

COMMONWEALTH OF PENNSYLVANIA
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SUBJECT: Miney Branch Aquatic Biology Investigation

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Introduction

The Pennsylvania Fish and Boat Commission (PFBC) conducted an aquatic investigation of an unnamed tributary (UNT) to Miney Branch and Miney Branch, located in Adams County, Pennsylvania. The purpose of the assessment was to determine any potential aquatic impacts to Miney Branch and associated tributaries corresponding to a permitted discharge from the Specialty Granules, Incorporated, (SGI) surface mining operation in the area. Currently, aquatic life use within Miney Branch is protected as Cold Water Fishes (CWF) under Pennsylvania Code 25 § 93.9(z).

A previous aquatic assessment of the Miney Branch watershed associated with the permitted SGI discharge was conducted on May 23, 1995, by the Pennsylvania Department of Environmental Resources, a predecessor to the Pennsylvania Department of Environmental Protection (PADEP). The 1995 assessment generally characterized the unnamed tributary to Miney Branch downstream of SGI's discharge as being impacted by siltation from the discharge, while Miney Branch proper was not impacted by the SGI discharge, through examination of aquatic macroinvertebrates (Botts 1995). The efforts of the current PFBC aquatic investigation attempted to evaluate the same locations as those sampled by the PADEP on May 23, 1995, to allow for comparison.

Methods

An UNT to Miney Branch and Miney Branch were sampled on September 5, 2019, to determine whether SGI's permitted discharge had impacted the aquatic macroinvertebrate community within

the Miney Branch watershed (Figure 1). For consistency and comparative purposes, four benthic macroinvertebrate sample sites were chosen based on their proximity to the location of SGI's discharge as well as those historically sampled by Botts (1995), with the exception of one sample location. Two reference sites—a historical sample site (UNTMB1) and a new site (MB1) chosen for this investigation—were situated upstream of SGI's discharge on the UNT to Miney Branch and Miney Branch, respectively. Two historical treatment sites, UNTMB2 and MB 2, were situated downstream of SGI's discharge on the UNT to Miney Branch and Miney Branch, respectively. The sampling regime chosen for this investigation deviated from Botts (1995) as their chosen sample sites included a sample site just upstream of the Waynesboro Pike road crossing on Miney Branch. This investigation chose to sample Miney Branch upstream of the confluence with the UNT to Miney Branch as another reference location instead of the downstream most location chosen by Botts (1995). A D-frame kick net (500 μ m mesh) was utilized to collect approximately six 1 m² samples from each sample station. Macroinvertebrate samples were then preserved in isopropyl alcohol and transported to laboratory, where invertebrates were subsampled and identified in accordance with PADEP (2012) methods. A Rapid Visual Habitat Assessment (RVHA) was conducted at each sample station to quantify habitat as described in Barbour et al. (1999). Lastly, water quality was determined at each station with the use of a handheld YSI Professional Plus multiparameter instrument.

Results

The UNT to Miney Branch and Miney Branch were largely similar in regards to water quality and RVHA scores (Table 1). In particular, pH, water temperature and RVHA scores did not vary drastically between the two streams. The only water quality parameter that differed between the two streams was Specific Conductivity, where Miney Branch had elevated Specific Conductivity compared to the UNT to Miney Branch, especially at station MB1.

Macroinvertebrate species and abundance varied between stations (Table 2). Station UNTMB1 upstream of SGI's discharge and located on the UNT to Miney Branch, had the highest Index of Biological Integrity (IBI) score at 47.0 (Table 1). UNTMB2 located downstream of the discharge on the UNT to Miney Branch had the next highest IBI score at 40.2, followed by MB2 located downstream of the discharge on Miney Branch with an IBI score of 36.0 and lastly, MB1 upstream of the discharge on Miney Branch had the lowest IBI score at 25.1 (Table 1).

Discussion

PADEP (2012) identifies IBI scores at or above 43, when sampled anytime between June and September and not meeting the criteria set forth in four screening questions, as attaining aquatic life for use CWF streams. An IBI score less than 43 is considered impaired for aquatic life use. In this investigation, station UNTMB1 was determined to be attaining for aquatic life use, as its IBI score was 47 and the four screening question criteria were not met. UNTMB1 is situated above SGI's discharge, and therefore is not directly impaired by the discharge. All other stations, including station MB1 above SGI's discharge, would be considered impaired for aquatic life use since their IBI scores were below 43. This finding indicates that SGI's discharge is likely having an impact on the aquatic life of the UNT to Miney Branch.

Station MB1 had the lowest IBI score of all stations sampled and is not directly impacted by SGI's permitted discharge. The highest Specific Conductivity was noted at this station and the second

highest Specific Conductivity noted at MB2. The low IBI score and elevated Specific Conductivity within Miney Branch could be attributed to a mix of upstream land uses, including: mining support activities, stormwater runoff from Iron Springs Road, stormwater from a railroad spur, stormwater from residential development, or a combination thereof.

