.1	6.1	2002-2004 USGS, 2008-2011 SRMP
Aluminum, Dissolved mg/L	14	0.004	0.002	0.008	2009-2010 SRMP archived
Ammonia-Nitrogen as N, Total mg/L *	35	0.007	0.006	0.008	2008-2011 SRMP (12/35 non-detects)
Barium, Dissolved mg/L	14	0.009	0.008	0.009	2009-2010 SRMP archived
Calcium, Dissolved mg/L	28	3.61	3.31	4.04	2002-2004 USGS, 2009-2010 SRMP
Chloride, Dissolved mg/L	14	5.67	4.42	6.74	2001-2004 USGS
Chloride, Total mg/L	42	6.95	6.70	7.67	2008-2011 SRMP
Dissolved Oxygen (DO) mg/L *	72	9.41	9.20	9.56	2001-2004 USGS; 2008-2011 SRMP
Dissolved Oxygen Saturation %	72	98	97	98.4	2001-2004 USGS; 2008-2011 SRMP
Enterococcus #/100ml	39	30	12	90	2008-2011 SRMP
Escherichia coli #/100ml	39	10	6	16	2008-2011 SRMP
Fecal coliform #/100ml *	39	12	9	16	2008-2011 SRMP
Hardness as CaCO ₃ , Total mg/L	56	15.0	13.8	16.0	2001-2004 USGS; 2008-2011 SRMP
Magnesium, Dissolved mg/L	28	1.33	1.13	1.49	2001-2004 USGS; 2009-2010 SRMP
Manganese, Dissolved µg/L	14	13.7	10.7	15.2	2009-2010 SRMP archived
Nitrate+Nitrite as N, Dissolved mg/L	33	0.11	0.06	0.13	2001-2004 USGS
Nitrate+Nitrite as N, Total mg/L *	42	0.094	0.075	0.112	2008-2011 SRMP
Nitrogen as N, Total mg/L *	72	0.360	0.340	0.379	2001-2004 USGS; 2008-2011 SRMP
Nitrogen, Kjeldahl as N, Total mg/L	65	0.234	0.212	0.268	2001-2003 USGS; 2008-2011 SRMP
Nitrogen, Organic as N, Total mg/L	11	0.28	0.16	0.41	2002-2004 USGS
pH units *	72	6.90	6.80	7.02	2001-2004 USGS; 2008-2011 SRMP
Phosphate as P, Dissolved mg/L	33	<0.013	<0.010	<0.020	2001-2004 USGS (>16/33 non-detects)
Phosphate as P, Total mg/L	35	0.008	0.007	0.009	2008-2011 SRMP (0 non-detects)
Phosphorus as P, Total mg/L *	75	0.016	0.015	0.017	2001-2004 USGS; 2008-2011 SRMP
Potassium, Dissolved mg/L	14	0.28	0.22	0.31	2009-2010 SRMP archived
Sodium, Dissolved mg/L	14	3.73	3.22	4.05	2009-2010 SRMP archived
Specific Conductance µS/cm	72	49.8	47.2	53.6	2001-2004 USGS; 2008-2011 SRMP
Strontium, Dissolved mg/L	14	0.016	0.012	0.019	2009-2010 SRMP archived
Sulfate, Dissolved mg/L	14	5.52	4.46	6.08	2001-2004 USGS
Sulfate, Total mg/L	12	4.87	4.42	5.29	2009-2010 SRMP archived
Temperature, Water, degrees C	72	17.5	16.5	18.0	2001-2004 USGS; 2008-2011 SRMP
Total Dissolved Solids (TDS) mg/L	56	37.5	35.9	39.0	2001-2004 USGS; 2008-2011 SRMP
Total Suspended Solids (TSS) mg/L *	42	1.33	1.00	1.70	2008-2011 SRMP
Turbidity NTU	73	2.06	1.65	8.00	2001-2004 USGS; 2008-2011 SRMP

Two-tailed confidence limits were used for these EWQ targets

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

2269A BCP Bushkill Creek at DWGNRA Boundary

Monroe County, PA. Latitude 41.0882 Longitude -75.00379 by GPS NAD83 decimal degrees.

USGS Site No 01439500; PADEP Site No. WQN0139

Watershed Population: 2000: 10,920 2010: 16,114 Change: +5,194 (+47.6%)

Drainage Area: 117 square miles, tributary to Delaware River Zone 1C

Water quality at this location does not include Little Bushkill Creek or Sand Hill Creek drainage.

Site Specific EWQ monitoring was completed 2004 by USGS/NPS Delaware Water Gap Study: Hickman R.E., and Fischer J.M. 2008. Water quality of streams in and near the Delaware Water Gap National Recreation Area, Pennsylvania and New Jersey, 2002-04: U.S. Geological Survey Scientific Investigations Report 2007-5290, 65 p.

Additional monitoring was completed by DRBC/NPS Scenic Rivers Monitoring Program 2008-2011. Data also include quarterly samples 2000-2011 by PADEP.

This watershed is tributary to the Delaware Water Gap National Recreation Area (DEWA)

Classified by DRBC as Outstanding Basin Waters.

Nearest upstream Interstate Control Point: 2281 ICP Delaware River at Bushkill Access

Nearest downstream Interstate Control Point: 2184 ICP Delaware River at Smithfield Access

Known dischargers within watershed: Undefined.

Watershed is 82.4% forested; urban land cover is 3.78%. Watershed was 100 glaciated, and is underlain by 0.5% carbonate bedrock. Mean annual precipitation 43.4 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics (USGS BaSE Model):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
4,800	531	302	201	159	120	71.0	26.0	2.60

StreamStats Low-Flow Stream Statistics

M7D2Y (ft ³ /s)	18.1
M30D2Y (ft ³ /s)	24.0
M7D10Y (ft ³ /s)	8.91
M30D10Y (ft ³ /s)	11.6
M90D10Y (ft ³ /s)	17.5

StreamStats Mean/Baseflow Stream Statistics

QA (ft ³ /s)	198
QAH (ft ³ /s)	52.6
BF10YR (ft ³ /s)	79.9
BF25YR (ft ³ /s)	71.5
BF50YR (ft ³ /s)	66.7

StreamStats Peak-Flow Stream Statistics

PK2 (ft ³ /s)	2,960
PK5 (ft ³ /s)	4,890
PK10 (ft ³ /s)	6,470
PK50 (ft ³ /s)	10,800
PK100 (ft ³ /s)	13,100
PK500 (ft ³ /s)	19,400

Existing Water Quality: 2269A BCP Bushkill Creek at DWGNRA Boundary

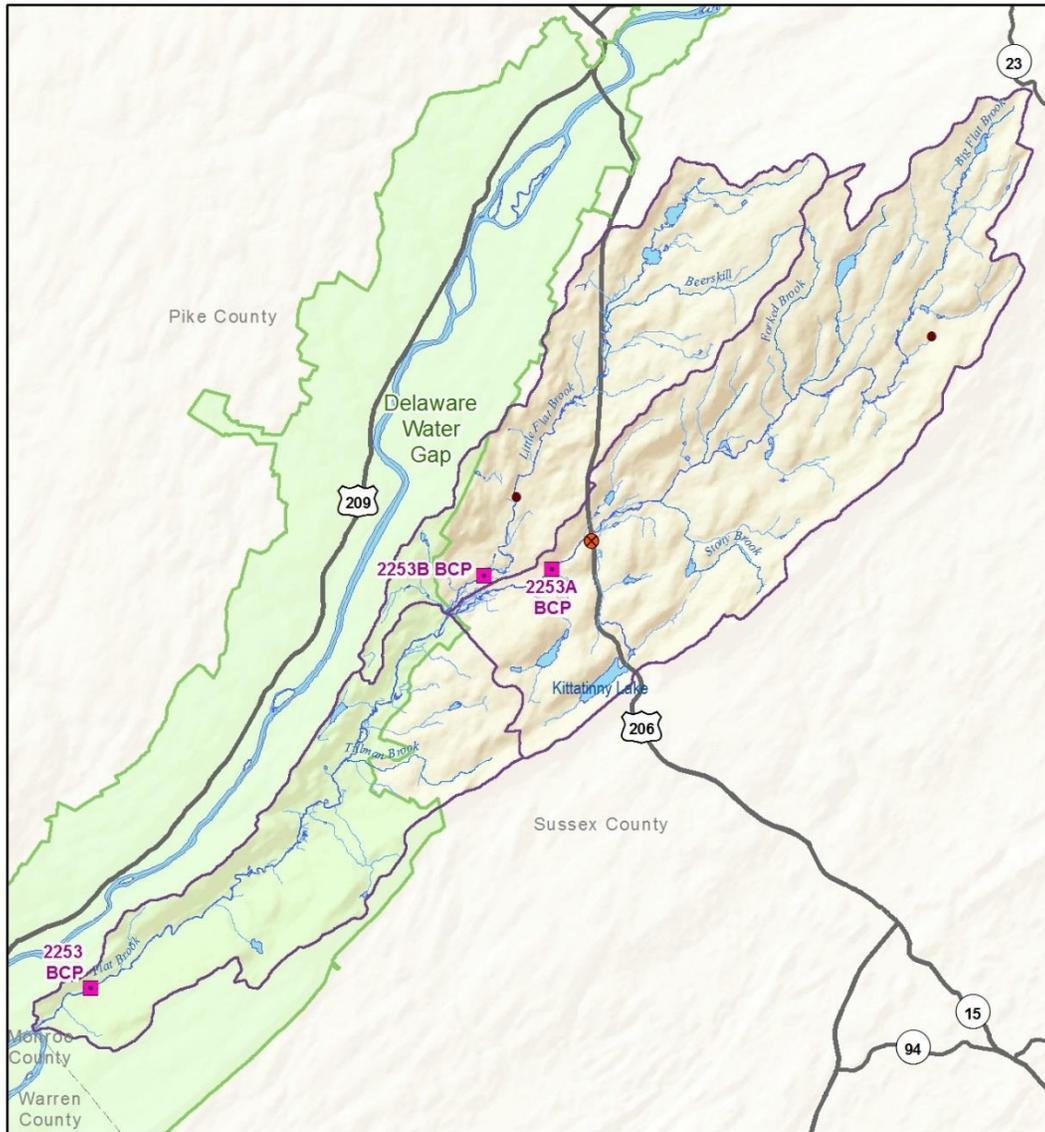
Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	80	7.0	6.1	7.2	1999-2009 USGS/PA; 2008-2011 SRMP
Aluminum, Dissolved mg/L	15	0.004	0.003	0.005	2009-2010 SRMP archived
Ammonia-Nitrogen as N, Total mg/L *	62	<0.012	<0.007	<0.016	1999-2009 USGS/PA; 2008-2011 SRMP
Barium, Dissolved mg/L	15	0.010	0.008	0.012	2009-2010 SRMP archived
Calcium, Dissolved mg/L	59	3.54	3.45	3.80	1999-2009 USGS/PA; 2009-2010 SRMP
Calcium, Total mg/L	27	3.54	3.34	4.11	1999-2009 USGS/PA
Chloride, Dissolved mg/L	18	5.03	4.27	5.64	1999-2009 USGS/PA
Chloride, Total mg/L	44	5.03	4.80	6.03	2008-2011 SRMP
Dissolved Oxygen (DO) mg/L *	103	9.60	9.30	9.75	1999-2009 USGS/PA; 2008-2011 SRMP
Dissolved Oxygen Saturation %	72	100.5	99.0	102.2	1999-2009 USGS/PA; 2008-2011 SRMP
Enterococcus #/100ml	39	70	30	120	2008-2011 SRMP
Escherichia coli #/100ml	39	21	11	27	2008-2011 SRMP
Fecal coliform #/100ml *	39	28	19	42	2008-2011 SRMP
Hardness as CaCO ₃ , Total mg/L	84	13.8	13.0	14.4	1999-2009 USGS/PA; 2008-2011 SRMP
Iron, Dissolved µg/L	30	46	38	62	1999-2009 USGS/PA
Iron, Total µg/L	27	99	74	149	1999-2009 PADEP
Magnesium, Dissolved mg/L	58	1.06	1.02	1.13	1999-2009 USGS/PA; 2009-2010 SRMP
Magnesium, Total mg/L	27	1.06	1.02	1.17	1999-2009 PADEP
Manganese, Dissolved µg/L	44	4.75	3.70	5.20	1999-2009 USGS/PA; 2009-2010 SRMP
Manganese, Total µg/L	27	11.3	9.0	15.7	1999-2009 PADEP
Nitrate as N, Total mg/L	28	<0.040	<0.040	0.056	1999-2009 USGS/PA (14/28 non-detect)
Nitrate+Nitrite as N, Dissolved mg/L	31	0.060	0.050	0.130	2002-2004 USGS/NPS (7/31 non-detect)
Nitrate+Nitrite as N, Total mg/L *	41	0.037	0.027	0.065	2008-2011 SRMP
Nitrogen as N, Total mg/L *	86	0.275	0.245	0.290	1999-2009 USGS/PA, 2008-2011 SRMP
Nitrogen, Kjeldahl as N, Total mg/L	64	0.182	0.178	0.200	1999-2003 USGS/NPS, 2008-2011 SRMP
Nitrogen, Organic as N, Total mg/L	14	0.190	0.140	0.240	2002-2004 USGS/PADEP
pH units *	100	6.97	6.84	7.16	1999-2009 USGS/PA, 2008-2011 SRMP
Phosphate as P, Dissolved mg/L	33	<0.020	<0.010	<0.030	1999-2004 USGS (8/33 non-detects)
Phosphate as P, Total mg/L	55	0.010	0.010	0.018	2002-2009 USGS/PA, 2008-2011 SRMP
Phosphorus as P, Total mg/L *	101	0.022	0.019	0.026	1999-2009 USGS/PA, 2008-2011 SRMP
Potassium, Dissolved mg/L	15	0.31	0.27	0.59	2009-2010 SRMP archived
Sodium, Dissolved mg/L	15	3.35	2.96	5.42	2009-2010 SRMP archived
Specific Conductance µS/cm	100	45	43	47	1999-2009 USGS/PA, 2008-2011 SRMP
Strontium, Dissolved mg/L	15	0.016	0.015	0.024	2009-2010 SRMP archived
Sulfate, Dissolved mg/L	35	6.0	5.7	6.3	1999-2009 USGS
Sulfate, Total mg/L	40	5.74	5.60	6.16	1999-2009 PADEP, 2009-2010 SRMP
Temperature, Water, degrees C	100	18.05	17.20	19.10	1999-2009 USGS/PA, 2008-2011 SRMP
Total Dissolved Solids (TDS) mg/L	81	35.6	33.6	39.4	1999-2009 USGS/PA, 2008-2011 SRMP
Total Suspended Solids (TSS) mg/L *	69	2.00	1.15	2.00	1999-2009 USGS/PA, 2008-2011 SRMP
Turbidity NTU	74	2.00	1.68	8.00	1999-2009 USGS/PA, 2008-2011 SRMP

Two-tailed confidence limits were used for these EWQ targets

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

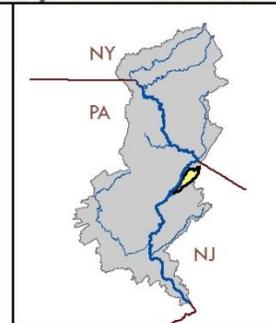
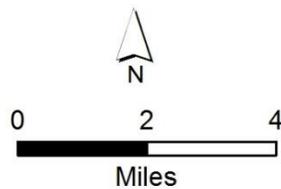
2253, 2253A, 2253B BCP Flat Brook, Big Flat Brook and Little Flat Brook



Flat Brook, Little Flat Brook, and Big Flat Brook

Drainage Area = 66.29 mi²

- Sampling Location
- NPDES
- ⊗ Stream Gage
- ▭ NPS Boundary
- ▭ Drainage Area



2253 BCP Flat Brook at Flatbrookville

Sussex County, NJ. Latitude 41.106101 Longitude -74.952504 by GPS NAD83 decimal degrees.

USGS Gage No 01440000; NJDEP Site No. 01440000

Watershed Population: 2000: 2,028 2010: 2,272 Change: +244 (+12.0%)

Drainage Area: 64.00 square miles, tributary to Delaware River Zone 1C

Site Specific EWQ monitoring is incomplete; and will be defined using NJDEP long-term quarterly water quality samples, as well as DRBC/NPS Scenic Rivers Monitoring Program 2014-2016 confirmatory data.

Water quality at this site reflects the entire watershed near the Delaware River confluence.

This watershed is tributary to the Delaware Water Gap National Recreation Area (DEWA)

Classified by DRBC as Outstanding Basin Waters.

Nearest upstream Interstate Control Point: 2281 ICP Delaware River at Bushkill Access

Nearest downstream Interstate Control Point: 2184 ICP Delaware River at Smithfield Access

Known dischargers within watershed: Undefined.

Watershed is 87.3% forested; urban land cover is 1.38%. Watershed was 100 glaciated, and is 12.2% underlain by carbonate bedrock. Mean annual precipitation 43.8 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics (USGS BaSE Model, data from USGS Gage 01440000, 1923-2013):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
5,110	219	125	84.0	65.0	48.0	26.0	14.0	4.60

StreamStats Low-Flow Stream Statistics

M7D2Y (ft ³ /s)	10.7
M30D2Y (ft ³ /s)	14.3
M7D10Y (ft ³ /s)	5.11
M30D10Y (ft ³ /s)	6.71
M90D10Y (ft ³ /s)	10.3

StreamStats Mean/Baseflow Stream Statistics

QA (ft ³ /s)	110
QAH (ft ³ /s)	39.0
BF10YR (ft ³ /s)	53.2
BF25YR (ft ³ /s)	47.7
BF50YR (ft ³ /s)	44.6

StreamStats Peak-Flow Stream Statistics

PK2 (ft ³ /s)	2,200
PK5 (ft ³ /s)	3,670
PK10 (ft ³ /s)	4,860
PK50 (ft ³ /s)	8,060
PK100 (ft ³ /s)	9,670
PK500 (ft ³ /s)	14,100

Existing Water Quality: 2253 BCP Flat Brook at Flatbrookville

Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , mg/L, Total	64	69.5	59.0	79.0	USGS/NJDEP 1993-2015; SRMP 2014-15
Ammonia as N, mg/L, Dissolved	45	<0.03	<0.02	<0.03	USGS/NJDEP 1993-2015 (23 ND)
Ammonia as N, mg/L, Total *	40	<0.03	0.006	<0.03	NJDEP 1993-2003; SRMP 2014-15 (21 ND)
Calcium, mg/L, Dissolved	47	24.9	21.0	27.6	USGS/NJDEP 1993-2015
Chloride, mg/L, Dissolved	47	15.3	14.2	16.4	USGS/NJDEP 1993-2015
Chloride, mg/L, Total	22	16.4	13.5	18.8	SRMP 2014-2015
Dissolved Oxygen, mg/L *	68	9.6	9.3	9.9	USGS/NJDEP 1993-2015; SRMP 2014-15
Dissolved Oxygen Saturation, %	67	101	99.5	103.5	USGS/NJDEP 1993-2015; SRMP 2014-15
Enterococcus, #/100 ml	47	70	50	130	USGS/NJDEP 1993-2006
E. coli, #/100 ml	25	60	40	250	USGS/NJDEP 2006-2012 (removed older)
Fecal Coliform, #/100 ml *	77	42	40	70	USGS/NJDEP 1993-2015; SRMP 2014-15
Hardness as CaCO ₃ , mg/L, Total	69	87	79	100	USGS/NJDEP 1993-2015; SRMP 2014-15
Magnesium, mg/L, Dissolved	14	5.28	3.71	7.59	USGS/NJDEP 2001, 2010-2015
Nitrate + Nitrite as N, Diss., mg/L *	47	0.070	0.050	0.100	USGS/NJDEP 1993-2015
Nitrate + Nitrite as N, Total, mg/L	24	0.155	0.099	0.195	USGS 1993; SRMP 2014-2015
Nitrogen as N, Dissolved, mg/L	29	0.280	0.210	0.320	USGS/NJDEP 1993-2015
Nitrogen as N, Total, mg/L *	47	0.330	0.300	0.347	USGS/NJDEP 1993-2015; SRMP 2014-15
Nitrogen, Kjeldahl as N, Diss. mg/L	12	0.150	0.110	0.200	USGS/NJDEP 2010-2015
Nitrogen, Kjeldahl as N, Total mg/L	41	0.178	0.170	0.201	USGS 1993-2001; SRMP 2014-2015
Nitrogen, Organic as N, Diss. mg/L	11	0.130	0.080	0.180	USGS/NJDEP 2010-2015
Organic Carbon, Dissolved, mg/L	47	2.10	1.95	2.60	USGS/NJDEP 1993-2015
Organic Carbon, Particulate, mg/L	12	0.22	0.15	0.30	USGS/NJDEP 2010-2015
pH, standard units *	70	8.0	7.9	8.1	USGS/NJDEP 1993-2015; SRMP 2014-15
Phosphate as P, Dissolved mg/L	21	0.010	0.008	0.020	USGS/NJDEP 1999-2009
Phosphate as P, Total mg/L	22	0.008	0.006	0.012	SRMP 2014-2015
Phosphorus as P, Dissolved mg/L	12	0.008	0.005	0.013	USGS/NJDEP 2010-2015
Phosphorus as P, Total mg/L *	69	0.017	0.014	0.021	USGS/NJDEP 1993-2015; SRMP 2014-15
Potassium, Dissolved mg/L	12	0.57	0.54	0.71	USGS/NJDEP 2010-2015
Silica, Dissolved mg/L	12	3.95	3.36	4.91	USGS/NJDEP 2010-2015
Sodium, Dissolved mg/L	12	9.57	8.23	10.20	USGS/NJDEP 2010-2015
Specific Conductance, µS/cm	69	229	198	237	USGS/NJDEP 1993-2015; SRMP 2014-15
Sulfate as SO ₄ , Dissolved mg/L	47	12.0	10.5	13.6	USGS/NJDEP 1993-2015
Temperature, Water, Degrees C	103	17.3	16.6	18.5	USGS/NJDEP 1993-2015; SRMP 2014-15
Total Carbon, Suspended mg/L	12	0.22	0.15	0.30	USGS/NJDEP 2010-2015
Total Dissolved Solids, mg/L	69	129	119	141	USGS/NJDEP 1993-2015; SRMP 2014-15
Total Suspended Solids, mg/L *	58	<1.0	<1.0	2.0	USGS/NJDEP 1993-2015; SRMP 2014-15
Turbidity, NTU	35	0.72	0.57	1.17	USGS/NJDEP 1999-2004; SRMP 2014-15

The Scenic Rivers Monitoring Program is monitoring the Flat Brook in 2016, adding one more year to the EWQ data set (10 more samples). This table will be revised once 2016 monitoring is completed.

Two-tailed confidence limits were used for these EWQ targets

Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

2253A BCP Big Flat Brook at DWGNRA Boundary

Sussex County, NJ. Latitude 41.190000 Longitude -74.845833 by GPS NAD83 decimal degrees.

USGS Site No 01439830

Watershed Population: 2000: 682 2010: 797 Change: +115 (+16.9%)

Drainage Area: 32.7 square miles, tributary to Delaware River Zone 1C

Site Specific EWQ monitoring was completed 2004 by USGS/NPS Delaware Water Gap Study: Hickman R.E., and Fischer J.M. 2008. Water quality of streams in and near the Delaware Water Gap National Recreation Area, Pennsylvania and New Jersey, 2002-04: U.S. Geological Survey Scientific Investigations Report 2007-5290, 65 p.

Additional monitoring was completed by DRBC/NPS Scenic Rivers Monitoring Program 2008-2011.

Water quality at this site reflects the portion of the watershed entering the park, but not the entire watershed.

This watershed is tributary to the Delaware Water Gap National Recreation Area (DEWA)

Classified by DRBC as Outstanding Basin Waters.

Nearest upstream Interstate Control Point: 2281 ICP Delaware River at Bushkill Access

Nearest downstream Interstate Control Point: 2184 ICP Delaware River at Smithfield Access

Known dischargers within watershed: Undefined.

Watershed is 95.2% forested; urban land cover is 0.5%. Watershed was 100 glaciated, and is not underlain by carbonate bedrock. Mean annual precipitation 43.8 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics (USGS BaSE Model):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
3,570	116	58.3	41.7	33.2	24.7	14.3	6.82	1.25

StreamStats Low-Flow Stream Statistics

M7D2Y (ft ³ /s)	5.40
M30D2Y (ft ³ /s)	7.26
M7D10Y (ft ³ /s)	2.46
M30D10Y (ft ³ /s)	3.23
M90D10Y (ft ³ /s)	5.10

StreamStats Mean/Baseflow Stream Statistics

QA (ft ³ /s)	55.3
QAH (ft ³ /s)	14.6
BF10YR (ft ³ /s)	24.8
BF25YR (ft ³ /s)	22.3
BF50YR (ft ³ /s)	20.9

StreamStats Peak-Flow Stream Statistics

PK2 (ft ³ /s)	1,200
PK5 (ft ³ /s)	2,040
PK10 (ft ³ /s)	2,720
PK50 (ft ³ /s)	4,540
PK100 (ft ³ /s)	5,470
PK500 (ft ³ /s)	8,030

Existing Water Quality: 2253A BCP Big Flat Brook at DWGNRA Boundary

Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	94	27.5	24.1	32.9	1981-2009 USGS; 2008-2011 SRMP
Aluminum, Dissolved mg/L	15	0.003	0.003	0.006	2009-2010 SRMP archived
Ammonia-Nitrogen as N, Dissolved mg/L	68	<0.015	<0.015	<0.020	1993-2009 USGS (>38/68 non-detects)
Ammonia-Nitrogen as N, Total mg/L *	57	0.014	0.008	0.030	1980-2009 USGS; 2008-2011 SRMP
Barium, Dissolved mg/L	15	0.023	0.020	0.024	2009-2010 SRMP archived
Calcium, Dissolved mg/L	74	12.0	10.0	19.1	1980-2009 USGS; 2009-2010 SRMP
Chloride, Dissolved mg/L	59	13.1	11.2	15.0	1999-2009 USGS
Chloride, Total mg/L	41	13.1	11.2	14.1	2008-2011 SRMP
Dissolved Oxygen (DO) mg/L *	118	9.54	9.33	9.88	1980-2009 USGS; 2008-2011 SRMP
Dissolved Oxygen Saturation %	108	99	97	100	1993-2009 USGS; 2008-2011 SRMP
Enterococcus #/100ml	122	70	50	90	1993-2009 USGS; 2008-2011 SRMP
Escherichia coli #/100ml	54	35	21	61	2006-2009 USGS; 2008-2011 SRMP
Fecal coliform #/100ml *	105	40	26	50	1980-2008 USGS; 2008-2011 SRMP
Hardness as CaCO ₃ , Total mg/L	90	42.0	36.2	49.8	1980-2009 USGS; 2009-2011 SRMP
Iron, Dissolved µg/L	5	51	21	89	1997-2001 USGS
Magnesium, Dissolved mg/L	74	3.61	3.43	4.11	1980-2009 USGS; 2009-2010 SRMP
Manganese, Dissolved µg/L	21	4.1	2.5	8.0	1997-2001 USGS; 2009-2010 SRMP
Nitrate+Nitrite as N, Dissolved mg/L	69	0.07	0.06	0.08	1993-2009 USGS (12/69 non-detect)
Nitrate+Nitrite as N, Total mg/L *	52	0.079	0.056	0.094	1980-1993 USGS; 2008-2011 SRMP
Nitrogen as N, Dissolved mg/L	21	0.28	0.21	0.31	1993-2009 USGS
Nitrogen as N, Total mg/L *	93	0.260	0.237	0.290	1980-2009 USGS, 2008-2011 SRMP
Nitrogen, Kjeldahl as N, Total mg/L	93	0.164	0.153	0.192	1980-2003 USGS, 2008-2011 SRMP
Nitrogen, Organic as N, Total mg/L	16	0.23	0.16	0.29	1980-2004 USGS
Organic Carbon, Dissolved mg/L	38	2.1	1.9	2.8	1980-2009 USGS
pH units *	119	7.60	7.49	7.67	1980-2009 USGS, 2008-2011 SRMP
Phosphate as P, Dissolved mg/L	52	<0.01	<0.01	<0.01	1997-2009 USGS (almost all non-detects)
Phosphate as P, Total mg/L	31	0.005	0.004	0.005	2009-2011 SRMP
Phosphorus as P, Total mg/L *	110	0.012	0.011	0.014	1993-2009 USGS, 2008-2011 SRMP
Potassium, Dissolved mg/L	15	0.509	0.362	0.558	2009-2010 SRMP archived
Sodium, Dissolved mg/L	15	8.01	6.49	8.19	2009-2010 SRMP archived
Specific Conductance µS/cm	119	112.2	103.1	123.0	1980-2009 USGS, 2008-2011 SRMP
Strontium, Dissolved mg/L	15	0.041	0.031	0.048	2009-2010 SRMP archived
Sulfate, Dissolved mg/L	59	10.5	9.9	12.0	1980-2009 USGS
Sulfate, Total mg/L	14	7.25	6.37	8.26	2009-2010 SRMP archived
Temperature, Water, degrees C	142	17.0	16.1	17.6	1980-2009 USGS, 2008-2011 SRMP
Total Dissolved Solids (TDS) mg/L	90	68.5	64.5	88.0	1980-2009 USGS, 2009-2011 SRMP
Total Suspended Solids (TSS) mg/L *	68	1.15	1.00	1.70	1995-2009 USGS, 2008-2011 SRMP
Turbidity NTU	54	1.57	1.44	1.98	1999-2004 USGS, 2008-2011 SRMP

Two-tailed confidence limits were used for these EWQ targets

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

2253B BCP Little Flat Brook at DWGNRA Boundary

Sussex County, NJ. Latitude 41.190278 Longitude -74.846944 by GPS NAD83 decimal degrees.

USGS Site No 01439920

Watershed Population: 2000: 1,285 2010: 1,444 Change: +159 (+12.3%)

Drainage Area: 16.0 square miles, tributary to Flat Brook, to Delaware River Zone 1C

Site Specific EWQ monitoring was completed 2004 by USGS/NPS Delaware Water Gap Study: Hickman R.E., and Fischer J.M. 2008. Water quality of streams in and near the Delaware Water Gap National Recreation Area, Pennsylvania and New Jersey, 2002-04: U.S. Geological Survey Scientific Investigations Report 2007-5290, 65 p.

Additional monitoring was completed by DRBC/NPS Scenic Rivers Monitoring Program 2008-2011.

Water quality at this site reflects the portion of the watershed entering the park, but not the entire watershed.

This watershed is tributary to the Delaware Water Gap National Recreation Area (DEWA)

Classified by DRBC as Outstanding Basin Waters.

Nearest upstream Interstate Control Point: 2281 ICP Delaware River at Bushkill Access

Nearest downstream Interstate Control Point: 2184 ICP Delaware River at Smithfield Access

Known dischargers within watershed: Undefined.

Watershed is 69.7% forested; urban land cover is 3.2%. Watershed was 100 glaciated, and is underlain by 26.1% carbonate bedrock. Mean annual precipitation 43 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics (USGS BaSE Model):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
1,490	47.4	26.1	19.0	15.1	12.7	7.85	4.15	1.02

StreamStats Low-Flow Stream Statistics

M7D2Y (ft ³ /s)	1.44
M30D2Y (ft ³ /s)	2.07
M7D10Y (ft ³ /s)	0.53
M30D10Y (ft ³ /s)	0.81
M90D10Y (ft ³ /s)	1.37

StreamStats Mean/Baseflow Stream Statistics

QA (ft ³ /s)	25.2
QAH (ft ³ /s)	10.1
BF10YR (ft ³ /s)	12.6
BF25YR (ft ³ /s)	11.2
BF50YR (ft ³ /s)	10.4

StreamStats Peak-Flow Stream Statistics

PK2 (ft ³ /s)	628
PK5 (ft ³ /s)	1,080
PK10 (ft ³ /s)	1,450
PK50 (ft ³ /s)	2,460
PK100 (ft ³ /s)	2,980
PK500 (ft ³ /s)	4,420

Existing Water Quality: 2253B BCP Little Flat Brook at DWGNRA Boundary

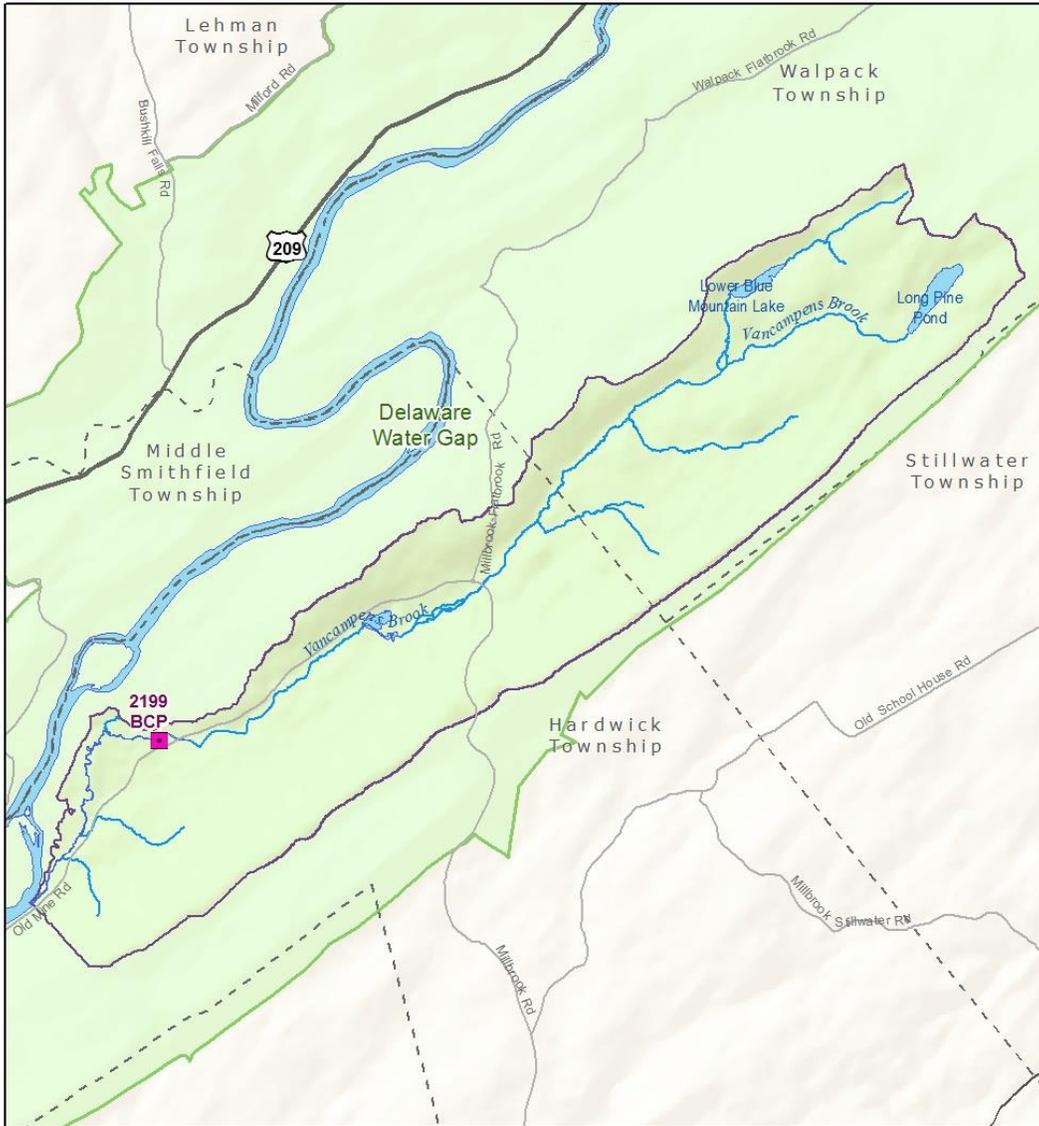
Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	54	114.4	101.0	124.7	2002-2004 USGS/NPS; 2008-2011 SRMP
Aluminum, Dissolved mg/L	15	0.003	0.001	0.003	2009-2010 SRMP archived
Ammonia-Nitrogen as N, Dissolved mg/L	31	0.015	0.010	0.016	2002-2004 USGS/NPS (8 non-detects)
Ammonia-Nitrogen as N, Total mg/L *	31	0.008	0.006	0.011	2009-2011 SRMP (9 non-detects)
Barium, Dissolved mg/L	15	0.007	0.004	0.011	2009-2010 SRMP archived
Calcium, Dissolved mg/L	27	21.86	9.77	34.00	2002-2004 USGS/NPS; 2009-2010 SRMP
Chloride, Dissolved mg/L	12	35.0	25.1	44.5	2002-2004 USGS/NPS
Chloride, Total mg/L	42	33.9	31.6	35.8	2008-2011 SRMP
Dissolved Oxygen (DO) mg/L *	71	9.88	9.32	10.21	2002-2004 USGS/NPS; 2008-2011 SRMP
Dissolved Oxygen Saturation %	71	100.5	97.0	105.2	2002-2004 USGS/NPS; 2008-2011 SRMP
Enterococcus #/100ml	39	100	54	130	2008-2011 SRMP
Escherichia coli #/100ml	39	68	44	130	2008-2011 SRMP
Fecal coliform #/100ml *	36	147	104	215	2008-2011 SRMP
Hardness as CaCO ₃ , Total mg/L	44	132.9	112.6	145.4	2002-2004 USGS/NPS; 2009-2011 SRMP
Magnesium, Dissolved mg/L	27	8.23	6.48	10.19	2002-2004 USGS/NPS; 2009-2010 SRMP
Manganese, Dissolved µg/L	15	0.3	0.1	0.9	2009-2010 SRMP archived
Nitrate+Nitrite as N, Dissolved mg/L	31	0.28	0.24	0.34	2002-2004 USGS/NPS
Nitrate+Nitrite as N, Total mg/L *	42	0.318	0.291	0.364	2008-2011 SRMP
Nitrogen as N, Total mg/L *	73	0.592	0.560	0.650	2002-2004 USGS/NPS, 2008-2011 SRMP
Nitrogen, Kjeldahl as N, Total mg/L	63	0.252	0.231	0.312	2002-2003 USGS/NPS, 2008-2011 SRMP
Nitrogen, Organic as N, Total mg/L	27	0.27	0.22	0.33	2002-2004 USGS/NPS
pH units *	70	8.06	7.90	8.10	2002-2004 USGS/NPS, 2008-2011 SRMP
Phosphate as P, Dissolved mg/L	31	<0.019	<0.010	<0.020	2002-2004 USGS/NPS (9 non-detects)
Phosphate as P, Total mg/L	32	0.005	0.003	0.008	2009-2011 SRMP
Phosphorus as P, Total mg/L *	73	0.016	0.015	0.021	2002-2004 USGS/NPS, 2008-2011 SRMP
Potassium, Dissolved mg/L	15	0.76	0.60	1.15	2009-2010 SRMP archived
Sodium, Dissolved mg/L	15	19.15	17.36	20.45	2009-2010 SRMP archived
Specific Conductance µS/cm	71	334	317	355	2002-2004 USGS/NPS, 2008-2011 SRMP
Strontium, Dissolved mg/L	15	0.127	0.111	0.142	2009-2010 SRMP archived
Sulfate, Dissolved mg/L	12	9.73	7.99	11.20	2002-2004 USGS/NPS
Sulfate, Total mg/L	14	8.47	6.95	10.81	2009-2010 SRMP archived
Temperature, Water, degrees C	71	17.5	17.0	18.7	2002-2004 USGS/NPS, 2008-2011 SRMP
Total Dissolved Solids (TDS) mg/L	44	194	177	210	2002-2004 USGS/NPS, 2009-2011 SRMP
Total Suspended Solids (TSS) mg/L *	42	2.20	1.65	3.05	2002-2004 USGS/NPS, 2009-2011 SRMP
Turbidity NTU	42	1.91	1.67	2.55	2008-2011 SRMP

Two-tailed confidence limits were used for these EWQ targets

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

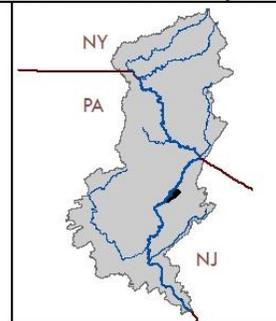
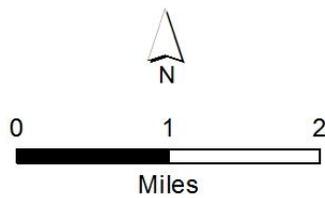
2199 BCP Van Campens Brook at DePew Recreation Site Rd.



Van Campens Brook

Drainage Area = 9.18 mi²

- Sampling Location
- Drainage Area
- NPS Boundary



2199 BCP Van Campens Brook at DePew Recreation Site Rd.

Sussex County, NJ. Latitude 41.057780 Longitude -75.00333 by GPS NAD83 decimal degrees.

USGS Site No 01440100; NJDEP Site No. 01440000

Watershed Population: 2000: 4 2010: 5 Change: +1

Drainage Area: 8.00 square miles, tributary to Delaware River Zone 1C

Site Specific EWQ monitoring was completed 2004 by USGS/NPS Delaware Water Gap Study: Hickman R.E., and Fischer J.M. 2008. Water quality of streams in and near the Delaware Water Gap National Recreation Area, Pennsylvania and New Jersey, 2002-04: U.S. Geological Survey Scientific Investigations Report 2007-5290, 65 p.

Additional monitoring was completed by DRBC/NPS Scenic Rivers Monitoring Program 2008.

This watershed is tributary to the Delaware Water Gap National Recreation Area (DEWA)

Classified by DRBC as Outstanding Basin Waters.

Nearest upstream Interstate Control Point: 2281 ICP Delaware River at Bushkill Access

Nearest downstream Interstate Control Point: 2184 ICP Delaware River at Smithfield Access

Known dischargers within watershed: Undefined.

