

**UNNAMED TRIBUTARY TO TOHICKON CREEK  
(BOG RUN)**

**BUCKS COUNTY**

**WATER QUALITY STANDARDS REVIEW  
STREAM EVALUATION REPORT**

**Segment: Basin  
Stream Code: 03181  
Drainage List: E**

**WATER QUALITY MONITORING SECTION (MAB)  
WATER QUALITY DIVISION  
BUREAU OF CLEAN WATER  
DEPARTMENT OF ENVIRONMENTAL PROTECTION**

**2021**

## **INTRODUCTION**

The Department of Environmental Protection (DEP) conducted an evaluation of the Unnamed Tributary (UNT) to Tohickon Creek, locally known as Bog Run, basin in response to a National Pollutant Discharge Elimination System (NPDES) permit (PA0594121) renewal for the Rockhill Quarry (aka Hanson Quarry) located within the UNT to Tohickon Creek basin. The UNT to Tohickon Creek basin is currently designated Trout Stocking, Migratory Fishes (TSF, MF).

The stream redesignation process begins with an evaluation of the “existing uses” and the “designated uses” of a stream. “Existing uses” are water uses actually attained in the waterbody. Existing uses are protected through permit or approval actions taken by the DEP. “Designated uses” are water uses identified in regulations that protect a waterbody. Candidates for stream redesignation may be identified by the DEP based on routine waterbody investigations or based on requests initiated by other agencies or from the general public through a rulemaking petition to the Environmental Quality Board (EQB).

## **GENERAL WATERSHED DESCRIPTION**

The UNT to Tohickon Creek is a second order tributary to Tohickon Creek located at River Mile 21.60. The UNT to Tohickon Creek basin is located in Richland, East Rockhill, West Rockhill and Haycock townships, Bucks County. The basin has a drainage area of approximately 4.88 square miles and consists of 4.73 stream miles. The land use within the basin consists of deciduous forest (70%), woody wetlands (9%), developed open space (8%) and pasture/hayfields (7%) (Dewitz 2019). Within the UNT to Tohickon Creek basin is the Quakertown Swamp, a 400-acre wetland that encompasses most of the riparian corridor. The Rockhill Quarry has a single NPDES permit and is one of eight NPDES permits within the basin.

## **WATER QUALITY**

### **Water Chemistry**

Limited water quality data were available to allow for direct comparison to water quality criteria. The DEP collected in-situ water chemistry at a single station located near the mouth once in 2015 and again in 2020 (Table 1, Figure 1). The total iron result (2,130 ug/L) from the 2020 sample exceeds the water quality criterion (1,500 ug/L) in 25 Pa. Code § 93.7 and is more elevated than the 2015 result (672 ug/L). In addition, other concentrations of parameters indicate some degree of anthropogenic influence is occurring within the basin. Additional, ongoing water chemistry data collection efforts will be necessary to define existing water chemistry conditions and assess the protected use. While the results of ongoing water chemistry data collection efforts would be necessary to assess the protected use, it would have limited bearing on redesignation recommendations or existing use determinations.

**Table 1. UNT Tohickon Creek 2015 & 2020 – Water Chemistry**

	PARAMETER	UNITS	2015	2020
METALS AND IONS	ALUMINUM D	ug/L	-	<15.0
	ALUMINUM T	ug/L	462.0	117.0
	BARIUM T	ug/L	-	19.0
	BORON T	ug/L	-	<200.0
	BROMIDE	ug/L	-	40.66
	CADMIUM D	ug/L	<0.2	<0.2
	CALCIUM T	mg/L	12.3	24.9
	CHLORIDE	mg/L	39.3	29.63
	COPPER D	ug/L	-	<4.0
	COPPER T	ug/L	<10	<4.0
	IRON D	ug/L	-	<100.0
	IRON T	ug/L	672.0	2130.0
	LEAD D	ug/L	-	<1.0
	LEAD T	ug/L	1.09	<1.0
	LITHIUM D	ug/L	-	<25.0
	LITHIUM T	ug/L	-	<25.0
	MAGNESIUM T	mg/L	5.787	12.1
	MANGANESE D	ug/L	-	503.0
	MANGANESE T	ug/L	46.0	528.0
	MERCURY T	ug/L	<0.2	
	NICKEL D	ug/L	-	<50.0
	NICKEL T	ug/L	<50.0	<50.0
	POTASSIUM T	mg/L	-	1.38
	SELENIUM T	ug/L	-	<7.0
	SODIUM T	mg/L	-	10.7
	STRONTIUM T	ug/L	-	88.0
SULFATE T	mg/L	11.47	13.11	
ZINC D	ug/L	-	<30.0	
ZINC T	ug/L	<10.0	<30.0	
NUTRIENTS	AMMONIA D	mg/L	-	0.074
	AMMONIA T	mg/L	<0.02	0.08
	NITROGEN D	mg/L	-	0.64
	NITROGEN T	mg/L	0.34	0.69
	NITRATE & NITRITE D	mg/L	-	0.13
	NITRATE & NITRITE T	mg/L	-	0.13
	ORTHO PHOSPHORUS D	mg/L	-	0.033
	ORTHO PHOSPHORUS T	mg/L	-	0.07
	PHOSPHORUS D	mg/L	-	0.031
	PHOSPHORUS T	mg/L	0.026	0.13
PHYSICAL/OTHER	ALKALINITY	mg/L	32.4	81.0
	CBOD	mg/L	2	-
	COD	mg/L	23.7	-
	HARDNESS	mg/L	55.0	112.0
	OSMOTIC PRES	mosm	-	3.0
	pH	pH units	6.96	7.3
	SPECIFIC COND	µS/cm <sup>c</sup>	213.0	299.0
	TOC	mg/L	-	7.22
	TSS	mg/L	16.0	6.0
	TDS	mg/L	144.0	194.0