A comparison of this investigation and Botts (1995) showed that Taxa Richness was relatively stable through time at stations UNTMB1 and MB2, while Taxa Richness increased at UNTMB2. A station above the Waynesboro Pike stream crossing sampled by Botts (1995) was not sampled herein, therefore, no direct comparisons could be made at that location. This finding qualitatively demonstrates that the water quality in the UNT to Miney Branch has likely improved since 1995. In addition, no observations of obvious siltation problems associated with SGI's discharge were noted at any of the sampling stations, as noted in Botts (1995).

The purpose of this report is to determine whether SGI's discharge is detrimental to the aquatic life within the UNT to Miney Branch. Given that the IBI score at station UNTMB2, downstream of SGI's discharge, was below the 43 threshold, an approximate 200 yard reach between SGI's discharge and the mouth of the UNT to Miney Branch should be considered as impaired for aquatic life use. Although the IBI threshold of 43 was not met at UNTMB2, I suspect that aquatic macroinvertebrate sampling during September played a role in macroinvertebrate presence and absence, and subsequently, altered IBI values at this station. Specifically, PADEP (2012) encourages benthic macroinvertebrate sampling be conducted between November and May whenever feasible. I recommend that a spring macroinvertebrate monitoring effort be conducted to definitively determine whether or not SGI's permitted discharge is impacting the UNT to Miney Branch, given how close the IBI value at station UNTMB2 was to the attaining threshold.

Literature Cited

- Barbour, M. T., Gerritsen, J., Snyder, B.D., and J. B. Stribling. 1999. Rapid Bioassessment Protocols for use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates and Fish, Second Edition. EPA 841-B-99-002. U.S. Environmental Protection Agency; Office of Water, Washington D.C.
- Botts, W. F. 1995. Aquatic Biological Investigation, Miney Branch, Adams County. Pennsylvania Department of Environmental Resources; Harrisburg, PA. 8 pp.
- PADEP. 2012. A Benthic Macroinvertebrate Index of Biotic Integrity for Wadeable Freestone Riffle-Run Streams in Pennsylvania. Pennsylvania Department of Environmental Protection; Harrisburg, PA. 154 pp.

Table 1. Description of stations sampled on an unnamed tributary (UNT) to Miney Branch and Miney Branch, either upstream (UPS) or downstream (DNS) of the Specialty Granules, Incorporated, permitted discharge. Parameters quantified included location, Rapid Visual Habitat Assessment scores, water quality, and an Index of Biotic Integrity (IBI) score, at each station.

	<i>Station</i>			
	<i>UNTMB1</i>	<i>UNTMB2</i>	<i>MB1</i>	<i>MB2</i>
<i>Location Description</i>	UPS of discharge to UNT to Miney Branch	DNS of discharge to UNT to Miney Branch	UPS of confluence with UNT to Miney Branch	DNS of confluence with UNT to Miney Branch
<i>Latitude</i>	39.74258	39.74281	39.74521	39.74221
<i>Longitude</i>	-77.45689	-77.45486	-77.45396	-77.45358
<i>RVHA Score</i>	137	156	146	146
<i>Temperature (°C)</i>	18.4	18.6	16.9	17.9
<i>Specific Conductance (µS/cm)</i>	118.3	128.7	639	432.5
<i>Dissolved Oxygen (mg/L)</i>	6.85	7.3	7.2	7.54
<i>pH</i>	7.13	7.36	7.61	7.87
<i>IBI Score</i>	47.0	40.2	25.1	36.0

Table 2. Macroinvertebrate species and abundance at each sample station located on an unnamed tributary (UNT) to Miney Branch and Miney Branch. Included are Taxa Richness data Botts (1995) determined at three historical, corresponding sites.

Class/Order	Taxa		Station			
	Family	Genus	UNTMB1	UNTMB2	MB1	MB2
	Baetidae		3			
	Baetidae	<i>Baetis</i>			4	
Ephemeroptera	Heptageniidae			1		
	Heptageniidae	<i>Stenonema</i>				2
	Ephemerellidae	<i>Ephemerella</i>		1		
	Ephemerellidae	<i>Eurylophella</i>				1
Odonata	Gomphidae	<i>Lanthus</i>	1	2	1	1
	Peltoperlidae	<i>Peltoperla</i>	2			
Plecoptera	Leuctridae	<i>Leuctra</i>	14	13		9
	Perlidae	<i>Acroneuria</i>	6	2		
Hemiptera	Chloroperlidae	<i>Alloperla</i>				1
	Veliidae	<i>Rhagovelia</i>		2	1	1
	Polycentropodidae	<i>Cyrnellus</i>	6			2
Trichoptera	Hydropsychidae	<i>Cheumatopsyche</i>	13	98	32	87
	Hydropsychidae	<i>Hydropsyche</i>	1	8	26	16
	Rhyacophilidae	<i>Rhyacophila</i>	2		1	
	Glossosomatidae		2	1		
Coleoptera	Psephenidae	<i>Psephenus</i>	2	6		3
	Psephenidae	<i>Ectopria</i>		1	1	1
	Elmidae	<i>Optioservus</i>	44	29	1	12
	Elmidae	<i>Promoresia</i>	1			
	Elmidae	<i>Stenelmis</i>		25		13
	Ceratopogonidae	<i>Bezzia</i>	1			
Diptera	Tipulidae	<i>Tipula</i>			8	
	Tipulidae	<i>Antocha</i>				2
	Tipulidae	<i>Hexatoma</i>	2	1		
	Tipulidae	<i>Molophilus</i>			1	
	Simuliidae	<i>Simulium</i>	4		1	
Oligochaeta	Chironomidae		52	14	105	47
			1			2
Decapoda	Cambaridae		5	2	1	
Hydracarina						1
Total No. Organisms:			162	206	183	201
Total Taxa (This report):			19	16	13	17
Total Taxa (Botts 1995):			23	9	N/A	19