Watershed is 77.5% forested; urban land cover is 16.1%. Watershed was 100 glaciated, and is not underlain by carbonate bedrock. Mean annual precipitation 45.5 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics (USGS BaSE Model, data from USGS Gage 01440000, 1923-2013):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
1,060	33.3	17.2	12.5	10.0	7.31	3.96	1.78	0.29

StreamStats Low-Flow Stream Statistics

M7D2Y (ft ³ /s)	1.08
M30D2Y (ft ³ /s)	1.53
M7D10Y (ft ³ /s)	0.41
M30D10Y (ft ³ /s)	0.61
M90D10Y (ft ³ /s)	1.02

StreamStats Mean/Baseflow Stream Statistics

QA (ft ³ /s)	16.9
QAH (ft ³ /s)	4.83
BF10YR (ft ³ /s)	7.30
BF25YR (ft ³ /s)	6.59
BF50YR (ft ³ /s)	6.19

StreamStats Peak-Flow Stream Statistics

PK2 (ft ³ /s)	411
PK5 (ft ³ /s)	717
PK10 (ft ³ /s)	966
PK50 (ft ³ /s)	1,640
PK100 (ft ³ /s)	1,980
PK500 (ft ³ /s)	2,920

NOTE: USGS Stream Stats land use statistics for this site appear to be incorrect. The Van Campens Brook watershed is entirely within the park boundaries of the Delaware Water Gap National Recreation Area. Aerial photography indicates that infrastructure was constructed for a residential development, but these properties were bought up for construction of Tocks Island Dam. The dam was never constructed, and the properties went to the National Park Service. A few houses were in place, but most of the lots were not developed. Thus the urban land cover should be much lower than indicated above.

Existing Water Quality: 2199 BCP Van Campens Brook at DePew Recreation Site Rd.

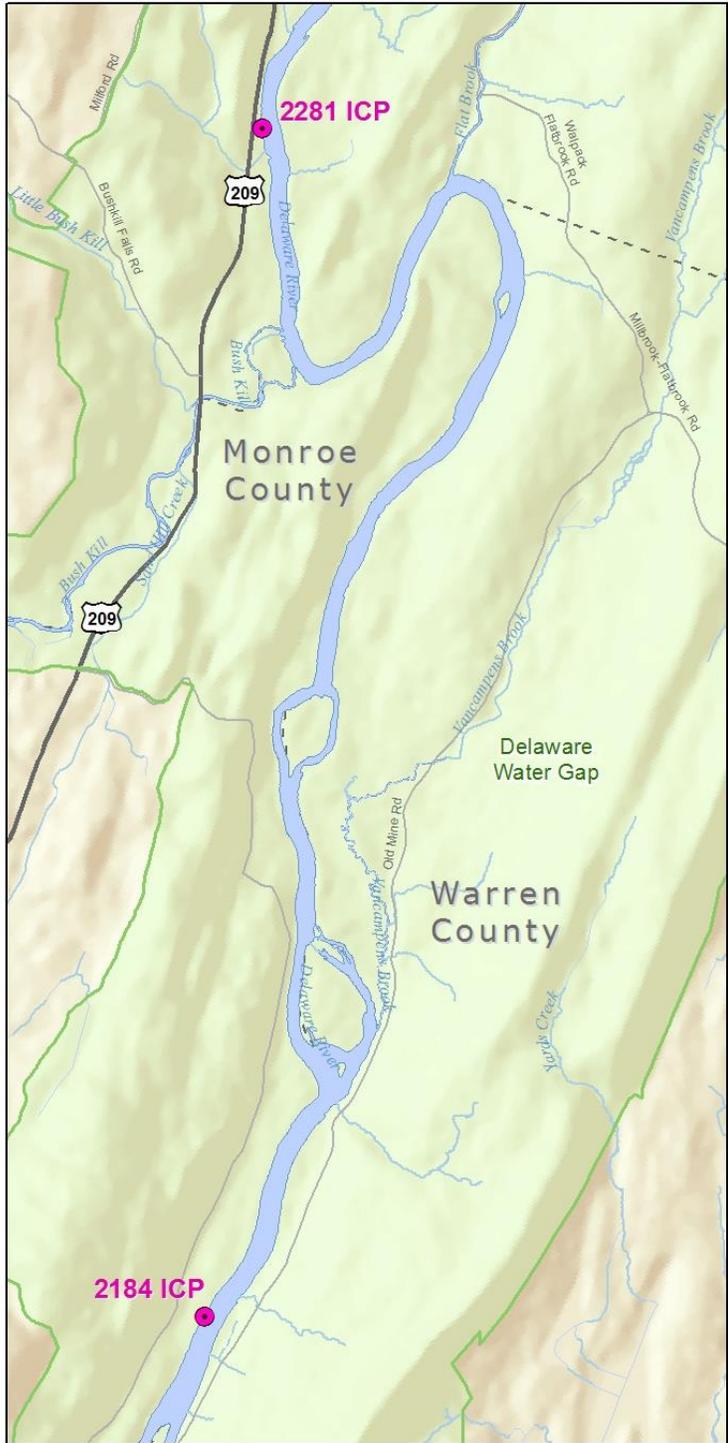
Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	25	22.0	18.0	27.0	2002-2006 USGS; 2008 SRMP
Ammonia-Nitrogen as N, Dissolved mg/L *	31	<0.015	<0.015	<0.015	2002-2004 USGS/NPS (8 non-detects)
Ammonia-Nitrogen as N, Total mg/L	5	<0.005	<0.005	<0.005	2008 SRMP (all non-detects)
Calcium, Dissolved mg/L	15	6.70	5.14	8.44	2002-2006 USGS/NPS
Chloride, Dissolved mg/L	15	2.63	1.34	3.06	2002-2006 USGS/NPS
Chloride, Total mg/L	10	3.80	3.10	4.15	2008 SRMP
Dissolved Oxygen (DO) mg/L *	46	9.29	9.00	9.70	2001-2006 USGS/NPS/NJDEP; 2008 SRMP
Dissolved Oxygen Saturation %	44	96.0	94.4	97.7	2002-2006 USGS/NPS; 2008 SRMP
Enterococcus #/100ml	20	80	30	120	2005-2006 USGS; 2008 SRMP
Escherichia coli #/100ml	20	33	17	<100	2005-2006 USGS; 2008 SRMP
Fecal coliform #/100ml *	23	20	<20	52	2005-2006 USGS; 2008 SRMP
Hardness as CaCO ₃ , Total mg/L	15	25.0	20.0	32.0	2002-2006 USGS/NPS
Magnesium, Dissolved mg/L	15	2.11	1.70	2.60	2002-2006 USGS/NPS
Nitrate+Nitrite as N, Dissolved mg/L *	32	<0.060	<0.060	0.070	2002-2006 USGS/NPS (19 non-detects)
Nitrate+Nitrite as N, Total mg/L	10	0.052	0.016	0.085	2008 SRMP
Nitrogen as N, Total mg/L *	25	0.130	0.120	0.143	2002-2004 USGS/NPS, 2008 SRMP
Nitrogen, Kjeldahl as N, Total mg/L	30	0.087	0.070	0.100	2002-2003 USGS/NPS, 2008 SRMP
pH units *	46	7.30	7.10	7.44	2001-2006 USGS/NPS/NJDEP, 2008 SRMP
Phosphate as P, Dissolved mg/L	32	<0.020	0.007	0.020	2002-2004 USGS/NPS (22 non-detects)
Phosphate as P, Total mg/L	5	<0.003	<0.003	<0.003	2008 (all non-detects)
Phosphorus as P, Total mg/L *	42	0.013	0.009	0.040	2002-2006 USGS/NPS, 2008 SRMP
Specific Conductance µS/cm	46	69.5	64.0	79.6	2001-2006 USGS/NPS/NJDEP, 2008 SRMP
Sulfate, Dissolved mg/L	15	7.68	7.25	7.96	2002-2006 USGS/NPS/NJDEP
Temperature, Water, degrees C	56	16.6	15.6	17.5	2001-2006 USGS/NPS/NJDEP, 2008 SRMP
Total Dissolved Solids (TDS) mg/L	15	38.0	35.0	56.0	2002-2006 USGS/NPS/NJDEP
Total Suspended Solids (TSS) mg/L	13	0.55	0.20	1.00	2005-2006 USGS, 2008 SRMP
Turbidity NTU	11	1.18	1.06	1.49	2008 SRMP

Two-tailed confidence limits were used for these EWQ targets

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

2184 ICP Delaware River at Smithfield Access



2184 ICP
Delaware River at Smithfield Access



- Sampling Location
- - - County Boundary
- NPS Boundary



2184 ICP Delaware River at Smithfield Access

Latitude 41.029409 Longitude -75.049839 by GPS NAD83 decimal degrees.

No USGS or State monitoring sites nearby.

Watershed Population figures were not calculated for main-stem Delaware River sites.

Drainage Area: 3,850 square miles, Delaware River Zone 1C

Site Specific EWQ defined 2006-2011 by the DRBC/NPS Scenic Rivers Monitoring Program.

This site is located in the Delaware Water Gap National Recreation Area.

Classified by DRBC as Outstanding Basin Waters

Nearest upstream Interstate Control Point: 2281 ICP Delaware River at Bushkill Access

Nearest downstream Interstate Control Point: 2115 ICP Delaware River at Kittatinny Visitor Center

Known dischargers within watershed: Undefined

Tributaries to upstream reach: Major tributaries 2269A BCP, 2269B BCP, 2269C BCP Bushkill Creek and tributaries, PA; 2253 BCP, 2253A BCP, 2253B BCP Flat Brook and tributaries, NJ; small tributary 2199 BCP Van Campens Brook, NJ.

No Stream Stats web site data available (drainage area too large to calculate on web site).

Flow Statistics Associated with Water Quality Samples (calculated by drainage area weighting from USGS gage data):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
178,100	13,600	7,600	5,090	4,040	3,210	2,320	1,930	996

Existing Water Quality: 2184 ICP Delaware River at Smithfield Access

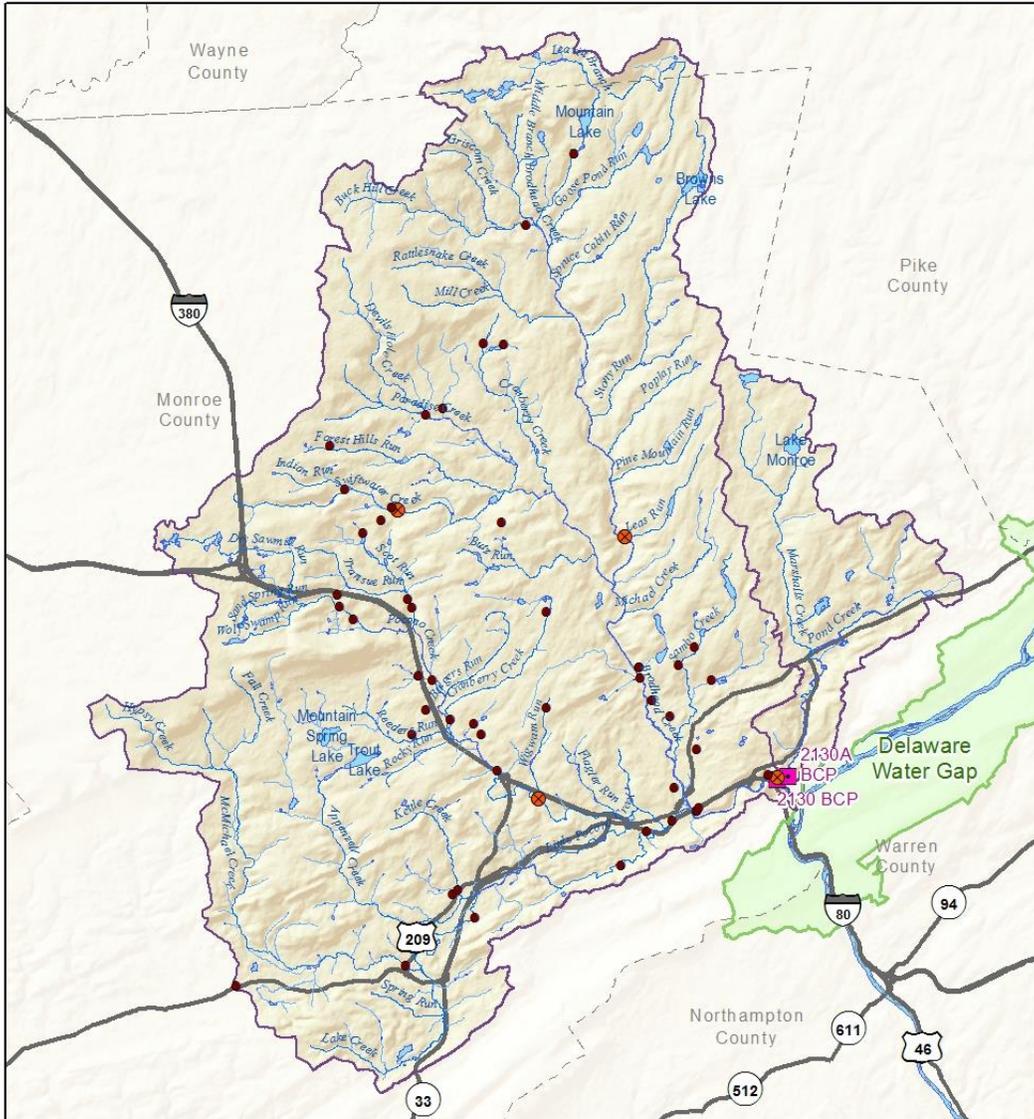
Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	63	17.2	16.0	18.0	2006-2011 SRMP
Aluminum, Dissolved mg/L	15	0.004	0.004	0.007	2009-2010 SRMP archived
Ammonia-Nitrogen as N, Total mg/L *	61	0.012	0.010	0.015	2006-2011 SRMP
Barium, Dissolved mg/L	15	0.022	0.018	0.025	2009-2010 SRMP archived
Calcium, Dissolved mg/L	15	6.96	6.54	7.57	2009-2010 SRMP archived
Chloride, Total mg/L	62	12.35	11.84	13.40	2006-2011 SRMP
Dissolved Oxygen (DO) mg/L *	58	8.55	8.12	8.93	2006-2011 SRMP
Dissolved Oxygen Saturation %	38	96.5	94.3	97.8	2008-2011 SRMP
Enterococcus #/100ml	48	22	16	41	2007-2011 SRMP
Escherichia coli #/100ml	48	9	7	22	2007-2011 SRMP
Fecal coliform #/100ml *	71	14	10	22	2006-2011 SRMP
Hardness as CaCO ₃ , Total mg/L	63	27.0	25.8	28.0	2006-2011 SRMP
Magnesium, Dissolved mg/L	15	1.61	1.28	1.71	2009-2010 SRMP archived
Manganese, Dissolved µg/L	15	8.8	4.6	11.8	2009-2010 SRMP archived
Nitrate+Nitrite as N, Total mg/L *	53	0.112	0.086	0.123	2007-2011 SRMP
Nitrogen as N, Total mg/L *	53	0.300	0.268	0.337	2007-2011 SRMP
Nitrogen, Kjeldahl as N, Total mg/L	53	0.200	0.184	0.209	2007-2011 SRMP
pH units *	58	7.44	7.27	7.60	2006-2011 SRMP
Phosphate as P, Total mg/L	53	0.006	0.005	0.007	2007-2011 SRMP
Phosphorus as P, Total mg/L *	53	0.013	0.012	0.015	2007-2011 SRMP
Potassium, Dissolved mg/L	15	0.68	0.55	0.75	2009-2010 SRMP archived
Sodium, Dissolved mg/L	15	6.89	6.33	7.79	2009-2010 SRMP archived
Specific Conductance µS/cm	58	93.5	90.0	97.1	2006-2011 SRMP
Strontium, Dissolved mg/L	15	0.045	0.038	0.050	2009-2010 SRMP archived
Sulfate, Total mg/L	13	6.06	5.32	6.92	2009-2010 SRMP archived
Temperature, Water, degrees C	58	20.7	19.7	22.7	2006-2011 SRMP
Total Dissolved Solids (TDS) mg/L	63	53.0	52.0	54.6	2006-2011 SRMP
Total Suspended Solids (TSS) mg/L *	54	1.85	1.50	2.80	2006-2011 SRMP
Turbidity NTU	50	2.21	1.85	2.56	2007-2011 SRMP

Two-tailed confidence limits were used for these EWQ targets

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

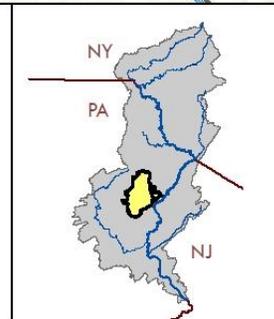
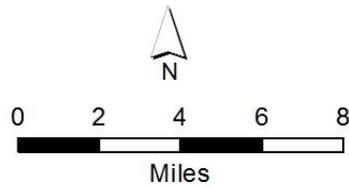
2130A BCP Brodhead Creek at River Rd. and 2130B Marshalls Creek



Brodhead Creek and Marshalls Creek

Drainage Area = 287.71 mi²

- NPDES
- Stream Gage
- Sampling Location
- NPS Boundary



2130A BCP Brodhead Creek at River Rd.

Monroe County, PA. Latitude 40.993490 Longitude -75.137610 by GPS NAD83 decimal degrees.

USGS Gage No 01442500; PADEP Site No. WQN0137

Watershed Population: 2000: 85,986 2010: 103,182 Change: +17,196 (+20.0%)

Drainage Area: 294 square miles, tributary to Delaware River Zone 1D

Site Specific EWQ defined 2006-2011 by the DRBC/NPS Scenic Rivers Monitoring Program; supplemented by quarterly PADEP Water Quality Network samples 2000-2011.

Water quality at this site includes that of 2130B BCP Marshalls Creek, a tributary that is partially within the DWGNRA.

This watershed is tributary to the Delaware Water Gap National Recreation Area (DEWA)

Classified by DRBC as Outstanding Basin Waters.

Nearest upstream Interstate Control Point: 2184 ICP Delaware River at Smithfield Access

Nearest downstream Interstate Control Point: 2115 ICP Delaware River at Kittatinny Visitor Center

Known dischargers within watershed: Numerous, as yet undefined.

Watershed is 79.6% forested; urban land cover is 8.6%. Watershed was 96% glaciated, and is 0.13% underlain by carbonate bedrock. Mean annual precipitation 46.3 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics Associated with Water Quality Samples (USGS BaSE Model, data from USGS Gage 01442500):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
27,040	1,245	644	466	675	272	177	96.7	19.2

StreamStats Low-Flow Stream Statistics

M7D2Y (ft ³ /s)	64.1
M30D2Y (ft ³ /s)	81.9
M7D10Y (ft ³ /s)	36.4
M30D10Y (ft ³ /s)	45.9
M90D10Y (ft ³ /s)	64.3

StreamStats Mean/Baseflow Stream Statistics

QA (ft ³ /s)	552
QAH (ft ³ /s)	190
BF10YR (ft ³ /s)	233
BF25YR (ft ³ /s)	210
BF50YR (ft ³ /s)	197

StreamStats Peak-Flow Stream Statistics

PK2 (ft ³ /s)	7,840
PK5 (ft ³ /s)	12,700
PK10 (ft ³ /s)	16,500
PK50 (ft ³ /s)	26,900
PK100 (ft ³ /s)	32,200
PK500 (ft ³ /s)	46,600

Existing Water Quality: 2130A BCP Brodhead Creek at River Rd.

Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	91	29.9	26.2	34.0	1999-2009 USGS/PA; 2006-2011 SRMP
Aluminum, Dissolved mg/L	14	0.003	0.002	0.005	2009-2010 SRMP archived
Ammonia-Nitrogen as N, Total mg/L *	91	0.020	0.017	0.025	1999-2009 USGS/PA; 2006-2011 SRMP
Barium, Dissolved mg/L	14	0.006	0.004	0.008	2009-2010 SRMP archived
Calcium, Dissolved mg/L	16	15.16	13.77	17.67	1999 USGS; 2009-2010 SRMP archived
Calcium, Total mg/L	28	15.8	12.6	17.4	1999-2009 USGS/PADEP
Chloride, Total mg/L	65	28.2	26.1	30.2	2006-2011 SRMP, PADEP
Dissolved Oxygen (DO) mg/L *	91	9.76	9.49	10.02	1999-2009 USGS/PA; 2006-2011 SRMP
Dissolved Oxygen Saturation %	43	102.8	100.4	108.5	1999, 2007 USGS; 2008-2011 SRMP
Enterococcus #/100ml	51	44	22	70	2007-2011 SRMP
Escherichia coli #/100ml	52	47	31	90	2007-2011 SRMP
Fecal coliform #/100ml *	70	66	42	86	1999-2001 USGS/PA; 2006-2011 SRMP
Hardness as CaCO ₃ , Total mg/L	93	49.7	45.0	53.6	1999-2009 USGS/PA; 2006-2011 SRMP
Iron, Total µg/L	28	90	69	108	1999-2009 USGS/PADEP
Magnesium, Dissolved mg/L	16	2.69	2.44	3.20	1999 USGS; 2009-2010 SRMP archived
Manganese, Dissolved µg/L	16	3.0	0.7	6.3	2009-2010 SRMP archived
Manganese, Total µg/L	28	22.0	17.0	25.0	1999-2009 USGS/PADEP
Nitrate as N, Total mg/L	29	0.41	0.37	0.49	1999-2009 USGS/PADEP
Nitrate+Nitrite as N, Total mg/L *	52	0.386	0.365	0.447	2007-2011 SRMP
Nitrogen as N, Total mg/L *	74	0.590	0.573	0.682	1999-2009 USGS/PA; 2007-2011 SRMP
Nitrogen, Kjeldahl as N, Total mg/L	54	0.197	0.185	0.226	1999 USGS; 2007-2011 SRMP
Organic Carbon, Total mg/L	16	2.05	1.70	2.40	1999-2004 USGS/PADEP
pH units *	92	7.62	7.55	7.70	1999-2009 USGS/PA; 2006-2011 SRMP
Phosphate as P, Total mg/L	72	0.040	0.035	0.051	2002-2009 USGS/PA; 2007-2011 SRMP
Phosphorus as P, Total mg/L *	84	0.043	0.037	0.055	1999-2009 USGS/PA; 2007-2011 SRMP
Potassium, Dissolved mg/L	14	0.67	0.49	0.81	2009-2010 SRMP archived
Sodium, Dissolved mg/L	14	10.85	8.95	12.85	2009-2010 SRMP archived
Specific Conductance µS/cm	92	184	172	191	1999-2009 USGS/PA; 2006-2011 SRMP
Strontium, Dissolved mg/L	14	0.081	0.071	0.114	2009-2010 SRMP archived
Sulfate, Dissolved mg/L	22	12.35	11.20	14.40	1999-2009 USGS/PADEP
Sulfate, Total mg/L	41	14.4	12.4	15.9	1999-2009 PADEP; 2009-2010 SRMP
Temperature, Water, degrees C	92	18.7	18.1	19.6	1999-2009 USGS/PA; 2006-2011 SRMP
Total Dissolved Solids (TDS) mg/L	91	110.0	104.0	118.6	1999-2009 PADEP; 2006-2011 SRMP
Total Suspended Solids (TSS) mg/L *	85	2.0	1.95	3.0	1999-2009 USGS/PA; 2006-2011 SRMP
Turbidity NTU	53	1.55	1.38	1.75	2007-2011 SRMP

Two-tailed confidence limits were used for these EWQ targets

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

2130B BCP Marshalls Creek at DWGNRA Boundary

Monroe County, PA. Latitude 40.998885 Longitude -75.137717 by GPS NAD83 decimal degrees.

No USGS or PADEP sites nearby.

Watershed Population: 2000: 6,975 2010: 9,023 Change: +2,048 (+29.4%)

Drainage Area: 20.9 square miles, tributary to Brodhead Creek, to Delaware River Zone 1D

Site Specific EWQ defined 2006-2011 by the DRBC/NPS Scenic Rivers Monitoring Program.

This watershed is tributary to the Delaware Water Gap National Recreation Area (DEWA)

Classified by DRBC as Outstanding Basin Waters.

Nearest upstream Interstate Control Point: 2184 ICP Delaware River at Smithfield Access

Nearest downstream Interstate Control Point: 2115 ICP Delaware River at Kittatinny Visitor Center

Known dischargers within watershed: Some, as yet undefined.

Watershed is 79.2% forested; urban land cover is 11.5%. Watershed was 100% glaciated, and is 0.14% underlain by carbonate bedrock. Mean annual precipitation 46.4 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics Associated with Water Quality Samples (USGS BaSE Model):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
2,860	100	52.0	38.1	30.8	24.6	15.5	8.30	1.89

StreamStats Low-Flow Stream Statistics

M7D2Y (ft³/s) 4.18

M30D2Y (ft³/s) 5.71

M7D10Y (ft³/s) 1.83

M30D10Y (ft³/s) 2.57

M90D10Y (ft³/s) 4.03

StreamStats Mean/Baseflow Stream Statistics

QA (ft³/s) 49.3

QAH (ft³/s) 15.7

BF10YR (ft³/s) 22.1

BF25YR (ft³/s) 19.9

BF50YR (ft³/s) 18.7

StreamStats Peak-Flow Stream Statistics

PK2 (ft³/s) 979

PK5 (ft³/s) 1,670

PK10 (ft³/s) 2,230

PK50 (ft³/s) 3,740

PK100 (ft³/s) 4,520

PK500 (ft³/s) 6,660

Existing Water Quality: 2130B BCP Marshalls Creek at DWGNRA Boundary

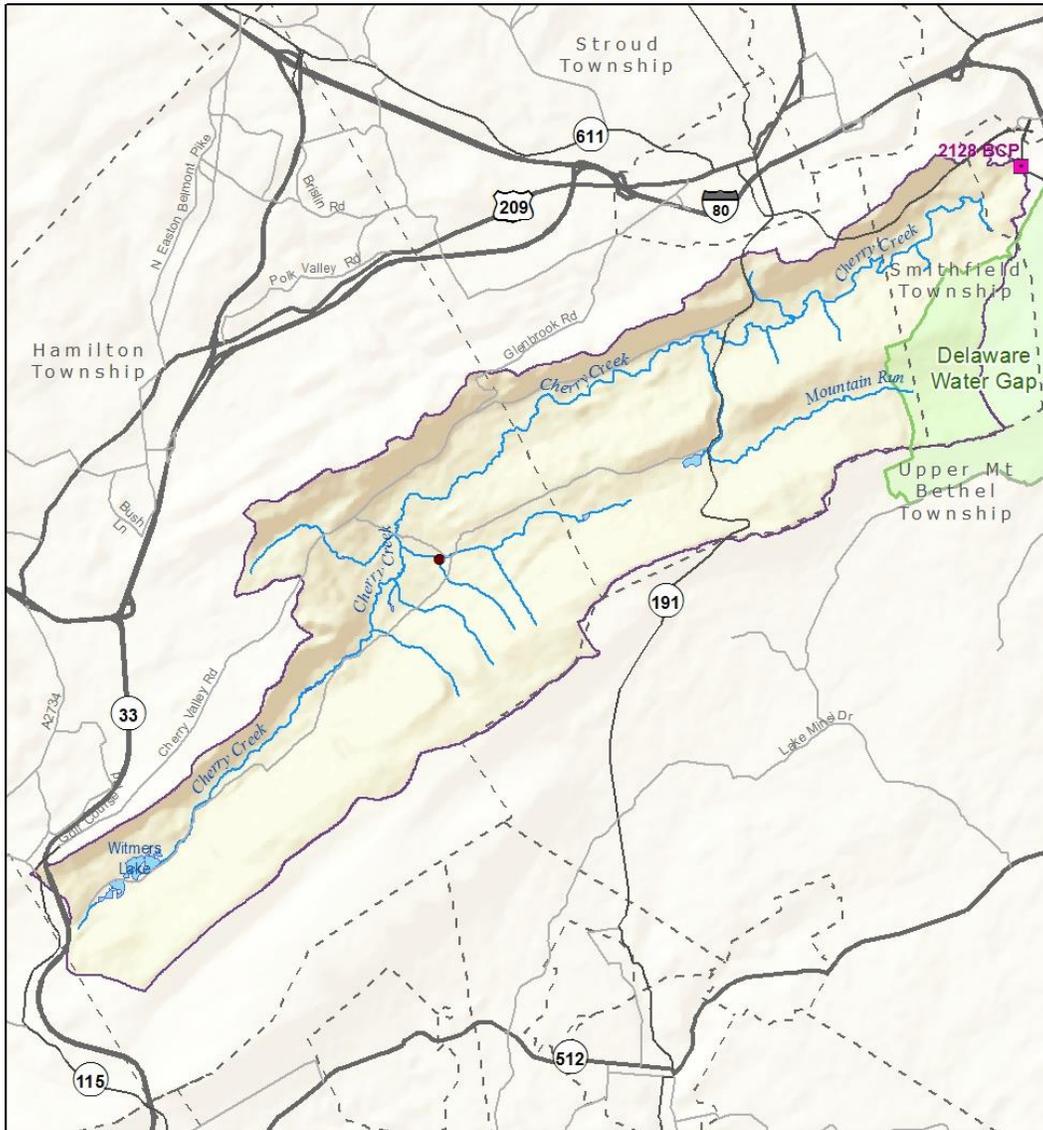
Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	61	41.8	35.7	48.8	2006-2011 SRMP
Aluminum, Dissolved mg/L	15	0.004	0.003	0.005	2009-2010 SRMP archived
Ammonia-Nitrogen as N, Total mg/L *	60	0.009	0.006	0.010	2006-2011 SRMP (13 non-detects)
Barium, Dissolved mg/L	15	0.012	0.010	0.013	2009-2010 SRMP archived
Calcium, Dissolved mg/L	15	13.77	11.17	15.81	2009-2010 SRMP archived
Chloride, Total mg/L	61	18.63	16.30	19.58	2006-2011 SRMP
Dissolved Oxygen (DO) mg/L *	60	9.43	8.95	9.84	2006-2011 SRMP
Dissolved Oxygen Saturation %	40	100.2	96.6	103.5	2008-2011 SRMP
Enterococcus #/100ml	44	81	47	180	2007-2011 SRMP
Escherichia coli #/100ml	44	60	38	90	2007-2011 SRMP
Fecal coliform #/100ml *	66	61	48	78	2006-2011 SRMP
Hardness as CaCO ₃ , Total mg/L	61	63.6	54.8	71.8	2006-2011 SRMP
Magnesium, Dissolved mg/L	15	2.52	2.22	3.00	2009-2010 SRMP archived
Manganese, Dissolved µg/L	15	3.6	2.1	5.5	2009-2010 SRMP archived
Nitrate+Nitrite as N, Total mg/L *	51	0.256	0.231	0.288	2007-2011 SRMP
Nitrogen as N, Total mg/L *	51	0.433	0.411	0.467	2007-2011 SRMP
Nitrogen, Kjeldahl as N, Total mg/L	51	0.174	0.166	0.195	2007-2011 SRMP
pH units *	59	7.56	7.48	7.60	2006-2011 SRMP
Phosphate as P, Total mg/L	51	0.011	0.009	0.012	2007-2011 SRMP
Phosphorus as P, Total mg/L *	51	0.021	0.017	0.024	2007-2011 SRMP
Potassium, Dissolved mg/L	15	0.80	0.68	1.20	2009-2010 SRMP archived
Sodium, Dissolved mg/L	15	14.5	13.4	19.4	2009-2010 SRMP archived
Specific Conductance µS/cm	60	165.4	153.7	182.7	2006-2011 SRMP
Strontium, Dissolved mg/L	15	0.060	0.053	0.083	2009-2010 SRMP archived
Sulfate, Total mg/L	14	12.55	10.69	16.49	2009-2010 SRMP archived
Temperature, Water, degrees C	60	18.2	16.9	19.4	2006-2011 SRMP
Total Dissolved Solids (TDS) mg/L	61	109.0	102.9	115.6	2006-2011 SRMP
Total Suspended Solids (TSS) mg/L *	53	1.80	1.20	2.45	2006-2011 SRMP
Turbidity NTU	51	1.69	1.46	1.96	2007-2011 SRMP

Two-tailed confidence limits were used for these EWQ targets

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

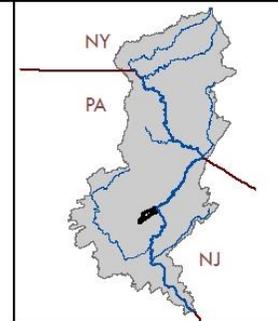
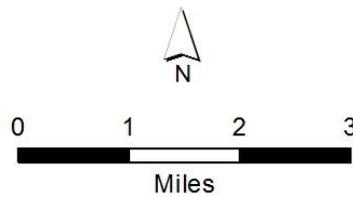
2128 BCP Cherry Creek at Rt. 611 (Incomplete)



Cherry Creek

Drainage Area = 20.43 mi²

- Sampling Location
- Other Sampling Location
- NPDES
- Drainage Area
- NPS Boundary



2128 BCP Cherry Creek at Rt. 611

Monroe County, PA. Latitude 40.985106 Longitude -75.144737 by GPS NAD83 decimal degrees.

No USGS or PADEP sites nearby.

Watershed Population: 2000: 1,915 2010: 2,204 Change: +289 (+15.1%)

Drainage Area: 20.9 square miles, tributary to Delaware River Zone 1D

Site Specific EWQ sampling began 2014 by the DRBC/NPS Scenic Rivers Monitoring Program.

This watershed is tributary to the Delaware Water Gap National Recreation Area (DEWA)

Classified by DRBC as Outstanding Basin Waters.

Nearest upstream Interstate Control Point: 2184 ICP Delaware River at Smithfield Access

Nearest downstream Interstate Control Point: 2115 ICP Delaware River at Kittatinny Visitor Center

Known dischargers within watershed: Some, as yet undefined.

Watershed is 80.8% forested; urban land cover is 2.5%. Watershed was 88% glaciated, and is 16.3% underlain by carbonate bedrock. Mean annual precipitation 47 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics Associated with Water Quality Samples (USGS BaSE Model):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
1,890	67.4	37.4	28.2	23.0	19.1	11.6	5.90	1.27

StreamStats Low-Flow Stream Statistics

M7D2Y (ft³/s) 3.16

M30D2Y (ft³/s) 4.40

M7D10Y (ft³/s) 1.33

M30D10Y (ft³/s) 1.93

M90D10Y (ft³/s) 3.07

StreamStats Mean/Baseflow Stream Statistics

QA (ft³/s) 37.9

QAH (ft³/s) 15.9

BF10YR (ft³/s) 19.8

BF25YR (ft³/s) 17.8

BF50YR (ft³/s) 16.7

StreamStats Peak-Flow Stream Statistics

PK2 (ft³/s) 828

PK5 (ft³/s) 1,420

PK10 (ft³/s) 1,900

PK50 (ft³/s) 3,180

PK100 (ft³/s) 3,840

PK500 (ft³/s) 5,640

Existing Water Quality: 2128 BCP Cherry Creek at Rt. 611

Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	20	90	82	97	SRMP 2014-2015
Ammonia-Nitrogen as N, Total mg/L *	20	0.010	0.007	0.012	SRMP 2014-2015 (5/20 non-detects)
Chloride, Total mg/L	20	11.2	10.8	11.7	SRMP 2014-2015
Dissolved Oxygen (DO) mg/L *	20	9.53	9.21	9.79	SRMP 2014-2015
Dissolved Oxygen Saturation %	20	99.7	98.6	100.7	SRMP 2014-2015
Enterococcus #/100ml					No Data
Escherichia coli #/100ml					No Data
Fecal coliform #/100ml *					No Data
Hardness as CaCO ₃ , Total mg/L	20	129	107	145	SRMP 2014-2015
Nitrate+Nitrite as N, Total mg/L *	20	0.320	0.270	0.384	SRMP 2014-2015
Nitrogen as N, Total mg/L *	20	0.548	0.419	0.627	SRMP 2014-2015
Nitrogen, Kjeldahl as N, Total mg/L	20	0.194	0.161	0.237	SRMP 2014-2015
pH units *	20	8.03	7.98	8.13	SRMP 2014-2015
Phosphate as P, Total mg/L	20	0.019	0.017	0.022	SRMP 2014-2015
Phosphorus as P, Total mg/L *	20	0.034	0.029	0.043	SRMP 2014-2015
Specific Conductance μ S/cm	20	258	222	293	SRMP 2014-2015
Temperature, Water, degrees C	20	18.8	16.6	19.3	SRMP 2014-2015
Total Dissolved Solids (TDS) mg/L	20	166	144	170	SRMP 2014-2015
Total Suspended Solids (TSS) mg/L *	20	4.5	2.0	7.0	SRMP 2014-2015
Turbidity NTU	20	1.90	1.14	2.64	SRMP 2014-2015

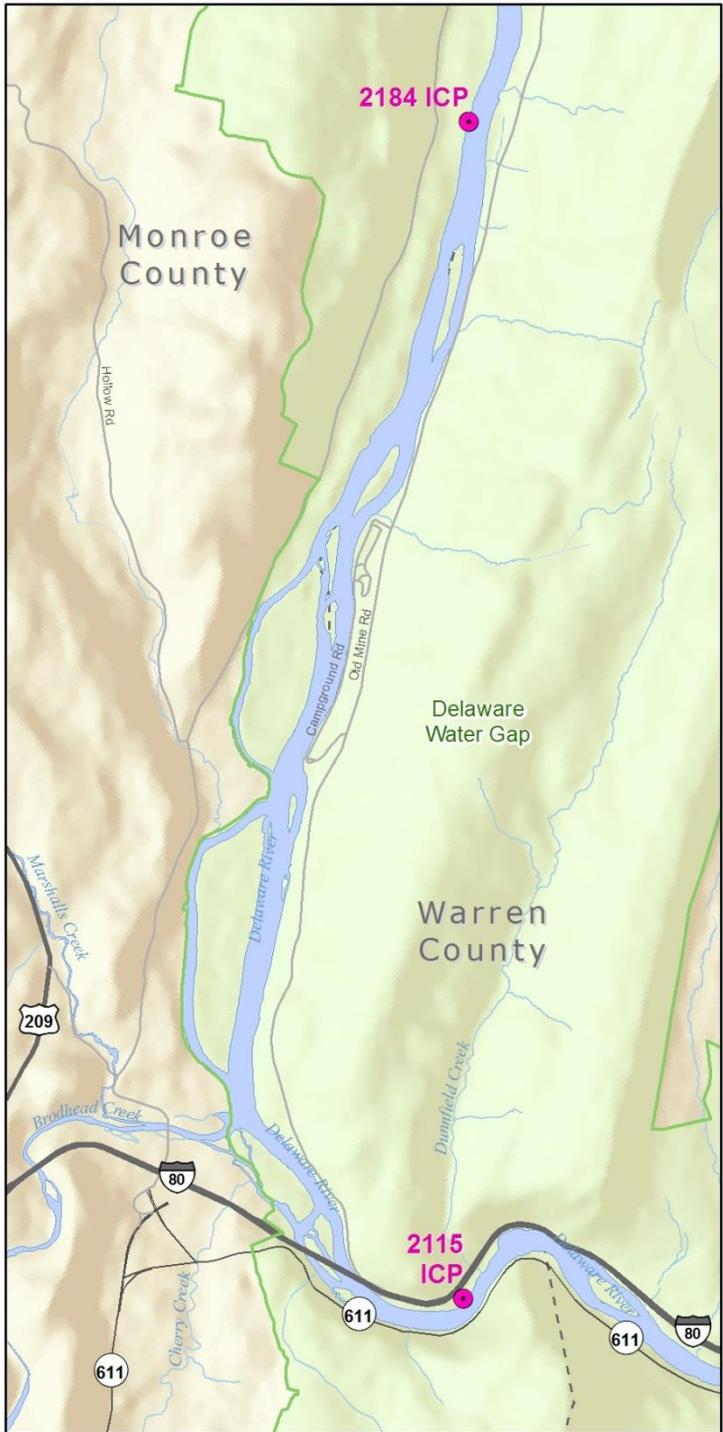
Two-tailed confidence limits were used for these EWQ targets

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

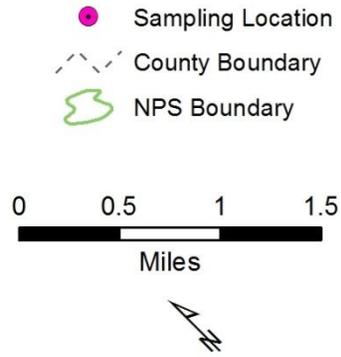
Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

The table above is incomplete. The SRMP continues to define Existing Water Quality, monitoring Cherry Creek in 2016 and 2017. Once those additional 20 samples are collected, this table will be updated and finalized. Bacteria data have not been collected here, and may be added at some future date.

2115 ICP Delaware River at Kittatiny Visitor Center off I-80



2115 ICP
 Delaware River at at Kittatiny Visitor Center by I-80



2115 ICP Delaware River at Kittatinny Visitor Center off I-80

Latitude 40.9700 Longitude -75.1375 by GPS NAD83 decimal degrees.

No USGS or State monitoring sites nearby.

Watershed Population figures were not calculated for main-stem Delaware River sites.

Drainage Area: 4,150 square miles, Delaware River Zone 1D

Site Specific EWQ defined 2006-2011 by the DRBC/NPS Scenic Rivers Monitoring Program.

This site is located in the Delaware Water Gap National Recreation Area.

Classified by DRBC as Outstanding Basin Waters

Nearest upstream Interstate Control Point: 2184 ICP Delaware River at Smithfield Access

Nearest downstream Interstate Control Point: 2074 ICP Delaware River at Portland Footbridge

Known dischargers within watershed: Undefined

Tributaries to upstream reach: Major tributaries 2130A BCP, 2130B BCP Brodhead Creek and tributaries, PA; 2128 BCP Cherry Creek, PA; small tributary 214.4 Shawnee Creek, PA; 212.2 Caledonia Creek, PA.

No Stream Stats web site data available (drainage area too large to calculate on web site).