"<" indicate concentrations below the reporting limit.

"-" indicate parameter was not tested

## **WATERS QUALIFYING AS EXCEPTIONAL VALUE (EV) AS SURFACE WATERS OF EXCEPTIONAL ECOLOGICAL SIGNIFICANCE**

The DEP reviewed information gathered for the Pennsylvania Natural Heritage Program and reported in the Bucks County Natural Heritage Inventory. The Bucks County Natural Heritage Inventory identified an area with statewide ecological significance that is based upon the importance, rarity and uniqueness of the areas' endemic ecological community types. The area, Quakertown Swamp (Figure 1), contains a Bottomland Oak – Hardwood Palustrine Forest Community (The Nature Conservancy 2011), which is a rare and endemic community type hydrologically connected to riverine surface water and therefore, is water quality dependent.

Bottomland oak – hardwood palustrine forest occurs on poorly drained land along the stream valley. It is characterized by white ash (*Fraxinus americana*), green ash (*Fraxinus pennsylvanica*), shagbark hickory (*Carya ovata*), red maple (*Acer rubrum*), American elm (*Ulmus americana*), basswood (*Tilia americana*), swamp white oak (*Quercus bicolor*), pin oak (*Quercus palustris*), and blackgum (*Nyssa sylvatica*). It serves as important habitat for wood frogs (*Rana sylvatica*), spotted salamander (*Ambystoma maculatum*), marbled salamander (*Ambystoma opacum*) and Jefferson salamander (*Ambystoma jeffersonianum*) and provides an important buffer for sediment and other pollution from neighboring development (The Nature Conservancy 2011 and Zimmerman et al. 2012). This palustrine community has a NatureServe state rank of S2, which indicates that it is imperiled in the state because of rarity or some factor(s), making it vulnerable to extirpation (Master et al. 2012 and The Nature Conservancy 2011). The presence of this plant community dependent on water quality or hydrology, its ecological and hydrological importance and rarity in Pennsylvania satisfies the exceptional ecological significance criterion at § 93.4b(b)(2)<sup>1</sup>.

## **PUBLIC NOTICE AND REQUEST FOR TECHNICAL DATA**

The Department provided public notice of this evaluation and requested any technical data from the general public through publication in the *Pennsylvania Bulletin* on November 2, 2019 (49 Pa.B. 6626). Bucks County Conservation District, Bucks County, East Rockhill Township, West Rockhill Township and Richland Township were notified of the redesignation evaluation in a letter dated October 31, 2019. In addition, a notification was posted on the DEP's website. In response to the public notice, The Pennsylvania Campaign for Clean Water and the Delaware Riverkeeper Network offered general support for the evaluation and offered additional information to be considered as part of the evaluation.

<sup>1</sup> Definition at 25 Pa. Code § 93.1: Surface water of exceptional ecological significance—A surface water which is important, unique or sensitive ecologically, but whose water quality as measured by traditional parameters (for example, chemical, physical or biological) may not be particularly high, or whose character cannot be adequately described by these parameters. These waters include:

- (i) Thermal springs.
- (ii) Wetlands which are exceptional value wetlands under § 105.17(1) (relating to wetlands).

## **RECOMMENDATION**

Based on applicable regulatory definitions in 25 Pa. Code § 93.3, the DEP recommends that the UNT to Tohickon Creek (Bog Run) basin be redesignated from Trout Stocking, Migratory Fishes (TSF, MF) to Exceptional Value, Migratory Fishes (EV, MF) based on 25 Pa. Code § 93.4b(b)(2)<sup>1</sup> (exceptional ecological significance). This recommendation adds 4.73 stream miles of EV waters to Chapter 93.

In addition, DEP staff will continue to collect water chemistry data in order to more definitely characterize existing water quality conditions, which would be protected with an EV designation.

