DUNBAR CREEK

FAYETTE COUNTY

WATER QUALITY STANDARDS REVIEW

STREAM REDESIGNATION EVALUATION REPORT

Segment: Basin, Source to Gist Run
Stream Code: 38164
Drainage List: V

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

2021

INTRODUCTION

The Department of Environmental Protection (DEP) conducted an evaluation of the Dunbar Creek basin from its source to Gist Run in response to a request by the Pennsylvania Fish & Boat Commission (PFBC) to redesignate this portion of the basin to Exceptional Value (EV). The Dunbar Creek basin is currently designated High Quality – Cold Water Fishes (HQ-CWF).

The initial field survey in response to the PFBC request was completed November – December 1996. Additional data applicable to the lower portion of Dunbar Creek was collected by the DEP in May 2000. Shortly after the additional data was collected in 2000, the DEP modified its benthic macroinvertebrate methodology, and in 2003, the DEP revised its Water Quality Antidegradation Implementation Guidance. The Dunbar Creek basin was surveyed again in April 2006 using the latest benthic macroinvertebrate methodology. Components of this evaluation include water chemistry collected in 1996 – 2002, 2006, and again in 2016, benthic macroinvertebrate surveys conducted in April 2006 as well as water quality protective measures implemented within the Dunbar Creek basin.

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. When existing uses are determined, the stream is protected for those uses 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 state Environmental Quality Board.

GENERAL WATERSHED DESCRIPTION

Dunbar Creek is a tributary to the Youghiogheny River located in Dunbar Township, with smaller headwater areas in North Union, Stewart, and Wharton townships, Fayette County. The study area addressed by this report is the basin upstream of its confluence with Gist Run (immediately upstream from the Borough of Dunbar). This portion of Dunbar Creek drains approximately 25 square miles. Approximately 63% of the watershed (10,000+ acres) is owned by the Pennsylvania Game Commission and is managed as part of State Game Lands 51 (Figures 1 & 2, Tables 1 & 2). Most of the Dunbar Creek watershed is forested (85%) with other land use consisting of agricultural (12%) and transitional (3%).

The Dunbar Creek basin drains the western face of the Chestnut Ridge, a geologic feature that traverses this area of the state in a southwesterly/northeasterly direction. Dunbar Creek is located in the Western Appalachian Plateaus physiographic province. The most important geologic exposures influencing base-flow water quality of Dunbar Creek are the non-calcareous strata associated with the Mauch Chunk Formation and Burgoon sandstones. Another important geologic formation influencing Dunbar Creek water quality is the coal-bearing Allegheny Group. Exposures of this formation are located in the upper elevations of the basin, primarily on the ridge tops in southern headwater areas.

Table 1. Dunbar Creek Basin – Station Locations

STATION	LOCATION
1DC	Dunbar Creek, 200 meters upstream of Glade Run. Dunbar Township, Fayette County Lat: 39.9150 Long: -79.6041
2GR	Glade Run, 375 meters downstream of Flat Rock Run. Wharton Township, Fayette County Lat: 39.8829 Long: -79.5901
3UNT	UNT 38212 to Glade Run, 125 meters upstream of confluence with Glade Run. Wharton Township, Fayette County Lat: 39.8929 Long: -79.5912
4RR	Rock Run, 85 meters upstream of confluence with Glade Run. Wharton Township, Fayette County Lat: 39.8996 Long: -79.5968
5GR	Glade Run, 200 meters upstream of confluence with Dunbar Creek. Dunbar Township, Fayette County Lat: 39.9145 Long: -79.6017
6LR	Limestone Run, 150 meters upstream of confluence with Dunbar Creek. Dunbar Township, Fayette County Lat: 39.9279 Long: -79.5861
7DC	Dunbar Creek, 230 meters downstream of Limestone Run. Dunbar Township, Fayette County Lat: 39.9307 Long: -79.5879
8TR	Tucker Run, 200 meters upstream of confluence with Dunbar Creek. Dunbar Township, Fayette County Lat: 39.9437 Long: -79.5785
9ERR	Elk Rock Run, 200 meters upstream of confluence with Dunbar Creek. Dunbar Township, Fayette County Lat: 39.9512 Long: -79.5767
10DC	Dunbar Creek, 700 meters upstream of UNT 38188, along Furnace Hill Road. Dunbar Township, Fayette County Lat: 39.9613 Long: -79.5827
11IR	Irishtown Run, 50 meters upstream of confluence with Dunbar Creek. Dunbar Township, Fayette County Lat: 39.9684 Long: -79.6038
12DC	Dunbar Creek, 175 meters upstream of Gist Run. Dunbar Township, Fayette County Lat: 39.9715 Long: -79.6124
CSC (Ref)	Clear Shade Creek, just upstream of Cub Run. Ogle Township, Somerset County Lat: 40.1716 Long: -78.7461