Flow Statistics Associated with Water Quality Samples (calculated by drainage area weighting from USGS gage data):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
174,800	15,600	9,100	6,230	4,890	3,890	2,730	2,020	1,030

Existing Water Quality: 2115 ICP Delaware River at Kittatinny Visitor Center

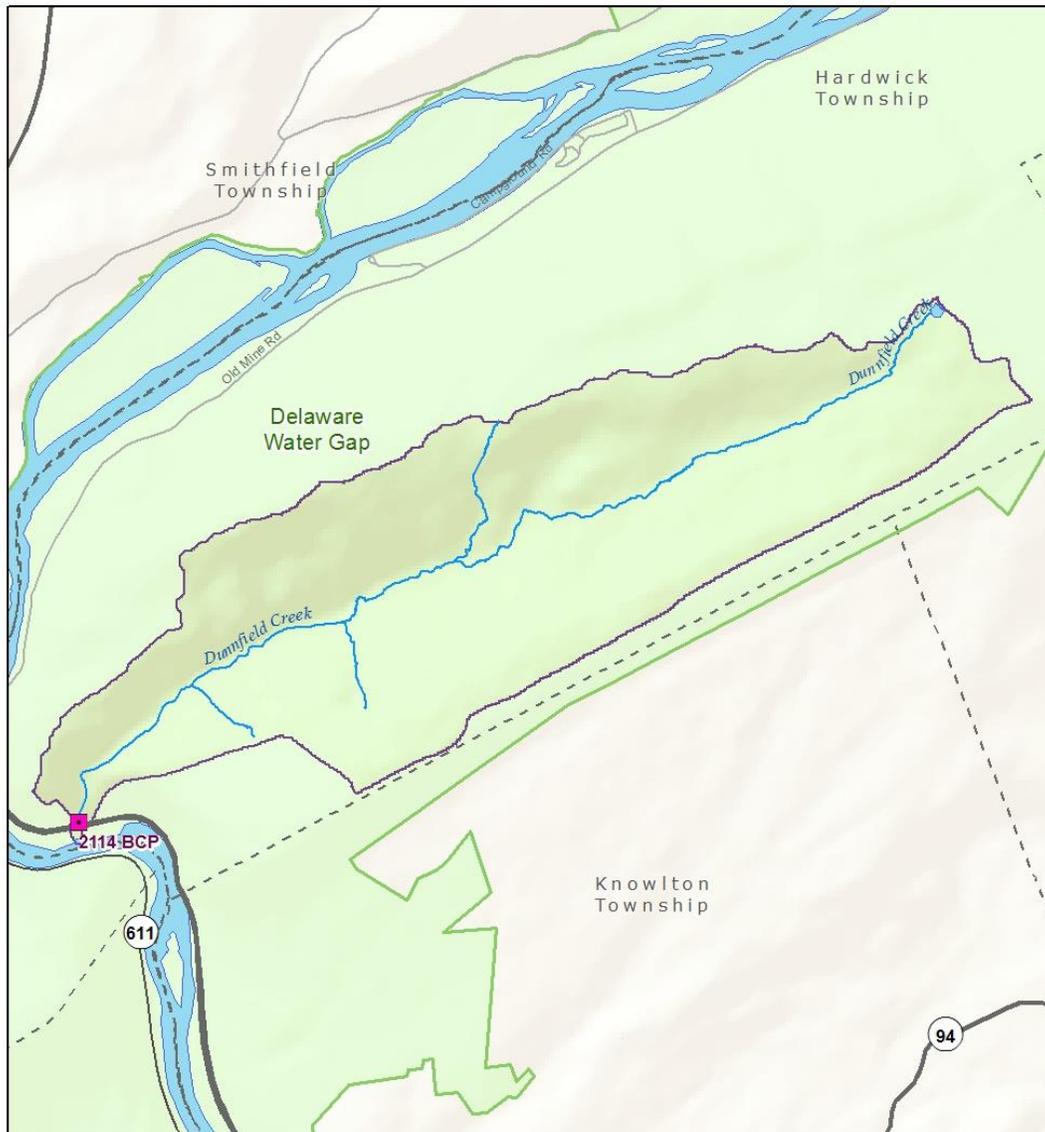
Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	63	17.3	15.6	18.0	2006-2011 SRMP
Aluminum, Dissolved mg/L	14	0.004	0.003	0.005	2009-2010 SRMP archived
Ammonia-Nitrogen as N, Total mg/L *	62	0.014	0.013	0.017	2006-2011 SRMP
Barium, Dissolved mg/L	14	0.023	0.021	0.024	2009-2010 SRMP archived
Calcium, Dissolved mg/L	14	7.34	5.46	7.99	2009-2010 SRMP archived
Chloride, Total mg/L	63	12.9	12.3	13.4	2006-2011 SRMP
Dissolved Oxygen (DO) mg/L *	57	8.30	7.62	8.50	2006-2011 SRMP
Dissolved Oxygen Saturation %	39	91.4	86.9	95.4	2008-2011 SRMP
Enterococcus #/100ml	49	21	15	35	2007-2011 SRMP
Escherichia coli #/100ml	49	15	10	20	2007-2011 SRMP
Fecal coliform #/100ml *	69	22	16	30	2006-2011 SRMP
Hardness as CaCO ₃ , Total mg/L	62	26.4	24.2	28.0	2006-2011 SRMP
Magnesium, Dissolved mg/L	14	1.52	1.12	1.73	2009-2010 SRMP archived
Manganese, Dissolved µg/L	14	15.4	5.6	22.2	2009-2010 SRMP archived
Nitrate+Nitrite as N, Total mg/L *	53	0.115	0.095	0.131	2007-2011 SRMP
Nitrogen as N, Total mg/L *	53	0.311	0.275	0.335	2007-2011 SRMP
Nitrogen, Kjeldahl as N, Total mg/L	52	0.207	0.192	0.224	2007-2011 SRMP
pH units *	59	7.40	7.27	7.45	2006-2011 SRMP
Phosphate as P, Total mg/L	53	0.008	0.006	0.011	2007-2011 SRMP
Phosphorus as P, Total mg/L *	53	0.016	0.012	0.018	2007-2011 SRMP
Potassium, Dissolved mg/L	14	0.69	0.61	0.82	2009-2010 SRMP archived
Sodium, Dissolved mg/L	14	7.35	6.47	8.24	2009-2010 SRMP archived
Specific Conductance µS/cm	59	95.0	88.4	98.6	2006-2011 SRMP
Strontium, Dissolved mg/L	14	0.037	0.025	0.047	2009-2010 SRMP archived
Sulfate, Total mg/L	12	6.24	5.66	7.32	2009-2010 SRMP archived
Temperature, Water, degrees C	59	20.9	20.1	23.0	2006-2011 SRMP
Total Dissolved Solids (TDS) mg/L	62	52.4	51.0	56.0	2006-2011 SRMP
Total Suspended Solids (TSS) mg/L *	54	1.90	1.30	3.50	2006-2011 SRMP
Turbidity NTU	50	2.19	1.84	2.43	2007-2011 SRMP

Two-tailed confidence limits were used for these EWQ targets

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

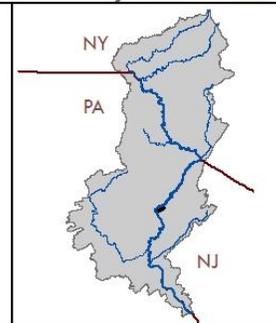
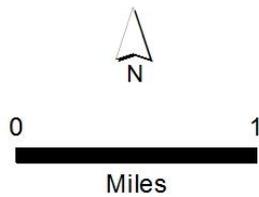
2114 BCP Dunnfield Creek at Appalachian Trail



Dunnfield Creek

Drainage Area = 3.56 mi²

- Sampling Location
- Drainage Area
- NPS Boundary



2114 BCP Dunnfield Creek at Appalachian Trail

Warren County, NJ. Latitude 40.97101 Longitude -75.1268 by GPS NAD83 decimal degrees.

USGS Site No. 01442760; NJDEP Site No. 01442760

Watershed Population: 2000: 4 2010: 5 Change: +1

Drainage Area: 3.56 square miles, tributary to Delaware River Zone 1D

Site Specific EWQ monitoring was completed 2004 by USGS/NPS Delaware Water Gap Study: Hickman R.E., and Fischer J.M. 2008. Water quality of streams in and near the Delaware Water Gap National Recreation Area, Pennsylvania and New Jersey, 2002-04: U.S. Geological Survey Scientific Investigations Report 2007-5290, 65 p.

Additional monitoring was conducted quarterly by NJDEP/USGS 2001-2011.

This watershed is tributary to the Delaware Water Gap National Recreation Area (DEWA)

Classified by DRBC as Outstanding Basin Waters.

Nearest upstream Interstate Control Point: 2115 ICP Delaware River at Kittatinny Visitor Center

Nearest downstream Interstate Control Point: 2074 ICP Delaware River at Portland Foot Bridge

Known dischargers within watershed: None.

Watershed is 96.8% forested; urban land cover is 0.1%. Watershed was 100% glaciated, and is not underlain by carbonate bedrock. Mean annual precipitation 48 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics Associated with Water Quality Samples (USGS BaSE Model):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
424	13.4	7.14	5.30	4.29	3.15	1.65	0.72	0.11

StreamStats Low-Flow Stream Statistics

M7D2Y (ft³/s) 0.63

M30D2Y (ft³/s) 0.88

M7D10Y (ft³/s) 0.25

M30D10Y (ft³/s) 0.35

M90D10Y (ft³/s) 0.59

StreamStats Mean/Baseflow Stream Statistics

QA (ft³/s) 7.11

QAH (ft³/s) 1.97

BF10YR (ft³/s) 3.43

BF25YR (ft³/s) 3.10

BF50YR (ft³/s) 2.91

StreamStats Peak-Flow Stream Statistics

PK2 (ft³/s) 197

PK5 (ft³/s) 351

PK10 (ft³/s) 476

PK50 (ft³/s) 810

PK100 (ft³/s) 979

PK500 (ft³/s) 1,440

Existing Water Quality: 2114 BCP Dunnfield Creek at Appalachian Trail

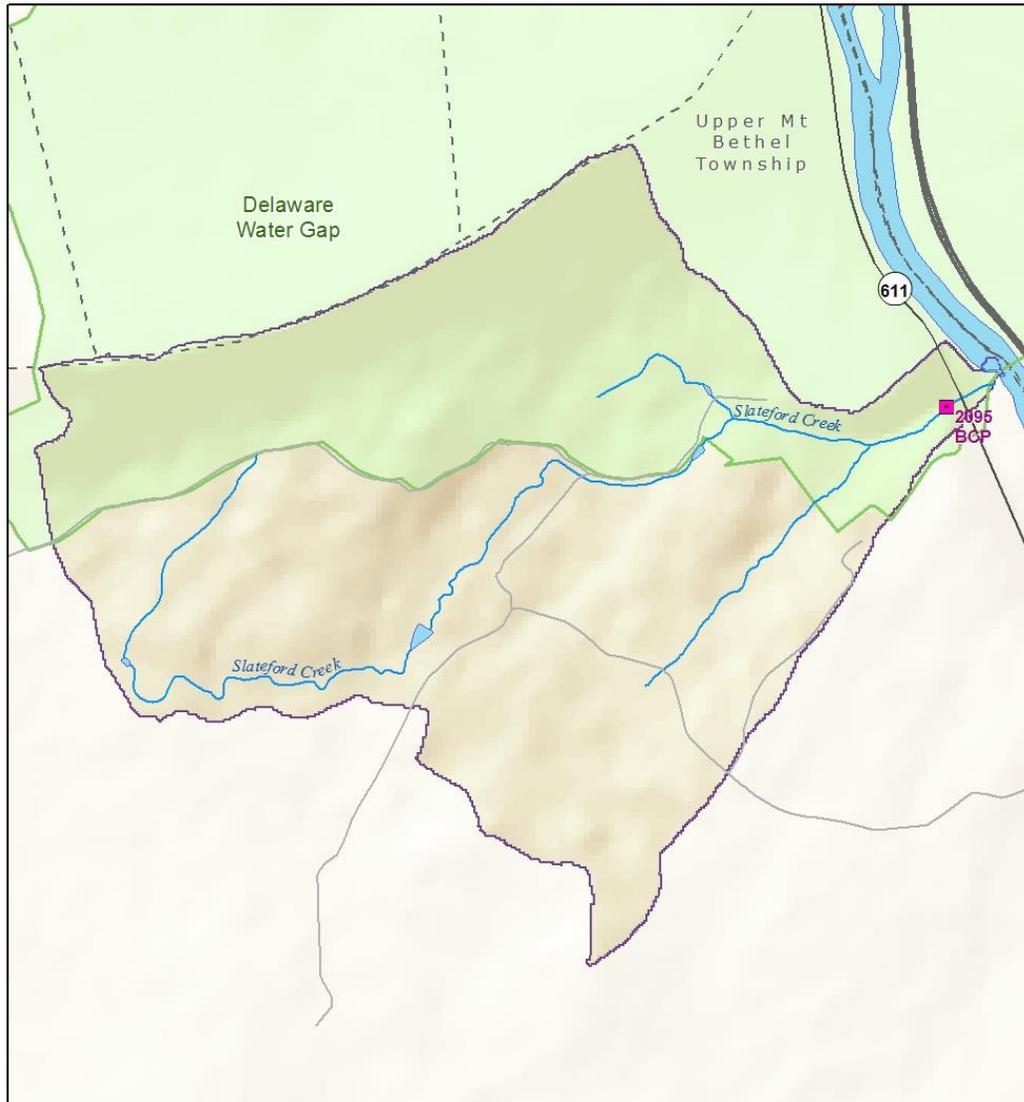
Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	22	6.0	5.0	7.0	1998-2008 USGS
Ammonia Nitrogen as N, Dissolved mg/L	25	<0.030	0.016	<0.030	1998-2009 USGS (16 non-detects)
Ammonia-Nitrogen as N, Total mg/L *	12	<0.030	<0.030	<0.030	1998-2003 USGS (10 non-detects)
Calcium, Dissolved mg/L	24	3.10	2.81	3.26	1998-2009 USGS
Chloride, Dissolved mg/L	24	1.13	1.03	1.28	1998-2009 USGS
Dissolved Oxygen (DO) mg/L *	26	9.95	9.10	10.90	1998-2009 USGS
Dissolved Oxygen Saturation %	25	98	96	100	1998-2009 USGS
Enterococcus #/100ml	40	50	40	80	1998-2006 USGS
Escherichia coli #/100ml	42	<100	<100	<100	2000-2008 USGS
Fecal coliform #/100ml *	50	<20	<20	<20	1998-2008 USGS
Hardness as CaCO ₃ , Total mg/L	24	12.0	11.0	13.0	1998-2009 USGS
Magnesium, Dissolved mg/L	24	1.05	0.97	1.14	1998-2009 USGS
Nitrate+Nitrite as N, Dissolved mg/L *	25	<0.06	<0.05	0.16	1998-2009 USGS (12 non-detects)
Nitrogen as N, Dissolved mg/L	9	0.21	0.10	0.48	1999-2006 USGS
Nitrogen as N, Total mg/L *	7	0.42	0.15	1.30	1998-2004 USGS
Nitrogen, Kjeldahl as N, Total mg/L	8	0.09	0.04	0.42	1998-2001 USGS (3 non-detects)
Organic Carbon, Dissolved mg/L	24	0.8	0.7	1.0	1998-2009 USGS
pH units *	27	6.7	6.5	6.9	1998-2009 USGS
Phosphate as P, Total mg/L	17	0.01	0.007	0.02	1998-2009 USGS (8 non-detects)
Phosphorus as P, Total mg/L *	24	0.019	0.008	0.054	1998-2009 USGS (6 non-detects)
Specific Conductance μ S/cm	27	34	33	37	1998-2009 USGS
Sulfate, Dissolved mg/L	24	7.44	7.02	7.75	1998-2009 USGS
Temperature, Water, degrees C	57	16.3	14.7	17.0	1998-2009 USGS
Total Dissolved Solids (TDS) mg/L	24	26	24	28	1998-2009 USGS
Total Suspended Solids (TSS) mg/L *	21	<1.0	<1.0	3.0	1998-2009 USGS (11 non-detects)
Turbidity NTU	7	0.5	0.2	1.2	2001-2004 USGS

Two-tailed confidence limits were used for these EWQ targets

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

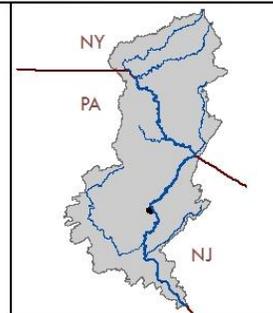
2095 BCP Slateford Creek at National Park Drive



Slateford Creek

Drainage Area = 2.97 mi²

- Sampling Location
- Other Sampling Location
- 🗺 Drainage Area
- 🌿 NPS Boundary



2095 BCP Slateford Creek at National Park Drive

Northampton County, PA. Latitude 40.946735 Longitude -75.115074 by GPS NAD83 decimal degrees.

No USGS or PADEP sites nearby.

Watershed Population: 2000 = 173 2010 = 283 Change = +110 (+63.9%)

Drainage Area: 2.95 square miles, tributary to Delaware River Zone 1D

Site Specific EWQ defined 2011-2013 by DRBC.

This watershed is tributary to the Delaware Water Gap National Recreation Area (DEWA)

Classified by DRBC as Outstanding Basin Waters.

Nearest upstream Interstate Control Point: 2115 ICP Delaware River at Kittatinny Visitor Center

Nearest downstream Interstate Control Point: 2074 ICP Delaware River at Portland Foot Bridge

Known dischargers within watershed: Few, as yet undefined.

Watershed is 89.2% forested; urban land cover is 0.1%. Watershed was 100% glaciated, and is not underlain by carbonate bedrock. Mean annual precipitation 47 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics Associated with Water Quality Samples (USGS BaSE Model):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
353	9.78	5.22	3.83	3.10	2.73	1.67	0.86	0.24

StreamStats Low-Flow Stream Statistics

M7D2Y (ft³/s) 0.51

M30D2Y (ft³/s) 0.67

M7D10Y (ft³/s) 0.24

M30D10Y (ft³/s) 0.31

M90D10Y (ft³/s) 0.46

StreamStats Mean/Baseflow Stream Statistics

QA (ft³/s) 5.34

QAH (ft³/s) 1.44

BF10YR (ft³/s) 2.57

BF25YR (ft³/s) 2.31

BF50YR (ft³/s) 2.16

StreamStats Peak-Flow Stream Statistics

PK2 (ft³/s) 153

PK5 (ft³/s) 274

PK10 (ft³/s) 373

PK50 (ft³/s) 641

PK100 (ft³/s) 778

PK500 (ft³/s) 1,160

Existing Water Quality: 2015 BCP Slateford Creek at National Park Drive

Parameter	N	median	L95CL	U95CL	Flow Relationship	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	30	51.5	45	62	Inverse	SRMP 2011-2013
Ammonia-Nitrogen as N, Total mg/L *	30	<0.006	<0.006	<0.006	None	SRMP 2011-2013 (26/30 non-detects)
Chloride, Total mg/L	30	7.4	6.1	8.1	Inverse	SRMP 2011-2013
Dissolved Oxygen (DO) mg/L *	28	9.40	8.83	9.71	None	SRMP 2011-2013 mid-day
Dissolved Oxygen Saturation %	28	96.7	95.5	99.2	None	SRMP 2011-2013 mid-day
Enterococcus #/100mL	7	30	11	240	None	SRMP 2011 – insufficient data for EWQ
Escherichia coli #/100mL	8	16	6	180	Positive	SRMP 2011 – insufficient data for EWQ
Fecal coliform #/100mL *	8	17	1	270	Positive	SRMP 2011 – insufficient data for EWQ
Hardness as CaCO ₃ , Total mg/L	30	78.3	67.4	83.2	Inverse	SRMP 2011-2013
Nitrate+Nitrite as N, Total mg/L *	30	0.250	0.171	0.283	None	SRMP 2011-2013
Nitrogen as N, Total mg/L *	30	0.398	0.365	0.440	None	SRMP 2011-2013
Nitrogen, Kjeldahl as N, Total mg/L	30	0.149	0.126	0.197	None	SRMP 2011-2013
pH units *	28	7.74	7.68	7.85	None	SRMP 2011-2013 mid-day
Phosphate as P, Total mg/L	30	0.009	0.007	0.014	None	SRMP 2011-2013
Phosphorus as P, Total mg/L *	30	0.013	0.010	0.017	Positive	SRMP 2011-2013
Specific Conductance µS/cm	28	180	153	204	Inverse	SRMP 2011-2013
Temperature, Water, degrees C	28	17.1	16.3	18.2	None	SRMP 2011-2013 mid-day
Total Dissolved Solids (TDS) mg/L	30	105	89	112	Inverse	SRMP 2011-2013
Total Suspended Solids (TSS) mg/L *	30	2.0	1.0	3.3	None	SRMP 2011-2013
Turbidity NTU	47	1.56	1.25	2.20	Positive	SRMP 2011-2013

Two-tailed 95% (Lower and Upper) confidence limits were used for these EWQ targets

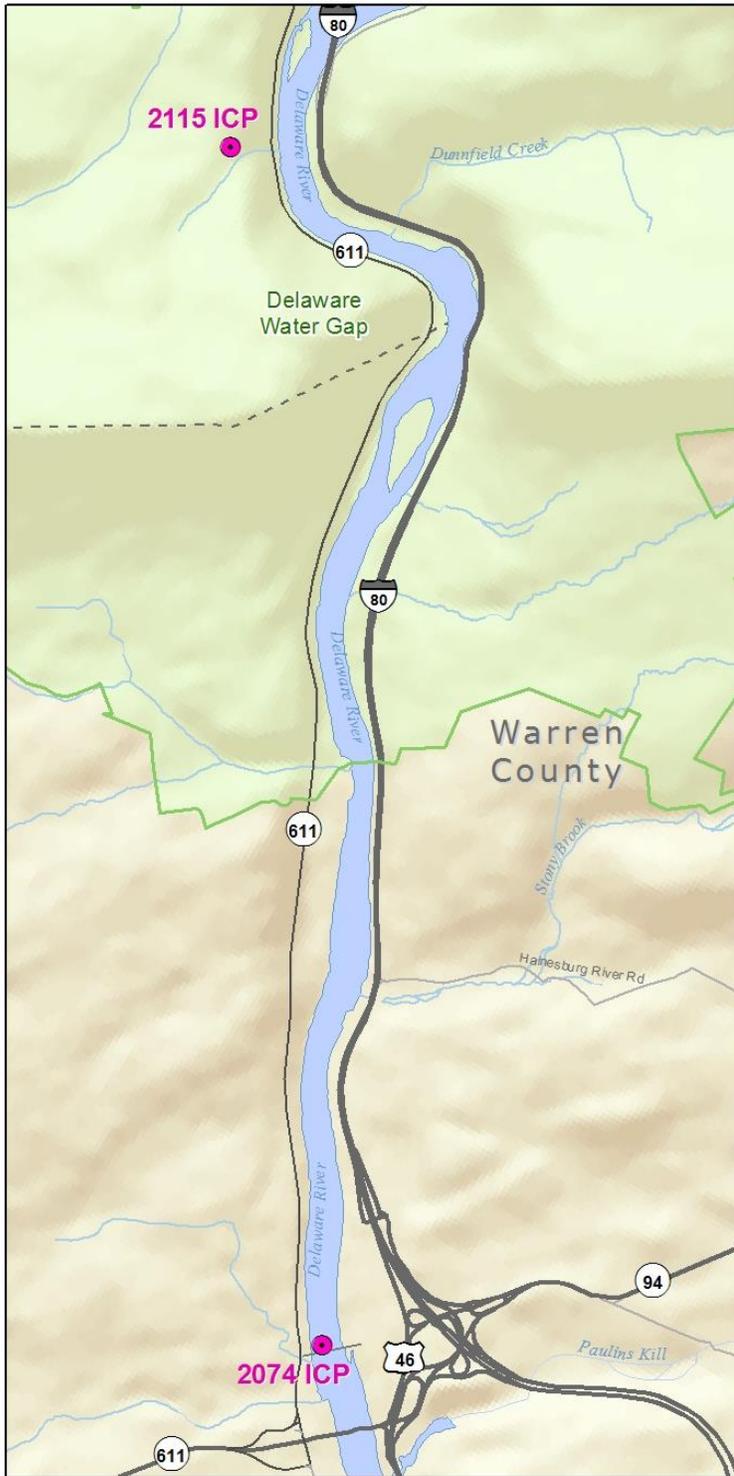
* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

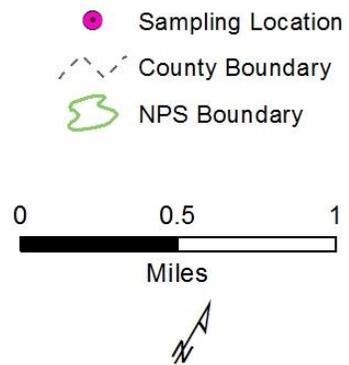
Slateford Creek is located at the southern terminus of the Delaware Water Gap National Recreation Area (shown in green on the map). DRBC took 30 samples from the National Park Drive road crossing for the May to September period of three years: 2011-2013. The watershed is only 2.97 square miles, and was chosen for EWQ establishment not because of the stream’s potential influence upon the Delaware River, which is small, but because of pending development in the watershed and for the watershed’s partial location within the Delaware Water Gap National Recreation Area.

Lower Delaware Scenic and Recreational River: Significant Resource Waters

2074 ICP Delaware River at Portland Footbridge



2074 ICP
Delaware River at Portland Foot Bridge



2074 ICP Delaware River at Portland Footbridge

Warren County, NJ – Northampton County, PA; Latitude 40.92417 Longitude -75.09611 by GPS NAD83 decimal degrees.

USGS/NJDEP site no 01443000.

Watershed Population figures were not calculated for main-stem Delaware River sites.

Drainage Area: 4,165 square miles, Delaware River Zone 1D

Site Specific EWQ defined 2000-2004 by the DRBC/NPS Scenic Rivers Monitoring Program.

Classified by DRBC as Significant Resource Waters

Nearest upstream Interstate Control Point: 2115 ICP Delaware River at Kittatinny Visitor Center off I-80

Nearest downstream Interstate Control Point: 1978 ICP Delaware River at Belvidere Bridge

Known dischargers within watershed: Undefined

Tributaries to upstream reach: Major tributaries 2114 BCP Dunnfield Creek, NJ, 2095 BCP Slateford Creek, PA; minor tributaries 208.8 Stony Brook, NJ, 207.5 Jacoby Creek, PA.

No Stream Stats web site data available (drainage area too large to calculate on web site).

Flow Statistics Associated with Water Quality Samples (calculated by drainage area weighting from USGS gage data):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
193,785	15,705	9,111	6,254	4,904	3,903	2,737	2,021	1,039

Existing Water Quality: 2074 ICP Delaware River at Portland Footbridge

Parameter (Y)	Definition of Existing Water Quality			
	Median	Lower 95%CI	Upper 95%CI	Flow-Relationships Site specific regression equation.
Ammonia NH3-N (mg/L) *	<0.05	<0.05	<0.05	
Chloride (mg/L)	12	11	13	$Y = -0.00019515 Q + 13.325$
Chlorophyll a (mg/m ³)	2.13	1.30	2.70	
Dissolved Oxygen (mg/L) mid-day*	8.70	8.38	9.06	
Dissolved Oxygen Saturation (%)	97%	95%	99%	
E. coli (colonies/100 ml)	16	8	25	$Y = \text{antilog} (0.00007074 Q + 0.6659)$
Enterococcus (colonies/100 ml)	20	12	60	
Fecal coliform (colonies/100 ml) *	20	12	36	$Y = \text{antilog} (0.00006854 Q + 0.955)$
Nitrate NO3-N (mg/L) *	0.68	0.48	0.74	
Orthophosphate (mg/L)	0.01	<0.01	0.01	
pH *	7.40	7.29	7.58	
Specific Conductance (uS/cm)	97	88	104	$Y = -0.00151181 Q + 106.6$
Total Dissolved Solids (mg/L)	83	74	91	
Total Kjeldahl Nitrogen (mg/L)	0.29	0.19	0.40	
Total Nitrogen (mg/L) *	0.86	0.74	1.05	
Total Phosphorus (mg/L) *	0.04	0.03	0.05	
Total Suspended Solids (mg/L) *	3.0	2.0	4.0	$Y = 0.00122363 Q - 2.8618$
Turbidity (NTU)	1.6	1.1	2.8	$Y = \text{antilog} (0.00005157 Q - 0.1356)$
Alkalinity (mg/L)	20	16	22	$Y = -0.00046984 Q + 23.547$
Hardness (mg/L)	30	28	31	

EWQ values represent data collected twice per month from May through September 2000-2004. Table from DRBC Water Quality Regulations.

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ.

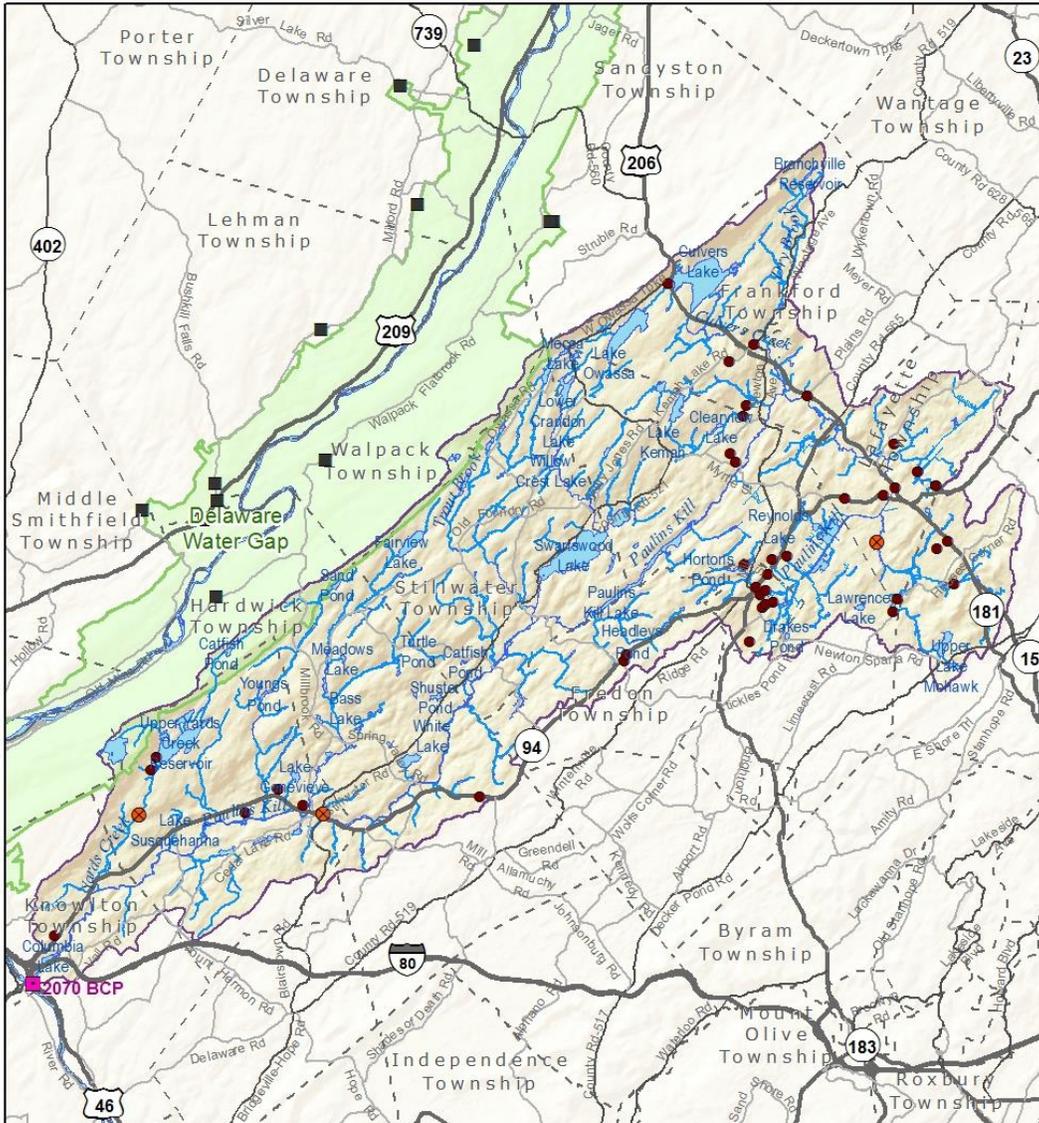
Implementation guidance should be consulted for discharge evaluations.

** = EWQ exceeds DRBC or state water quality criteria. Discharge evaluations should be conducted at criterion concentration.

Corrections 2016:

Orthophosphate lower 95% CL should be <0.01 mg/L. Listed in rule as 0.005 mg/L.

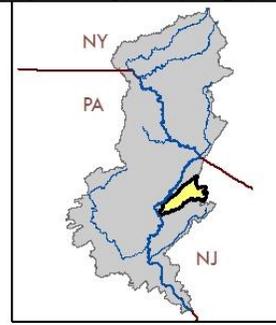
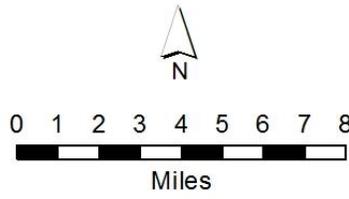
2070 BCP Paulins Kill at Rt. 46, NJ



Paulins Kill

Drainage Area = 177.07 mi²

- Sampling Location
- Other Sampling Location
- NPDES
- Stream Gage
- Drainage Area
- NPS Boundary



2070 BCP Paulins Kill at Rt. 46, NJ

Warren County, NJ. Latitude 40.92083 Longitude -75.08833 by GPS NAD83 decimal degrees.

USGS/NJDEP site 01444100

Watershed Population: 2000 = 37,762 Population 2010 = 39,226 Change: +1,464 (+3.9%)

Drainage Area: 177 square miles, tributary to Delaware River Zone 1D

Site Specific EWQ defined 2000-2004 by the DRBC/NPS Scenic Rivers Monitoring Program.

Classified by DRBC as Significant Resource Waters.

Nearest upstream Interstate Control Point: 2074 ICP Delaware River at Portland Foot Bridge

Nearest downstream Interstate Control Point: 1978 ICP Delaware River at Belvidere

Known dischargers within watershed: Many, as yet undefined.

Watershed is 62% forested; urban land cover is 5.9%. Watershed was 100% glaciated, and 29% underlain by carbonate bedrock. Mean annual precipitation 45.6 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics Associated with Water Quality Samples (USGS BaSE Model). Due to hydropower generation and peaking, these statistics are best estimates of flow percentiles. Flows associated with water quality sampling were obtained using a benchmark gage height and a stream discharge curve generated for this project:

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
13,145	580	335	246	200	160	103	54.5	12.02

StreamStats Low-Flow Stream Statistics

M7D2Y (ft ³ /s)	66.1
M30D2Y (ft ³ /s)	77.2
M7D10Y (ft ³ /s)	42.4
M30D10Y (ft ³ /s)	49.2
M90D10Y (ft ³ /s)	59.0

StreamStats Mean/Baseflow Stream Statistics

QA (ft ³ /s)	295
QAH (ft ³ /s)	164
BF10YR (ft ³ /s)	149
BF25YR (ft ³ /s)	133
BF50YR (ft ³ /s)	124

StreamStats Peak-Flow Stream Statistics

PK2 (ft ³ /s)	4,590
PK5 (ft ³ /s)	7,500
PK10 (ft ³ /s)	9,880
PK50 (ft ³ /s)	16,300
PK100 (ft ³ /s)	19,600
PK500 (ft ³ /s)	28,800

Existing Water Quality: 2070 BCP Paulins Kill at Rt. 46, NJ

Parameter (Y)	Definition of Existing Water Quality			
	Median	Lower 95%CI	Upper 95%CI	Flow-Relationships Site specific regression equation.
Ammonia NH3-N (mg/L) *	0.06	0.05	0.08	
Chloride (mg/L)	41.9	36	48	$Y = -17.4858 (\log Q) + 79.5946$
Chlorophyll a (mg/m ³)	3.3	2.7	5.3	
Dissolved Oxygen (mg/L) mid-day *	7.95	7.31	8.39	
Dissolved Oxygen Saturation (%)	88%	83%	91%	
E. coli (colonies/100 ml)	75	40	140	$Y = \text{antilog} (0.7993 (\log Q) + 0.157)$
Enterococcus (colonies/100 ml)	120 **	84 **	180 **	
Fecal coliform (colonies/100 ml) *	110	84	190	$Y = \text{antilog} (0.967 (\log Q) - 0.0255)$
Nitrate NO3-N (mg/L) *	0.75	0.70	0.86	
Orthophosphate (mg/L)	0.02	0.01	0.02	
pH *	7.79	7.70	7.87	
Specific Conductance (µS/cm)	416	380	453	$Y = -141.2449 (\log Q) + 715.5098$
Total Dissolved Solids (mg/L)	280	250	300	$Y = -75.186 (\log Q) + 426.1389$
Total Kjeldahl Nitrogen (mg/L)	0.39	0.29	0.53	
Total Nitrogen (mg/L) *	1.13	0.99	1.28	
Total Phosphorus (mg/L) *	0.05	0.05	0.06	
Total Suspended Solids (mg/L) *	7.0	5.0	8.0	
Turbidity (NTU)	4.0	3.0	4.8	$Y = \text{antilog} (0.4057 (\log Q) - 0.269)$
Alkalinity (mg/L)	125	110	140	$Y = -49.5 (\log Q) + 229.2$
Hardness (mg/L)	158	140	176	$Y = -56.8657 (\log Q) + 280.7477$

Two-tailed 95% (Lower and Upper) confidence limits were used for these EWQ targets

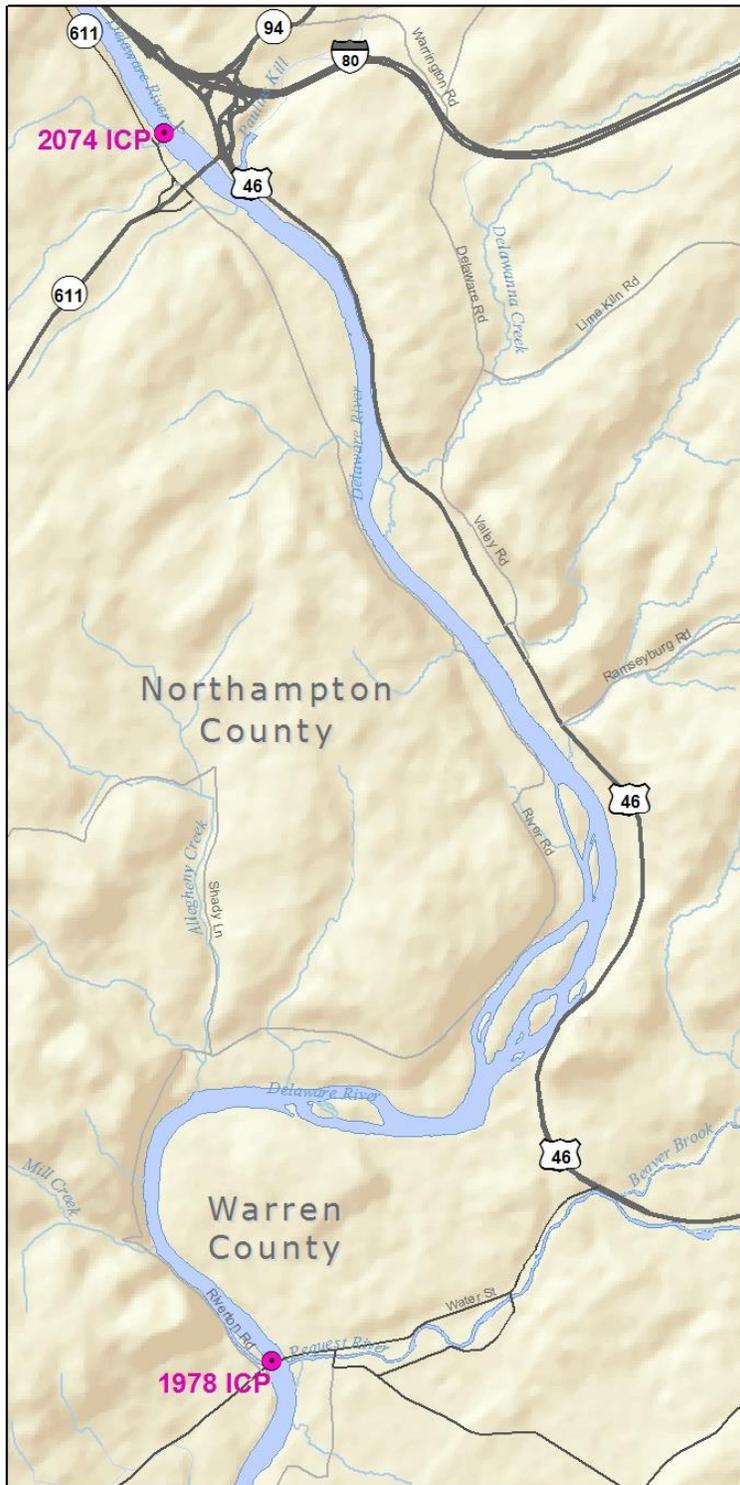
Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

EWQ established 2000-2004 by DRBC

Corrections 2016:

Ammonia lower 95% CL should be 0.05 mg/L. Listed in rule as 0.04 mg/L.

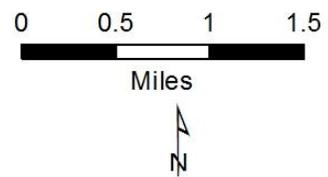
1978 ICP Delaware River at Belvidere, NJ/PA



1978 ICP
Delaware River at Belvidere Bridge



- Sampling Location
- County Boundary



1978 ICP Delaware River at Belvidere, NJ/PA

Warren County, NJ / Northampton County, PA; Latitude 40.82889 Longitude -75.085 by GPS NAD83 decimal degrees.

USGS site 01444800, PADEP site WQN0194

Watershed Population figures were not calculated for main-stem Delaware River sites.

Drainage Area: 4,535 square miles, tributary to Delaware River Zone 1D

Site Specific EWQ defined 2000-2004 by DRBC.

Classified by DRBC as Significant Resource Waters.

Nearest upstream Interstate Control Point: 2074 ICP Delaware River at Portland Foot Bridge

Nearest downstream Interstate Control Point: 1891 ICP Delaware River at Sandts Eddy Access

Known dischargers to upstream reach: undefined.

Tributaries to Upstream Reach: Major tributary 2070 BCP Paulins Kill; Minor tributaries 205.2 Delawanna Creek, NJ;

199.6 Allegheny Creek, PA; 198.7 Mill Creek, PA.

No Stream Stats web site data available (drainage area too large to calculate on web site).

Flow Statistics Associated with Water Quality Samples (USGS Gage 01444800 1975-2014):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
211,000	17,100	9,920	6,810	5,340	4,250	2,980	2,200	1,130

Existing Water Quality: 1978 ICP Delaware River at Belvidere, NJ/PA

Delaware River at Belvidere-Riverton Bridge, NJ/PA, River Mile 197.84

Parameter (Y)	Definition of Existing Water Quality			
	Median	Lower 95%CI	Upper 95%CI	Flow-Relationships Site specific regression equation.
Ammonia NH ₃ -N (mg/L) *	<0.05	<0.05	<0.05	
Chloride (mg/L)	14	12	15	Y = -0.00020113 Q + 14.872
Chlorophyll a (mg/m ³)	1.9	1.3	2.7	
Dissolved Oxygen (mg/L) mid-day*	8.52	8.00	8.95	
Dissolved Oxygen Saturation (%)	94%	92%	96%	
E. coli (colonies/100 ml)	20	5	30	Y = antilog (0.00005716 Q + 0.8244)
Enterococcus (colonies/100 ml)	50	35	68	
Fecal coliform (colonies/100 ml) *	30	20	50	Y = antilog (0.00006282 Q + 1.0055)
Nitrate NO ₃ -N (mg/L) *	0.53	0.47	0.71	
Orthophosphate (mg/L)	<0.01	<0.01	0.02	
pH *	7.49	7.25	7.60	
Specific Conductance (uS/cm)	111.5	105	125	Y = -0.00185194 Q + 125.8
Total Dissolved Solids (mg/L)	98	86	100	
Total Kjeldahl Nitrogen (mg/L)	0.33	0.24	0.40	
Total Nitrogen (mg/L) *	0.89	0.82	1.11	
Total Phosphorus (mg/L) *	0.04	0.04	0.05	
Total Suspended Solids (mg/L) *	3.0	2.0	4.0	Y = 0.00120841 Q - 3.003
Turbidity (NTU)	1.7	1.2	2.5	Y = antilog (0.00003844 Q + 0.0483)
Alkalinity (mg/L)	26	24	28	Y = -0.00046346 Q + 29.199
Hardness (mg/L)	35	33	36	

EWQ values represent data collected twice per month from May through September 2000-2004.