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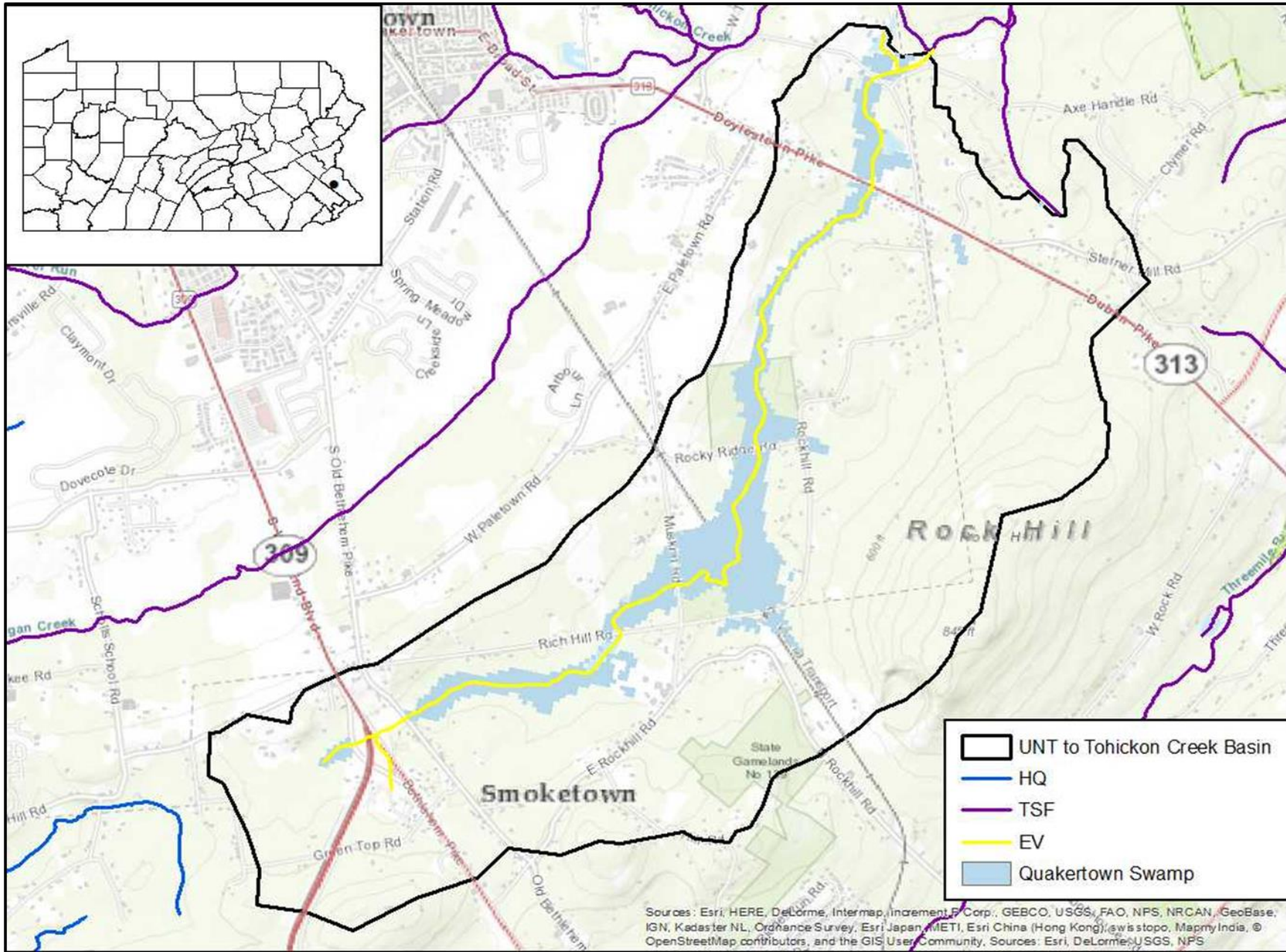


Figure 1. UNT Tohickon Creek Basin.

## **REFERENCES**

- Dewitz, J., 2019, National Land Cover Database (NLCD) 2016 Products (ver. 2.0, July 2020): U.S. Geological Survey data release, <https://doi.org/10.5066/P96HHBIE>.
- Master, L. L., D. Faber-Langendoen, R. Bittman, G. A. Hammerson, B. Heidel, L. Ramsay, K. Snow, A. Teucher, and A. Tomaino. 2012. NatureServe conservation status assessments: Factors for evaluating species and ecosystem risk. NatureServe, Arlington, Virginia.
- The Nature Conservancy (Pennsylvania Science Office). 2011. A Natural Areas Inventory Update of Bucks County, Pennsylvania. Bucks County.
- Zimmerman, E., Davis, T., Podniesinski, G., Furedi, M., McPherson, J., Seymour, S., Eichelberger, B., Dewar, N., Wagner, J. and Fike, J. (editors). 2012. Terrestrial and palustrine plant communities of Pennsylvania, 2nd Edition. Pennsylvania Natural Heritage Program, Pennsylvania Department of Conservation and Natural Resources, Harrisburg, Pennsylvania.

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