

**BRINTON RUN AND TWO
UNNAMED TRIBUTARIES TO BRANDYWINE CREEK
CHESTER AND DELAWARE COUNTIES**

**STREAM REDESIGNATION EVALUATION REPORT
WATER QUALITY STANDARDS REVIEW**

**SEGMENT: BASINS
DRAINAGE LIST: G
STREAM CODES: 00040, 00044, 00052**

**WATER QUALITY MONITORING AND ASSESSMENT SECTION (DSB)
DIVISION OF WATER QUALITY ASSESSMENT AND STANDARDS
BUREAU OF WATER SUPPLY AND WASTEWATER MANAGEMENT
DEPARTMENT OF ENVIRONMENTAL PROTECTION**

**JUNE 2000
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GENERAL WATERSHED DESCRIPTION

Brinton Run (00040) is a tributary to Brandywine Creek located in Birmingham Township, Delaware County and Birmingham Township, Chester County (Figure 1, Table 1). This basin has a drainage area of 1.3 square miles and contains 3.1 stream miles. Unnamed Tributaries to Brandywine Creek 00044 and 00052 are known locally as Wylie and Renwick Runs respectively. They are located in Birmingham Township, Chester County and have drainage areas of 1.3 and 0.5 square miles and contain 3.3 and 1.4 stream miles respectively. All three candidate streams are currently designated Warm Water Fishes (WWF) and Migratory Fishes (MF). In response to a petition submitted by the Birmingham Township Recreation, Parks, and Open Space Committee, these watersheds were evaluated for a possible upgrade to Exceptional Value Waters (EV). This evaluation is based on field surveys conducted in July 1998 and April 1999.

The land use in all three candidate basins is a mixture of agriculture and low density residential with smaller areas of second growth woodlands. These watersheds contain no major population centers. The National Wetlands Inventory maps indicate the presence of small areas of forested swamp adjacent to the streams in these basins and some larger areas of emergent marsh in the floodplain of Brandywine Creek near the mouth of UNT 00044. Based on these maps, wetlands constitute less than 5% of the total watershed area.

WATER QUALITY AND USES

Surface Water

No long term water quality data were available to allow a direct comparison to water quality criteria. Grab samples were taken at three stations (Table 2). These samples showed that water quality was generally good. The instantaneous nature of grab samples precludes comparison to applicable water quality criteria. The indigenous aquatic community is a better indicator of long term conditions and is used as a measure of both water quality and ecological significance.

There are no permitted surface water withdrawals or NPDES discharges in the three candidate watersheds.

Aquatic Biota

The total habitat score for aquatic biota at all stations was in the Suboptimal range (Table 3). Instream habitat has been degraded by erosion especially at Stations 44UT and 52UT. The riparian zone along all three streams has been impacted by development and/or agriculture. Benthic macroinvertebrate samples were collected at three stations during the April 1999 survey. The results of these sampling efforts are presented in Table 4. Benthic macroinvertebrates were collected using sampling techniques adapted from the EPA Rapid Bioassessment Protocols. Taxonomic diversity was reasonably good but the number of intolerant taxa is indicative of the negative effects of human activity especially at Station 44UT.

NATIONAL, STATE, REGIONAL, OR LOCAL SIGNIFICANCE

There are no known portions of the candidate basins that exhibit the characteristics of outstanding national, state, regional, or local resource waters under the Department's regulatory criteria.

ECOLOGICAL OR RECREATIONAL SIGNIFICANCE

Selected benthic macroinvertebrate community metrics were compared to a reference station with a comparable drainage area (Table 7). Birch Run (01563), a tributary to French Creek (see Table 1), was used as the reference stream. This stream is currently designated EV in Chapter 93 and has a drainage area of 6.5 square miles. Both candidate and reference basins are located in the Piedmont Uplands (64c) subcoregion. All sampling was conducted on the same day to minimize the effects of seasonal variation. This comparison was done using the following metrics which were selected as being indicative of community health: taxa richness; modified EPT index (total number of intolerant Ephemeroptera, Plecoptera, and Trichoptera taxa); modified Hilsenhoff Biotic Index; percent dominant taxon; and percent modified mayflies.