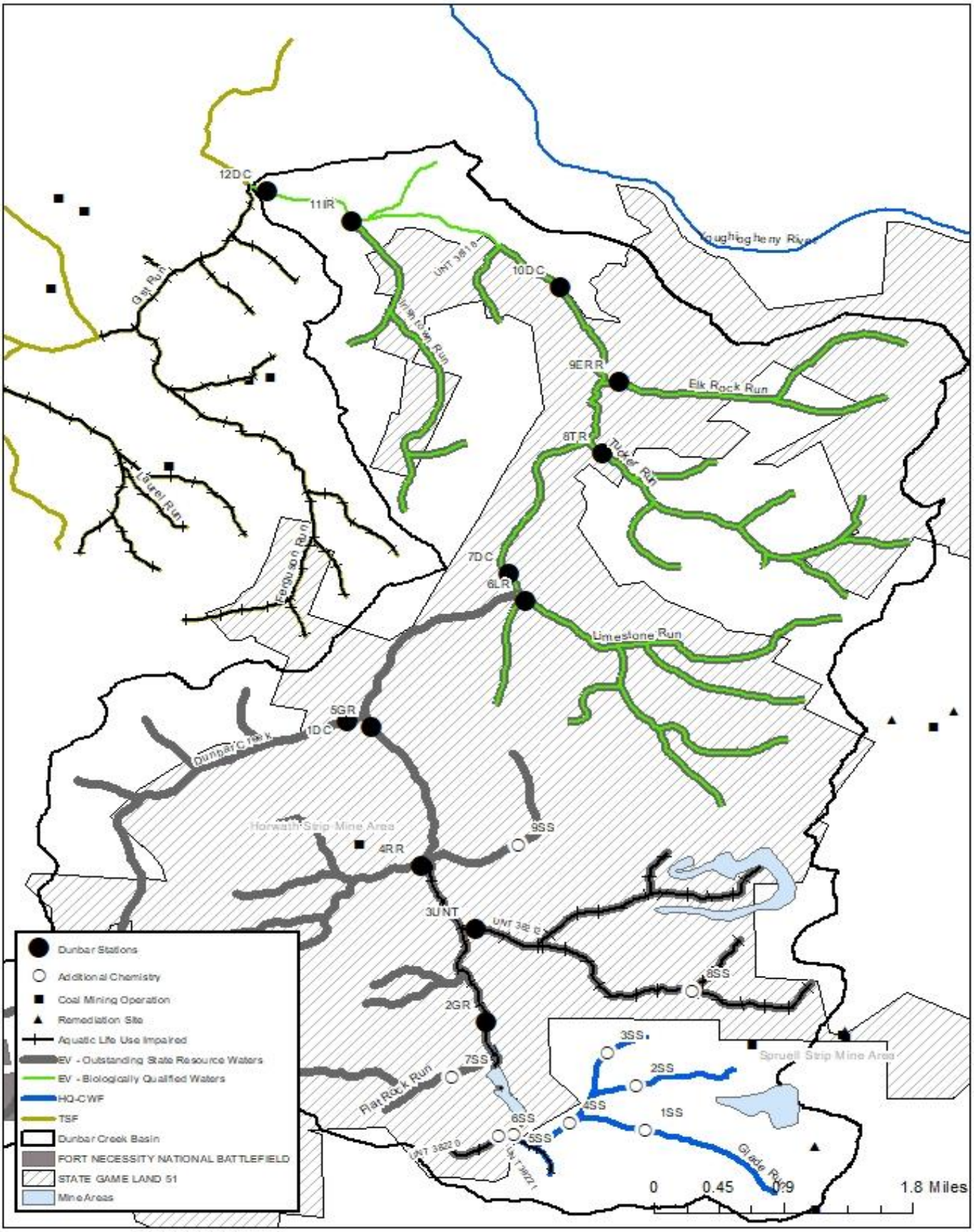

Figure 1. Dunbar Creek Basin – Station Locations

Table 2. Glade Run Basin – Additional Chemistry Station Locations

STATION	LOCATION
1SS	Glade Run, 580 meters upstream of UNT 38222 Wharton Township, Fayette County Lat: 39.8715 Long: -79.5740
2SS	UNT 38223 to Glade Run, 400 meters upstream of UNT 38224 Stewart Township, Fayette County Lat: 39.8762 Long: -79.5749
3SS	UNT 38224 to Glade Run, 540 meters upstream of confluence with UNT 38223. Stewart Township, Fayette County Lat: 39.8797 Long: -79.5779
4SS	Glade Run, 50 meters downstream of UNT 38222. Wharton Township, Fayette County Lat: 39.8723 Long: -79.5818
5SS	Glade Run, 50 meters upstream of UNT 38220. Wharton Township, Fayette County Lat: 39.8710 Long: -79.5874
6SS	UNT 38220 to Glade Run, 150 meters upstream of confluence with Dunbar Creek. Wharton Township, Fayette County Lat: 39.8710 Long: -79.5889
7SS	Flat Rock Run, 440 meters upstream of confluence with Dunbar Creek. Wharton Township, Fayette County Lat: 39.8771 Long: -79.5937
8SS	UNT 38215 to Glade Run, 40 meters upstream of UNT 38212. Stewart Township, Fayette County Lat: 39.8863 Long: -79.5693
9SS	UNT 38206 to Glade Run, 880 meters upstream of confluence with Dunbar Creek. Dunbar Township, Fayette County Lat: 39.9020 Long: -79.5870