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ.

Implementation guidance should be consulted for discharge evaluations.

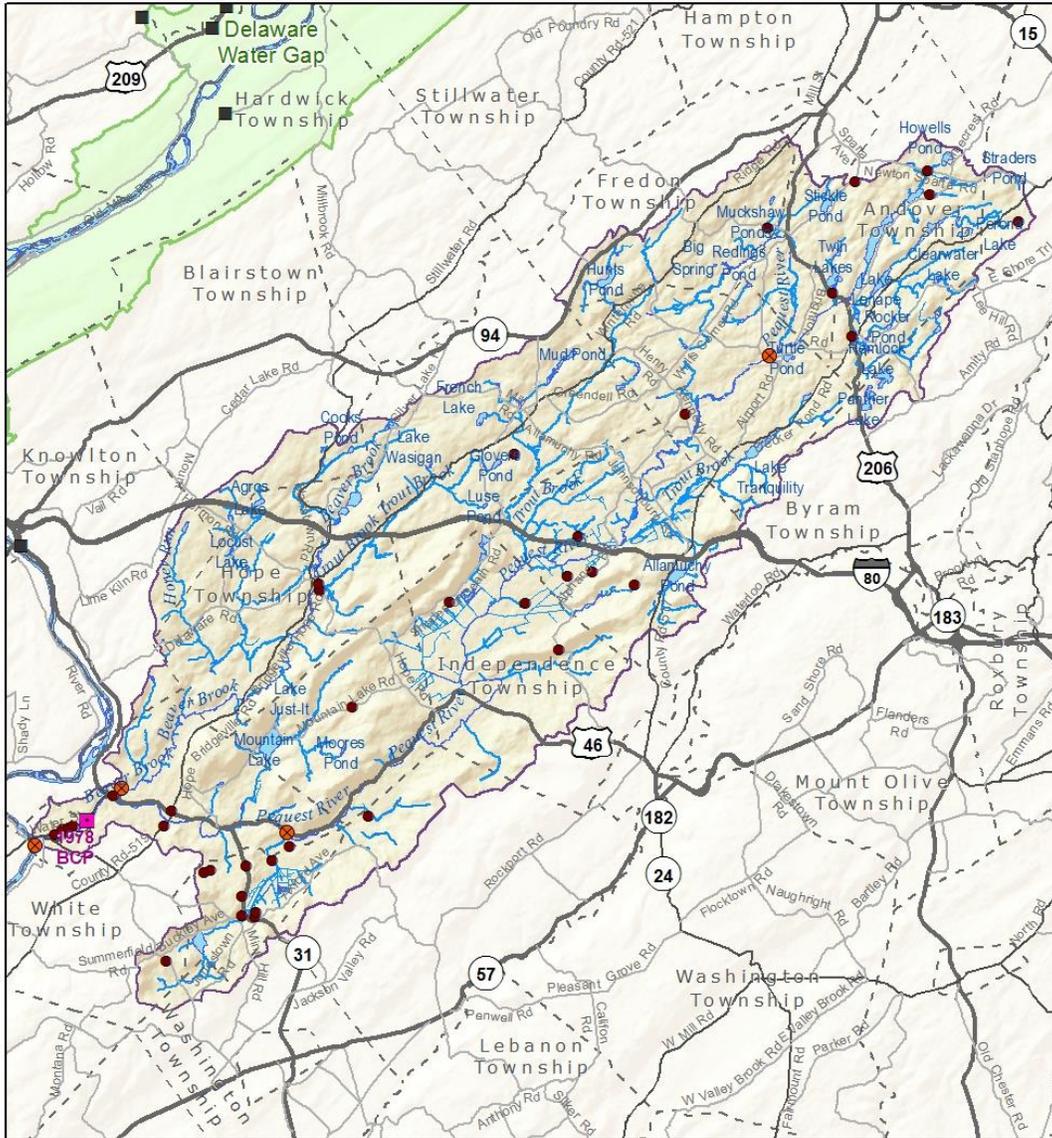
** = EWQ exceeds DRBC or state water quality criteria. Discharge evaluations should be conducted at criterion concentration.

EWQ established 2000-2004 by DRBC

Corrections 2016:

Alkalinity median should be 25 mg/L. Listed in rule as 26 mg/L.

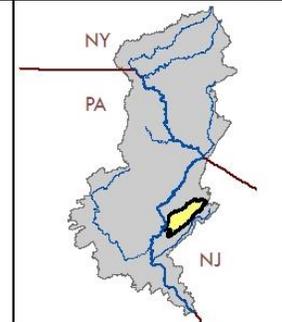
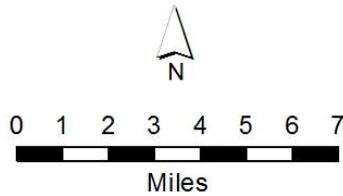
1978 BCP Pequest River at Orchard St, Belvidere, NJ



Pequest River

Drainage Area = 157.01 mi²

- Sampling Location
- Other Sampling Location
- NPDES
- Stream Gage
- Drainage Area
- NPS Boundary



1978 BCP Pequest River at Orchard St, Belvidere, NJ

Warren County, NJ. Latitude 40.83417 Longitude -75.06111 by GPS NAD83 decimal degrees.

USGS/NJDEP site 01446400 nearby

Watershed Population: 2000 = 31,927 Population 2010 = 34,023 Change: +2,096 (+6.6%)

Drainage Area: 157 square miles, tributary to Delaware River Zone 1D

Site Specific EWQ defined 2000-2004 by the DRBC.

Tributary to Significant Resource Waters.

Nearest upstream Interstate Control Point: 1978 ICP Delaware River at Belvidere

Nearest downstream Interstate Control Point: 1891 ICP Delaware River at Sandts Eddy Access

Known dischargers within watershed: Many, as yet undefined.

Watershed is 57.7% forested; urban land cover is 4.5%. Watershed was 93% glaciated, and is 47.3% underlain by carbonate bedrock. Mean annual precipitation 47 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics Associated with Water Quality Samples (USGS BaSE Model using USGS gage 01446400):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
10,206	490	304	230	188	166	116	67.4	20.4

StreamStats Low-Flow Stream Statistics

M7D2Y (ft ³ /s)	104
M30D2Y (ft ³ /s)	111
M7D10Y (ft ³ /s)	80.1
M30D10Y (ft ³ /s)	83.8
M90D10Y (ft ³ /s)	86.7

StreamStats Mean/Baseflow Stream Statistics

QA (ft ³ /s)	268
QAH (ft ³ /s)	209
BF10YR (ft ³ /s)	154
BF25YR (ft ³ /s)	138
BF50YR (ft ³ /s)	129

StreamStats Peak-Flow Stream Statistics

PK2 (ft ³ /s)	4,110
PK5 (ft ³ /s)	6,740
PK10 (ft ³ /s)	8,880
PK50 (ft ³ /s)	14,700
PK100 (ft ³ /s)	17,700
PK500 (ft ³ /s)	26,000

Existing Water Quality: 1978 BCP Pequest River, NJ

Pequest River, New Jersey, River Mile 197.80 – 1.48

Boundary Control Point is located at Orchard Street Bridge, Belvidere

Parameter (Y)	Definition of Existing Water Quality			
	Median	Lower 95%CI	Upper 95%CI	Flow-Relationships Site specific regression equation.
Ammonia NH3-N (mg/L) *	<0.05	<0.05	0.05	
Chloride (mg/L)	35.9	34.0	38.0	$Y = -12.7769 (\log Q) + 62.875$
Chlorophyll a (mg/m ³)	2.14	2.00	2.70	
Dissolved Oxygen (mg/L) mid-day *	9.89	9.37	10.37	
Dissolved Oxygen Saturation (%)	103%	99%	107%	
E. coli (colonies/100 ml)	130	110	160	$Y = \text{antilog} (0.6728 (\log Q) + 0.7112)$
Enterococcus (colonies/100 ml)	250 **	140 **	460 **	
Fecal coliform (colonies/100 ml) *	180	150	230 **	
Nitrate NO3-N (mg/L) *	1.29	1.13	1.45	
Orthophosphate (mg/L)	<0.05	<0.05	0.07	
pH *	8.20	8.10	8.30	
Specific Conductance (µS/cm)	491	472	511	$Y = -0.18929204 Q + 517.8326$
Total Dissolved Solids (mg/L)	330	310	340	$Y = -75.8279 (\log Q) + 479.4783$
Total Kjeldahl Nitrogen (mg/L)	0.47	0.32	0.55	
Total Nitrogen (mg/L) *	1.69	1.54	2.00	
Total Phosphorus (mg/L) *	0.10	0.08	0.11 **	
Total Suspended Solids (mg/L) *	6.5	4.0	11.0	
Turbidity (NTU)	3.4	2.1	5.8	$Y = \text{antilog} (1.0964 (\log Q) - 1.87)$
Alkalinity (mg/L)	189	180	200	$Y = -64.33 (\log Q) + 319.85$
Hardness (mg/L)	228	220	230	$Y = -50.0952 (\log Q) + 329.8323$

EWQ values represent data collected twice per month from May through September 2000-2004.

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ.

Implementation guidance should be consulted for discharge evaluations.

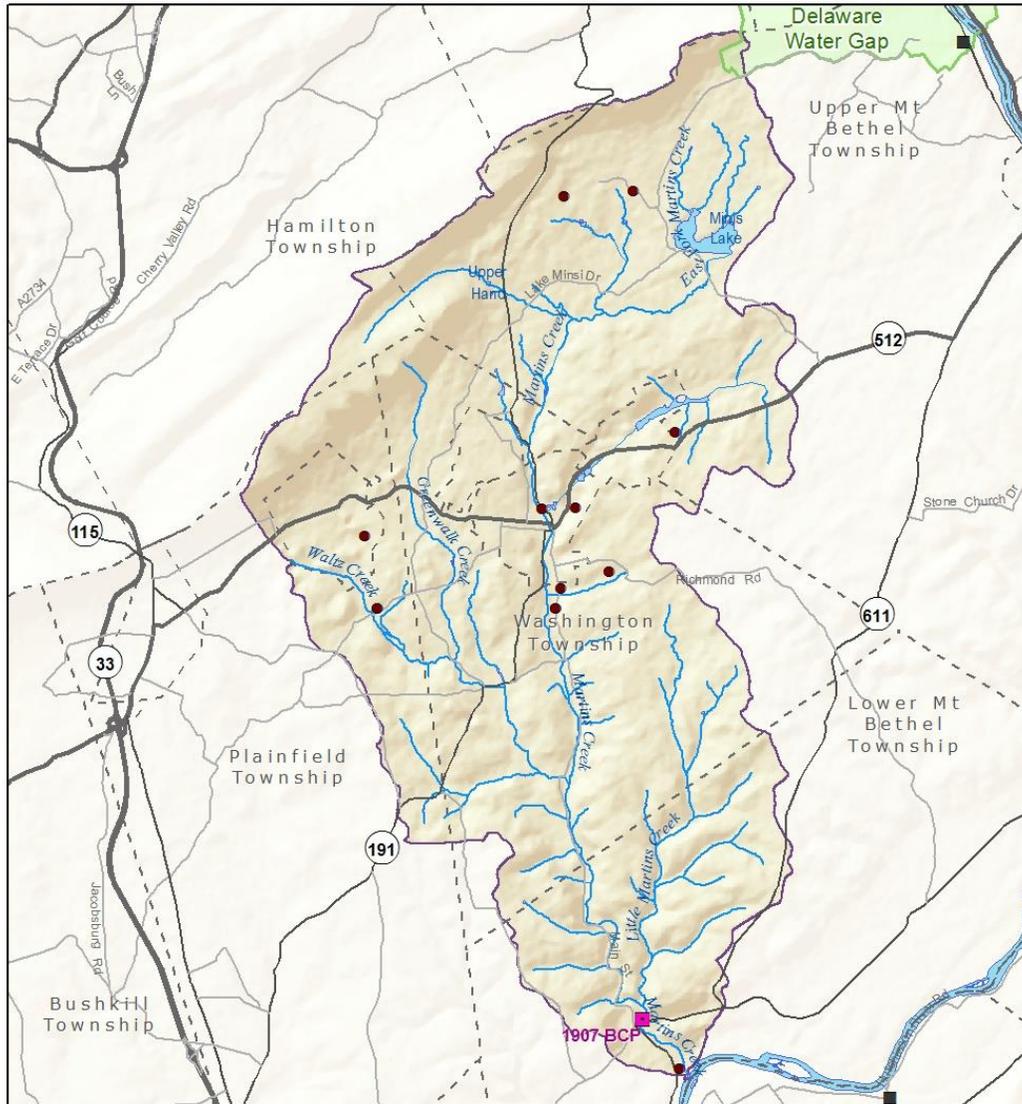
** = EWQ exceeds DRBC or state water quality criteria. Discharge evaluations should be conducted at criterion concentration.

EWQ established 2000-2004 by DRBC

Corrections 2016:

None

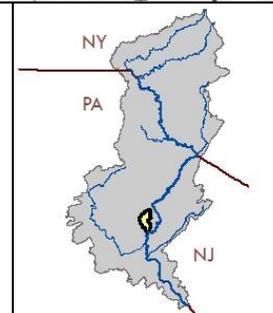
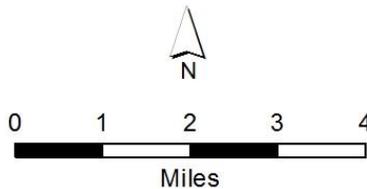
1907 BCP Martins Creek at Little Creek Road, PA



Martins Creek

Drainage Area = 44.56 mi²

- Sampling Location
- Other Sampling Location
- NPDES
- Drainage Area
- NPS Boundary



1907 BCP Martins Creek at Little Creek Road, PA

Northampton County, PA. Latitude 40.78472 Longitude -75.18472 by GPS NAD83 decimal degrees.

No PADEP or USGS sites nearby

Watershed Population: 2000 = 18,814 2010 = 19,952 Change: +1,138 (+6.0%)

Drainage Area: 44.6 square miles, tributary to Delaware River Zone 1D

Site Specific EWQ defined 2000-2004 by DRBC.

Tributary to DRBC Significant Resource Waters.

Nearest upstream Interstate Control Point: 1978 ICP Delaware River at Belvidere

Nearest downstream Interstate Control Point: 1891 ICP Delaware River at Sandts Eddy Access

Known dischargers within watershed: Some, as yet undefined.

Watershed is 54.7% forested; urban land cover is 8.4%. Watershed was 38% glaciated, and is 1.3% underlain by carbonate bedrock. Mean annual precipitation 47 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics Associated with Water Quality Samples (USGS BaSE Model):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
4,544	162	84.4	62.5	50.8	39.3	24.0	12.2	2.08

StreamStats Low-Flow Stream Statistics

M7D2Y (ft³/s) 9.99

M30D2Y (ft³/s) 12.9

M7D10Y (ft³/s) 5.11

M30D10Y (ft³/s) 6.57

M90D10Y (ft³/s) 9.45

StreamStats Mean/Baseflow Stream Statistics

QA (ft³/s) 76.2

QAH (ft³/s) 24.0

BF10YR (ft³/s) 30.3

BF25YR (ft³/s) 26.9

BF50YR (ft³/s) 25.0

StreamStats Peak-Flow Stream Statistics

PK2 (ft³/s) 1,600

PK5 (ft³/s) 2,690

PK10 (ft³/s) 3,580

PK50 (ft³/s) 5,940

PK100 (ft³/s) 7,140

PK500 (ft³/s) 10,400

Existing Water Quality: 1907 BCP Martins Creek at Little Creek Rd, PA

Martins Creek, Pennsylvania, River Mile 190.65 – 0.96

Boundary Control Point is located at Little Creek Road bridge in Martins Creek Village.

Parameter (Y)	Definition of Existing Water Quality			
	Median	Lower 95%CI	Upper 95%CI	Flow-Relationships Site specific regression equation.
Ammonia NH3-N (mg/L) *	<0.05	0.02***	0.05	
Chloride (mg/L)	21	19	24.3	$Y = -11.0817 (\log Q) + 39.9172$
Chlorophyll a (mg/m ³)	1.80	0.50	2.70	
Dissolved Oxygen (mg/L) mid-day *	9.55	9.23	9.62	
Dissolved Oxygen Saturation (%)	98%	96%	99%	
E. coli (colonies/100 ml)	150	48	350	$Y = \text{antilog} (0.7526 (\log Q) + 0.9599)$
Enterococcus (colonies/100 ml)	380	260	620	
Fecal coliform (colonies/100 ml) *	355 **	190	640 **	
Nitrate NO3-N (mg/L) *	2.38	2.04	2.80	
Orthophosphate (mg/L)	0.11	0.07	0.13	
pH *	7.73	7.6	7.78	
Specific Conductance (µS/cm)	322	283	338	$Y = -114.3186 (\log Q) + 506.634$
Total Dissolved Solids (mg/L)	229	210	250	$Y = -89.8812 (\log Q) + 373.2748$
Total Kjeldahl Nitrogen (mg/L)	0.34	0.28	0.50	
Total Nitrogen (mg/L) *	2.95	2.65	3.32	
Total Phosphorus (mg/L) *	0.13	0.10	0.20	
Total Suspended Solids (mg/L) *	4.0	2.0	5.0	
Turbidity (NTU)	2.4	1.6	4.0	$Y = \text{antilog} (0.642 (\log Q) - 0.684)$
Alkalinity (mg/L)	50	43	52	$Y = -19.48 (\log Q) + 81.48$
Hardness (mg/L)	120	112	130	$Y = -46.9931 (\log Q) + 201.407$

EWQ values represent data collected twice per month from May through September 2000-2004.

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ.

Implementation guidance should be consulted for discharge evaluations.

** = EWQ exceeds DRBC or state water quality criteria. Discharge evaluations should be conducted at criterion concentration.

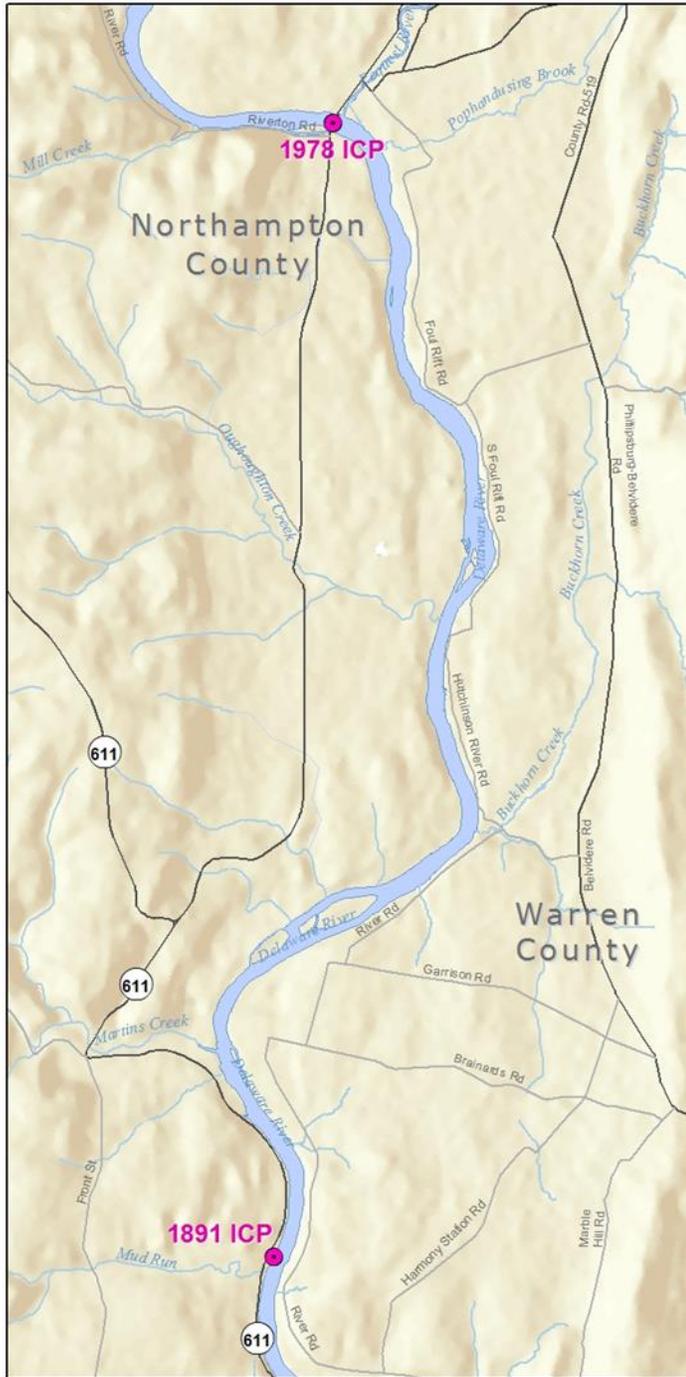
*** = Based on laboratory 'J' values reported below the 0.05 detection limit.

EWQ established 2000-2004 by DRBC

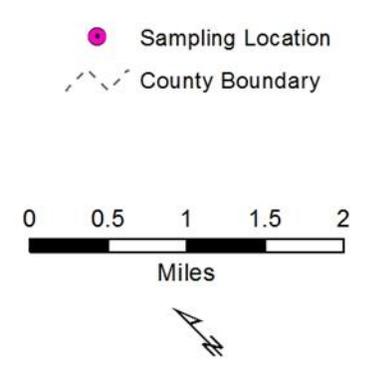
Corrections 2016:

None

1891 ICP Delaware River at Sandts Eddy Access, PA



1891 ICP
Delaware River at Sandt's Eddy Access



1891 ICP Delaware River at Sandts Eddy Access, PA

Northampton County, PA (site is sampled by wading to mid-river from PA shore, except for high water conditions)

Latitude 40.758252 Longitude -75.187719 by GPS NAD83 decimal degrees.

No USGS or State monitoring sites nearby. The closest is PADEP WQN 0148 at Martins Creek Railroad Bridge.

Watershed Population figures were not calculated for main-stem Delaware River sites.

Drainage Area: 4,610 square miles, Delaware River Zone 1D

Site Specific EWQ defined 2009-2013 by the DRBC/NPS Scenic Rivers Monitoring Program.

This site is located in the Lower Delaware Scenic and Recreational River.

Classified by DRBC as Significant Resource Waters

Nearest upstream Interstate Control Point: 1978 ICP Delaware River at Belvidere

Nearest downstream Interstate Control Point: 1838 ICP Delaware River at Easton

Known dischargers to upstream reach: Undefined

Tributaries to upstream reach: Major tributaries 1978 BCP Pequest River, NJ; 1907 BCP Martins Creek, PA; small tributaries 197.5 Pophandusing Brook, NJ; , 194.1 Oughoughton Creek, PA; 1929 BCP Buckhorn Creek, NJ.

No Stream Stats web site data available (drainage area too large to calculate on web site).

Flow Statistics Associated with Water Quality Samples (calculated by drainage area weighting from USGS gage data):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
214,500	17,400	10,100	6,920	5,430	4,320	3,030	2,240	1,150

Existing Water Quality: 1891 ICP Delaware River at Sandts Eddy Access, PA

Parameter	N	median	L95CL	U95CL	Flow Relation	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	49	36.1	33.1	38.1	None	2009-2013 SRMP
Aluminum, Dissolved mg/L	14	0.006	0.005	0.009	None	2009-2010 SRMP archived*
Ammonia-Nitrogen as N, Total mg/L *	47	0.009	0.006	0.011	None	2009-2013 SRMP (14 non-detect)
Barium, Dissolved mg/L	14	0.017	0.012	0.023	None	2009-2010 SRMP archived*
Calcium, Dissolved mg/L	14	8.66	7.18	9.77	None	2009-2010 SRMP archived*
Chloride, Total mg/L	49	16.8	15.8	17.2	Inverse	2009-2013 SRMP
Dissolved Oxygen (DO) mg/L *	47	9.35	8.85	9.55	None	2009-2013 SRMP mid-day
Dissolved Oxygen Saturation %	46	106.8	100.5	109.8	None	2009-2013 SRMP mid-day
Enterococcus #/100mL {1}	28	47	27	90	None	2009-2011 SRMP
Escherichia coli #/100mL	29	21	14	50	Positive	2009-2011 SRMP
Fecal coliform #/100mL *	29	29	20	50	Positive	2009-2011 SRMP
Hardness as CaCO ₃ , Total mg/L	49	52	48.8	55	None	2009-2013 SRMP
Magnesium, Dissolved mg/L	14	3.04	1.89	3.55	Inverse	2009-2010 SRMP archived*
Manganese, Dissolved µg/L	14	2.6	1.4	4.5	Positive	2009-2010 SRMP archived*
Nitrate + Nitrite as N, Total mg/L *	49	0.323	0.286	0.429	None	2009-2013 SRMP
Nitrogen, Kjeldahl as N, Total mg/L	49	0.229	0.217	0.251	None	2009-2013 SRMP
Nitrogen as N, Total mg/L *	49	0.605	0.521	0.680	None	2009-2013 SRMP
Orthophosphate as P, Total mg/L	49	0.018	0.016	0.021	None	2009-2013 SRMP
pH units *	47	7.96	7.75	8.20	Inverse	2009-2013 SRMP mid-day
Phosphorus as P, Total mg/L *	49	0.028	0.024	0.031	None	2009-2013 SRMP
Potassium, Dissolved mg/L	14	0.95	0.70	1.10	Inverse	2009-2010 SRMP archived*
Sodium, Dissolved mg/L	14	8.79	6.79	9.29	Inverse	2009-2010 SRMP archived*
Specific Conductance µS/cm	47	166	159	172	Inverse	2009-2013 SRMP mid-day
Strontium, Dissolved mg/L	14	0.045	0.035	0.05	Inverse	2009-2010 SRMP archived*
Sulfate as SO ₄ , Total mg/L	14	9.39	6.67	11.30	Inverse	2009-2010 SRMP archived*
Temperature, Water, degrees C	47	21.4	20.6	22.5	None	2009-2013 SRMP mid-day
Total Dissolved Solids (TDS) mg/L	49	83	81	87	None	2009-2013 SRMP
Total Suspended Solids (TSS) mg/L *	49	1.8	1.5	3.0	Positive	2009-2013 SRMP
Turbidity NTU	70	1.10	0.99	1.38	Positive	2009-2013 SRMP

Two-tailed 95% lower (L95CL) and upper (U95CL) confidence limits were used for these EWQ targets

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

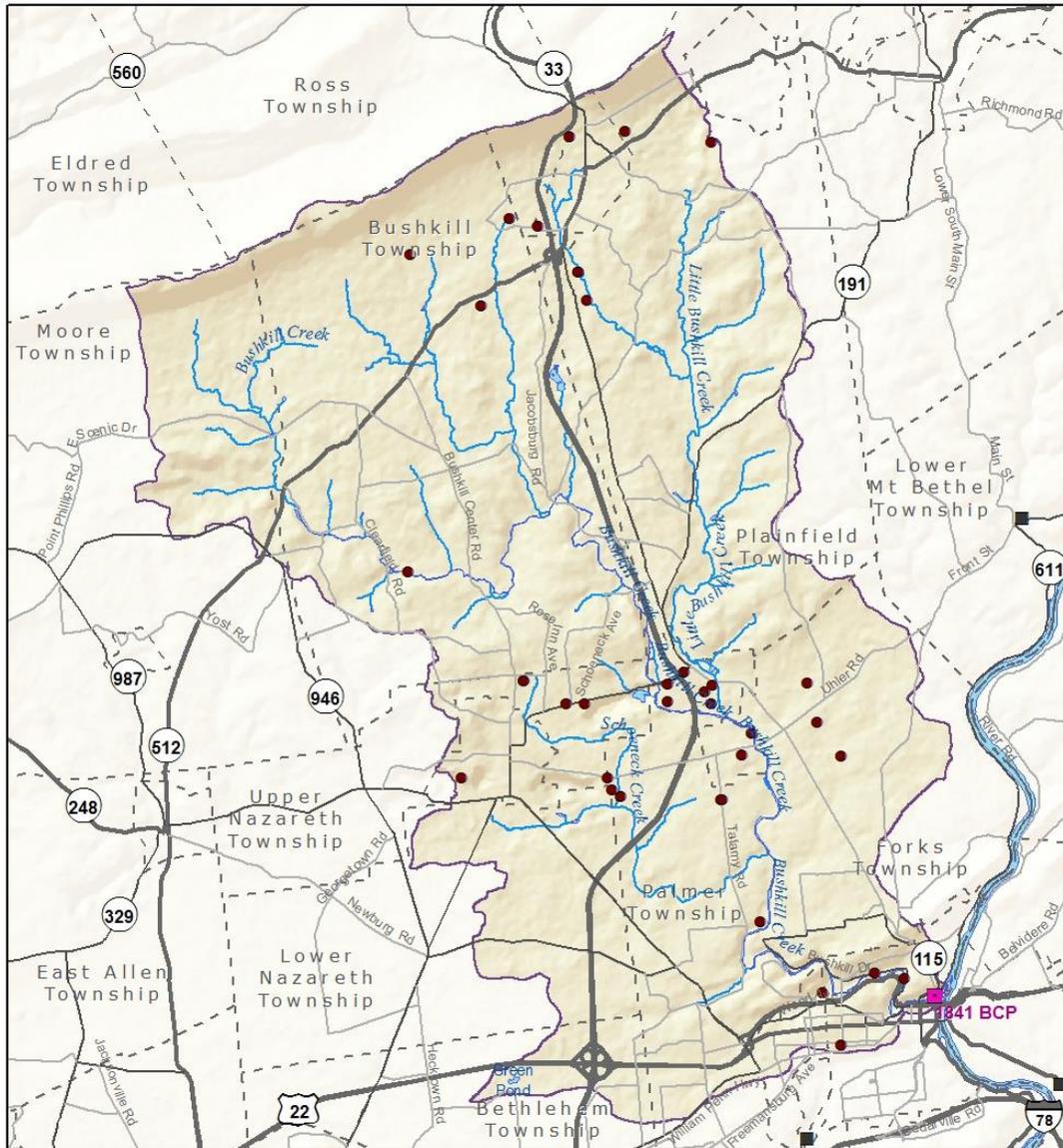
Note: All data are May to September season.

Note: Parameters denoted “archived” were 2009-2010 frozen samples analyzed in 2011 in anticipation of establishing background water quality conditions prior to natural gas development.

*Insufficient number of data to establish Existing Water Quality.

{1}: Median enterococcus concentrations exceed outdated NJ freshwater criterion.

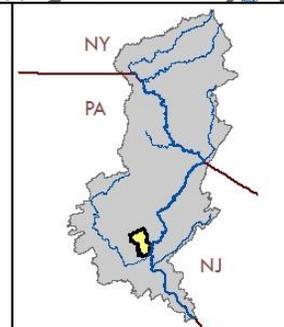
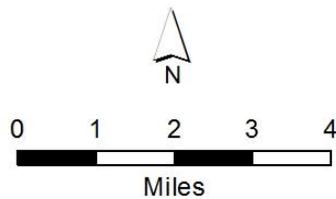
1841 BCP Bushkill Creek at Rt. 611, Easton, PA



Bushkill

Drainage Area = 79.98 mi²

- Sampling Location
- Other Sampling Location
- NPDES
- Drainage Area



1841 BCP Bushkill Creek at Rt. 611, Easton, PA

Northampton County, PA. Latitude 40.695767 Longitude -75.205612 by GPS NAD83 decimal degrees.

No USGS or PADEP sites nearby. Closest is USGS 01446900 by Penn Pump Park in Forks Township above Easton

Watershed Population: 2000 = 59,221 2010 = 70,864 Change: +11,643 (+19.7%)

Drainage Area: 80 square miles, tributary to Delaware River Zone 1D

Site Specific EWQ defined 2000-2004 by DRBC.

Tributary to DRBC Significant Resource Waters.

Nearest upstream Interstate Control Point: 1891 ICP Delaware River at Sandts Eddy Access

Nearest downstream Interstate Control Point: 1838 ICP Delaware River at Northampton St., Easton

Known dischargers within watershed: Many, as yet undefined.

Watershed is 31% forested; urban land cover is 15.1%. Watershed was not glaciated, and is 37.8% underlain by carbonate bedrock. Mean annual precipitation 45 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics from USGS BaSE Model:

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
5,700	233	146	102	82.8	67.2	47.4	27.0	5.58

BaSE model low flows are rarely, if ever encountered. An upstream quarry dewatering operation supports Bushkill Creek's flow at a minimum around the 40th flow percentile, or about 67 cfs. The quarry pumps about 60 cfs continually to the stream unless the pumps are out of operation, which is very rare.

StreamStats Low-Flow Stream Statistics

M7D2Y (ft ³ /s)	36.1
M30D2Y (ft ³ /s)	42.9
M7D10Y (ft ³ /s)	20.5
M30D10Y (ft ³ /s)	25.0
M90D10Y (ft ³ /s)	32.1

StreamStats Mean/Baseflow Stream Statistics

QA (ft ³ /s)	121
QAH (ft ³ /s)	72.8
BF10YR (ft ³ /s)	55.1
BF25YR (ft ³ /s)	48.5
BF50YR (ft ³ /s)	44.8

StreamStats Peak-Flow Stream Statistics

PK2 (ft ³ /s)	2,890
PK5 (ft ³ /s)	4,810
PK10 (ft ³ /s)	6,330
PK50 (ft ³ /s)	10,400
PK100 (ft ³ /s)	12,400
PK500 (ft ³ /s)	17,900

Existing Water Quality: 1841 BCP Bushkill Creek at Rt. 611, Easton, PA

Bushkill Creek, Northampton County, Pennsylvania, River Mile 184.10 – 0.05

Boundary Control Point is located at Route 611 bridge, Easton.

Parameter (Y)	Definition of Existing Water Quality			
	Median	Lower 95%CI	Upper 95%CI	Flow-Relationships Site specific regression equation.
Ammonia NH3-N (mg/L) *	0.10	0.07	0.13	
Chloride (mg/L)	27	25	28.4	$Y = -13.4942 (\log Q) + 54.7837$
Chlorophyll a (mg/m ³)	n/a	n/a	n/a	n/a
Dissolved Oxygen (mg/L) mid-day *	10.10	9.69	10.30	
Dissolved Oxygen Saturation (%)	102%	100%	104%	
E. coli (colonies/100 ml)	330	220	620	
Enterococcus (colonies/100 ml)	350	280	540	
Fecal coliform (colonies/100 ml) *	540 **	370 **	880 **	
Nitrate NO3-N (mg/L) *	3.90	3.63	4.26	
Orthophosphate (mg/L)	0.02	0.02	0.03	
pH *	8.00	7.99	8.08	
Specific Conductance (µS/cm)	578	542	615	$Y = -1.32108663 Q + 751.3559$
Total Dissolved Solids (mg/L)	410	360	440	$Y = -394.9208 (\log Q) + 1231.0249$
Total Kjeldahl Nitrogen (mg/L)	0.40	0.29	0.50	
Total Nitrogen (mg/L) *	4.37	4.11	4.73	
Total Phosphorus (mg/L) *	0.05	0.04	0.07	
Total Suspended Solids (mg/L) *	5.0	3.0	8.0	
Turbidity (NTU)	3.0	2.5	5.1	
Alkalinity (mg/L)	140	130	155	$Y = -152.34 (\log Q) + 459$
Hardness (mg/L)	218	210	225	$Y = -159.4372 (\log Q) + 549.8009$

EWQ values represent data collected twice per month from May through September 2000-2004.

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ.

Implementation guidance should be consulted for discharge evaluations.

** = EWQ exceeds DRBC or state water quality criteria. Discharge evaluations should be conducted at criterion concentration.

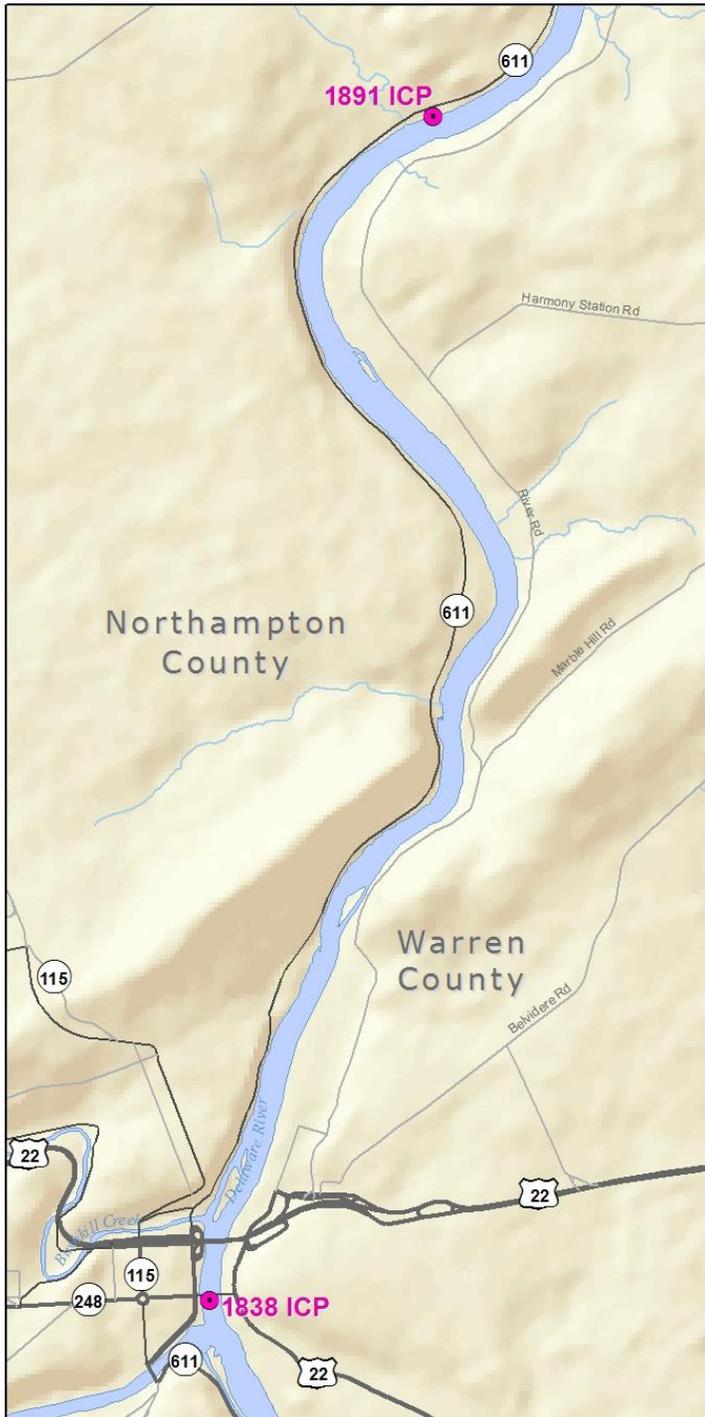
EWQ established 2000-2004 by DRBC

Corrections 2016:

Total Nitrogen median should be 4.37 mg/L. Listed in rules as 4.41 mg/L.

Total Phosphorus upper 95% CL should be 0.07 mg/L. Listed in rule as 0.06 mg/L.

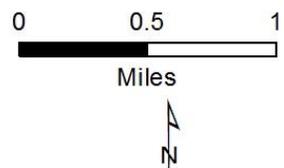
1838 ICP Delaware River at Northampton Street Bridge, PA/NJ



1838 ICP
Delaware River at Northampton Street Bridge



- Sampling Location
- - - County Boundary



1838 ICP Delaware River at Northampton Street Bridge, PA/NJ

Northampton County, PA to Warren County, NJ

Latitude 40.69111 Longitude -75.20417 by GPS NAD83 decimal degrees.

USGS site no 01447000

Watershed Population figures were not calculated for main-stem Delaware River sites.

Drainage Area: 4,717 square miles, Delaware River Zone 1D

Site Specific EWQ defined 2009-2013 by the DRBC/NPS Scenic Rivers Monitoring Program.

This site is located in the Lower Delaware Scenic and Recreational River.

Classified by DRBC as Significant Resource Waters

Nearest upstream Interstate Control Point: 1891 ICP Delaware River at Sandts Eddy Access

Nearest downstream Interstate Control Point: 1748 ICP Delaware River at Riegelsville

Known dischargers within upstream reach: Undefined

Tributaries to upstream reach: Major tributary 1841 BCP Bushkill Creek; Small tributary 188.9 Mud Run, PA.

No Stream Stats web site data available (drainage area too large to calculate on web site).

Flow Statistics Associated with Water Quality Samples (calculated by drainage area weighting from USGS gage data):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
219,468	17,786	10,318	7,083	5,554	4,421	3,100	2,288	1,175

Existing Water Quality: 1838 ICP Delaware River at Northampton St. Bridge

Delaware River at Northampton Street Bridge, Easton-Phillipsburg, PA/NJ, River Mile 183.82

Parameter (Y)	Definition of Existing Water Quality			
	Median	Lower 95%CI	Upper 95%CI	Flow-Relationships Site specific regression equation.
Ammonia NH3-N (mg/L) *	<.05	<.05	<0.05	
Chloride (mg/L)	16	14	17	$Y = -0.00022184 Q + 16.751$
Chlorophyll a (mg/m ³)	1.45	1.07	2.14	
Dissolved Oxygen (mg/L) mid-day*	8.10	7.90	8.58	
Dissolved Oxygen Saturation (%)	95%	92%	96%	
E. coli (colonies/100 ml)	31	24	64	$Y = \text{antilog}(0.00004425 Q + 1.273)$
Enterococcus (colonies/100 ml)	145	80	250	
Fecal coliform (colonies/100 ml) *	100	64	130	$Y = \text{antilog}(0.00004016 Q + 1.6615)$
Nitrate NO3-N (mg/L) *	0.85	0.70	0.90	
Orthophosphate (mg/L)	0.02	0.01	0.02	
pH *	7.55	7.41	7.70	
Specific Conductance (µS/cm)	142	127	155	$Y = -0.0024666 Q + 158.76$
Total Dissolved Solids (mg/L)	110	103	120	
Total Kjeldahl Nitrogen (mg/L)	0.35	0.26	0.46	
Total Nitrogen (mg/L) *	1.19	1.01	1.35	
Total Phosphorus (mg/L) *	0.05	0.04	0.06	
Total Suspended Solids (mg/L) *	4.0	3.0	5.0	$Y = 0.00177536 Q - 4.8027$
Turbidity (NTU)	2.6	1.8	4.0	$Y = \text{antilog}(0.00003836 Q + 0.1845)$
Alkalinity (mg/L)	34	30	39	$Y = -0.00073929 Q + 39.867$
Hardness (mg/L)	48	45	52	

EWQ values represent data collected twice per month from May through September 2000-2004.