Based on these five metrics, Stations 1BR, 44UT, and 52UT had biological condition scores that were 80%, 40%, and 80% of the reference station respectively. The candidate basins do not meet the 83% comparison standard required for redesignation to HQ-WWF.

PUBLIC RESPONSE AND PARTICIPATION SUMMARY

The Department provided public notice of this redesignation evaluation and requested any technical data from the general public through publication in the Pennsylvania Bulletin on December 25, 1999 (29 Pa.B 6524). A similar notice was also published in the Daily Local News, West Chester on December 27, 1999. In addition, Birmingham Township, Chester County and Birmingham Township, Delaware County were notified of the evaluation in a letter dated December 27, 1999. The Chester and Delaware County Planning Commissions were also notified at the same time. No data on water chemistry, instream habitat, or the aquatic community were received in response to these notices.

The Department sent copies of this draft report along with a cover letter dated May 17, 2001 requesting comments within a 30-day period, to Richard Gross, Chairman, Birmingham Township Recreation, Parks and Open Space Committee, the Chester County Planning Commission, the Delaware County Planning Department, and Birmingham and Chadds Ford Townships. The Department received responses from Richard Gross, State Representative Chris Ross, and G. Winfield Fairchild a Professor of Biology at West Chester University. All three respondents expressed concern that the Department was recommending no change to the designated use of Brinton Run and Unnamed Tributary 0052 (Renwick Run). The reasons they listed in support of an upgrade to High Quality do not comply with existing regulations (§ 93.4b). In particular, they cite the fact that a one-time sample is not a fair measure of stream quality but the reason the Department uses macroinvertebrates as an indicator of water quality is because they are present in the stream for an extended period of time and reflect long-term stream

conditions. No changes were made to the proposed recommendation as a result of these comments.

RECOMMENDATION

Based on applicable regulatory criteria, the Department recommends that the basins of Brinton Run, and Unnamed Tributaries to Brandywine Creek 00044 (Wylie Run) and 00052 (Renwick Run) retain the current Warm Water Fishes (WWF) and Migratory Fishes (MF) use designations. This recommendation will result in no change to approximately 3.1, 3.3, and 1.4 stream miles respectively. This designation provides less protection than the EV designation requested by the petitioner.