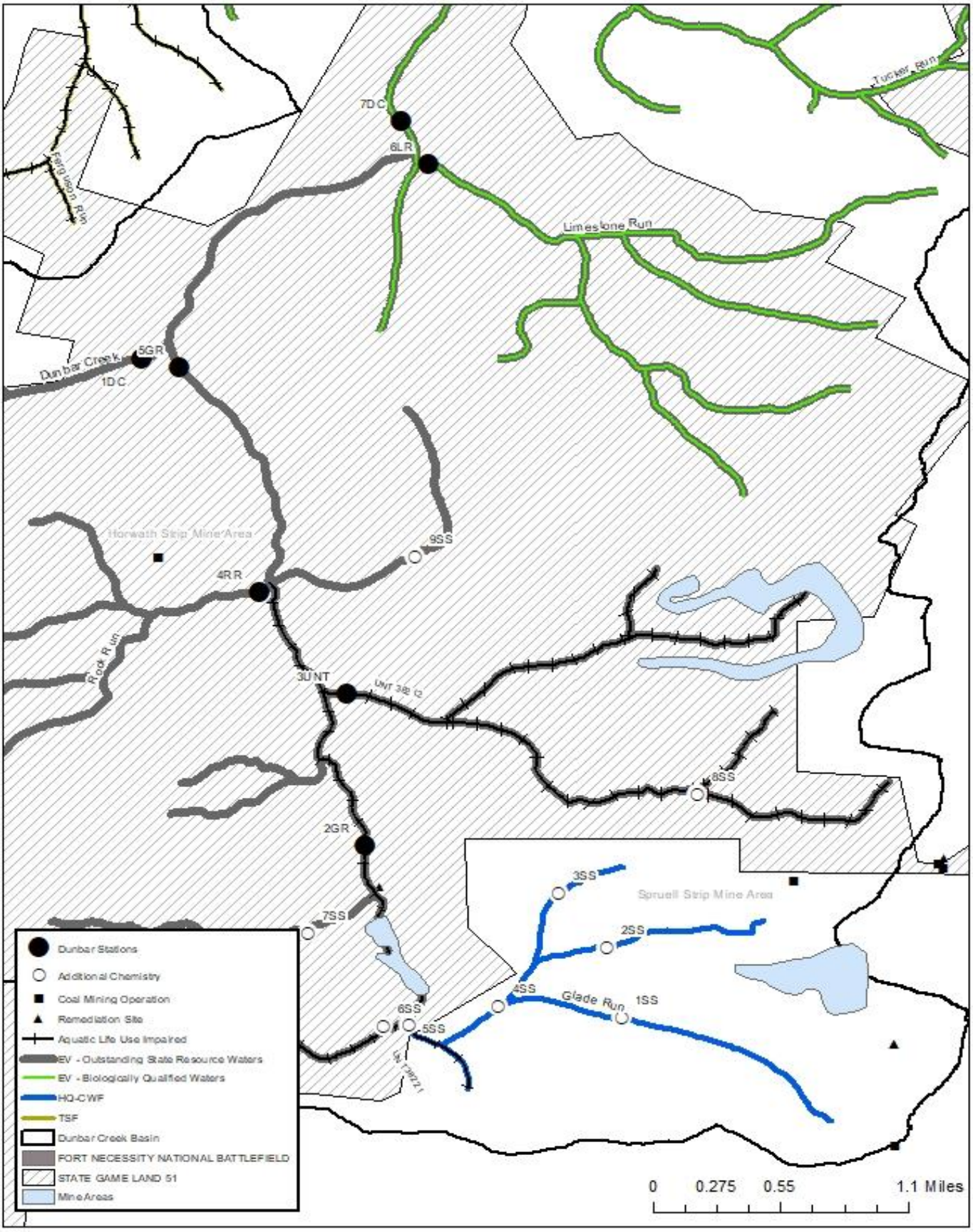

Figure 2. Glade Run Basin – Station Locations

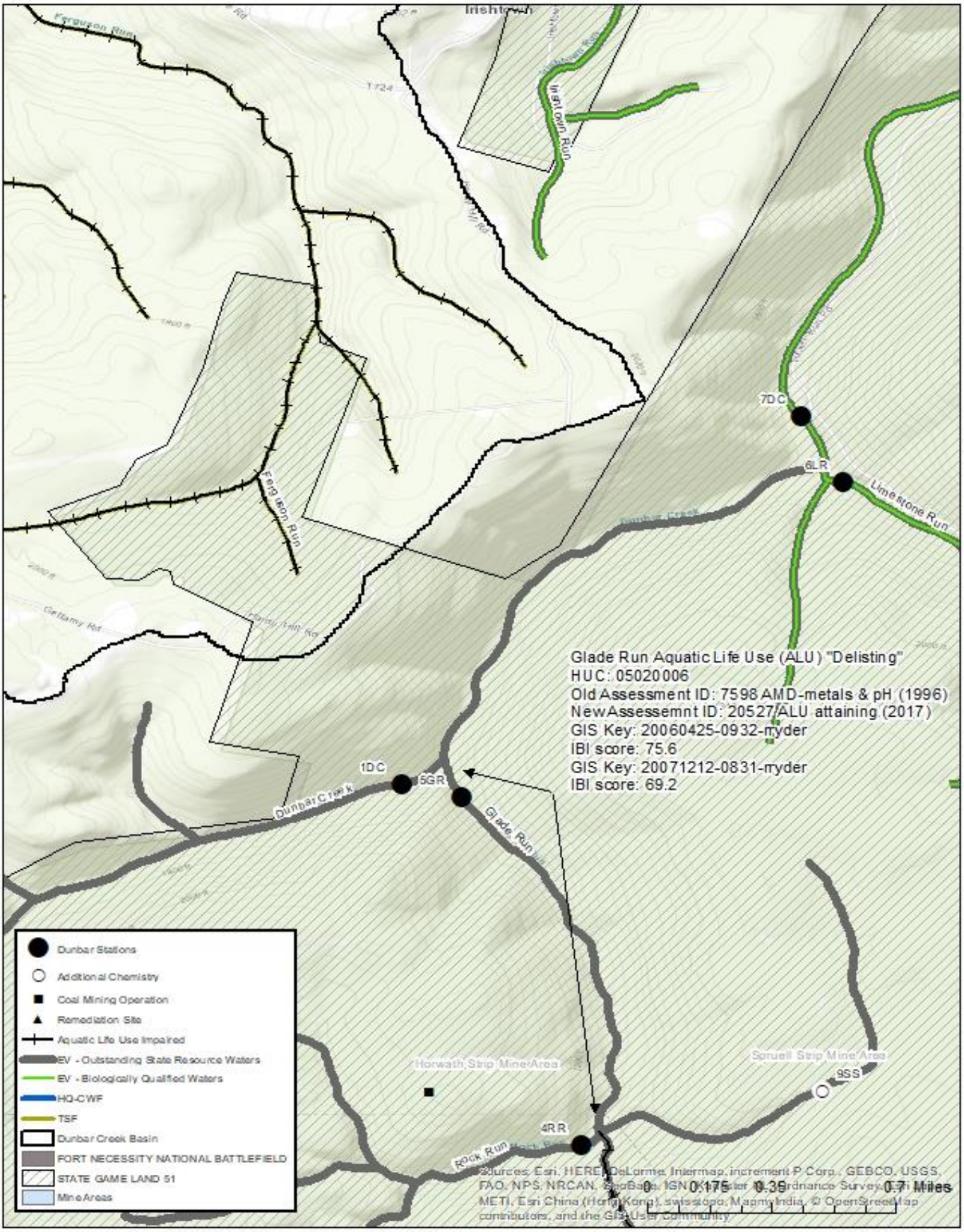

Figure 3. Glade Run Segment – Aquatic Life Use (ALU) Delisting

Some ridge-top areas along the basin's rim (headwater areas of Irishtown Run, Glade Run tributaries, and upper Dunbar Creek) have been mined for coal in the past. Historic non-coal mining sites are also located in the study area. There are several small sandstone quarry sites located on the slopes surrounding the Irishtown Run-Dunbar Creek confluence. There are also small, localized sites where iron-bearing rock was excavated to support iron production in the Dunbar Borough area (Furnace Hill, Factory Hill) earlier in the twentieth century.

WATER QUALITY AND USES

Surface Water

Biological data was collected to evaluate water quality conditions in the Dunbar Creek basin since the indigenous aquatic community is a better indicator of long-term water quality conditions. There is a total of two National Pollutant Discharge Elimination System (NPDES) permits, both stormwater permits associated with mining activities, and one surface water withdrawal all within the lower portion of the surveyed basin. Nonpoint sources include on-lot septic fields serving rural residences in the study area and the groundwater seeps and discharges emanating from a few abandoned mine operations.

Water Chemistry

Limited long-term water quality data were available to allow a direct comparison to water quality criteria. The DEP collected in-situ water chemistry at twelve locations in 1996 (Table 3). Since then, additional water chemistry has been collected in the upper portions of Dunbar Creek and Glade Run in the vicinity of the Spruell Strip Mine Area (Table 4). Water chemistry was collected at eight locations throughout the Dunbar Creek basin that coincide with the 2006 macroinvertebrate survey (Table 5), and additional water chemistry was collected at eight locations in July 2016 targeting the Glade Run basin (Table 6).