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

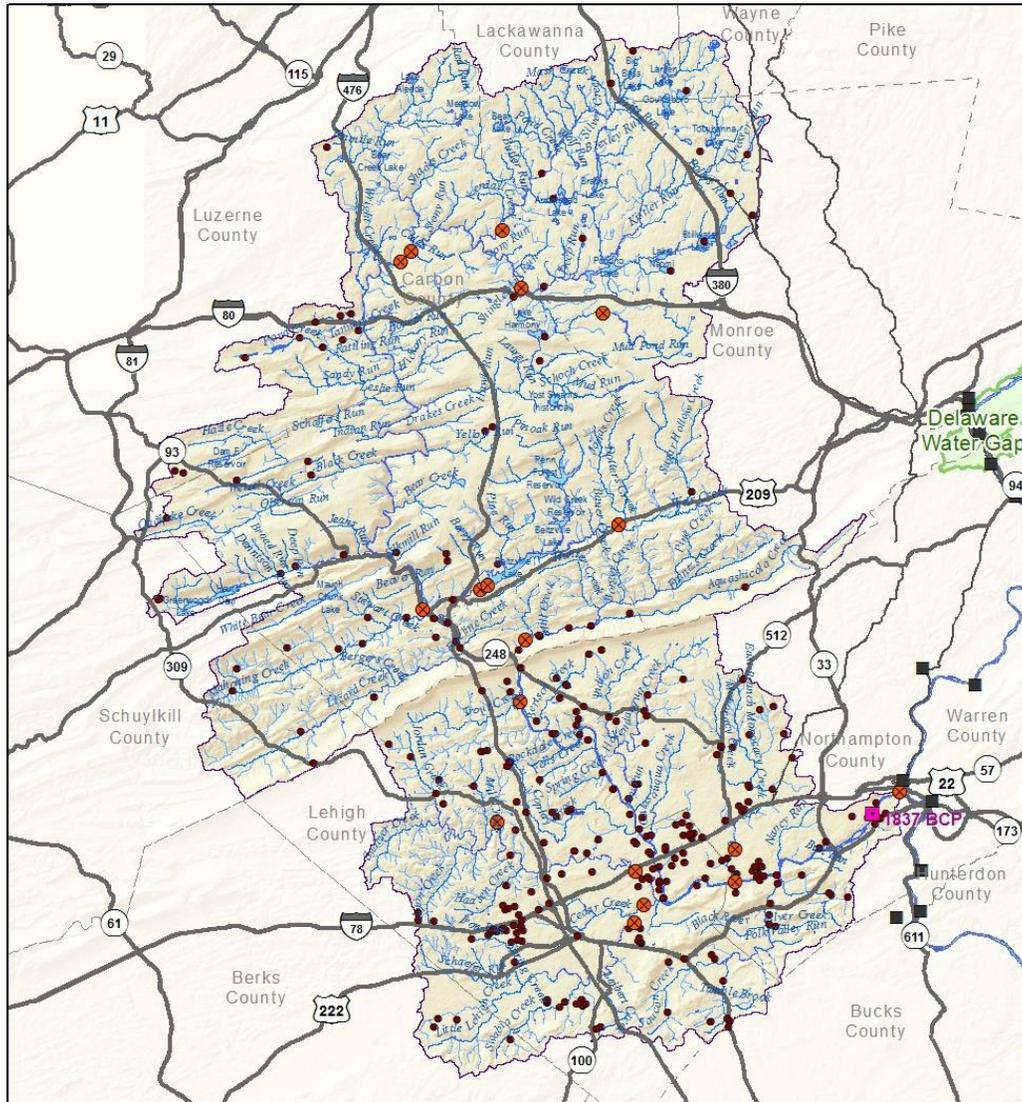
** = EWQ exceeds DRBC or state water quality criteria. Discharge evaluations should be conducted at criterion concentration.

EWQ established 2000-2004 by DRBC

Corrections 2016:

None

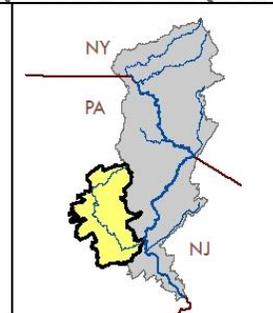
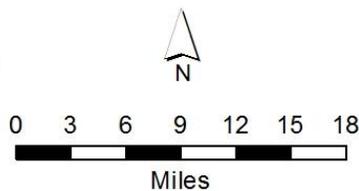
1837 BCP Lehigh River at Rt. 611, Easton, PA



Lehigh River

Drainage Area = 1360.69 mi²

- Sampling Location
- Other Sampling Location
- NPDES
- Stream Gauge
- Drainage Area
- NPS Boundary



1837 BCP Lehigh River at Rt. 611, Easton, PA

Multiple PA Counties: Northampton; Bucks; Lehigh; Berks; Carbon; Schuylkill; Luzerne; Lackawanna; Wayne

Latitude 40.66917 Longitude -75.23667 by GPS NAD83 decimal degrees.

USGS site 01454720, upstream gage USGS 01454700; PADEP site WQN0123

Watershed Population: 2000 = 604,954 2010 = 676,939 Change: +71,985 (+11.9%)

Drainage Area: 1362 square miles, tributary to Delaware River Zone 1E

Site Specific EWQ defined 2000-2004 by DRBC.

Tributary to DRBC Significant Resource Waters.

Nearest upstream Interstate Control Point: 1838 ICP Delaware River at Northampton St. Bridge, Easton

Nearest downstream Interstate Control Point: 1748 ICP Delaware River at Riegelsville

Known dischargers within watershed: Many, as yet undefined.

Watershed is 60.3% forested; urban land cover is 9.9%. Watershed was 28% glaciated, and is 16% underlain by carbonate bedrock. Mean annual precipitation 46 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics Associated with Water Quality Samples (Using USGS Lehigh River gage 01454700 at Glendon, PA):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
99,966	5,488	3,183	2,500	2,100	1,730	1,037	626	171

StreamStats Low-Flow Stream Statistics

M7D2Y (ft ³ /s)	542
M30D2Y (ft ³ /s)	631
M7D10Y (ft ³ /s)	372
M30D10Y (ft ³ /s)	429
M90D10Y (ft ³ /s)	512

StreamStats Mean/Baseflow Stream Statistics

QA (ft ³ /s)	2,520
QAH (ft ³ /s)	1,250
BF10YR (ft ³ /s)	1,080
BF25YR (ft ³ /s)	965
BF50YR (ft ³ /s)	899

StreamStats Peak-Flow Stream Statistics

PK2 (ft ³ /s)	29,500
PK5 (ft ³ /s)	46,100
PK10 (ft ³ /s)	59,300
PK50 (ft ³ /s)	94,900
PK100 (ft ³ /s)	113,000
PK500 (ft ³ /s)	162,000

Existing Water Quality: 1837 BCP Lehigh River at Rt. 611, PA

Lehigh River, Pennsylvania, River Mile 183.66 – 0.27
Boundary Control Point is located at Route 611 bridge, Easton.

Parameter (Y)	Definition of Existing Water Quality			
	Median	Lower 95%CI	Upper 95%CI	Flow-Relationships Site specific regression equation.
Ammonia NH3-N (mg/L) *	0.08	0.06	0.09	
Chloride (mg/L)	21	19	24	$Y = -16.5077 (\log Q) + 76.7534$
Chlorophyll a (mg/m ³)	2.70	1.80	3.60	
Dissolved Oxygen (mg/L) mid-day *	8.85	8.39	9.20	
Dissolved Oxygen Saturation (%)	97%	94%	98%	
E. coli (colonies/100 ml)	49	36	120	$Y = \text{antilog} (1.5045 (\log Q) - 3.0132)$
Enterococcus (colonies/100 ml)	110	56	210	
Fecal coliform (colonies/100 ml) *	120	70	200	$Y = \text{antilog} (1.4387 (\log Q) - 2.5712)$
Nitrate NO3-N (mg/L) *	1.80	1.70	2.00	
Orthophosphate (mg/L)	0.11	0.09	0.15	
pH *	7.60	7.50	7.70	
Specific Conductance (µS/cm)	264	218	292	$Y = -186.4602 (\log Q) + 870.6296$
Total Dissolved Solids (mg/L)	180	158	195	$Y = -93.4568 (\log Q) + 482.4929$
Total Kjeldahl Nitrogen (mg/L)	0.50	0.41	0.58	
Total Nitrogen (mg/L) *	2.43	2.13	2.74	
Total Phosphorus (mg/L) *	0.17	0.15	0.24	
Total Suspended Solids (mg/L) *	4.0	3.0	6.0	
Turbidity (NTU)	3.1	2.2	6.0	$Y = \text{antilog} (0.901 (\log Q) - 2.335)$
Alkalinity (mg/L)	55	49	69	$Y = -51.44 (\log Q) + 227.86$
Hardness (mg/L)	94	77	105	$Y = -58.1224 (\log Q) + 285.2788$

EWQ values represent data collected twice per month from May through September 2000-2004.

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

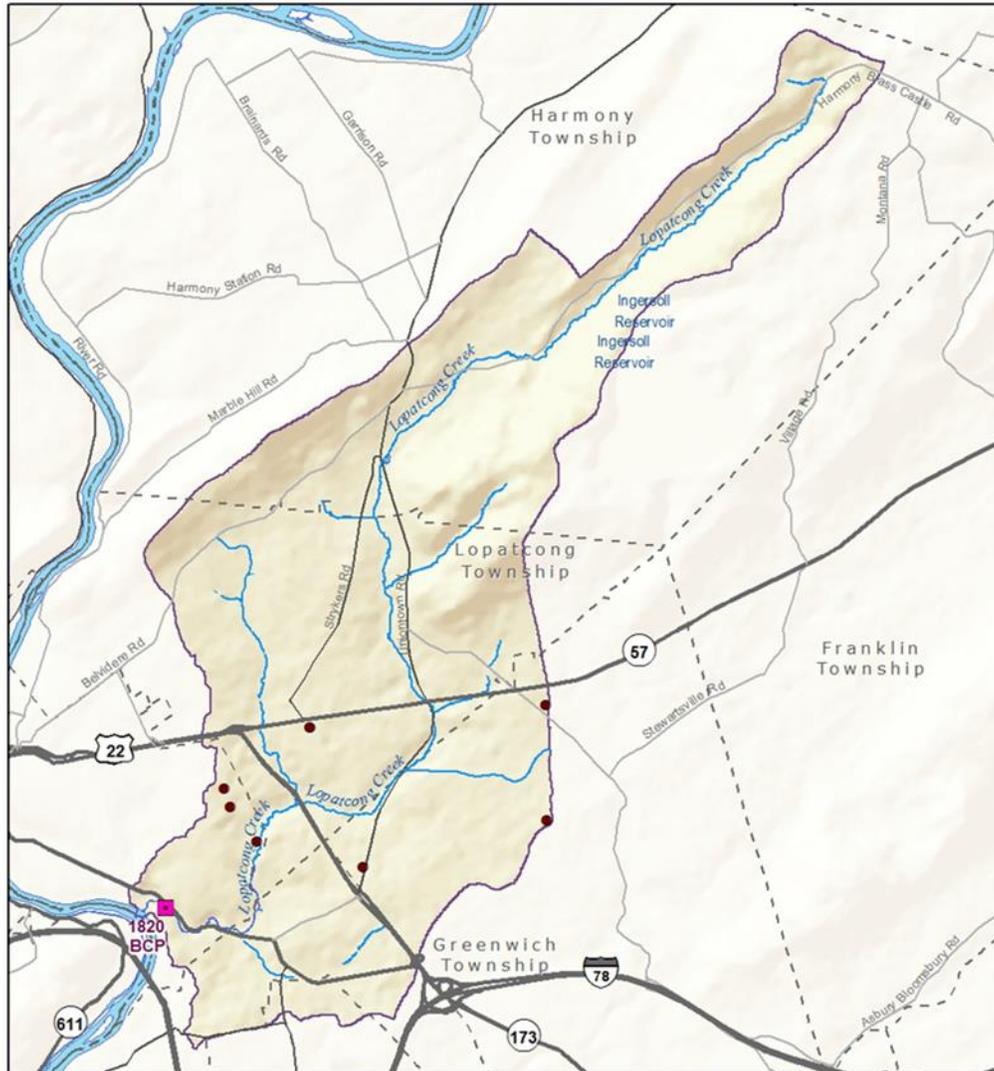
** = EWQ exceeds DRBC or state water quality criteria. Discharge evaluations should be conducted at criterion concentration.

EWQ established 2000-2004 by DRBC

Corrections 2016:

None

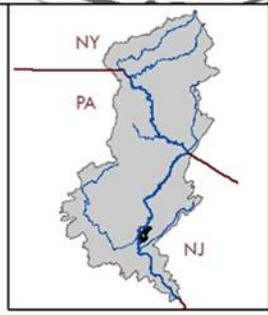
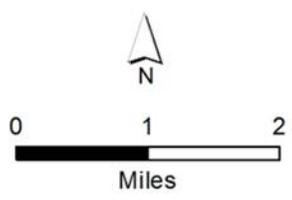
1820 BCP Lopatcong Creek above Phillipsburg WWTP, NJ



Lopatcong Creek

Drainage Area = 14.89 mi²

- Sampling Location
- NPDES
- Drainage Area



1820 BCP Lopatcong Creek above Phillipsburg WWTP

Warren County, NJ. Latitude 40.67949 Longitude -75.17499 by GPS NAD83 decimal degrees.

USGS Sites 01455100, 01455099; NJDEP Site No. 01455099

Watershed Population: 2000 = 11,262 2010 = 14,540 Change: +3,278 (+29.1%)

Drainage Area at site: 14.7 square miles, tributary to Delaware River Zone 1E

Site Specific EWQ defined by DRBC 2009-2013; additional USGS and NJDEP data from various time periods.

This watershed is tributary to the Lower Delaware Scenic and Recreational River (LDEL)

Classified by DRBC as Significant Resource Waters.

Nearest upstream Interstate Control Point: 1838 ICP Delaware River at Easton

Nearest downstream Interstate Control Point: 1748 ICP Delaware River at Riegelsville

Known dischargers within watershed: Some, undefined. For total Lopatcong Creek effect upon the Delaware River, add loadings produced by Phillipsburg WWTP, located downstream of the monitoring site.

Watershed is 32.8% forested; urban land cover is 17%. Watershed was not glaciated, and is 63% underlain by carbonate bedrock. Mean annual precipitation 45.5 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics (USGS BaSE Model):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
975	36.6	23.1	17.7	14.3	13.7	10.5	7.36	2.18

StreamStats Low-Flow Stream Statistics

M7D2Y (ft ³ /s)	12.2
M30D2Y (ft ³ /s)	12.8
M7D10Y (ft ³ /s)	9.56
M30D10Y (ft ³ /s)	9.65
M90D10Y (ft ³ /s)	9.94

StreamStats Mean/Baseflow Stream Statistics

QA (ft ³ /s)	22.2
QAH (ft ³ /s)	18.2
BF10YR (ft ³ /s)	12.4
BF25YR (ft ³ /s)	11.0
BF50YR (ft ³ /s)	10.2

StreamStats Peak-Flow Stream Statistics

PK2 (ft ³ /s)	707
PK5 (ft ³ /s)	1,220
PK10 (ft ³ /s)	1,630
PK50 (ft ³ /s)	2,720
PK100 (ft ³ /s)	3,260
PK500 (ft ³ /s)	4,750

Existing Water Quality: 1820 BCP Lopatcong Creek above Phillipsburg WWTP

Parameter	N	median	L95CL	U95CL	Flow Relation	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	74	150	140	156	None	1980-2000 USGS; 2009-2013 SRMP
Ammonia-Nitrogen as N, Total mg/L *	58	<0.006	<0.006	0.007	None	1999-2013 SRMP (50 non-detect)
Chloride, Total mg/L	61	36.8	36.0	37.1	None	2000, 2009-2013 SRMP
Dissolved Oxygen (DO) mg/L *	57	10.04	9.80	10.26	None	2000, 2009-2013 SRMP
Dissolved Oxygen Saturation %	61	97.5	96.3	100.3	None	1999-2000, 2009-2013 SRMP
Enterococcus #/100ml {1}	40	195	140	340	None	1999-2000, 2009-2011 SRMP
Escherichia coli #/100ml {2}	31	270	170	370	None	2009-2011 SRMP
Fecal coliform #/100ml *	32	240	180	330	None	2009-2011 SRMP
Hardness as CaCO ₃ , Total mg/L	61	214	202	222	None	2000, 2009-2013 SRMP
Nitrate + Nitrite as N, Total mg/L *	54	4.43	4.23	4.65	None	2009-2013 SRMP
Nitrogen as N, Total mg/L *	53	4.47	4.31	4.79	Inverse	2009-2013 SRMP
Nitrogen, Kjeldahl as N, Total mg/L	60	0.100	0.097	0.133	None	2000, 2009-2013 SRMP
Orthophosphate as P, Total mg/L	54	0.005	0.003	0.008	None	2000, 2009-13 SRMP (16 non-detect)
pH units *	61	7.90	7.82	7.96	None	1999-2000, 2009-2013 SRMP
Phosphorus as P, Total mg/L *	58	0.014	0.012	0.017	None	2000, 2009-2013 SRMP
Specific Conductance µS/cm	61	499	454	516	None	1999-2000, 2009-2013 SRMP
Temperature, Water, degrees C	61	14.2	13.8	14.6	None	1999-2000, 2009-2013 SRMP
Total Dissolved Solids (TDS) mg/L	60	275	269	284	None	2000, 2009-2013 SRMP
Total Suspended Solids (TSS) mg/L *	60	2.5	1.7	3.2	None	2000, 2009-2013 SRMP
Turbidity NTU	79	1.57	1.15	1.81	None	2000, 2009-2013 SRMP

Two-tailed 95% lower and upper confidence limits were used for these EWQ targets

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

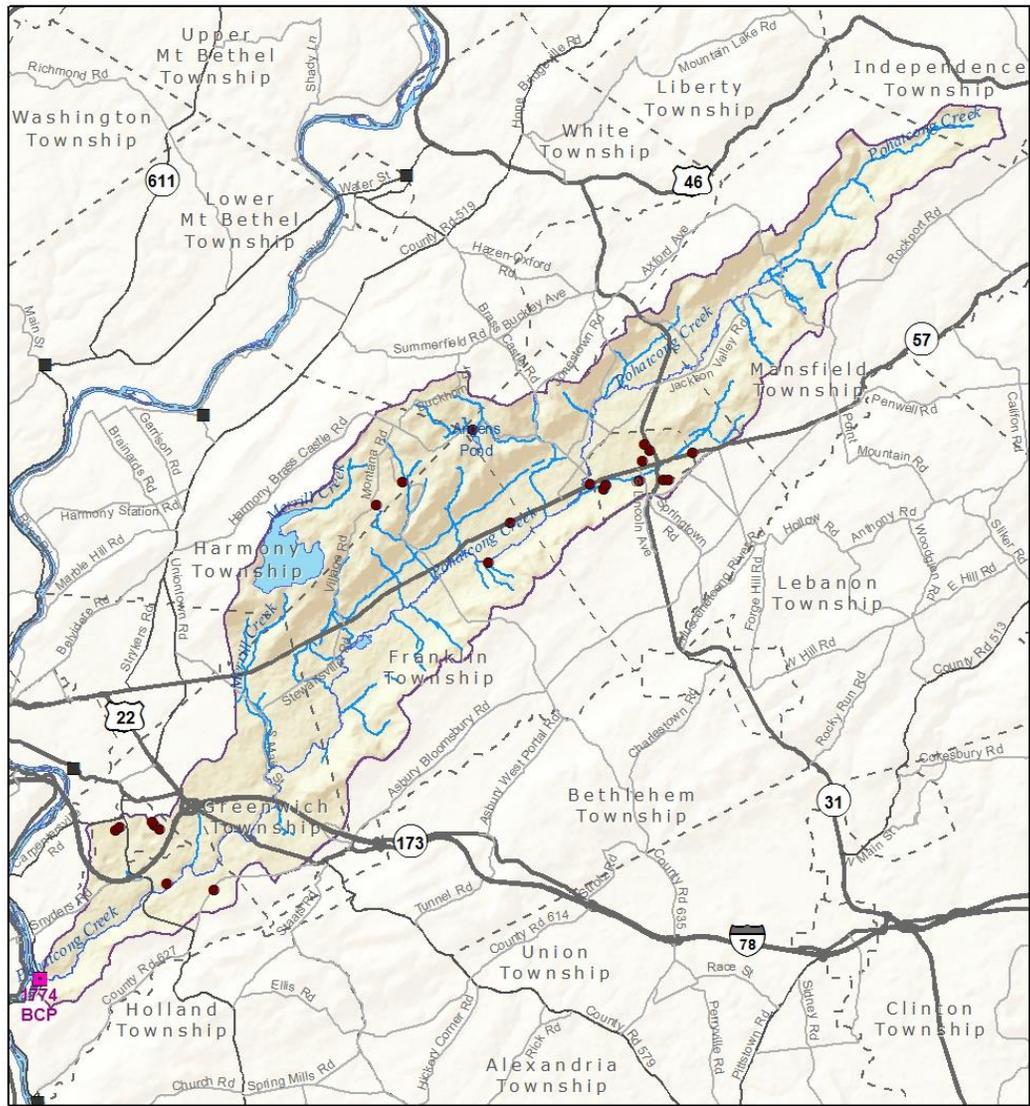
Note: Hydroqual study 2006-2007 results not included in this data set but were used in model for project development.

Note: Sample results do not incorporate City of Phillipsburg WWTP discharge, which is about 200 meters downstream of monitoring point and just upstream of Lopatcong Creek confluence with the Delaware River.

{1}: Enterococcus concentrations exceed outdated NJ freshwater criterion of 33 #/100 ml.

{2}: Escherichia coli concentrations exceed NJ freshwater criterion of 126 #/100 ml.

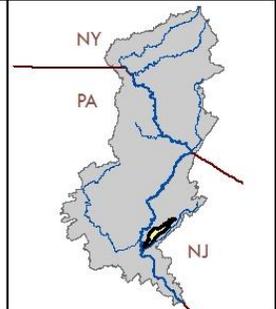
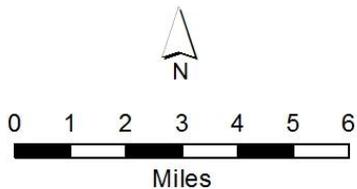
1774 BCP Pohatcong Creek at River Road, NJ



Pohatcong Creek

Drainage Area = 57.1 mi²

- Sampling Location
- Other Sampling Location
- NPDES
- Drainage Area



1774 BCP Pohatcong Creek at River Road, NJ

Warren County, NJ. Latitude 40.62472 Longitude -75.18611 by GPS NAD83 decimal degrees.

USGS/NJDEP site 01455300

Watershed Population: 2000 = 19,781 2010 = 19,547 Change: -234 (-1.2%)

Drainage Area: 57.1 square miles, tributary to Delaware River Zone 1E.

Site Specific EWQ defined by DRBC.

This watershed is tributary to the Lower Delaware Scenic and Recreational River (LDEL)

Classified by DRBC as Significant Resource Waters.

Nearest upstream Interstate Control Point: 1838 ICP Delaware River at Easton

Nearest downstream Interstate Control Point: 1748 ICP Delaware River at Riegelsville

Known dischargers within watershed: Some, undefined.

Watershed is 48.8% forested; urban land cover is 8%. Watershed was 0.3% glaciated, and is 47% underlain by carbonate bedrock. Mean annual precipitation 47.6 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics (USGS BaSE Model):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
3,886	169	108	80.9	66.5	66.4	52.2	34.8	16.1

StreamStats Low-Flow Stream Statistics

M7D2Y (ft ³ /s)	38.7
M30D2Y (ft ³ /s)	42.2
M7D10Y (ft ³ /s)	26.1
M30D10Y (ft ³ /s)	27.8
M90D10Y (ft ³ /s)	32.6

StreamStats Mean/Baseflow Stream Statistics

QA (ft ³ /s)	97.3
QAH (ft ³ /s)	73.6
BF10YR (ft ³ /s)	54.4
BF25YR (ft ³ /s)	48.5
BF50YR (ft ³ /s)	45.2

StreamStats Peak-Flow Stream Statistics

PK2 (ft ³ /s)	2,070
PK5 (ft ³ /s)	3,470
PK10 (ft ³ /s)	4,590
PK50 (ft ³ /s)	7,580
PK100 (ft ³ /s)	9,090
PK500 (ft ³ /s)	13,200

Existing Water Quality: 1774 BCP Pohatcong Creek at River Road, NJ

Pohatcong Creek, New Jersey, River Mile 177.36 – 0.35

Boundary Control Point is located at River Road bridge.

Parameter (Y)	Definition of Existing Water Quality			
	Median	Lower 95%CI	Upper 95%CI	Flow-Relationships Site specific regression equation.
Ammonia NH3-N (mg/L) *	<.05	<.05	<0.05	
Chloride (mg/L)	20	19	21	
Chlorophyll a (mg/m ³)	n/a	n/a	n/a	n/a
Dissolved Oxygen (mg/L) mid-day *	9.50	9.20	9.90	
Dissolved Oxygen Saturation (%)	97%	96%	100%	
E. coli (colonies/100 ml)	305	190	550	Y = antilog (1.0503 (log Q) + 0.976)
Enterococcus (colonies/100 ml)	610 **	380 **	820 **	
Fecal coliform (colonies/100 ml) *	580 **	420 **	810 **	
Nitrate NO3-N (mg/L) *	2.61	2.30	2.88	
Orthophosphate (mg/L)	0.05	0.05	0.07	
pH *	7.90	7.88	7.95	
Specific Conductance (µS/cm)	340	316	352	Y = -0.84542072 Q + 365.5539
Total Dissolved Solids (mg/L)	220	211	260	Y = -99.9173 (log Q) + 381.5349
Total Kjeldahl Nitrogen (mg/L)	0.33	0.19	0.36	
Total Nitrogen (mg/L) *	3.14	2.87	3.26	
Total Phosphorus (mg/L) *	0.10	0.08	0.11 **	
Total Suspended Solids (mg/L) *	6.5	5.0	8.0	
Turbidity (NTU)	4.6	2.1	5.1	Y = antilog (0.867 (log Q) – 0.69)
Alkalinity (mg/L)	116	104	120	Y = -81.8 (log Q) + 238.83
Hardness (mg/L)	140	135	160	Y = -76.5277 (log Q) + 261.5315

EWQ values represent data collected twice per month from May through September 2000-2004.

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ.

Implementation guidance should be consulted for discharge evaluations.

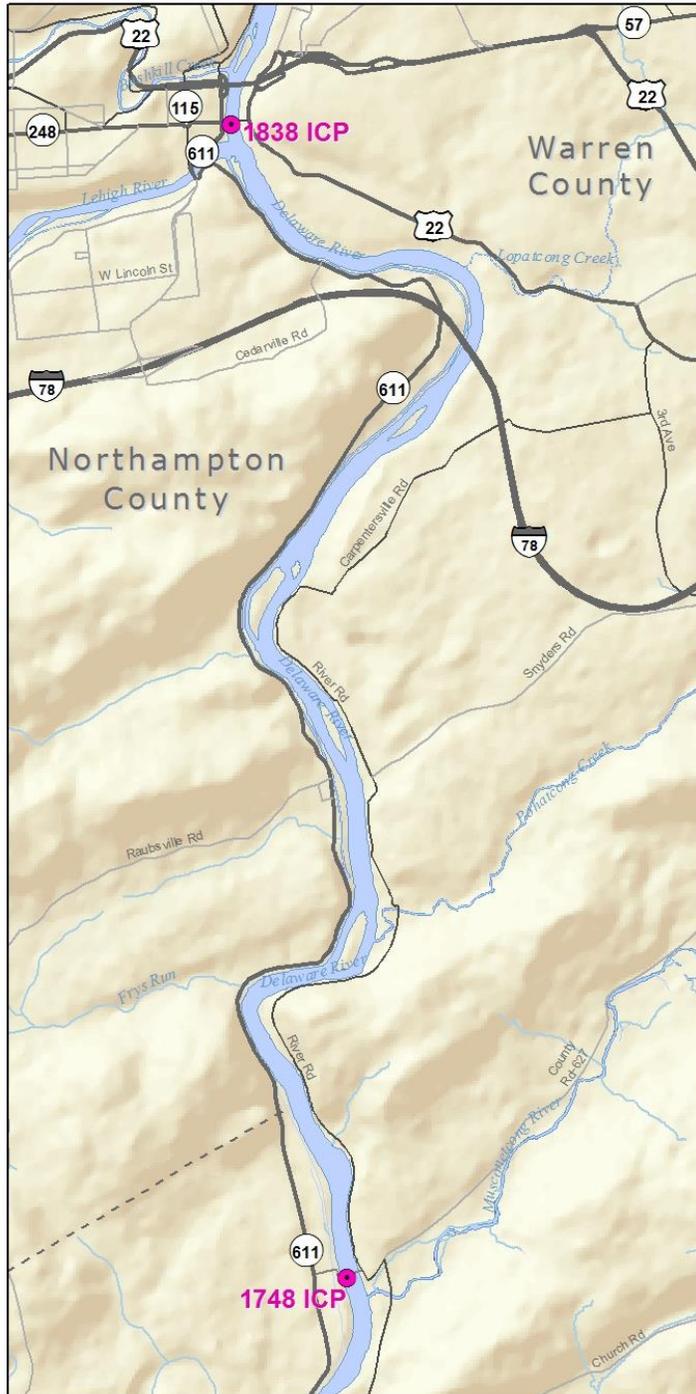
** = EWQ exceeds DRBC or state water quality criteria. Discharge evaluations should be conducted at criterion concentration.

EWQ established 2000-2004 by DRBC

Corrections 2016:

Alkalinity median should be 116 mg/L. Listed in rule as 113 mg/L.

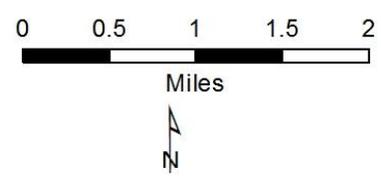
1748 ICP Delaware River at Riegelsville Bridge, PA/NJ



1748 ICP
Delaware River at Riegelsville Bridge



- Sampling Location
- - - County Boundary



1748 ICP Delaware River at Riegelsville Bridge, PA/NJ

Bucks County, PA to Warren County, NJ

Latitude 40.59389 Longitude -75.19111 by GPS NAD83 decimal degrees.

USGS site 01457500; NJDEP sites 01457500, 5700017400

Watershed Population figures were not calculated for main-stem Delaware River sites.

Drainage Area: 6,328 square miles, Delaware River Zone 1E

Site Specific EWQ defined 2000-2004 by DRBC.

This site is located in the Lower Delaware Scenic and Recreational River.

Classified by DRBC as Significant Resource Waters

Nearest upstream Interstate Control Point: 1838 ICP Delaware River at Northampton St. Bridge, Easton

Nearest downstream Interstate Control Point: 1677 ICP Delaware River at Milford / Upper Black Eddy Bridge

Known dischargers within reach: Easton WWTP, others undefined

Tributaries to upstream reach: Major tributaries 1837 BCP Lehigh River, PA; 1820 BCP Lopatcong Creek, NJ; 1774 BCP Pohatcong Creek, NJ; small tributary 176.6 Frys Run, PA.

No Stream Stats web site data available because drainage area is too large for web site retrieval as of 2012.

Flow Statistics Associated with Water Quality Samples (calculated by drainage area weighting from USGS gage data):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
214,667	24,080	14,280	9,987	8,157	6,543	4,629	3,201	1,773

Existing Water Quality: 1748 ICP Delaware River at Riegelsville Bridge, PA/NJ

Delaware River at Riegelsville Bridge, PA/NJ, River Mile 174.80

Parameter (Y)	Definition of Existing Water Quality			
	Median	Lower 95%CI	Upper 95%CI	Flow-Relationships Site specific regression equation.
Ammonia NH3-N (mg/L) *	<0.05	<0.05	0.05	
Chloride (mg/L)	17	15	19	$Y = -0.00026948 Q + 19.644$
Chlorophyll a (mg/m ³)	2.42	1.80	3.60	
Dissolved Oxygen (mg/L) mid-day *	8.80	8.20	9.05	
Dissolved Oxygen Saturation (%)	97%	95%	98%	
E. coli (colonies/100 ml)	40	20	80	$Y = \text{antilog} (0.0000513 Q + 0.9973)$
Enterococcus (colonies/100 ml)	80	52	110	
Fecal coliform (colonies/100 ml) *	84	54	160	$Y = \text{antilog} (0.00003636 Q + 1.5438)$
Nitrate NO3-N (mg/L) *	1.17	1.02	1.23	
Orthophosphate (mg/L)	0.04	<0.04	0.07	
pH *	7.60	7.48	7.80	
Specific Conductance (µS/cm)	183	155	197	$Y = -0.00298102 Q + 207.26$
Total Dissolved Solids (mg/L)	140	130	150	$Y = -0.00168753 Q + 152.78$
Total Kjeldahl Nitrogen (mg/L)	0.31	0.22	0.46	
Total Nitrogen (mg/L) *	1.44	1.31	1.62	
Total Phosphorus (mg/L) *	0.09	0.07	0.12	
Total Suspended Solids (mg/L) *	4.5	3.5	6.5	$Y = 0.00061523 Q + 0.2725$
Turbidity (NTU)	2.7	2.1	3.5	$Y = \text{antilog} (0.00002645 Q + 0.2252)$
Alkalinity (mg/L)	42	36	48	$Y = -0.0008322 Q + 50.44$
Hardness (mg/L)	65	54	70	$Y = -0.00121951 Q + 73.708$

EWQ values represent data collected twice per month from May through September 2000-2004.

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

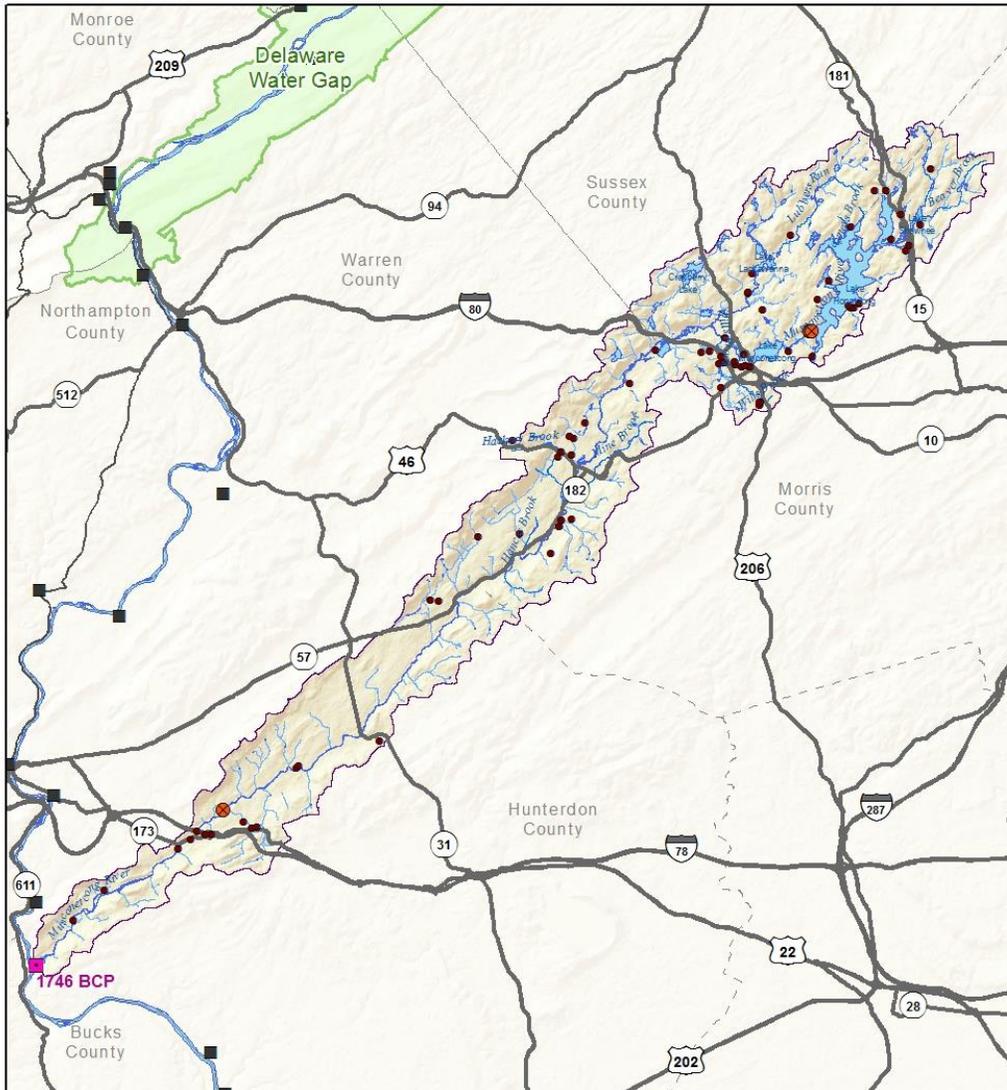
** = EWQ exceeds DRBC or state water quality criteria. Discharge evaluations should be conducted at criterion concentration.

EWQ established 2000-2004 by DRBC

Corrections 2016:

None

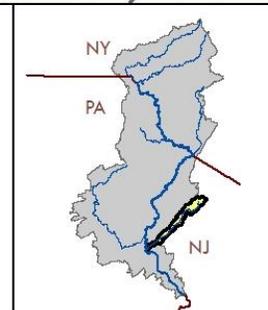
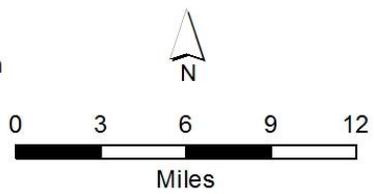
1746 BCP Musconetcong River at River Road, NJ



Musconetcong River

Drainage Area = 155.78 mi²

- Sampling Location
- Other Sampling Location
- NPDES
- Stream Gage
- Drainage Area
- NPS Boundary



1746 BCP Musconetcong River at River Road, NJ

Multiple NJ Counties: Warren, Sussex, Hunterdon and Morris

Site location Warren County, NJ. Latitude 40.5925 Longitude -75.18667 by GPS NAD83 decimal degrees.

USGS site 01457400, upstream USGS gage 01457100 Bloomsbury; NJDEP sites 01457400, 8983200070

Watershed Population: 2000 = 84,699 2010 = 89358 Change: +4,659 (+5.5%)

Drainage Area at site: 156 square miles, tributary to Delaware River Zone 1E

Site Specific EWQ defined by DRBC 2000-2004.

The Musconetcong River is a National Wild and Scenic designated river.

This watershed is tributary to the Lower Delaware Scenic and Recreational River (LDEL)

Tributary to DRBC Significant Resource Waters.

Nearest upstream Interstate Control Point: 1748 ICP Delaware River at Riegelsville

Nearest downstream Interstate Control Point: 1677 ICP Delaware River at Milford / Upper Black Eddy Bridge

Known dischargers within watershed: Many, undefined.

Watershed is 57.6% forested; urban land cover is 11.3%. Watershed was 48% glaciated, and is 25.4% underlain by carbonate bedrock. Mean annual precipitation 49 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics (USGS BaSE Model calculation from USGS Musconetcong River gage 01457100 at Bloomsbury, NJ):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
11,848	569	341	257	212	191	144	91.3	32.0

StreamStats Low-Flow Stream Statistics

M7D2Y (ft³/s) 88.0

M30D2Y (ft³/s) 98.5

M7D10Y (ft³/s) 59.6

M30D10Y (ft³/s) 65.0

M90D10Y (ft³/s) 77.8

StreamStats Mean/Baseflow Stream Statistics

QA (ft³/s) 302

QAH (ft³/s) 187

BF10YR (ft³/s) 152

BF25YR (ft³/s) 136

BF50YR (ft³/s) 128

StreamStats Peak-Flow Stream Statistics

PK2 (ft³/s) 4,130

PK5 (ft³/s) 6,770

PK10 (ft³/s) 8,920

PK50 (ft³/s) 14,800

PK100 (ft³/s) 17,700

PK500 (ft³/s) 26,000

Existing Water Quality: 1746 BCP Musconetcong River at River Road, NJ

Musconetcong River, New Jersey, River Mile 174.60 – 0.15

Boundary Control Point is located at River Road (Rt. 627) bridge

Parameter (Y)	Definition of Existing Water Quality			
	Median	Lower 95%CI	Upper 95%CI	Flow-Relationships Site specific regression equation.
Ammonia NH3-N (mg/L) *	0.06	0.05	0.08	
Chloride (mg/L)	43	42	45	
Chlorophyll a (mg/m ³)	3.20	2.56	3.71	
Dissolved Oxygen (mg/L) mid-day *	9.10	8.90	9.60	
Dissolved Oxygen Saturation (%)	99%	97%	100%	
E. coli (colonies/100 ml)	125	70	240	$Y = \text{antilog}(1.0008(\log Q) - 0.0526)$
Enterococcus (colonies/100 ml)	210 **	150 **	360 **	
Fecal coliform (colonies/100 ml) *	270 **	190	400 **	
Nitrate NO3-N (mg/L) *	2.09	1.85	2.30	
Orthophosphate (mg/L)	0.02	0.02	0.03	
pH *	7.90	7.80	8.00	
Specific Conductance (µS/cm)	396	375	426	$Y = -0.23045946 Q + 440.1906$
Total Dissolved Solids (mg/L)	255	240	270	$Y = -0.0954 Q + 272.5773$
Total Kjeldahl Nitrogen (mg/L)	0.49	0.37	0.87	
Total Nitrogen (mg/L) *	2.56	2.36	2.91	
Total Phosphorus (mg/L) *	0.07	0.05	0.09	
Total Suspended Solids (mg/L) *	7.0	5.5	11.0	
Turbidity (NTU)	3.5	2.3	5.4	$Y = \text{antilog}(0.86(\log Q) - 1.294)$
Alkalinity (mg/L)	103	97	118	$Y = -79.84(\log Q) + 298.41$
Hardness (mg/L)	149	130	160	$Y = -67.6003(\log Q) + 297.8314$

EWQ values represent data collected twice per month from May through September 2000-2004.