FIGURE 1.
BRINTON RUN, 00044, AND 00052
CHESTER COUNTY

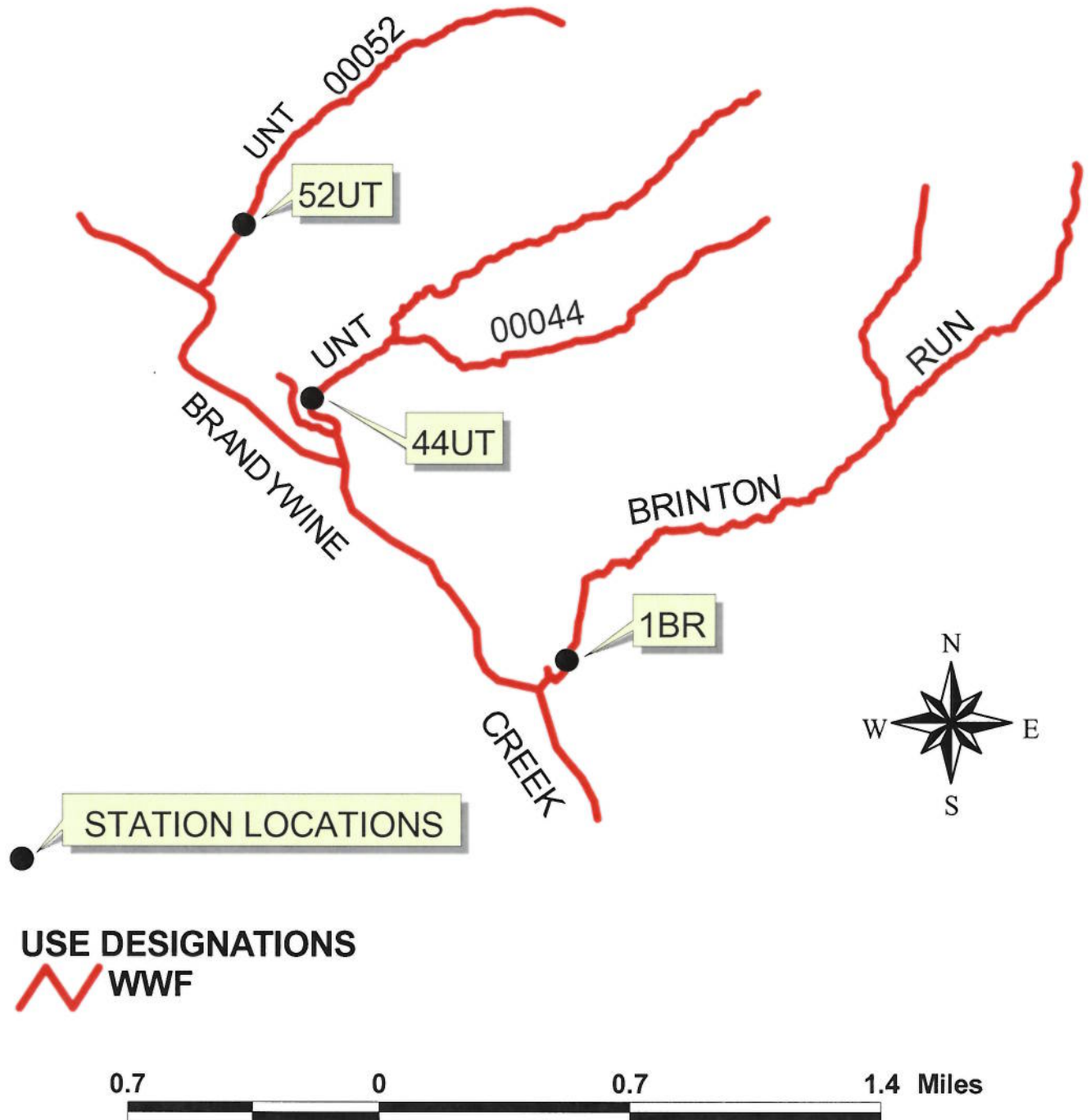


TABLE 1
STATION LOCATIONS
BRINTON RUN, 00044, AND 00052
CHESTER COUNTY

STATION	LOCATION
1BR	Brinton Run approximately 35 meters upstream of SR0100 crossing. Birmingham Township, Chester County Lat: 39 52 42 Long: 75 35 54 RMI: 0.1
44UT	Unnamed tributary to Brandywine Creek (00044) approximately 30 meters upstream of the SR0100 crossing. Birmingham Township, Chester County Lat: 39 53 21 Long: 75 36 40 RMI: 0.2
52UT	Unnamed tributary to Brandywine Creek (00052) approximately 40 meters upstream of the SR0100 crossing. Birmingham Township, Chester County Lat: 40 32 27 Long: 75 15 54 RMI: 0.2
R1	Birch Run approximately 20 meters upstream of the mouth. West Vincent Township, Chester County Lat: 40 08 51 Long: 75 37 17 RMI: 0.1