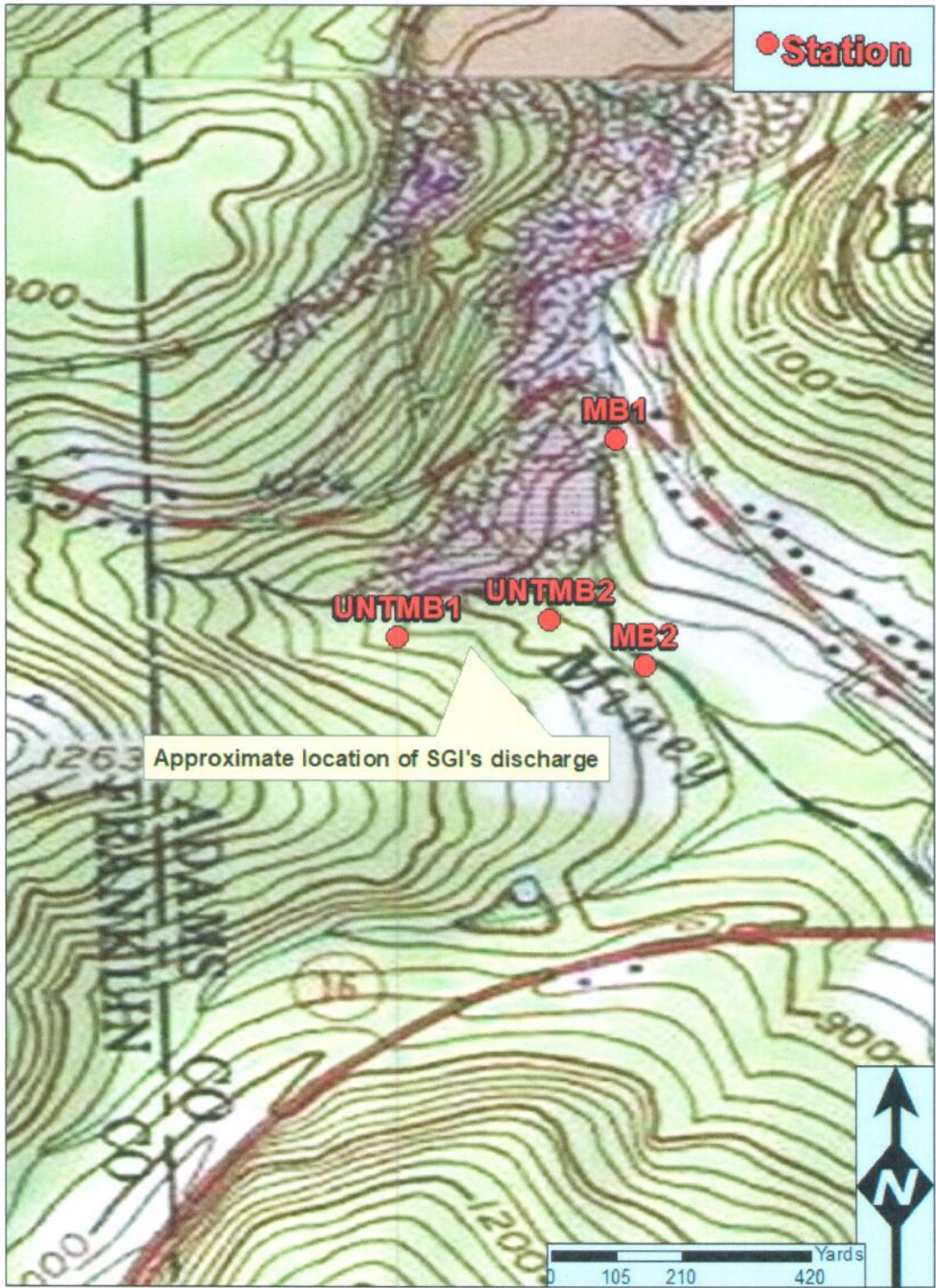


Figure 1. Map depicting station locations on an unnamed tributary (UNT) to Miney Branch and Miney Branch, proximate to Specialty Granules, Incorporated's, permitted discharge.