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

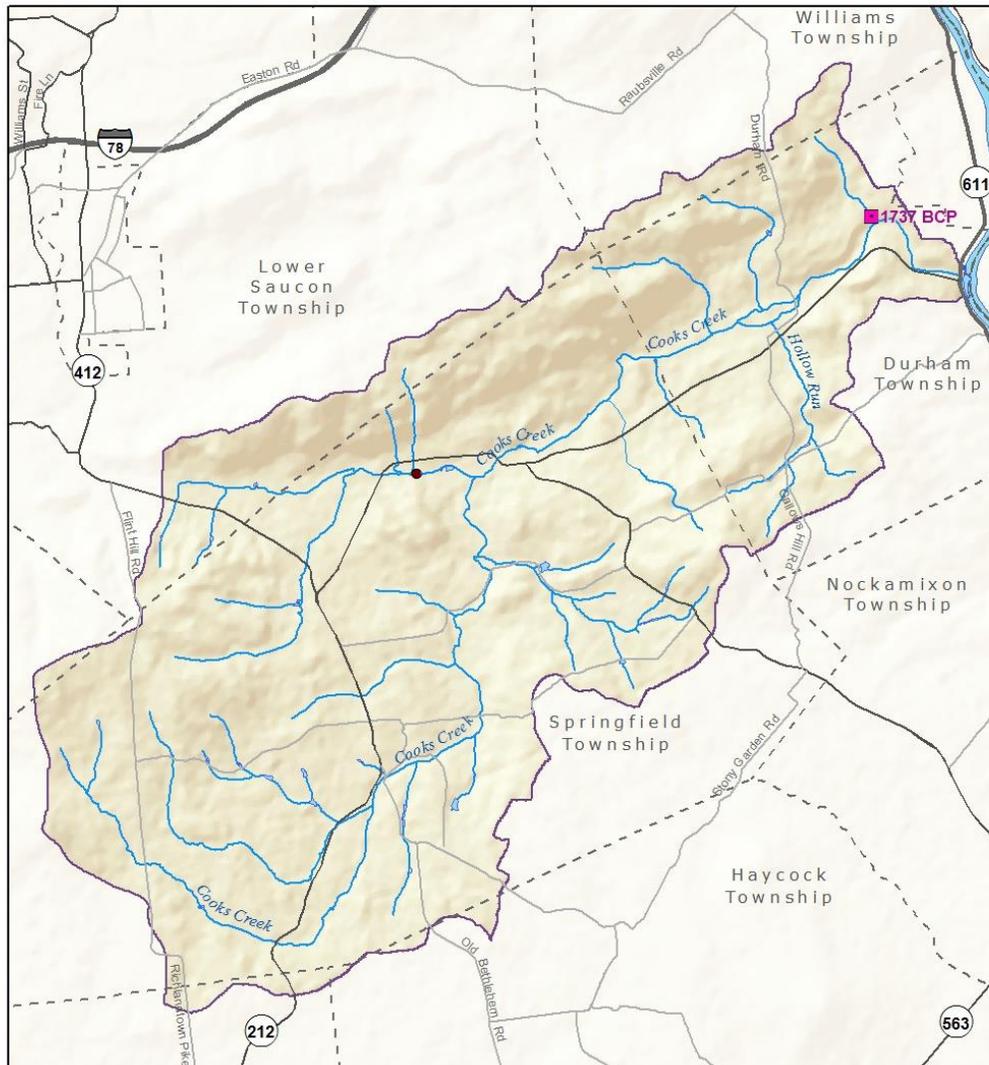
** = EWQ exceeds DRBC or state water quality criteria. Discharge evaluations should be conducted at criterion concentration.

EWQ established 2000-2004 by DRBC

Corrections 2016:

pH lower 95% CL should be 7.80. Listed in rules as 7.90.

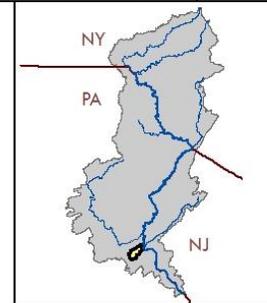
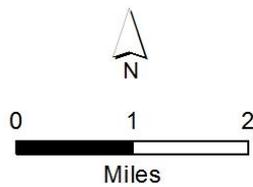
1737 BCP Cooks Creek at Red Bridge Road, PA



Cooks Creek

Drainage Area = 29.61 mi²

- Sampling Location
- Other Sampling Location
- NPDES
- 🗺️ Drainage Area



1737 BCP Cooks Creek at Red Bridge Road, PA

Bucks County and Northampton County, PA

Site location Bucks County, PA. Latitude 40.58737 Longitude -75.21157 by GPS NAD83 decimal degrees.

USGS Sites 01457800, 01457790; PADEP Site WQN0187

Watershed Population: 2000 = 4,744 2010 = 4,813 Change: +69 (+1.4%)

Watershed Drainage Area: 29.6 square miles, tributary to Delaware River Zone 1E

Drainage Area at site: 28.9 square miles

Site Specific EWQ defined by DRBC 2000-2004.

This watershed is tributary to the Lower Delaware Scenic and Recreational River (LDEL)

Tributary to DRBC Significant Resource Waters.

Nearest upstream Interstate Control Point: 1748 ICP Delaware River at Riegelsville

Nearest downstream Interstate Control Point: 1677 ICP Delaware River at Milford / Upper Black Eddy Bridge

Known dischargers within watershed: Few, undefined.

Watershed is 59.9% forested; urban land cover is 1.3%. Watershed was not glaciated, and is 35.5% underlain by carbonate bedrock. Mean annual precipitation 45 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics (USGS BaSE Model from nearby gage):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
2,268	80.3	47.8	34.9	28.3	26.4	17.5	9.65	3.12

StreamStats Low-Flow Stream Statistics

M7D2Y (ft³/s) 8.20

M30D2Y (ft³/s) 10.0

M7D10Y (ft³/s) 4.33

M30D10Y (ft³/s) 5.35

M90D10Y (ft³/s) 7.53

StreamStats Mean/Baseflow Stream Statistics

QA (ft³/s) 44.5

QAH (ft³/s) 24.1

BF10YR (ft³/s) 24.4

BF25YR (ft³/s) 21.6

BF50YR (ft³/s) 20.1

StreamStats Peak-Flow Stream Statistics

PK2 (ft³/s) 1,210

PK5 (ft³/s) 2,060

PK10 (ft³/s) 2,740

PK50 (ft³/s) 4,550

PK100 (ft³/s) 5,460

PK500 (ft³/s) 7,960

Existing Water Quality: 1737 BCP Cooks Creek at Red Bridge Road, PA

Cooks Creek, Pennsylvania, River Mile 173.70 – 1.06
Boundary Control Point is located at Red Bridge Road bridge.

Parameter (Y)	Definition of Existing Water Quality			
	Median	Lower 95%CI	Upper 95%CI	Flow-Relationships Site specific regression equation.
Ammonia NH3-N (mg/L) *	<0.05	<0.05	<0.05	
Chloride (mg/L)	9.7	8.9	10.9	
Chlorophyll a (mg/m ³)	n/a	n/a	n/a	n/a
Dissolved Oxygen (mg/L) mid-day *	9.93	9.70	10.30	
Dissolved Oxygen Saturation (%)	102%	98%	108%	
E. coli (colonies/100 ml)	110	80	200	Y = antilog (1.1307 (log Q) + 0.6483)
Enterococcus (colonies/100 ml)	380	250	520	
Fecal coliform (colonies/100 ml) *	210 **	140	360 **	
Nitrate NO3-N (mg/L) *	1.80	1.70	1.90	
Orthophosphate (mg/L)	0.01	0.01	0.02	
pH *	8.04	7.94	8.19	
Specific Conductance (µS/cm)	258	244	278	Y = -0.94618228 Q + 290.6508
Total Dissolved Solids (mg/L)	180	161	194	Y = -0.7015 Q + 197.6165
Total Kjeldahl Nitrogen (mg/L)	0.21	0.13	0.34	
Total Nitrogen (mg/L) *	2.01	1.95	2.32	
Total Phosphorus (mg/L) *	0.04	0.03	0.06	
Total Suspended Solids (mg/L) *	2.5	2.0	4.0	
Turbidity (NTU)	1.5	1.1	2.3	Y = antilog (0.888 (log Q) - 0.981)
Alkalinity (mg/L)	98	89	104	Y = -50.25 (log Q) + 168.52
Hardness (mg/L)	120	110	125	Y = -40.8625 (log Q) + 175.8628

EWQ values represent data collected twice per month from May through September 2000-2004.

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

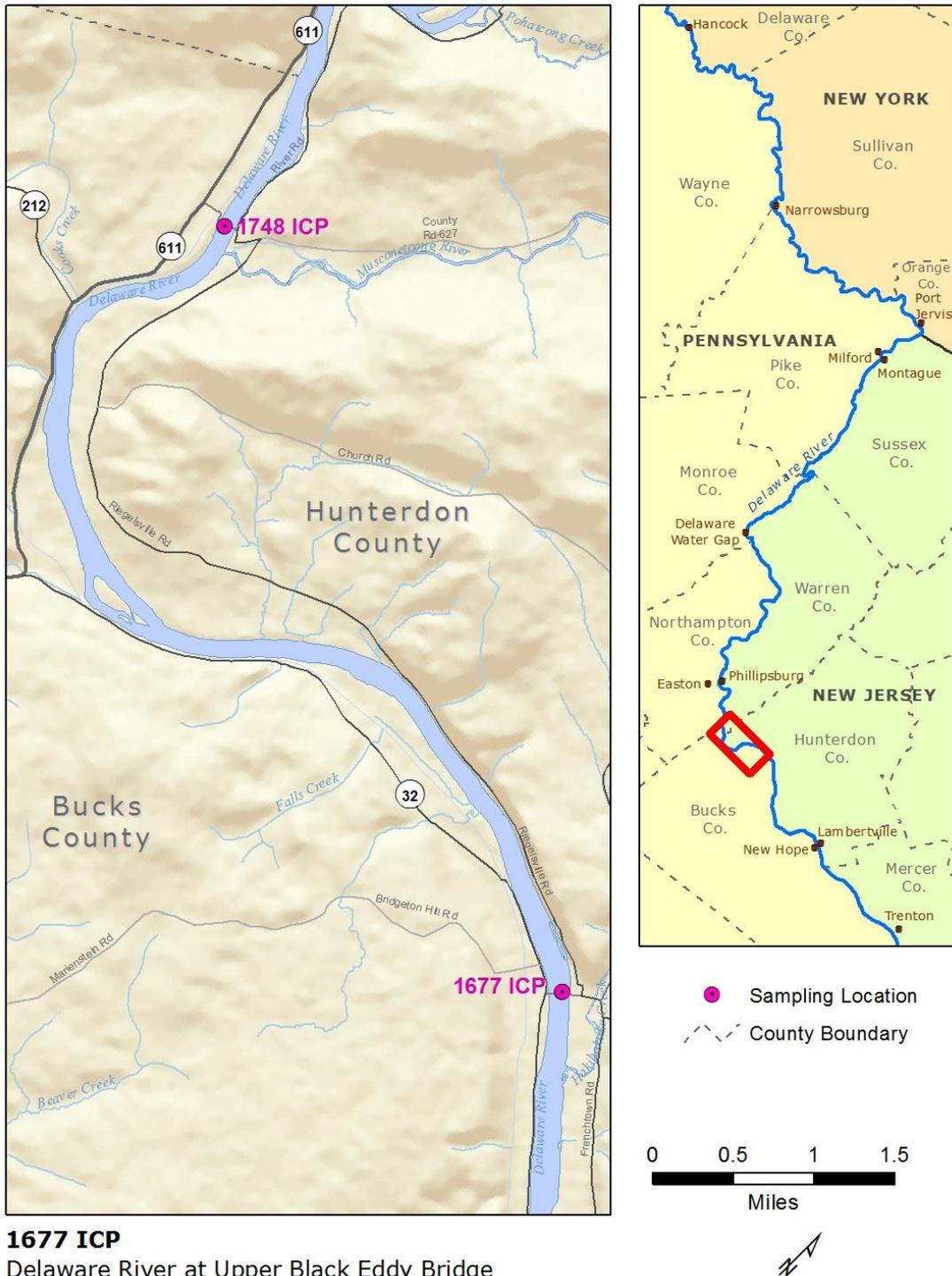
** = EWQ exceeds DRBC or state water quality criteria. Discharge evaluations should be conducted at criterion concentration.

EWQ established 2000-2004 by DRBC

Corrections 2016:

None

1677 ICP Delaware River at Upper Black Eddy Bridge, PA/NJ



1677 ICP
Delaware River at Upper Black Eddy Bridge

1677 ICP Delaware River at Upper Black Eddy Bridge, PA/NJ

Bucks County, PA and Hunterdon County, NJ

Latitude 40.566667 Longitude -75.098611 by GPS NAD83 decimal degrees.

USGS site 01458000, no PADEP or NJDEP sites at bridge.

Watershed Population figures were not calculated for main-stem Delaware River sites.

Drainage Area: 6,381 square miles, Delaware River Zone 1E

Site Specific EWQ defined 2000-2004 by DRBC.

This site is located in the Lower Delaware Scenic and Recreational River.

Classified by DRBC as Significant Resource Waters

Nearest upstream Interstate Control Point: 1748 ICP Delaware River at Riegelsville

Nearest downstream Interstate Control Point: 1554 ICP Delaware River at Bulls Island Foot Bridge

Known dischargers to upstream reach: Undefined

Tributaries to upstream reach: Major tributaries 1746 BCP Musconetcong River, NJ; 1737 BCP Cooks Creek, PA; small tributaries 173.5 Rodges Run, PA; 171.8 Gallows Run, PA; 170.3 Falls Creek, PA.

No Stream Stats web site data available because drainage area is too large for web site retrieval.

Flow Statistics Associated with Water Quality Samples (calculated by drainage area weighting from USGS gage data):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
216,465	24,282	14,400	10,070	8,226	6,597	4,668	3,228	1,788

Existing Water Quality: 1677 ICP Delaware River at Upper Black Eddy, PA/NJ

Delaware River at Milford-U. Black Eddy Bridge, NJ/PA, River Mile 167.70

Parameter (Y)	Definition of Existing Water Quality			
	Median	Lower 95%CI	Upper 95%CI	Flow-Relationships Site specific regression equation.
Ammonia NH3-N (mg/L) *	<0.05	<0.05	0.05	
Chloride (mg/L)	17	15	20	$Y = -0.00027835 Q + 20.221$
Chlorophyll a (mg/m ³)	1.80	0.90	2.70	
Dissolved Oxygen (mg/L) mid-day *	8.74	8.20	8.96	
Dissolved Oxygen Saturation (%)	96%	95%	97%	
E. coli (colonies/100 ml)	28	15	60	$Y = \text{antilog} (0.00004814 Q + 0.905)$
Enterococcus (colonies/100 ml)	45	28	98	
Fecal coliform (colonies/100 ml) *	60	40	120	$Y = \text{antilog} (0.00004177 Q + 1.2688)$
Nitrate NO3-N (mg/L) *	1.09	0.96	1.25	
Orthophosphate (mg/L)	0.04	0.04	0.07	
pH *	7.58	7.44	7.80	
Specific Conductance (µS/cm)	189	159	203	$Y = -0.00313416 Q + 212.42$
Total Dissolved Solids (mg/L)	149	130	160	$Y = -0.00270722 Q + 173.806$
Total Kjeldahl Nitrogen (mg/L)	0.34	0.26	0.46	
Total Nitrogen (mg/L) *	1.48	1.23	1.68	
Total Phosphorus (mg/L) *	0.09	0.07	0.12	
Total Suspended Solids (mg/L) *	6.0	4.5	7.0	$Y = 0.0006379 Q + 0.3729$
Turbidity (NTU)	2.9	2.2	3.8	$Y = \text{antilog} (0.00002693 Q + 0.1674)$
Alkalinity (mg/L)	44	37	49	$Y = -0.00087657 Q + 51.613$
Hardness (mg/L)	67	55	73	$Y = -0.0011369 Q + 74.63$

EWQ values represent data collected twice per month from May through September 2000-2004.

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

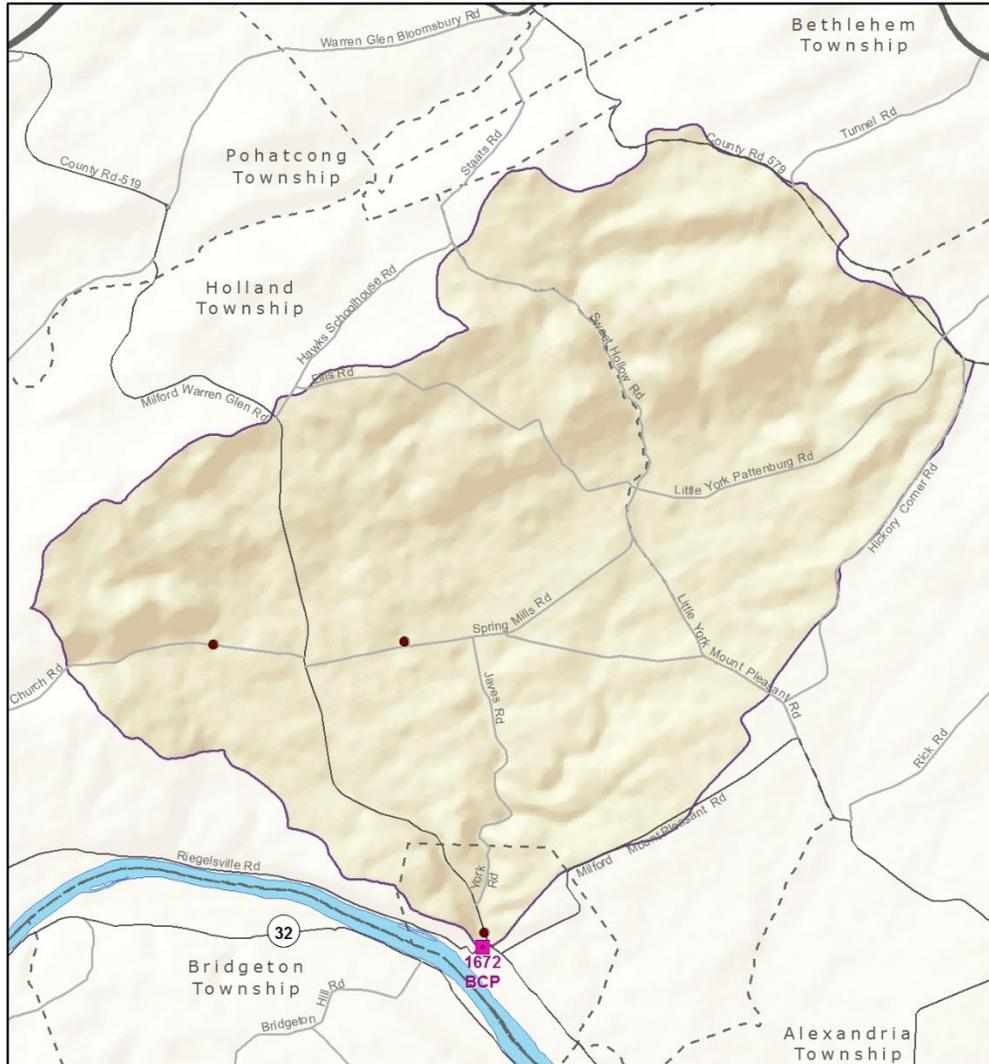
** = EWQ exceeds DRBC or state water quality criteria. Discharge evaluations should be conducted at criterion concentration.

Site Specific EWQ defined 2000-2004 by DRBC.

Corrections 2016:

None

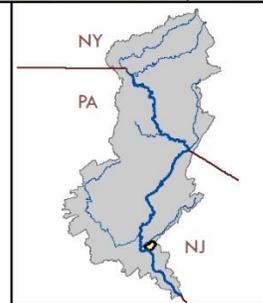
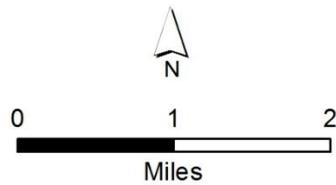
1672 BCP Hakiokake Creek at Bridge St., Milford, NJ



Hakiokake Creek

Drainage Area = 17.294955 mi²

- Sampling Location
- Other Sampling Location
- NPDES
- Drainage Area



1672 BCP Hakhokake Creek at Bridge St., Milford, NJ

Hunterdon County, NJ. Latitude 40.568444 Longitude -75.095167 by GPS NAD83 decimal degrees.

USGS/NJDEP site 01458100; NJDEP BA200: NJDEP AN0077

Watershed Population: 2000 = 4,262 2010 = 4,325 Change: +63 (+1.5%)

Watershed Drainage Area: 17.6 square miles, tributary to Delaware River Zone 1E

Site Specific EWQ definition underway by DRBC 2014-present; with additional USGS/NJDEP available data.

This watershed is tributary to the Lower Delaware Scenic and Recreational River (LDEL)

Tributary to DRBC Significant Resource Waters.

Nearest upstream Interstate Control Point: 1677 ICP Delaware River at Milford / Upper Black Eddy Bridge

Nearest downstream Interstate Control Point: 1554 ICP Delaware River at Bulls Island Foot Bridge

Known dischargers within watershed: Few, undefined.

Watershed is 53.7% forested; urban land cover is 5.8%. Watershed was not glaciated, and is 1.5% underlain by carbonate bedrock. Mean annual precipitation 46.9 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2014).

Flow Statistics (USGS BaSE Model):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
1,909	56.9	30.8	22.5	18.5	18.2	12.8	7.35	2.91

StreamStats Low-Flow Stream Statistics

M7D2Y (ft ³ /s)	6.89
M30D2Y (ft ³ /s)	8.10
M7D10Y (ft ³ /s)	3.91
M30D10Y (ft ³ /s)	4.63
M90D10Y (ft ³ /s)	5.94

StreamStats Mean/Baseflow Stream Statistics

QA (ft ³ /s)	28.5
QAH (ft ³ /s)	8.84
BF10YR (ft ³ /s)	11.9
BF25YR (ft ³ /s)	10.6
BF50YR (ft ³ /s)	9.79

StreamStats Peak-Flow Stream Statistics

PK2 (ft ³ /s)	763
PK5 (ft ³ /s)	1,310
PK10 (ft ³ /s)	1,750
PK50 (ft ³ /s)	2,930
PK100 (ft ³ /s)	3,530
PK500 (ft ³ /s)	5,170

Existing Water Quality: 1672 BCP Hakiwokake Creek, Milford, NJ

Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	46	81	70	86	USGS 1980-82; NJDEP 2005-11; SRMP 2000, 2014-15
Ammonia-Nitrogen as N, Diss. mg/L	10	<0.012	<0.002	0.021	NJDEP 2004-2011 (4/10 non-detects)
Ammonia-Nitrogen as N, Total mg/L *	33	<0.006	<0.005	0.026	USGS 1980-82; NJDEP 2003; SRMP 2014-15 (20/33 ND)
Calcium, Dissolved mg/L	18	25.0	23.7	27.0	USGS 1980-82; NJDEP 2005-11
Chloride, Total mg/L	33	19.5	17.6	21.1	NJDEP 2003-10; SRMP 2014-15
Dissolved Oxygen (DO) mg/L mid-day *	65	9.57	9.34	9.90	USGS 1980-82; NJDEP 2003-11; SRMP 1999-2000, 2014-15
Dissolved Oxygen Saturation % mid-day	44	105.1	102.5	108.1	NJDEP 2005-11; SRMP 1999-2000, 2014-15
Enterococcus #/100ml {1}	8				Insufficient data for EWQ definition
Escherichia coli #/100mL {2}	10	100	21	194 **	NJDEP 2007, 2012; Insufficient data for EWQ definition
Fecal coliform #/100mL *	24	750 **	170	1300 **	USGS 1980-82; NJDEP 2006-07, 2012
Hardness as CaCO ₃ , Total mg/L	48	110	103	121	USGS 1980-82; NJDEP 2005-11; SRMP 2000, 2014-15
Magnesium, Dissolved mg/L	18	9.7	7.7	11.0	USGS 1980-82; NJDEP 2005-11
Nitrate+Nitrite as N, Total mg/L *	43	1.35	1.30	1.48	USGS 1980-82; NJDEP 2003-11; SRMP 1999, 2014-15
Nitrogen as N, Total mg/L *	27	1.67	1.49	1.77	USGS 1980-82, 2011; SRMP 2014-15
Nitrogen, Kjeldahl as N, Total mg/L	43	0.171	0.139	0.220	USGS 1980-82; NJDEP 2005-11; SRMP 2014-15
Organic Carbon, Total mg/L	17	1.70	1.27	2.26	USGS 1980-82; NJDEP 2005-11
pH units, mid-day *	53	8.20	8.10	8.30	USGS 1980-82; NJDEP 2003-11; SRMP 1999-2000, 2014-15
Phosphate as P, Dissolved mg/L	11	0.031	0.020	0.041	NJDEP 2003-2010
Phosphate as P, Total mg/L	22	0.031	0.026	0.033	SRMP 2014-15
Phosphorus as P, Dissolved mg/L	13	0.048	0.042	0.085	NJDEP 2003-2010
Phosphorus as P, Total mg/L *	48	0.045	0.040	0.050	USGS 1980-82; NJDEP 2003-11; SRMP 2000, 2014-15
Potassium, Dissolved mg/L	18	1.42	1.32	1.59	USGS 1980-82; NJDEP 2005-11
Sodium, Dissolved mg/L	18	9.7	8.3	10.0	USGS 1980-82; NJDEP 2005-11
Specific Conductance µS/cm	53	262	250	272	USGS 1980-82; NJDEP 2003-11; SRMP 1999-2000, 2014-15
Sulfate, Total mg/L	10	15.4	12.8	18.7	NJDEP 2003-2010
Temperature, Water, degrees C mid-day	66	18.7	17.5	20.1	USGS 1980-82; NJDEP 2003-12; SRMP 1999-2000, 2014-15
Total Dissolved Solids (TDS) mg/L	50	170	164	181	USGS 1980-82; NJDEP 2003-11; SRMP 2000, 2014-15
Total Suspended Solids (TSS) mg/L *	41	3.0	2.0	5.0	NJDEP 2003-2010; SRMP 2000, 2014-15
Turbidity NTU	34	0.93	0.62	1.28	NJDEP 2004-2011; SRMP 2014-15

Two-tailed 95% (Lower and Upper) confidence limits were used for these EWQ targets

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

** Value exceeds state and/or DRBC water quality criterion

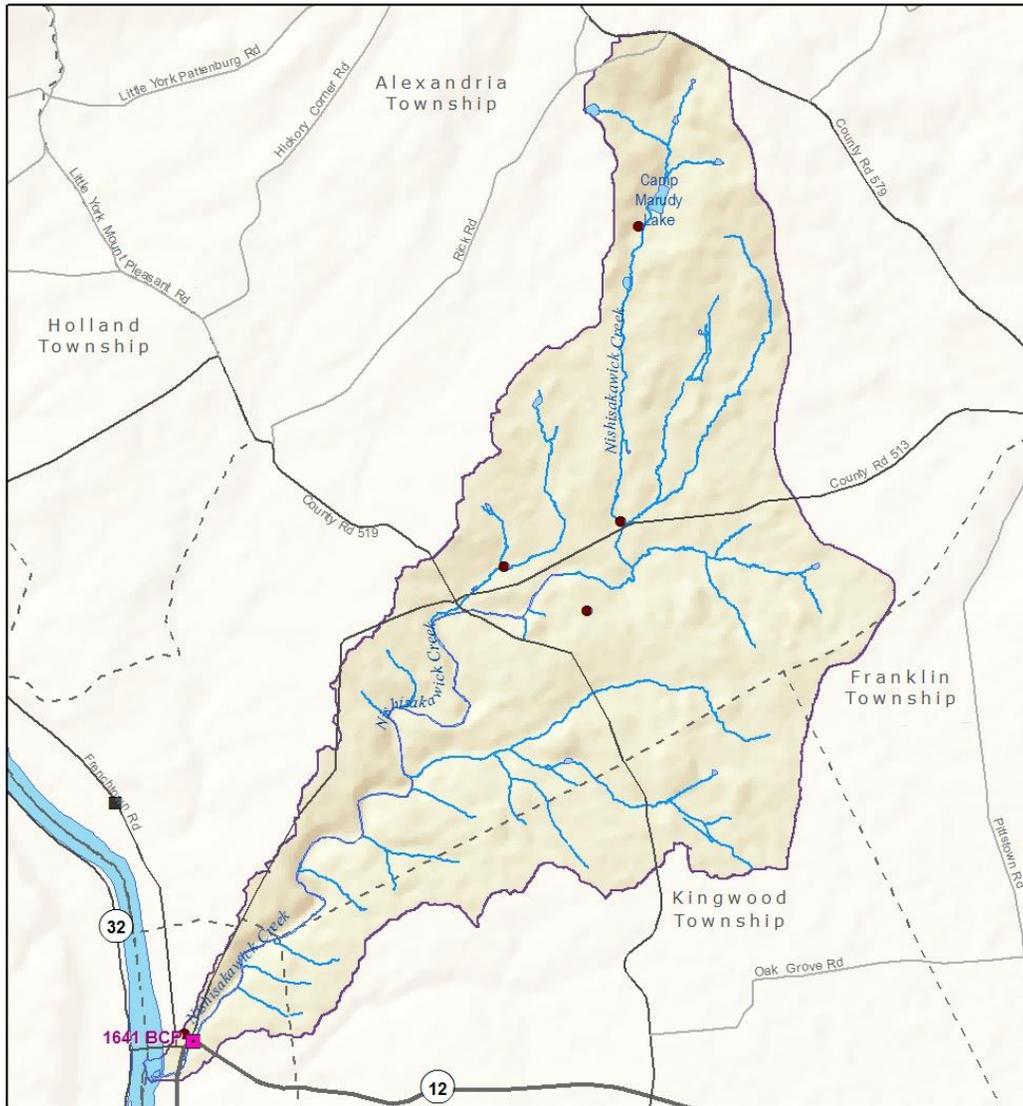
Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

There were many more parameters collected at this site over the years, but were excluded from this table because of insufficient frequency of sampling or because most results were not detected.

Dissolved oxygen, pH and temperature data represent mid-day near maximum values, as they are all grab samples taken between 10 AM and 3 PM.

This table is incomplete. The SRMP is conducting one more year of confirmatory monitoring in 2016 to supplement historical and current NJDEP and USGS data used to calculate existing water quality at this site.

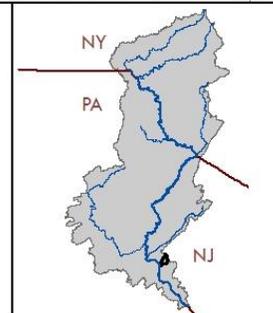
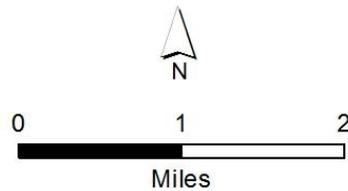
1641 BCP Nishisakawick Creek at Kingwood Ave., Frenchtown, NJ



Nishisakawick Creek

Drainage Area = 11.21 mi²

- Sampling Location
- Other Sampling Location
- NPDES
- 🗺️ Drainage Area



1641 BCP Nishisakawick Creek at Kingwood Ave., Frenchtown, NJ

Hunterdon County, NJ. Latitude 40.5268 Longitude -75.0597 by GPS NAD83 decimal degrees.

USGS sites 01458600, 01458570

Watershed Population: 2000 = 2,077 2010 = 2,114 Change: +37 (+1.8%)

Watershed Drainage Area: 11.2 square miles, tributary to Delaware River Zone 1E

Site Specific EWQ defined by DRBC 2000-2004.

This watershed is tributary to the Lower Delaware Scenic and Recreational River (LDEL)

Tributary to DRBC Significant Resource Waters. Small tributary representative of NJ Piedmont streams.

Nearest upstream Interstate Control Point: 1677 ICP Delaware River at Milford / Upper Black Eddy Bridge

Nearest downstream Interstate Control Point: 1554 ICP Delaware River at Bulls Island Foot Bridge

Known dischargers within watershed: Few, undefined.

Watershed is 30.2% forested; urban land cover 2001 is 2.8%. Watershed was not glaciated, and is not underlain by carbonate bedrock. Mean annual precipitation 47.2 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics (USGS BaSE Model):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
1,265	37.3	19.6	14.7	12.1	9.30	4.86	2.03	0.27

StreamStats Low-Flow Stream Statistics

M7D2Y (ft ³ /s)	0.79
M30D2Y (ft ³ /s)	1.20
M7D10Y (ft ³ /s)	0.29
M30D10Y (ft ³ /s)	0.46
M90D10Y (ft ³ /s)	0.90

StreamStats Mean/Baseflow Stream Statistics

QA (ft ³ /s)	16.7
QAH (ft ³ /s)	4.53
BF10YR (ft ³ /s)	5.97
BF25YR (ft ³ /s)	5.20
BF50YR (ft ³ /s)	4.77

StreamStats Peak-Flow Stream Statistics

PK2 (ft ³ /s)	518
PK5 (ft ³ /s)	901
PK10 (ft ³ /s)	1,210
PK50 (ft ³ /s)	2,030
PK100 (ft ³ /s)	2,450
PK500 (ft ³ /s)	3,590

Existing Water Quality: 1641 BCP Nishisakawick Creek, Frenchtown, NJ

Nishisakawick Creek, New Jersey, River Mile 164.10 – 0.35

Boundary Control Point is located at Route 12 bridge, Frenchtown.

Parameter (Y)	Definition of Existing Water Quality			
	Median	Lower 95%CI	Upper 95%CI	Flow-Relationships Site specific regression equation.
Ammonia NH3-N (mg/L) *	<0.05	<0.05	0.06	
Chloride (mg/L)	15	14	16	
Chlorophyll a (mg/m ³)	n/a	n/a	n/a	n/a
Dissolved Oxygen (mg/L) mid-day *	9.65	9.11	10.10	
Dissolved Oxygen Saturation (%)	101%	99%	105%	
E. coli (colonies/100 ml)	48	20	96	$Y = \text{antilog}(0.5217(\log Q) + 1.5665)$
Enterococcus (colonies/100 ml)	240 **	170 **	790 **	
Fecal coliform (colonies/100 ml) *	85	50	120	
Nitrate NO3-N (mg/L) *	1.62	1.52	1.83	
Orthophosphate (mg/L)	0.04	0.03	0.05	
pH *	7.89	7.56	8.00	
Specific Conductance (µS/cm)	181	176	190	$Y = -24.8604(\log Q) + 189.4554$
Total Dissolved Solids (mg/L)	130	120	144	$Y = -0.9989 Q + 139.9081$
Total Kjeldahl Nitrogen (mg/L)	0.35	0.21	0.59	
Total Nitrogen (mg/L) *	2.09	1.70	2.39	
Total Phosphorus (mg/L) *	0.06	0.05	0.07	
Total Suspended Solids (mg/L) *	1.5	1.0	2.0	
Turbidity (NTU)	1.3	0.9	2.0	$Y = \text{antilog}(0.0315 Q - 0.1328)$
Alkalinity (mg/L)	45	40	51	$Y = -16.39(\log Q) + 55.14$
Hardness (mg/L)	60	59	65	$Y = -12.5184(\log Q) + 66.8341$

EWQ values represent data collected twice per month from May through September 2000-2004.

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

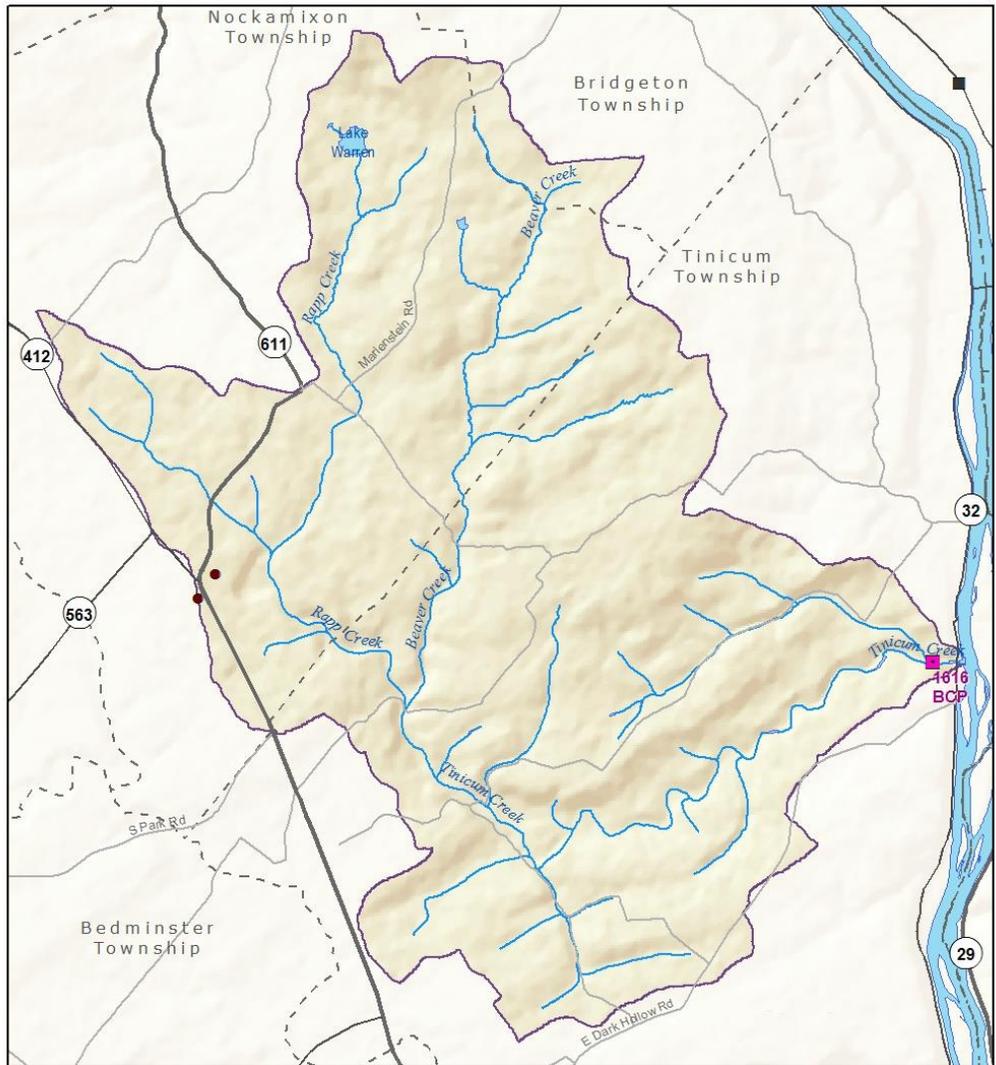
** = EWQ exceeds DRBC or state water quality criteria. Discharge evaluations should be conducted at criterion concentration.

Site Specific EWQ defined by DRBC 2000-2004.

Corrections 2016:

None

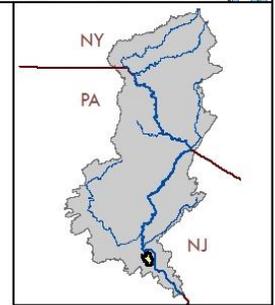
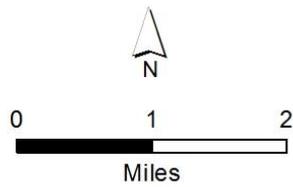
1616 BCP Tincum Creek above Rt. 32, PA



Tincum Creek

Drainage Area = 23.95 mi²

- Sampling Location
- Other Sampling Location
- NPDES
- 🗺️ Drainage Area



1616 BCP Tinicum Creek above Rt. 32, PA

Bucks County, PA. Latitude 40.4857 Longitude -75.0725 by GPS NAD83 decimal degrees.

USGS Sites 01458920. 01458900 nearby

Watershed Population: 2000 = 3,297 2010 = 3,103 Change: -194 (-5.9%)

Drainage Area at site: 24 square miles, tributary to Delaware River Zone 1E

Site Specific EWQ defined by DRBC 2000-2004.

Tinicum Creek is a designated national Wild and Scenic River.

This watershed is tributary to the Lower Delaware Scenic and Recreational River (LDEL)

Tributary to DRBC Significant Resource Waters.

Nearest upstream Interstate Control Point: 1677 ICP Delaware River at Milford / Upper Black Eddy Bridge

Nearest downstream Interstate Control Point: 1554 ICP Delaware River at Bulls Island Foot Bridge

Known dischargers within watershed: Few, undefined.

Watershed is 76.8% forested; urban land cover is 0.8%. Watershed was not glaciated, and is not underlain by carbonate bedrock. Mean annual precipitation 45.1 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics (USGS BaSE Model):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
2,594	75.1	35.9	28.2	23.0	18.3	9.70	4.35	0.58

StreamStats Low-Flow Stream Statistics

M7D2Y (ft ³ /s)	3.82
M30D2Y (ft ³ /s)	5.07
M7D10Y (ft ³ /s)	1.76
M30D10Y (ft ³ /s)	2.39
M90D10Y (ft ³ /s)	3.78

StreamStats Mean/Baseflow Stream Statistics

QA (ft ³ /s)	36.8
QAH (ft ³ /s)	10.9
BF10YR (ft ³ /s)	17.2
BF25YR (ft ³ /s)	15.3
BF50YR (ft ³ /s)	14.3

StreamStats Peak-Flow Stream Statistics

PK2 (ft ³ /s)	1,010
PK5 (ft ³ /s)	1,730
PK10 (ft ³ /s)	2,300
PK50 (ft ³ /s)	3,830
PK100 (ft ³ /s)	4,600
PK500 (ft ³ /s)	6,710

Existing Water Quality: 1616 BCP Tinicum Creek above Rt. 32, PA

Tinicum Creek, Pennsylvania, River Mile 161.60 – 0.24

Boundary Control Point is located on private property by Tinicum Creek Road, just below confluence of first unnamed tributary.