TABLE 2
WATER CHEMISTRY¹
BRINTON RUN, 00044, AND 00052
CHESTER COUNTY
JULY 15, 1998

STATION	1BR	44UT	52UT
Field Parameters			
Temp (°C)	19.5	21.2	18.6
pH	7.2	7.3	7.4
Cond (µmhos)	214	248	168
Diss. O ₂	NO DATA		
Laboratory Parameters			
pH	6.7	7.0	6.5
Alkalinity	38	64	24
Acidity	0	0	0
Hardness	58	84	44
T Diss. Sol.	164	194	144
Susp. Sol.	8	<2.0	8
NH ₃ -N	<.02	<.02	0.02
NO ₂ -N	<.01	<.01	<.01
NO ₃ -N	1.72	1.07	2.15
Total P	0.02	<0.02	<0.02
Ca	18.0	22.5	12.7
Mg	6.34	8.57	4.63
Cl	20	18	14
SO ₄	31	18	14
As*	< 4.0	< 4.0	< 4.0
As Diss	< 4.0	< 4.0	< 4.0
Cd*	< 0.2	< 0.2	< 0.2
Cd Diss	< 0.2	< 0.2	< 0.2
hex Cr*	<10	<10	<10
Cr*	<50	<50	<50
Cu*	< 4.0	< 4.0	< 4.0
Cu Diss	< 4.0	< 4.0	< 4.0
Fe*	213	319	246
Pb*	< 1.0	< 1.0	< 1.0
Pb Diss	< 1.0	< 1.0	< 1.0
Mn*	17	33	39
Ni*	< 4.0	< 4.0	< 4.0
Ni Diss	< 4.0	< 4.0	< 4.0
Zn*	< 5.0	6.8	< 5.0
Zn Diss	< 5.0	< 5.0	< 5.0
Al*	75.6	117	114
fecal coliforms	140	140	40

¹ - Except for pH & conductance and indicated otherwise, all values are total concentrations in mg/l

* - Total concentrations in µg/l

TABLE 3
HABITAT ASSESSMENT SUMMARY
BRINTON RUN, 00044, AND 00052
CHESTER COUNTY
APRIL 21,1999

HABITAT PARAMETER	STATIONS ¹			
	1BR	44UT	52UT	R1
1. instream cover	15	12	12	16
2. epifaunal substrate	16	10	9	17
3. embeddedness	14	13	12	15
4. velocity/depth	12	12	14	14
5. channel alterations	17	16	17	17
6. sediment deposition	16	9	13	17
7. riffle frequency	17	13	15	18
8. channel flow status	18	17	18	18
9. bank condition	11	14	16	12
10. bank vegetation protection	13	15	17	14
11. grazing/disruptive pressures	18	14	15	11
12. riparian vegetation zone width	16	11	12	9
Total Score	183	156	170	178
Rating	SUB	SUB	SUB	SUB

¹ Refer to Figure 1. and Table 1. for station locations.

TABLE 4
BENTHIC MACROINVERTEBRATE RESULTS
BRINTON RUN, 00044, AND 00052
CHESTER COUNTY
April 21, 1999

TAXA	STATION			
	1BR	44UT	52UT	R1
Ephemeroptera (mayflies)				
Baetidae; <i>Acentrella</i>				R
<i>Baetis</i>			P	
Ephemerellidae; <i>Ephemerella</i>	VA	VA	VA	VA
<i>Eurylophella</i>		R	P	
<i>Drunella</i>				VA
<i>Serratella</i>			C	P
Heptageniidae; <i>Epeorus</i>	C			C
<i>Stenonema</i>	P	P	C	C
Leptophlebiidae; <i>Habrophlebiodes</i>			R	
Ameletidae; <i>Ameletus</i>	C			
Plecoptera (stoneflies)				
Chloroperlidae; <i>Haploperla</i>	R			
Leuctridae; <i>Leuctra</i>	R			R
Nemouridae; <i>Amphinemoura</i>	A	A	VA	P
Perlidae; <i>Acroneuria</i>	A			A
<i>Paragnetina</i>				P
<i>Eccoptera</i>	R		P	
<i>Perlesta</i>				R
Perlodidae; <i>Diploperla</i>			C	
Tricoptera (caddisflies)				
Brachycentridae; <i>Micrasema</i>	P			P
Glossosomatidae; <i>Agapetus</i>	R	R		P
<i>Glossosoma</i>	P			P
Hydroptilidae; <i>Leucotrichia</i>				R
Hydropsychidae; <i>Cheumatopsyche</i>	C	A		
<i>Diplectrona</i>	A	C	VA	
<i>Hydropsyche</i>	C	C	C	A
Lepidostomatidae; <i>Lepidostoma</i>			A	P
Limnophilidae; <i>Goera</i>	P			
<i>Pycnopsyche</i>	R		P	
<i>Isonychia</i>			R	
Philopotamidae; <i>Chimarra</i>	R		C	P
Polycentropidae; <i>Polycentropus</i>	R			

TAXA	STATION			
	1BR	44UT	52UT	R1
Psychomyiidae; <i>Psychomyia</i>	R			P
<i>Lype</i>		R	R	
Rhyacophilidae; <i>Rhyacophila</i>	P		P	R
Uenoidae; <i>Neophylax</i>	P	A	R	
Diptera (true flies)				
Blephariceridae; <i>Blepharicera</i>				A
Empididae; <i>Clinocera</i>	C	P		P
<i>Chelifera</i>		P		
Psychodidae			P	
Simuliidae; <i>Simulium</i>	A	P		P
<i>Prosimulium</i>	P			
Tabanidae; <i>Chrysops</i>		P	R	
Tipulidae; <i>Antocha</i>	P	R		C
<i>Limnophila</i>			R	
<i>Tipula</i>	C	R	P	
Chironomidae	A	VA	C	A
Megaloptera				
Corydalidae; <i>Nigronia</i>	R	R		R
Sialidae; <i>Sialis</i>			P	R
Odonata (dragon-, damselflies)				
Aeshnidae; <i>Boyeria</i>	R			
Gomphidae				P
<i>Gomphus</i>		R		
<i>Stylogomphus</i>		R		
Lepidoptera (moths)				
Pyralidae; <i>Petrophila</i>				P
Coleoptera (aquatic beetles)				
Dryopidae; <i>Helichus</i>			P	
Elmidae; <i>Dubiraphia</i>		R		
<i>Macronychus</i>		P		
<i>Optioservus</i>	A	A	C	P
<i>Oulimnius</i>	P	P		
<i>Promoresia</i>				P
<i>Stenelmis</i>	P	C	A	R
<i>Psephenidae; Ectopria</i>	R			
<i>Psephenus</i>	C	P		C
Ptilodactylidae; <i>Anchytarsus</i>	P		A	
Non-Insect Taxa				
Turbellaria (flat worms)				
<i>Cura</i>			P	
Hirudinea			R	
Oligochaeta	C	P		

TAXA	STATION			
	1BR	44	52	R1
Lumbricidae				P
Amphipoda (scuds)				
Gammaridae; <i>Gammarus</i>		VA	C	
Isopoda (sow bugs)				
Asellidae; <i>Caecidotea</i>			P	
Decapoda (crayfish)				
Cambaridae	R			
Gastropoda (univalves, snails)				
Ancylidae; <i>Ferrissia</i>				P
Physidae		R		
Pelecypoda (bivalve clams)				
Sphaeriidae		P	P	
Number of taxa in total sample	38	30	33	35

R=rare (<3 organisms); P=present (3-9 organisms); C=common (10-24 organisms);
A=abundant (25-99 organisms); VA=very abundant (>99 organisms)