Parameter (Y)	Definition of Existing Water Quality			
	Median	Lower 95%CI	Upper 95%CI	Flow-Relationships Site specific regression equation.
Ammonia NH3-N (mg/L) *	<0.05	<0.05	<0.05	
Chloride (mg/L)	14	12	16	
Chlorophyll a (mg/m ³)	n/a	n/a	n/a	n/a
Dissolved Oxygen (mg/L) mid-day *	9.80	8.90	10.10	
Dissolved Oxygen Saturation (%)	104%	101%	107%	
E. coli (colonies/100 ml)	80	55	180	$Y = \text{antilog}(0.4334(\log Q) + 1.5807)$
Enterococcus (colonies/100 ml)	200	96	340	
Fecal coliform (colonies/100 ml) *	155	124	280 **	
Nitrate NO3-N (mg/L) *	0.79	0.64	1.00	
Orthophosphate (mg/L)	0.01	0.01	0.02	
pH *	8.00	7.70	8.30	
Specific Conductance (µS/cm)	247	219	262	$Y = -69.3482(\log Q) + 285.899$
Total Dissolved Solids (mg/L)	180	170	190	$Y = -39.2799(\log Q) + 204.5375$
Total Kjeldahl Nitrogen (mg/L)	0.30	0.13	0.41	
Total Nitrogen (mg/L) *	1.14	0.79	1.23	
Total Phosphorus (mg/L) *	0.04	0.03	0.04	
Total Suspended Solids (mg/L) *	2.0	1.0	3.0	
Turbidity (NTU)	1.1	0.9	1.8	$Y = \text{antilog}(0.4453(\log Q) - 0.2226)$
Alkalinity (mg/L)	61	52	72	$Y = -19.56(\log Q) + 75.97$
Hardness (mg/L)	91	75	101	$Y = -29.6089(\log Q) + 113.3701$

EWQ values represent data collected twice per month from May through September 2000-2004.

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

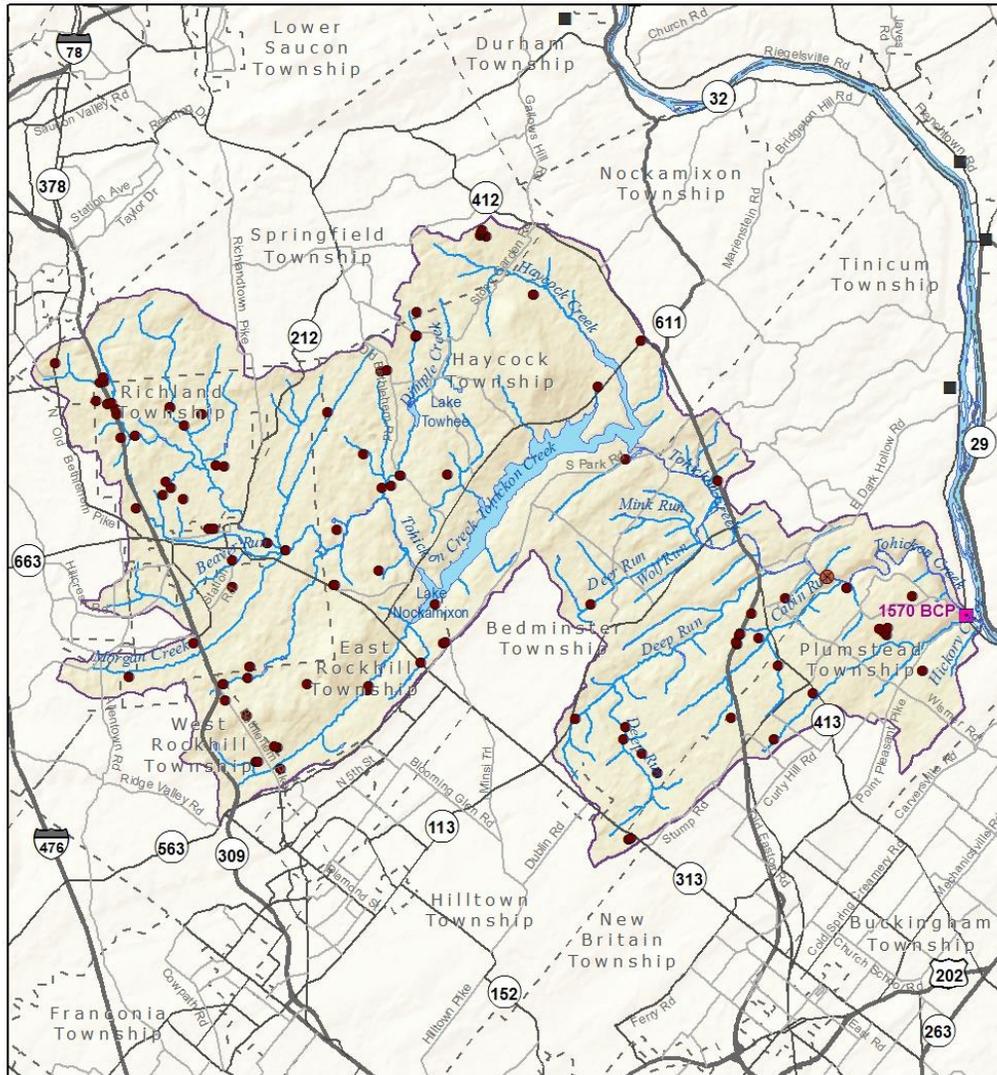
** = EWQ exceeds DRBC or state water quality criteria. Discharge evaluations should be conducted at criterion concentration.

Site Specific EWQ defined by DRBC 2000-2004.

Corrections 2016:

None

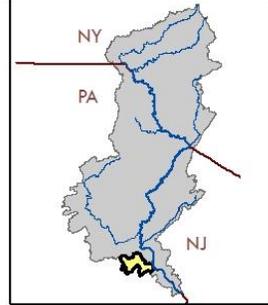
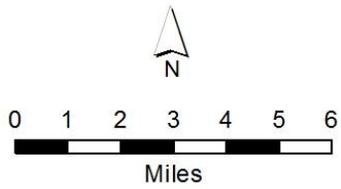
1570 BCP Tohickon Creek at Aqueduct below Rt. 32, PA



Tohickon Creek

Drainage Area = 113.77 mi²

- Sampling Location
- Other Sampling Location
- NPDES
- Stream Gage
- Drainage Area



1570 BCP Tohickon Creek at Aqueduct below Rt. 32, PA

Bucks County, PA. Latitude 40.42306 Longitude -75.06667 by GPS NAD83 decimal degrees.

USGS sites 01459500 Pipersville gage, 01460000 water quality site near BCP

Watershed Population: 2000 = 38,249 2010 = 42,600 Change: +4,351 (+11.4%)

Drainage Area: 113.9 square miles, tributary to Delaware River Zone 1E

Site Specific EWQ defined by DRBC 2000-2004.

The lower Tohickon Creek is a designated national Wild and Scenic River.

This watershed is tributary to the Lower Delaware Scenic and Recreational River (LDEL)

Tributary to DRBC Significant Resource Waters.

Nearest upstream Interstate Control Point: 1677 ICP Delaware River at Milford / Upper Black Eddy Bridge

Nearest downstream Interstate Control Point: 1554 ICP Delaware River at Bulls Island Foot Bridge

Known dischargers within watershed: Many, undefined. Nockamixon Reservoir controls flow.

Watershed is 57.3% forested; urban land cover is 4.4%. Watershed was not glaciated, and is not underlain by carbonate bedrock. Mean annual precipitation 45 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics (USGS BaSE Model estimates based on USGS Tohickon Creek gage 01459500 at Pipersville, PA):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
7,875	450	159	141	52.0	85.1	17.3	5.77	0.69

StreamStats Low-Flow Stream Statistics

M7D2Y (ft ³ /s)	8.05
M30D2Y (ft ³ /s)	12.3
M7D10Y (ft ³ /s)	3.16
M30D10Y (ft ³ /s)	4.93
M90D10Y (ft ³ /s)	10.5

StreamStats Mean/Baseflow Stream Statistics

QA (ft ³ /s)	174
QAH (ft ³ /s)	53.5
BF10YR (ft ³ /s)	70.2
BF25YR (ft ³ /s)	62.2
BF50YR (ft ³ /s)	57.6

StreamStats Peak-Flow Stream Statistics

PK2 (ft ³ /s)	3,480
PK5 (ft ³ /s)	5,740
PK10 (ft ³ /s)	7,560
PK50 (ft ³ /s)	12,500
PK100 (ft ³ /s)	14,900
PK500 (ft ³ /s)	21,800

Existing Water Quality: 1570 BCP Tohickon Creek at Aqueduct below Rt. 32, PA

Tohickon Creek, Pennsylvania, River Mile 157.00 – 0.19

Boundary Control Point is located at the Delaware Canal Aqueduct crossing in Point Pleasant.

Parameter (Y)	Definition of Existing Water Quality			
	Median	Lower 95%CI	Upper 95%CI	Flow-Relationships Site specific regression equation.
Ammonia NH3-N (mg/L) *	<0.05	<0.05	<0.05	
Chloride (mg/L)	27	25	29	$Y = -4.6046 (\log Q) + 34.3562$
Chlorophyll a (mg/m ³)	2.14	1.07	3.20	
Dissolved Oxygen (mg/L) mid-day *	9.06	8.60	9.20	
Dissolved Oxygen Saturation (%)	100%	98%	103%	
E. coli (colonies/100 ml)	38	20	60	$Y = \text{antilog} (0.8609 (\log Q) + 0.2319)$
Enterococcus (colonies/100 ml)	540	250	980	
Fecal coliform (colonies/100 ml) *	90	60	170	$Y = \text{antilog} (0.6939 (\log Q) + 0.9399)$
Nitrate NO3-N (mg/L) *	0.63	0.52	0.72	
Orthophosphate (mg/L)	0.015	0.01	0.02	
pH *	8.00	7.80	8.20	
Specific Conductance (µS/cm)	218	212	226	$Y = -27.1873 (\log Q) + 261.345$
Total Dissolved Solids (mg/L)	162	150	170	$Y = -27.494 (\log Q) + 204.9618$
Total Kjeldahl Nitrogen (mg/L)	0.37	0.34	0.49	
Total Nitrogen (mg/L) *	1.03	0.87	1.16	
Total Phosphorus (mg/L) *	0.04	0.04	0.05	
Total Suspended Solids (mg/L) *	2.0	1.0	2.5	
Turbidity (NTU)	1.3	0.9	2.0	$Y = \text{antilog} (0.5292 (\log Q) - 0.6216)$
Alkalinity (mg/L)	46	40	49	$Y = -8.96 (\log Q) + 60$
Hardness (mg/L)	64	62	68	$Y = -10.6687 (\log Q) + 81.5734$

EWQ values represent data collected twice per month from May through September 2000-2004.

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

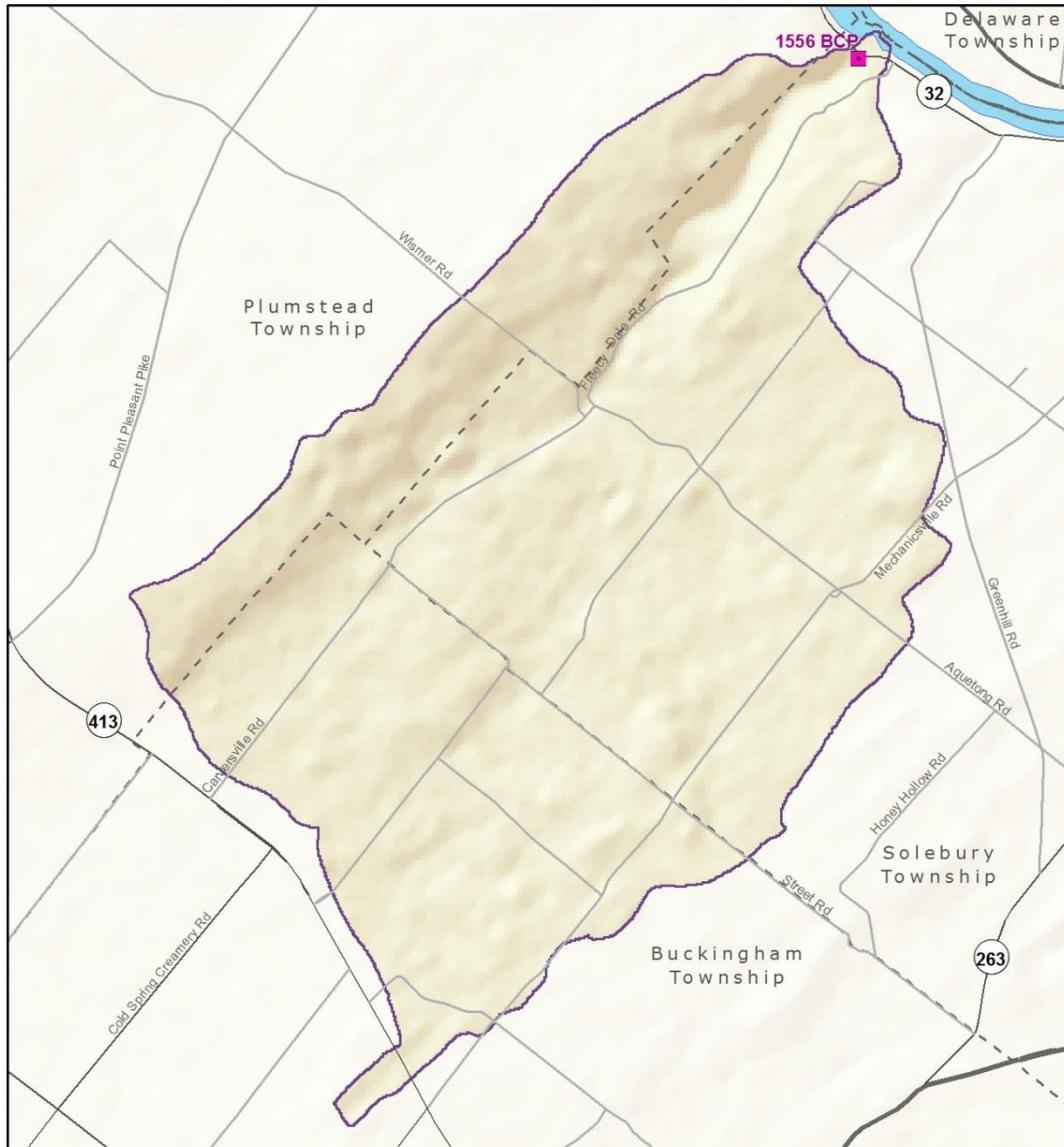
** = EWQ exceeds DRBC or state water quality criteria. Discharge evaluations should be conducted at criterion concentration.

Site Specific EWQ defined by DRBC 2000-2004.

Corrections 2016:

None

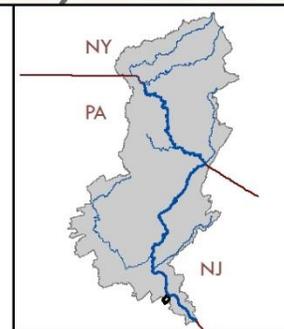
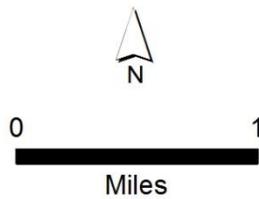
1556 BCP Paunacussing Creek at Rt. 32, PA



Paunacussing Creek

Drainage Area = 7.9 mi²

- Sampling Location
- Other Sampling Location
- 🌀 Drainage Area



1556 BCP Paunacussing Creek at Rt. 32, PA

Bucks County, PA. Latitude 40.4076 Longitude -75.0416 by GPS NAD83 decimal degrees.

No USGS or PADEP sites nearby

Watershed Population: 2000 = 2,359 2010 = 2,558 Change = +199 (+8.4%)

Drainage Area at site: 7.9 square miles, tributary to Delaware River Zone 1E

Site Specific EWQ defined by DRBC 2000-2004.

Paunacussing Creek is a designated National Wild and Scenic River.

This watershed is tributary to the Lower Delaware Scenic and Recreational River (LDEL)

Tributary to DRBC Significant Resource Waters.

Nearest upstream Interstate Control Point: 1677 ICP Delaware River at Milford / Upper Black Eddy Bridge

Nearest downstream Interstate Control Point: 1554 ICP Delaware River at Bulls Island Foot Bridge

Known dischargers within watershed: None.

Watershed is 49.7% forested; urban land cover is 0.9%. Watershed was not glaciated, and is not underlain by carbonate bedrock. Mean annual precipitation 45 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics from flow duration curve associated with water quality samples (USGS BaSE Model):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
911	23.2	11.0	8.78	7.13	5.78	2.99	1.33	0.17

StreamStats Low-Flow Stream Statistics

M7D2Y (ft ³ /s)	0.87
M30D2Y (ft ³ /s)	1.25
M7D10Y (ft ³ /s)	0.34
M30D10Y (ft ³ /s)	0.51
M90D10Y (ft ³ /s)	0.95

StreamStats Mean/Baseflow Stream Statistics

QA (ft ³ /s)	11.0
QAH (ft ³ /s)	2.84
BF10YR (ft ³ /s)	4.48
BF25YR (ft ³ /s)	3.93
BF50YR (ft ³ /s)	3.62

StreamStats Peak-Flow Stream Statistics

PK2 (ft ³ /s)	411
PK5 (ft ³ /s)	720
PK10 (ft ³ /s)	968
PK50 (ft ³ /s)	1,620
PK100 (ft ³ /s)	1,950
PK500 (ft ³ /s)	2,860

Existing Water Quality: 1556 BCP Paunacussing Creek at Rt. 32, PA

Paunacussing Creek, Pennsylvania, River Mile 155.90 – 0.12

Boundary Control Point is located at Route 32 bridge, Lumberville.

Parameter (Y)	Definition of Existing Water Quality			
	Median	Lower 95%CI	Upper 95%CI	Flow-Relationships Site specific regression equation.
Ammonia NH3-N (mg/L) *	<0.05	<0.05	<0.05	
Chloride (mg/L)	24	23	25	
Chlorophyll a (mg/m ³)	n/a	n/a	n/a	n/a
Dissolved Oxygen (mg/L) mid-day *	9.42	8.90	9.81	
Dissolved Oxygen Saturation (%)	98%	96%	101%	
E. coli (colonies/100 ml)	28	15	84	$Y = \text{antilog}(0.742(\log Q) + 1.3102)$
Enterococcus (colonies/100 ml)	320	160	520	
Fecal coliform (colonies/100 ml) *	80	60	130	$Y = \text{antilog}(0.5676(\log Q) + 1.7382)$
Nitrate NO3-N (mg/L) *	2.58	2.15	2.75	
Orthophosphate (mg/L)	0.05	0.04	0.05	
pH *	7.60	7.47	7.72	
Specific Conductance (µS/cm)	229	218	242	$Y = -18.8373(\log Q) + 238.7433$
Total Dissolved Solids (mg/L)	130	120	144	$Y = -24.3907(\log Q) + 154.9198$
Total Kjeldahl Nitrogen (mg/L)	0.30	0.17	0.36	
Total Nitrogen (mg/L) *	2.96	2.83	3.15	
Total Phosphorus (mg/L) *	0.07	0.06	0.08	
Total Suspended Solids (mg/L) *	1.0	1.0	2.0	
Turbidity (NTU)	0.8	0.5	1.6	
Alkalinity (mg/L)	47	42	55	$Y = -13.64(\log Q) + 52.88$
Hardness (mg/L)	80	75	85	$Y = -12.1905(\log Q) + 84.3707$

EWQ values represent data collected twice per month from May through September 2000-2004.

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ.

Implementation guidance should be consulted for discharge evaluations.

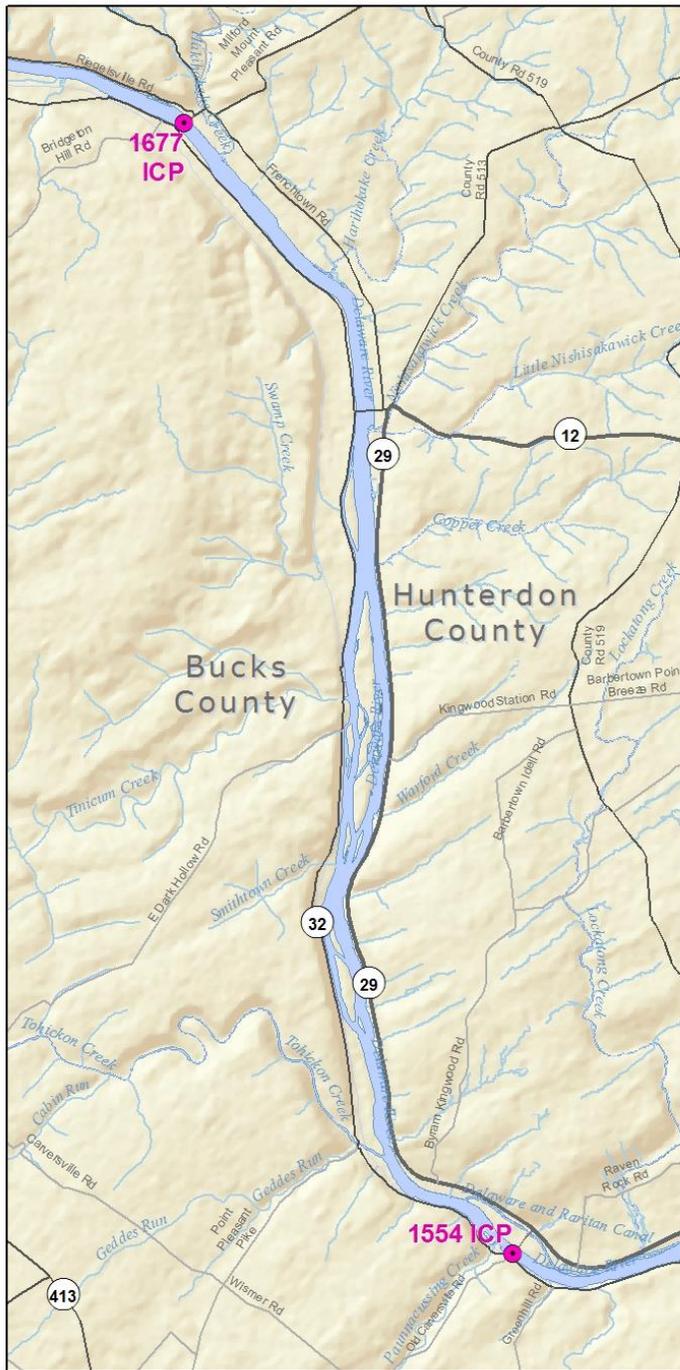
** = EWQ exceeds DRBC or state water quality criteria. Discharge evaluations should be conducted at criterion concentration.

Site Specific EWQ defined by DRBC 2000-2004.

Corrections 2016:

None

1554 ICP Delaware River at Bulls Island Foot Bridge, PA/NJ



1554 ICP
Delaware River at Bull's Island Foot Bridge



- Sampling Location
- County Boundary



1554 ICP Delaware River at Bulls Island Foot Bridge, PA/NJ

Hunterdon County, NJ and Bucks County, PA

Latitude 40.4075 Longitude -75.03778 by GPS NAD83 decimal degrees.

USGS sites 01461000, 01460820; NJDEP site 01461000

Watershed Population figures were not calculated for main-stem Delaware River sites.

Drainage Area: 6,598 square miles, Delaware River Zone 1E

Site Specific EWQ defined 2000-2004 by DRBC.

This site is located in the Lower Delaware Scenic and Recreational River.

Classified by DRBC as Significant Resource Waters

Nearest upstream Interstate Control Point: 1677 ICP Delaware River at Milford / Upper Black Eddy Bridge

Nearest downstream Interstate Control Point: 1487 ICP Delaware River at Lambertville

Known dischargers within upstream reach: Undefined

Tributaries to upstream reach: Major tributaries 1672 BCP Hakhokake Creek, NJ; 1641 BCP Nishisakawick Creek, NJ; 1616 BCP Tinicum Creek, PA; 1570 BCP Tohickon Creek, PA; 1556 BCP Paunacussing Creek, PA. Small tributaries 165.7 Harihokake Creek, NJ; 164.9 Little Nishisakawick Creek, NJ; 162.9 Copper Creek, NJ; 161.1 Warford Creek, NJ; 160.6 Smithtown Creek, PA; 160.2 Warsaw Creek, NJ.

No Stream Stats web site data available because drainage area too large for web site retrieval.

Flow Statistics Associated with Water Quality Samples (calculated by drainage area weighting from USGS gage data):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
223,826	25,107	14,889	10,413	8,505	6,822	4,827	3,338	1,849

Existing Water Quality: 1554 ICP Delaware River at Bulls Island Foot Bridge

Delaware River at Bulls Island (Lumberville-Raven Rock) Foot Bridge, PA/NJ, River Mile 155.40

Parameter (Y)	Definition of Existing Water Quality			
	Median	Lower 95%CI	Upper 95%CI	Flow-Relationships Site specific regression equation.
Ammonia NH3-N (mg/L) *	<0.05	<0.05	<0.05	
Chloride (mg/L)	17	15	20	$Y = -0.00044266 Q + 21.906$
Chlorophyll a (mg/m ³)	2.70	1.07	3.20	
Dissolved Oxygen (mg/L) mid-day *	8.80	8.40	9.30	
Dissolved Oxygen Saturation (%)	98%	95%	100%	
E. coli (colonies/100 ml)	40	23	80	$Y = \text{antilog}(0.00003626 Q + 1.0914)$
Enterococcus (colonies/100 ml)	49	32	100	
Fecal coliform (colonies/100 ml) *	71	36	90	$Y = \text{antilog}(0.00003537 Q + 1.3646)$
Nitrate NO3-N (mg/L) *	1.00	0.88	1.23	
Orthophosphate (mg/L)	0.04	0.04	0.06	
pH *	7.60	7.50	7.74	
Specific Conductance (µS/cm)	186	170	202	$Y = -0.00482529 Q + 229.19$
Total Dissolved Solids (mg/L)	140	130	160	$Y = -0.00277475 Q + 169.368$
Total Kjeldahl Nitrogen (mg/L)	0.32	0.27	0.55	
Total Nitrogen (mg/L) *	1.48	1.26	1.59	
Total Phosphorus (mg/L) *	0.10	0.07	0.12	
Total Suspended Solids (mg/L) *	5.0	4.0	7.0	$Y = 0.0007482 Q - 0.48$
Turbidity (NTU)	3.8	2.2	6.0	
Alkalinity (mg/L)	45	38	51	$Y = -0.00129755 Q + 56.978$
Hardness (mg/L)	68	60	72	$Y = -0.00134498 Q + 78.78$

EWQ values represent data collected twice per month from May through September 2000-2004.

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

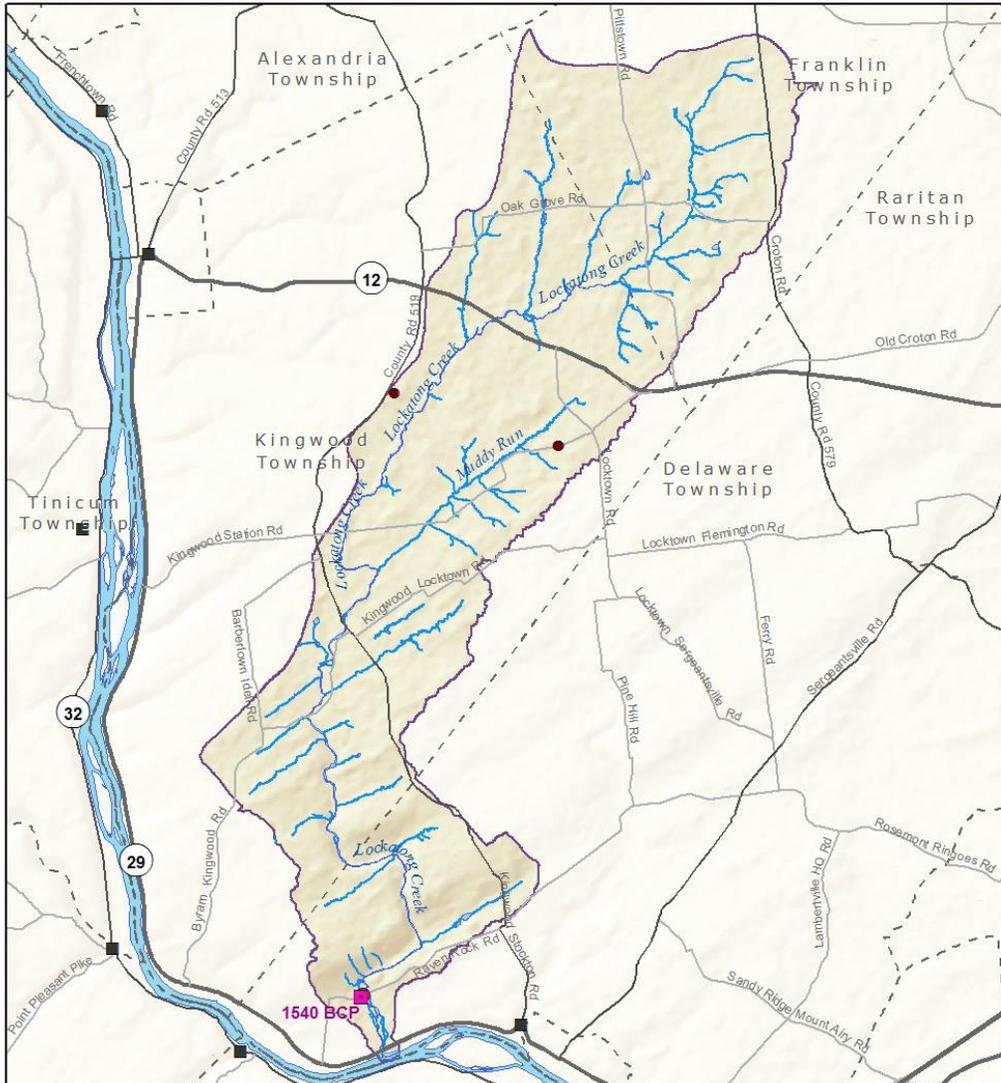
** = EWQ exceeds DRBC or state water quality criteria. Discharge evaluations should be conducted at criterion concentration.

Site Specific EWQ defined 2000-2004 by DRBC.

Corrections 2016:

None

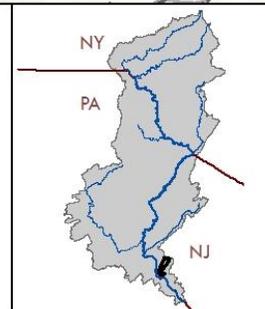
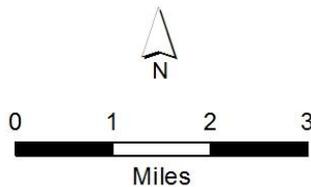
1540 BCP Lockatong Creek at Raven Rock-Rosemont Rd., NJ



Lockatong Creek

Drainage Area = 23.11 mi²

- Sampling Location
- Other Sampling Location
- NPDES
- Stream Gage
- ▭ Drainage Area



1540 BCP Lockatong Creek at Raven Rock-Rosemont Rd., NJ

Hunterdon County, NJ. Latitude 40.41583 Longitude -75.01806 by GPS NAD83 decimal degrees.

USGS/NJDEP site 01460900

Watershed Population: 2000 = 2,413 2010 = 2,514 Change: +101 (+4.2%)

Watershed Drainage Area: 23.1 square miles, tributary to Delaware River Zone 1E

Drainage Area at site 1540 BCP: 22.7 square miles.

Site Specific EWQ defined 2000-2004 by DRBC.

Watershed is tributary to the Delaware and Raritan Canal and the Lower Delaware Scenic and Recreational River (LDEL)

Tributary to DRBC Significant Resource Waters.

Nearest upstream Interstate Control Point: 1554 ICP Delaware River at Bulls Island Foot Bridge

Nearest downstream Interstate Control Point: 1487 ICP Delaware River at Lambertville

Known dischargers within watershed: Few, undefined. Lockatong Creek provides water supply to the New Jersey Water Supply Authority.

Watershed is 40.7% forested; urban land cover is 0.5%. Watershed was not glaciated, and is not underlain by carbonate bedrock. Mean annual precipitation 47.1 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics (USGS BaSE Model):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
2,525	77.6	38.8	30.5	25.1	20.1	10.9	4.89	0.71

StreamStats Low-Flow Stream Statistics

M7D2Y (ft³/s) 1.01

M30D2Y (ft³/s) 1.68

M7D10Y (ft³/s) 0.32

M30D10Y (ft³/s) 0.56

M90D10Y (ft³/s) 1.42

StreamStats Mean/Baseflow Stream Statistics

QA (ft³/s) 35.3

QAH (ft³/s) 10.1

BF10YR (ft³/s) 13.4

BF25YR (ft³/s) 11.8

BF50YR (ft³/s) 10.8

StreamStats Peak-Flow Stream Statistics

PK2 (ft³/s) 884

PK5 (ft³/s) 1,510

PK10 (ft³/s) 2,020

PK50 (ft³/s) 3,400

PK100 (ft³/s) 4,090

PK500 (ft³/s) 6,020

Existing Water Quality: 1540 BCP Lockatong Creek, NJ

Lockatong Creek, New Jersey, River Mile 154.00 – 0.75

Boundary Control Point is located at Rosemont-Raven Rock Road bridge.

Parameter (Y)	Definition of Existing Water Quality			
	Median	Lower 95%CI	Upper 95%CI	Flow-Relationships Site specific regression equation.
Ammonia NH3-N (mg/L) *	<0.05	<0.05	<0.05	
Chloride (mg/L)	13	11	14	$Y = -3.0659 (\log Q) + 14.6262$
Chlorophyll a (mg/m ³)	n/a	n/a	n/a	n/a
Dissolved Oxygen (mg/L) mid-day *	8.70	8.30	9.10	
Dissolved Oxygen Saturation (%)	94%	90%	96%	
E. coli (colonies/100 ml)	33	20	50	$Y = \text{antilog} (0.6703 (\log Q) + 1.1906)$
Enterococcus (colonies/100 ml)	260 **	98 **	480 **	
Fecal coliform (colonies/100 ml) *	32	20	76	$Y = \text{antilog} (1.0321 (\log Q) + 1.1157)$
Nitrate NO3-N (mg/L) *	1.13	0.92	1.40	
Orthophosphate (mg/L)	0.03	0.02	0.04	
pH *	7.30	7.20	7.50	
Specific Conductance (µS/cm)	180	165	191	$Y = -35.3137 (\log Q) + 193.0827$
Total Dissolved Solids (mg/L)	140	130	142	$Y = -24.7785 (\log Q) + 150.0884$
Total Kjeldahl Nitrogen (mg/L)	0.39	0.23	0.58	
Total Nitrogen (mg/L) *	1.56	1.26	1.81	
Total Phosphorus (mg/L) *	0.05	0.05	0.06	
Total Suspended Solids (mg/L) *	1.0	0.5	2.0	
Turbidity (NTU)	1.2	0.8	3.0	$Y = \text{antilog}(0.6517 (\log Q) - 0.2066)$
Alkalinity (mg/L)	43	35	46	$Y = -11.425 (\log Q) + 48.85$
Hardness (mg/L)	60	56	63	

EWQ values represent data collected twice per month from May through September 2000-2004.

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

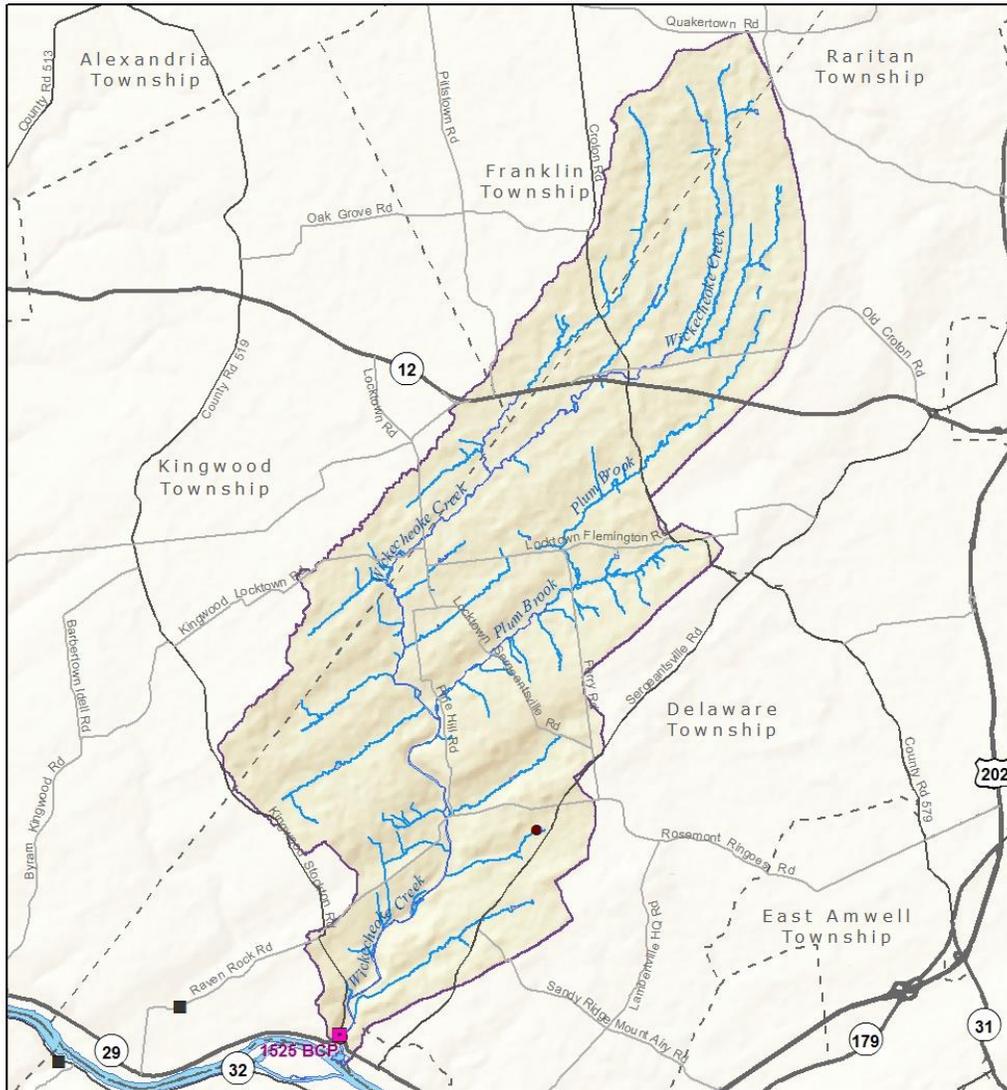
** = EWQ exceeds DRBC or state water quality criteria. Discharge evaluations should be conducted at criterion concentration.

Site Specific EWQ defined 2000-2004 by DRBC.

Corrections 2016:

None

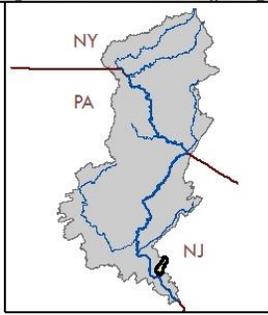
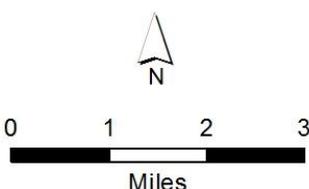
1525 BCP Wickecheoke Creek at Rt. 29, NJ



Wickecheoke Creek

Drainage Area = 27.01 mi²

- Sampling Location
- Other Sampling Location
- NPDES
- ⊗ Stream Gage
- Drainage Area



1525 BCP Wickecheoke Creek at Rt. 29, NJ

Hunterdon County, NJ. Latitude 40.41167 Longitude -75.98694 by GPS NAD83 decimal degrees.

USGS/NJDEP site 01461300

Watershed Population: 2000 = 3,095 2010 = 3,167 Change: +72 (+2.3%)

Watershed Drainage Area and site drainage area: 27 square miles, tributary to Delaware River Zone 1E

Site Specific EWQ defined 2000-2004 by DRBC.

This watershed is tributary to the Delaware and Raritan Canal and Lower Delaware Scenic and Recreational River (LDEL)

Tributary to DRBC Significant Resource Waters.

Nearest upstream Interstate Control Point: 1554 ICP Delaware River at Bulls Island Foot Bridge

Nearest downstream Interstate Control Point: 1487 ICP Delaware River at Lambertville

Known dischargers within watershed: Few, undefined. Wickecheoke Creek also provides water supply to the New Jersey Water Supply Authority via the Delaware and Raritan Canal.

Watershed is 47.9% forested; urban land cover is 0.6%. Watershed was not glaciated, and is not underlain by carbonate bedrock. Mean annual precipitation 47.2 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics (USGS BaSE Model):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
2,935	91.1	44.8	35.9	29.6	23.8	12.8	5.81	0.81

StreamStats Low-Flow Stream Statistics

M7D2Y (ft ³ /s)	1.82
M30D2Y (ft ³ /s)	2.80
M7D10Y (ft ³ /s)	0.66
M30D10Y (ft ³ /s)	1.05
M90D10Y (ft ³ /s)	2.31

StreamStats Mean/Baseflow Stream Statistics

QA (ft ³ /s)	42.1
QAH (ft ³ /s)	12.6
BF10YR (ft ³ /s)	16.9
BF25YR (ft ³ /s)	14.9
BF50YR (ft ³ /s)	13.7

StreamStats Peak-Flow Stream Statistics

PK2 (ft ³ /s)	1,010
PK5 (ft ³ /s)	1,730
PK10 (ft ³ /s)	2,310
PK50 (ft ³ /s)	3,870
PK100 (ft ³ /s)	4,660
PK500 (ft ³ /s)	6,850

Existing Water Quality: 1525 BCP Wickecheoke Creek at Rt. 29, NJ

Wickecheoke Creek, New Jersey, River Mile 152.51 – 0.21

Boundary Control Point is located at Route 29 bridge, Stockton.