TABLE 5
SEMI-QUANTITATIVE BENTHIC MACROINVERTEBRATE DATA
BRINTON RUN, 00044, AND 00052
APRIL 21, 1999

TAXA	STATION			
	1BR	44UT	52UT	R1
Ephemeroptera (mayflies)				
Baetidae; <i>Acentrella</i>				1
<i>Baetis</i>			1	
Ephemerellidae; <i>Ephemerella</i>	54	20	17	36
<i>Drunella</i>				40
<i>Serratella</i>			4	1
Heptageniidae; <i>Epeorus</i>	2			3
<i>Stenonema</i>	2		1	2
Ameletidae; <i>Ameletus</i>	1			
Plecoptera (stoneflies)				
Nemouridae; <i>Amphinemoura</i>	6	18	20	
Perlidae; <i>Acroneuria</i>	1			5
<i>Paragnetina</i>				1
<i>Perlesta</i>				1
Perlodidae; <i>Diploperla</i>			2	
Tricoptera (caddisflies)				
Glossosomatidae; <i>Agapetus</i>	1			2
Hydropsychidae; <i>Cheumatopsyche</i>	4	7		
<i>Diplectrona</i>	6	2	26	
<i>Hydropsyche</i>	3	2	3	6
Lepidostomatidae; <i>Lepidostoma</i>			4	2
Limnophilidae; <i>Goera</i>	1			
<i>Pycnopsyche</i>			1	
Philopotamidae; <i>Chimarra</i>			4	
Rhyacophilidae; <i>Rhyacophila</i>			1	1
Uenoidae; <i>Neophylax</i>		3		
Diptera (true flies)				
Blephariceridae; <i>Blepharicera</i>				5
Empididae; <i>Clinocera</i>		1		
Psychodidae sp.			1	
Simuliidae; <i>Simulium</i>	5			2
Tabanidae; <i>Chrysops</i>		1	1	
Tipulidae; <i>Antocha</i>		1		2
<i>Tipula</i>			1	
Chironomidae	15	48	3	8

TAXA	STATION			
	1BR	44UT	52UT	R1
Megaloptera				
Sialidae; <i>Sialis</i>			1	
Odonata (dragon-, damselflies)				
Gomphidae; <i>Gomphus</i>		1		
Coleoptera (aquatic beetles)				
Dryopidae; <i>Helichus</i>			1	
Elmidae; <i>Dubiraphia</i>		1		
<i>Macronychus</i>		1		
<i>Optioservus</i>	7	10	5	2
<i>Oulimnius</i>	2			
<i>Stenelmis</i>	1	3	8	1
Psephenidae; <i>Psephenus</i>	1			4
Ptilodactylidae; <i>Anchytarsus</i>	1		5	
Non-Insect Taxa				
Oligochaeta	2	2		
Lumbricidae				1
Amphipoda (scuds)				
Gammaridae; <i>Gammarus</i>		18	1	
Isopoda (sow bugs)				
Asellidae; <i>Caecidotea</i>			1	
Number of individuals in subsample	115	139	112	126

TABLE 6
RBP METRIC COMPARISON
BRINTON RUN, 00044 AND 00052
CHESTER COUNTY

METRIC	STATION ¹			
	1BR	44UT	52UT	R1
1. TAXA RICHNESS	19	17	23	21
Cand/Ref (%)	90	81	-2	***
Biol. Cond. Score	6	6	6	6
2. MOD. EPT INDEX	9	4	10	12
Cand/Ref (%)	75	33	83	***
Biol. Cond. Score	4	0	6	6
3. MOD. HBI	2.69	4.31	2.53	1.83
Cand-Ref	0.86	2.48	0.7	***
Biol. Cond. Score	4	0	6	6
4. % DOMINANT TAXA	47	31	23	32
Cand-Ref	15	-1	-9	***
Biol. Cond. Score	6*	6	6	6
5. % MOD. MAYFLYS	51	14	20	66
Ref-Cand	15	52	46	***
Biol. Cond. Score	4	0	0	6
TOTAL BIOLOGICAL CONDITION SCORE	24	12	24	30
% COMPARABILITY TO REFERENCE	80	40	80	***

1 - Candidate stations compared to R1 (Birch Run)

* - Dominant taxa with HBI score < 3