Parameter (Y)	Definition of Existing Water Quality			
	Median	Lower 95%CI	Upper 95%CI	Flow-Relationships Site specific regression equation.
Ammonia NH3-N (mg/L) *	<0.05	<0.05	<0.05	
Chloride (mg/L)	17	15	18	
Chlorophyll a (mg/m ³)	n/a	n/a	n/a	
Dissolved Oxygen (mg/L) mid-day *	9.45	8.95	9.90	
Dissolved Oxygen Saturation (%)	101%	96%	104%	
E. coli (colonies/100 ml)	52	40	76	$Y = \text{antilog}(0.5393(\log Q) + 1.4795)$
Enterococcus (colonies/100 ml)	170 **	84 **	300 **	
Fecal coliform (colonies/100 ml) *	92	65	190	
Nitrate NO3-N (mg/L) *	1.83	1.69	2.20	
Orthophosphate (mg/L)	0.03	0.03	0.04	
pH *	7.53	7.40	7.70	
Specific Conductance (µS/cm)	183	175	200	$Y = -28.7787(\log Q) + 199.7338$
Total Dissolved Solids (mg/L)	130	120	134	$Y = -30.5576(\log Q) + 148.5061$
Total Kjeldahl Nitrogen (mg/L)	0.44	0.30	0.70	
Total Nitrogen (mg/L) *	2.12	1.99	2.65	
Total Phosphorus (mg/L) *	0.06	0.05	0.07	
Total Suspended Solids (mg/L) *	1.0	<0.5	1.5	
Turbidity (NTU)	1.2	0.7	2.0	$Y = \text{antilog}(0.5729(\log Q) - 0.2123)$
Alkalinity (mg/L)	40	33	43	$Y = -9.35(\log Q) + 45.46$
Hardness (mg/L)	58	51	62	

EWQ values represent data collected twice per month from May through September 2000-2004.

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ.

Implementation guidance should be consulted for discharge evaluations.

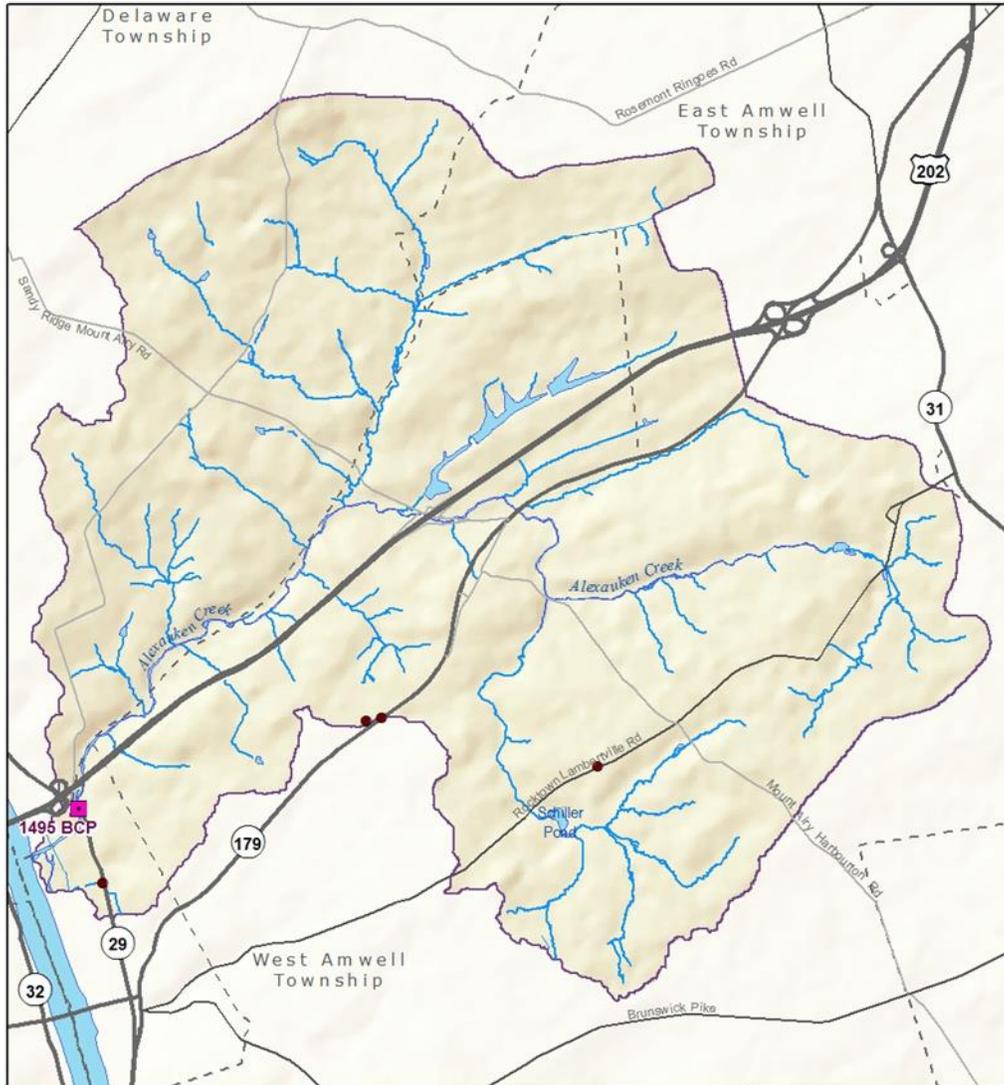
** = EWQ exceeds DRBC or state water quality criteria. Discharge evaluations should be conducted at criterion concentration.

Site Specific EWQ defined 2000-2004 by DRBC.

Corrections 2016:

None

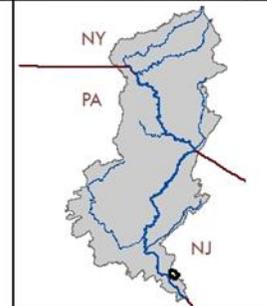
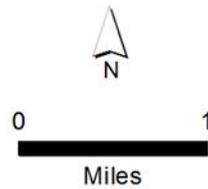
1495 BCP Alexauken Creek at Rt. 29, NJ



Alexauken Creek

Drainage Area = 15.45 mi²

- Sampling Location
- NPDES
- 🗺️ Drainage Area



1495 BCP Alexauken Creek at Rt. 29, NJ

Hunterdon County, NJ. Latitude 40.3806 Longitude -74.947961 by GPS NAD83 decimal degrees.

USGS Site No. 01461900; NJDEP Site No. 01461900

Watershed Population: 2000 = 2,409 2010 = 2,496 Change: +87 (+3.6%)

Drainage Area at site: 15.0 square miles, tributary to Delaware River Zone 1E

Site Specific EWQ monitoring began 2014 by DRBC; supplements USGS/NJDEP long-term quarterly and other data.

This watershed is tributary to the Lower Delaware Scenic and Recreational River (LDEL)

Tributary to DRBC Significant Resource Waters.

Nearest upstream Interstate Control Point: 1554 ICP Delaware River at Bulls Island Footbridge

Nearest downstream Interstate Control Point: 1487 ICP Delaware River at Lambertville

Known dischargers within watershed: Few, undefined.

Watershed is 44.3% forested; urban land cover is 1.6%. Watershed was not glaciated, and is not underlain by carbonate bedrock. Mean annual precipitation 45.1 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics (USGS BaSE Model):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
1,750	45.3	21.9	16.7	14.1	11.8	6.92	3.28	0.54

StreamStats Low-Flow Stream Statistics

M7D2Y (ft ³ /s)	1.93
M30D2Y (ft ³ /s)	2.70
M7D10Y (ft ³ /s)	0.81
M30D10Y (ft ³ /s)	1.17
M90D10Y (ft ³ /s)	2.07

StreamStats Mean/Baseflow Stream Statistics

QA (ft ³ /s)	20.6
QAH (ft ³ /s)	5.76
BF10YR (ft ³ /s)	8.43
BF25YR (ft ³ /s)	7.38
BF50YR (ft ³ /s)	6.79

StreamStats Peak-Flow Stream Statistics

PK2 (ft ³ /s)	670
PK5 (ft ³ /s)	1,160
PK10 (ft ³ /s)	1,550
PK50 (ft ³ /s)	2,600
PK100 (ft ³ /s)	3,130
PK500 (ft ³ /s)	4,590

Existing Water Quality: 1495 BCP Alexauken Creek at Rt. 29, NJ

Parameter	N	median	L95CL	U95CL	Period of Record (May-Sep data)
Alkalinity as CaCO ₃ , Total mg/L	35	61	55	66	USGS 1980-82; SRMP 2014-15
Ammonia-Nitrogen as N, Total mg/L *	28	0.005	0.004	0.044	USGS 1980-82; NJDEP 2003; SRMP 2014-15 (16/28 ND)
Calcium, Dissolved mg/L	10	24.5	20	31	USGS 1980-82, 2000
Chloride, Total mg/L	23	62.6	53.1	84.5	NJDEP 2003-04; SRMP 2014-15
Dissolved Oxygen (DO) mg/L mid-day *	42	8.71	8.10	9.17	USGS 1980-82; NJDEP 2003-11; SRMP 1999, 2014-15
Dissolved Oxygen Saturation % mid-day	26	94.9	87.3	106.0	USGS 2000, NJDEP 2004; SRMP 1999, 2014-15
Enterococcus #/100ml {1}	3	40			Insufficient data for EWQ definition
Escherichia coli #/100mL {2}	0				No Data
Fecal coliform #/100mL *	8				Insufficient data for EWQ definition
Hardness as CaCO ₃ , Total mg/L	30	117	107	128	USGS 1980-82, 2000; SRMP 2014-15
Magnesium, Dissolved mg/L	10	8.5	7.1	10.0	USGS 1980-82, 2000
Nitrate+Nitrite as N, Total mg/L *	30	0.197	0.140	0.588	USGS 1980-82; NJDEP 2003-04; SRMP 2014-15
Nitrogen as N, Total mg/L *	26	0.463	0.289	0.720	USGS 1980-82, 2000; SRMP 2014-15
Nitrogen, Kjeldahl as N, Total mg/L	31	0.203	0.150	0.272	USGS 1980-82, 2000; NJDEP 2004; SRMP 2014-15
Nitrogen, Organic as N, Total mg/L	9	0.26	0.18	0.61	USGS 1980-82, 2000
Organic Carbon, Total mg/L	7	1.6	0.1	5.9	USGS 1980-82
pH units, mid-day *	40	7.61	7.53	7.78	USGS 1980-82, 2000; NJDEP 2001-11; SRMP 1999, 2014-15
Phosphate as P, Total mg/L	20	0.033	0.025	0.040	SRMP 2014-15
Phosphorus as P, Total mg/L *	32	0.047	0.038	0.060	USGS 1980-82; NJDEP 2003-11; SRMP 2000, 2014-15
Potassium, Dissolved mg/L	10	2.2	2.0	2.5	USGS 1980-82, 2000
Silica, Dissolved mg/L	10	9.9	7.5	12.5	USGS 1980-82, 2000
Sodium, Dissolved mg/L	10	11.0	8.6	14.0	USGS 1980-82, 2000
Specific Conductance μ S/cm	40	326	288	406	USGS 1980-82, 2000; NJDEP 2001-11; SRMP 1999, 2014-15
Sulfate, Dissolved mg/L	10	38.7	32.0	57.0	USGS 1980-82, 2000
Temperature, Water, degrees C mid-day	43	20.3	19.3	22.0	USGS 1980-82, 2000; NJDEP 2001-13; SRMP 1999, 2014-15
Total Dissolved Solids (TDS) mg/L	32	226	176	270	USGS 1980-82, 2000; NJDEP 2003-04; SRMP 2014-15
Total Suspended Solids (TSS) mg/L *	22	3.5	1.0	4.0	NJDEP 2003-04; SRMP 2014-15
Turbidity NTU	23	0.55	0.33	0.71	USGS 2000; NJDEP 2004; SRMP 2014-15

Two-tailed 95% (Lower and Upper) confidence limits were used for these EWQ targets

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

** Value exceeds state and/or DRBC water quality criterion

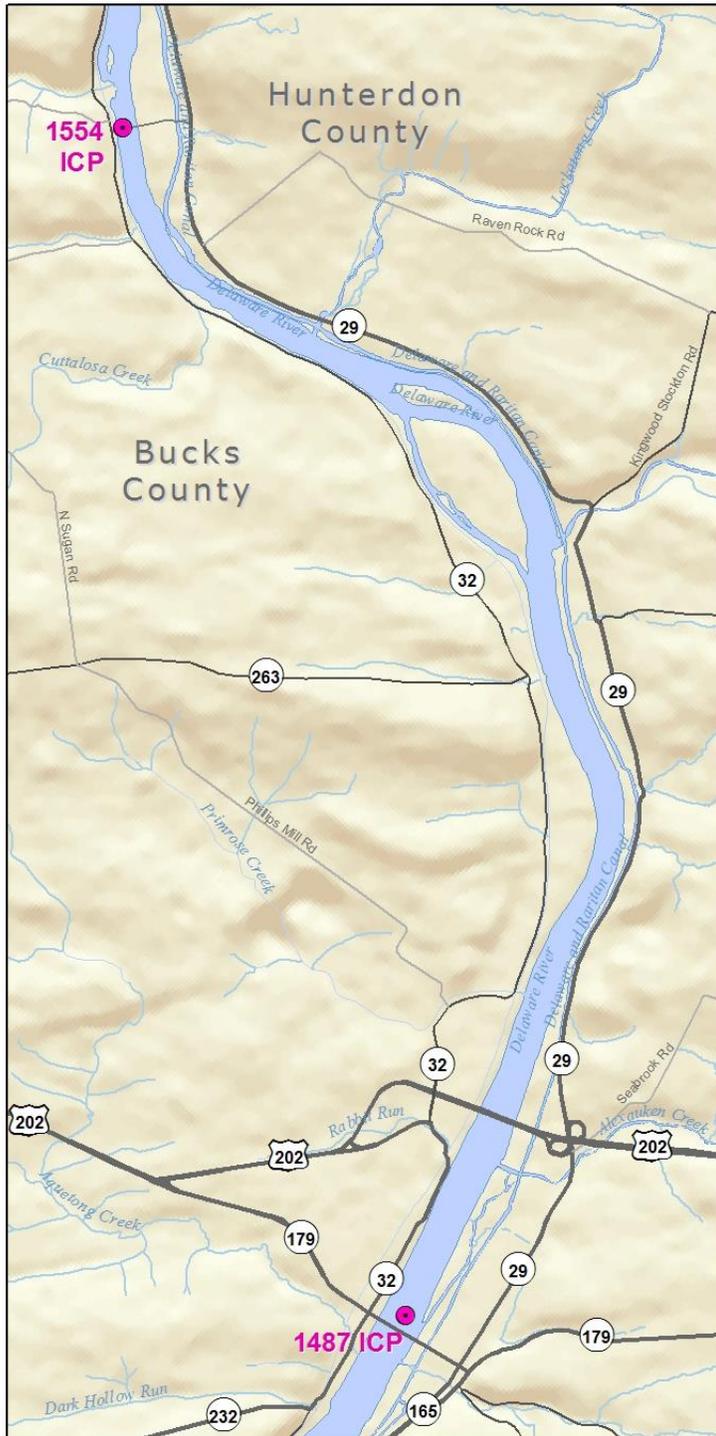
Note: All data are May to September season. Additional data are available for the October to April “non-seasonal” period, but data are insufficient in number for establishment of site-specific existing water quality targets.

There were many more parameters collected at this site over the years, but were excluded from this table because of insufficient frequency of sampling or because most results were not detected.

Dissolved oxygen, pH and temperature data represent mid-day near maximum values, as they are all grab samples taken between 10 AM and 3 PM.

This table is incomplete. The SRMP is conducting one more year of confirmatory monitoring in 2016 to supplement historical and current NJDEP and USGS data used to calculate existing water quality at this site.

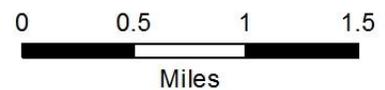
1487 ICP Delaware River at Lambertville Bridge, PA/NJ



1487 ICP
Delaware River at Lambertville Bridge



- Sampling Location
- County Boundary



1487 ICP Delaware River at Lambertville Bridge, PA/NJ

Bucks County, PA and Hunterdon County, NJ

Latitude 40.36583 Longitude -74.94917 by GPS NAD83 decimal degrees.

USGS site 01462000.

Watershed Population figures were not calculated for main-stem Delaware River sites.

Drainage Area: 6,680 square miles, Delaware River Zone 1E

Site Specific EWQ defined 2000-2004 by DRBC.

This site is located in the Lower Delaware Scenic and Recreational River.

Classified by DRBC as Significant Resource Waters

Nearest upstream Interstate Control Point: 1554 ICP Delaware River at Bulls Island Footbridge

Nearest downstream Interstate Control Point: 1418 ICP Delaware River at Washington Crossing

Known dischargers within upstream reach: Undefined

Tributaries to upstream reach: Major tributaries 1540 BCP Lockatong Creek, NJ; 1525 BCP Wickecheoke Creek, NJ; 1495 BCP Alexauken Creek, NJ; small tributaries 154.7 Cuttalossa Creek, PA; , 150.3 Primrose Creek, PA.

No Stream Stats web site data available because drainage area is too large for web site retrieval.

Flow Statistics Associated with Water Quality Samples (calculated by drainage area weighting from USGS gage data):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
226,608	25,419	15,074	10,542	8,611	6,907	4,887	3,379	1,872

Existing Water Quality: 1487 ICP Delaware River at Lambertville Bridge

Delaware River at Lambertville-New Hope Bridge, NJ/PA, River Mile 148.70

Parameter (Y)	Definition of Existing Water Quality			
	Median	Lower 95%CI	Upper 95%CI	Flow-Relationships Site specific regression equation.
Ammonia NH3-N (mg/L) *	<0.05	<0.05	0.05	
Chloride (mg/L)	18	16	20	$Y = -0.00046965 Q + 22.449$
Chlorophyll a (mg/m ³)	2.95	2.00	4.70	
Dissolved Oxygen (mg/L) mid-day *	8.50	7.90	8.63	
Dissolved Oxygen Saturation (%)	94%	93%	95%	
E. coli (colonies/100 ml)	40	16	62	$Y = \text{antilog}(0.00004662 Q + 1.0027)$
Enterococcus (colonies/100 ml)	60	38	80	
Fecal coliform (colonies/100 ml) *	55	32	120	$Y = \text{antilog}(0.00003689 Q + 1.3656)$
Nitrate NO3-N (mg/L) *	1.11	0.90	1.28	
Orthophosphate (mg/L)	0.04	0.04	0.07	
pH *	7.55	7.40	7.60	
Specific Conductance (µS/cm)	191	156	207	$Y = -0.00448812 Q + 229.4$
Total Dissolved Solids (mg/L)	140	127	160	$Y = -0.0020763 (\log Q) + 159.338$
Total Kjeldahl Nitrogen (mg/L)	0.46	0.34	0.66	
Total Nitrogen (mg/L) *	1.56	1.36	1.84	
Total Phosphorus (mg/L) *	0.10	0.08	0.12	
Total Suspended Solids (mg/L) *	6.5	3.5	9.0	$Y = 0.00075399 Q - 0.3458$
Turbidity (NTU)	2.5	1.8	6.0	$Y = \text{antilog}(0.00003256 Q + 0.0989)$
Alkalinity (mg/L)	46	36	52	$Y = -0.00162641 Q + 60.322$
Hardness (mg/L)	68	56	77	$Y = -0.00146091 Q + 80.092$

EWQ values represent data collected twice per month from May through September 2000-2004.

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

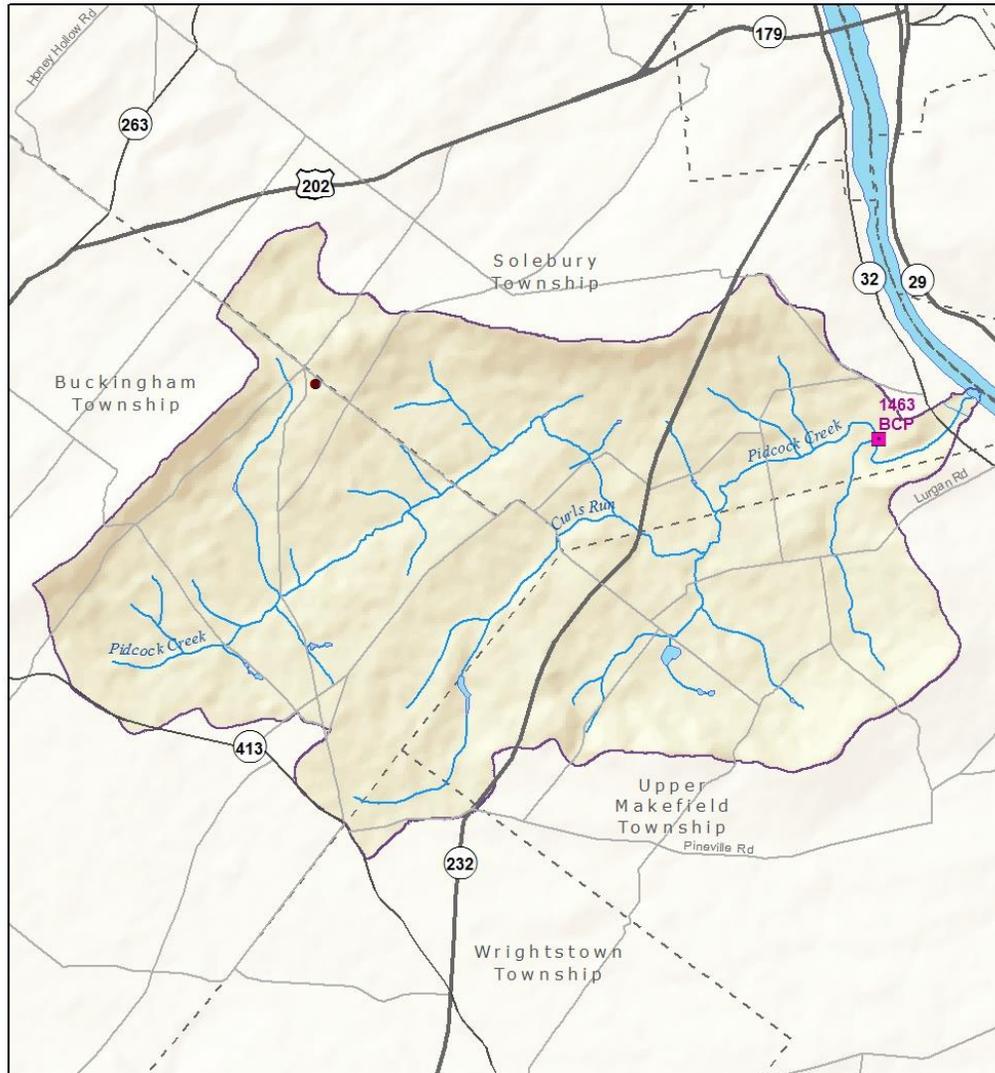
** = EWQ exceeds DRBC or state water quality criteria. Discharge evaluations should be conducted at criterion concentration.

Site Specific EWQ defined 2000-2004 by DRBC.

Corrections 2016:

None

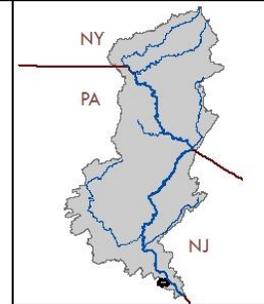
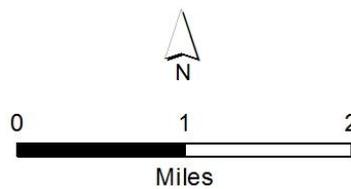
1463 BCP Pidcock Creek at BHWP Stone Bridge, PA



Pidcock Creek

Drainage Area = 12.73 mi²

- Sampling Location
- Other Sampling Location
- NPDES
- Drainage Area



1463 BCP Pidcock Creek at BHWP Stone Bridge, PA

Bucks County, PA. Latitude 40.328961 Longitude -75.945116 by GPS NAD83 decimal degrees.

USGS site 01462100 nearby

Watershed Population: 2000 = 1,960 2010 = 2,012 Change: +52 (+2.6%)

Watershed Drainage Area: 12.7 square miles, tributary to Delaware Canal and Delaware River Zone 1E

Site drainage area: 11.7 square miles

Site Specific EWQ defined 2000-2004 by DRBC.

This watershed is tributary to the Lower Delaware Scenic and Recreational River (LDEL)

Tributary to DRBC Significant Resource Waters.

Pidcock Creek was chosen as a small stream representative of the Piedmont physiographic province.

Nearest upstream Interstate Control Point: 1487 ICP Delaware River at Lambertville

Nearest downstream Interstate Control Point: 1418 ICP Delaware River at Washington Crossing

Known dischargers within watershed: Few, undefined. Pidcock Creek flows to Delaware Canal at low-flow, and to the Delaware River via a canal overspill under high-flow conditions.

Watershed is 59.9% forested; urban land cover is 0.3%. Watershed was not glaciated, and is 2.8% underlain by carbonate bedrock. Mean annual precipitation 45 inches. (<http://water.usgs.gov/osw/streamstats/>, accessed 2012).

Flow Statistics associate with water quality samples (USGS BaSE Model):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
1,408	35.7	16.5	13.8	11.3	9.15	4.50	1.91	0.20

StreamStats Low-Flow Stream Statistics

M7D2Y (ft³/s) 1.38

M30D2Y (ft³/s) 1.96

M7D10Y (ft³/s) 0.55

M30D10Y (ft³/s) 0.82

M90D10Y (ft³/s) 1.50

StreamStats Mean/Baseflow Stream Statistics

QA (ft³/s) 16.9

QAH (ft³/s) 5.29

BF10YR (ft³/s) 8.08

BF25YR (ft³/s) 7.14

BF50YR (ft³/s) 6.60

StreamStats Peak-Flow Stream Statistics

PK2 (ft³/s) 574

PK5 (ft³/s) 994

PK10 (ft³/s) 1,330

PK50 (ft³/s) 2,240

PK100 (ft³/s) 2,700

PK500 (ft³/s) 3,960

Existing Water Quality: 1463 BCP Pidcock Creek at BHWP Stone Bridge, PA

Pidcock Creek, Pennsylvania, River Mile 146.30 – 0.90

Boundary Control Point is located at stone foot bridge within Bowman’s Hill Wildflower Preserve.

Parameter (Y)	Definition of Existing Water Quality			
	Median	Lower 95%CI	Upper 95%CI	Flow-Relationships Site specific regression equation.
Ammonia NH3-N (mg/L) *	<0.05	<0.05	0.06	
Chloride (mg/L)	19	17	21	
Chlorophyll a (mg/m ³)	n/a	n/a	n/a	
Dissolved Oxygen (mg/L) mid-day *	7.45	7.20	8.50	
Dissolved Oxygen Saturation (%)	81%	78%	86%	
E. coli (colonies/100 ml)	91	64	170	Y = antilog (0.6675 (log Q) + 1.5652)
Enterococcus (colonies/100 ml)	485	170	720	
Fecal coliform (colonies/100 ml) *	195	130	310 **	Y = antilog (0.6669 (log Q) + 1.8192)
Nitrate NO3-N (mg/L) *	0.99	0.90	1.28	
Orthophosphate (mg/L)	0.07	0.05	0.08	
pH *	7.39	7.20	7.44	
Specific Conductance (µS/cm)	255	243	276	Y = -45.1671 (log Q) + 281.0884
Total Dissolved Solids (mg/L)	185	170	190	
Total Kjeldahl Nitrogen (mg/L)	0.50	0.28	0.72	
Total Nitrogen (mg/L) *	1.63	1.46	2.09	
Total Phosphorus (mg/L) *	0.10	0.08	0.12	
Total Suspended Solids (mg/L) *	3.0	2.0	4.0	
Turbidity (NTU)	3.7	2.5	5.3	Y = antilog (0.6463 (log Q) + 0.163)
Alkalinity (mg/L)	77	64	87	Y = -27.32 (log Q) + 92.67
Hardness (mg/L)	108	97	110	Y = -15.6248 (log Q) + 112.7103

EWQ values represent data collected twice per month from May through September 2000-2004.

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

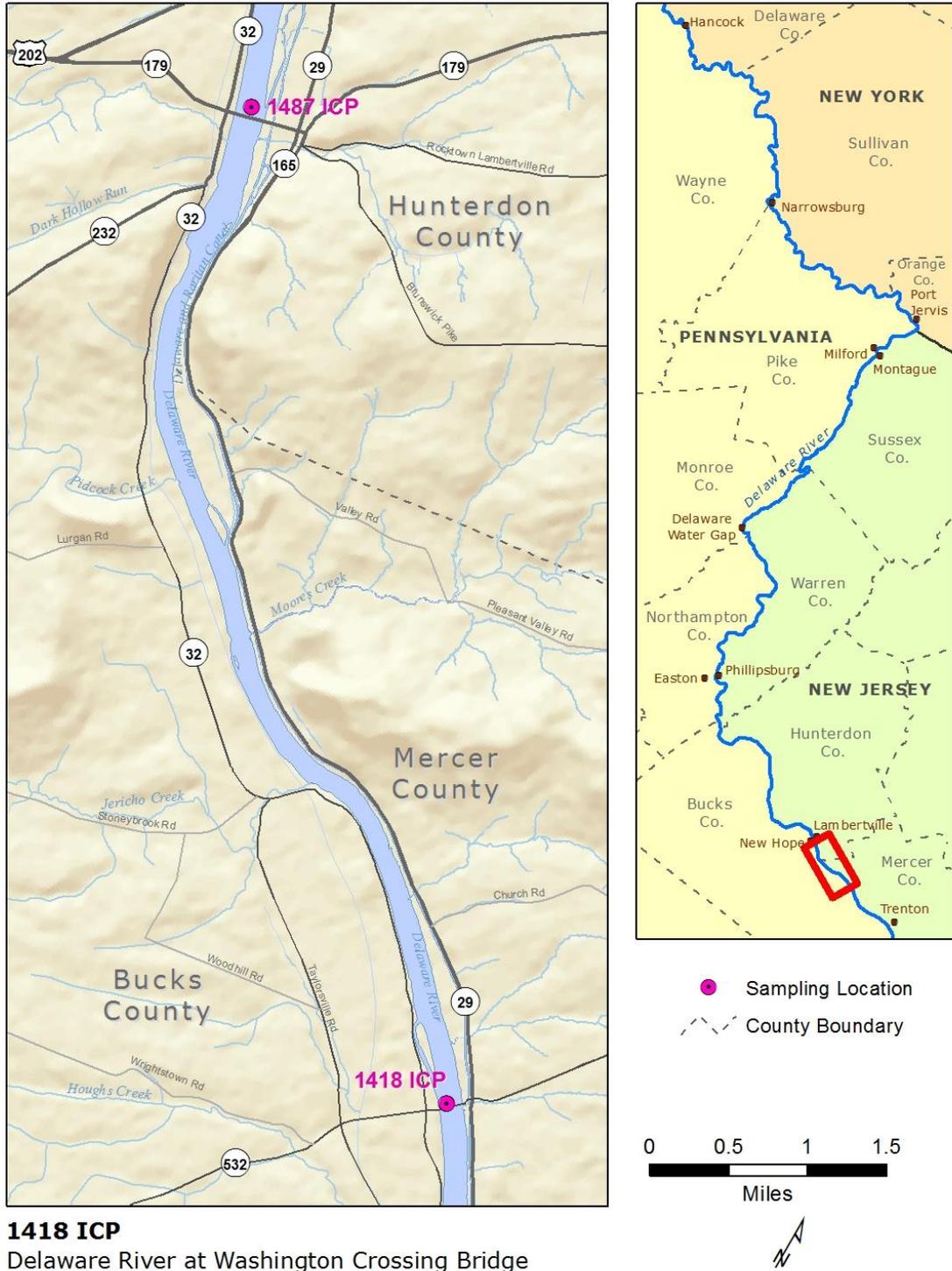
** = EWQ exceeds DRBC or state water quality criteria. Discharge evaluations should be conducted at criterion concentration.

Site Specific EWQ defined 2000-2004 by DRBC.

Corrections 2016:

None

1418 ICP Delaware River at Washington Crossing Bridge, PA/NJ



1418 ICP
Delaware River at Washington Crossing Bridge

1418 ICP Delaware River at Washington Crossing Bridge, PA/NJ

Bucks County, PA and Mercer County, NJ

Latitude 40.295278 Longitude -74.868889 by GPS NAD83 decimal degrees.

USGS site 01462500.

Watershed Population figures were not calculated for main-stem Delaware River sites.

Drainage Area: 6,735 square miles, Delaware River Zone 1E

Site Specific EWQ defined 2000-2004 by DRBC.

This site is located in the Lower Delaware Scenic and Recreational River.

Classified by DRBC as Significant Resource Waters

Nearest upstream Interstate Control Point: 1487 ICP Delaware River at Lambertville

Nearest downstream Interstate Control Point: 1343 ICP Delaware River at Calhoun St. Bridge, Trenton

Known dischargers within upstream reach: Lambertville WWTP, others unknown.

Tributaries to upstream reach: Major tributaries 1463 BCP Pidcock Creek, PA; small tributaries 148.6 Swan Creek, NJ; 148.5 Aquetong Creek, PA; 145.2 Moore Creek, NJ; 144.2 Jericho Creek, PA; 143.2 Fiddler Creek, NJ.

No Stream Stats web site data available because drainage area too large for web site retrieval.

Flow Statistics Associated with Water Quality Samples (calculated by drainage area weighting from USGS gage data):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
228,473	25,629	15,198	10,629	8,682	6,963	4,927	3,407	1,887

Existing Water Quality: 1418 ICP Delaware River at Washington Crossing

Delaware River at Washington Crossing Bridge, PA/NJ, River Mile 141.80

Parameter (Y)	Definition of Existing Water Quality			
	Median	Lower 95%CI	Upper 95%CI	Flow-Relationships Site specific regression equation.
Ammonia NH3-N (mg/L) *	<0.05	<0.05	0.09	
Chloride (mg/L)	18	16	20	$Y = -0.00032977 Q + 21.336$
Chlorophyll a (mg/m ³)	2.30	1.30	4.27	
Dissolved Oxygen (mg/L) mid-day *	8.69	8.46	9.00	
Dissolved Oxygen Saturation (%)	96%	95%	99%	
E. coli (colonies/100 ml)	33	20	60	$Y = \text{antilog}(0.00003267 Q + 1.1795)$
Enterococcus (colonies/100 ml)	55	23	90	
Fecal coliform (colonies/100 ml) *	70	48	110	$Y = \text{antilog}(0.00002852 Q + 1.4892)$
Nitrate NO3-N (mg/L) *	0.99	0.86	1.20	
Orthophosphate (mg/L)	0.04	0.03	0.06	
pH *	7.69	7.52	7.90	
Specific Conductance (µS/cm)	187	158	206	$Y = -0.00579709 Q + 239.8$
Total Dissolved Solids (mg/L)	138	130	160	$Y = -0.00317926 Q + 175.218$
Total Kjeldahl Nitrogen (mg/L)	0.37	0.30	0.64	
Total Nitrogen (mg/L) *	1.47	1.24	1.69	
Total Phosphorus (mg/L) *	0.10	0.07	0.12	
Total Suspended Solids (mg/L) *	6.0	5.0	8.0	$Y = 0.0007895 Q + 0.7126$
Turbidity (NTU)	4.0	2.4	5.3	
Alkalinity (mg/L)	45	36	50	$Y = -0.00128607 Q + 56.134$
Hardness (mg/L)	67	53	75	$Y = -0.0019019 Q + 82.144$

EWQ values represent data collected twice per month from May through September 2000-2004.

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

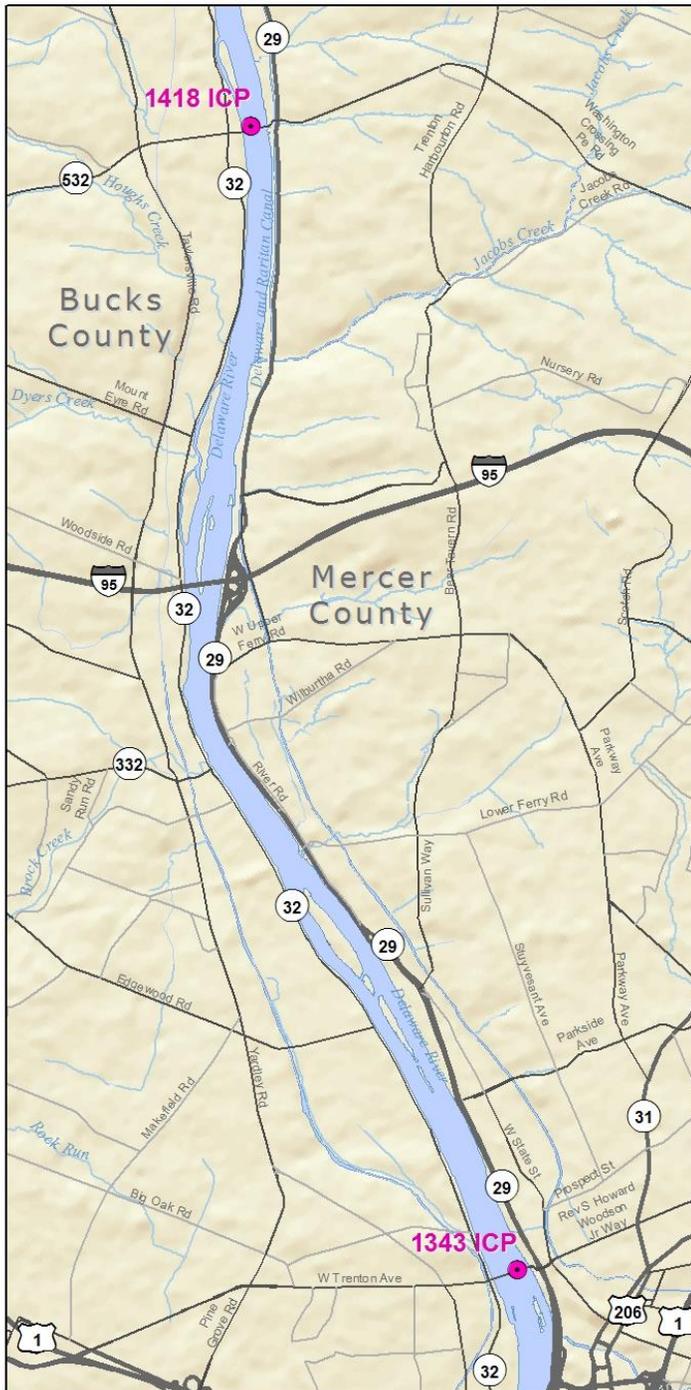
** = EWQ exceeds DRBC or state water quality criteria. Discharge evaluations should be conducted at criterion concentration.

Site Specific EWQ defined 2000-2004 by DRBC.

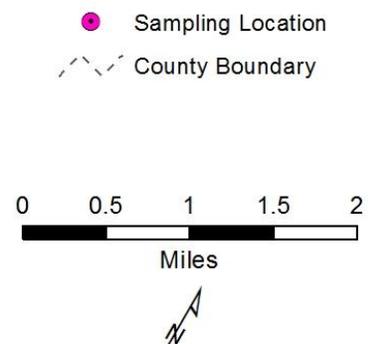
Corrections 2016:

None

1343 ICP Delaware River at Calhoun St. Bridge, PA/NJ



1343 ICP
Delaware River at Calhoun Street Bridge, Trenton



1343 ICP Delaware River at Calhoun St. Bridge, PA/NJ

Bucks County, PA and Mercer County, NJ

Latitude 40.22032 Longitude -74.7777 by GPS NAD83 decimal degrees.

USGS site 01463500; PADEP site WQN0101; NJDEP site 01463500

Watershed Population figures were not calculated for main-stem Delaware River sites.

Drainage Area: 6,780 square miles, Delaware River Zone 1E

Site Specific EWQ defined 2000-2004 by DRBC.

Lower terminus of DRBC Significant Resource Waters; just upstream of head-of-tide.

Downstream-most site of the DRBC Scenic Rivers Monitoring Program.

Sites downstream are monitored by the DRBC Delaware Estuary Boat Run Monitoring Program.

Nearest upstream Interstate Control Point: 1418 ICP Delaware River at Washington Crossing

Nearest downstream Interstate Control Point: NONE

Known dischargers within upstream reach: Undefined

Tributaries to upstream reach: No Major tributaries; small tributaries 140.4 Houghs Creek, PA; , 140.3 Jacobs Creek, NJ; 139.7 Dyers Run, PA; 137.8 Buck Creek, PA; 137.0 Gold Run, NJ.

No Stream Stats web site data available because drainage area is too large for web site retrieval.

Flow Statistics Associated with Water Quality Samples (from USGS gage 01463500 data):

Max Flow (CFS)	90% Flow (CFS)	75% Flow (CFS)	60% Flow (CFS)	50% Flow (CFS)	40% Flow (CFS)	25% Flow (CFS)	10% Flow (CFS)	Min Flow (CFS)
230,000	25,800	15,300	10,700	8,740	7,010	4,960	3,430	1,900

Existing Water Quality: 1343 ICP Delaware River at Calhoun St. Bridge

Delaware River at Calhoun Street Bridge, Trenton-Morrisville, NJ/PA, River Mile 134.34

Parameter (Y)	Definition of Existing Water Quality			
	Median	Lower 95%CI	Upper 95%CI	Flow-Relationships Site specific regression equation.
Ammonia NH3-N (mg/L) *	<0.05	<0.05	<0.05	
Chloride (mg/L)	17	16	21	$Y = -0.00046454 Q + 22.687$
Chlorophyll a (mg/m ³)	2.70	1.60	4.81	
Dissolved Oxygen (mg/L) mid-day *	8.74	8.40	9.20	
Dissolved Oxygen Saturation (%)	97%	94%	101%	
E. coli (colonies/100 ml)	40	24	65	$Y = \text{antilog}(0.00002609 Q + 1.2844)$
Enterococcus (colonies/100 ml)	45	20	80	
Fecal coliform (colonies/100 ml) *	88	60	140	
Nitrate NO3-N (mg/L) *	1.05	0.85	1.21	
Orthophosphate (mg/L)	0.04	0.03	0.06	
pH *	7.78	7.56	8.00	
Specific Conductance (µS/cm)	185	163	202	$Y = -0.00563728 Q + 240.35$
Total Dissolved Solids (mg/L)	140	130	156	$Y = -0.00300322 Q + 169.514$
Total Kjeldahl Nitrogen (mg/L)	0.48	0.36	0.58	
Total Nitrogen (mg/L) *	1.45	1.22	1.71	
Total Phosphorus (mg/L) *	0.10	0.07	0.12	
Total Suspended Solids (mg/L) *	6.3	5.0	8.5	$Y = 0.00085809 Q - 0.2021$
Turbidity (NTU)	2.9	2.2	5.8	
Alkalinity (mg/L)	45	36	50	$Y = -0.00160669 Q + 58.973$
Hardness (mg/L)	69	60	73	$Y = -0.00141561 Q + 79.891$

EWQ values represent data collected twice per month from May through September 2000-2004.

* = Dischargers may be required to evaluate this parameter for permit limits necessary to meet EWQ. Implementation guidance should be consulted for discharge evaluations.

** = EWQ exceeds DRBC or state water quality criteria. Discharge evaluations should be conducted at criterion concentration.

Site Specific EWQ defined 2000-2004 by DRBC.

Corrections 2016:

None

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