The 1996 data characterizes Dunbar Creek basin as a weakly buffered system evident of very little acid-neutralizing material (carbonate limestones) in the geologic formations in the basin. Parameter concentrations related to the stream's carbonate buffering capacity (alkalinity, acidity, pH, calcium, & magnesium) reflect the basin's fragile conditions and relative lack of acid-neutralizing materials. The water chemistry data from Glade Run, a tributary to Dunbar Creek, located in the upper third of the basin is characteristic of degraded water quality conditions that are typical of past mining activities in weakly buffered systems. The pH of Dunbar Creek and other tributaries ranged 6.3-6.8. The pH values from the four Glade Run stations ranged from 4.0-6.3, alkalinities ranged from 0-15.2 mg/L, and acidity typically exceeds alkalinity (Table 3).

There are abandoned, inactive mine sites located in the upper reaches of Glade Run and Unnamed Tributary (UNT) 38212 to Glade Run (station 3UNT). An area in the headwaters of UNT 38212 has been identified as a "problem area" (#PA4701) on the DEP's mine reclamation inventory maps. There is very little water quality data available from this site. The identified problems are

Table 3. Dunbar Creek Basin November-December 1996 – Water Chemistry

PARAMETER	UNITS	STATIONS											
		1DC	2GR	3UNT	4RR	5GR	6LR	7DC	8TR	9ERR	10DC	11IR	12DC
pH	pH units	6.5	***4.5***	***4.5***	***5.7***	***4.7***	6.4	6.3	6.8	6.5	6.4	6.3	6.4
ALKALINITY	mg/L	22	***0***	***0***	***3.2***	***1.6***	9.6	7.6	38	20	10.8	7	11.8
ACIDITY	mg/L	0	***10***	***11.4***	***4.6***	***8***	0	1.2	0	0	5	3.2	0
HARDNESS	mg/L	14	11	17	< 10	12	21	22	49	24	25	96	24
TDS	mg/L	80	78	90	74	93	50	38	94	90	32	32	72
TSS	mg/L	4	< 2	< 2	< 2	7	< 2	< 2	< 2	< 2	< 2	< 2	< 2
AMMONIA T	mg/L	< .02	< .02	< .02	< .02	< .02	< .02	< .02	< .02	< .02	< .02	< .02	< .02
NITRITE T	mg/L	< .004	< .004	< .004	< .004	< .004	< .004	< .004	< .004	< .004	< .004	< .004	< .004
NITRATE T	mg/L	0.55	0.07	0.09	0.29	0.13	0.26	0.26	0.7	0.57	0.37	0.51	0.4
PHOSPHORUS T	mg/L	< .02	< .02	< .02	< .02	< .02	< .02	< .02	< .02	< .02	< .02	< .02	< .02
ALUMINUM T	µg/L	38.5	***981***	***1170***	129	720	200	327	69.2	80.6	336	161	300
ARSENIC D	µg/L	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4
ARSENIC T	µg/L	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4
CADMIUM D	µg/L	< .2	***0.4***	***0.5***	0.2	0.3	0.2	0.2	< .2	< .2	0.24	0.19	0.2
CADMIUM T	µg/L	< .2	***0.42***	***0.5***	0.2	***0.4***	0.2	0.2	< .2	< .2	0.24	0.26	0.34
CALCIUM T	mg/L	13	4.19	3.03	2.8	2.97	6.25	6.64	18.4	11.9	7.78	15.4	8.91
CHLORIDE T	mg/L	2	2	1	1	1	2	1	5	< 1	2	2	2
CHROMIUM HEX	µg/L	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
CHROMIUM T	µg/L	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
COPPER D	µg/L	< 4	< 4	< 4	***7.1***	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4
COPPER T	µg/L	< 4	< 4	< 4	***7.1***	< 4	< 4	< 4	< 4	< 4	< 4	< 4	***5.9***
IRON T	µg/L	18	524	191	69	***9030***	44	63	68	67	91	374	111
LEAD D	µg/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
LEAD T	µg/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
MAGNESIUM T	mg/L	1.48	2.26	2.07	1.51	1.69	1.41	1.53	2.33	1.94	1.46	6.42	1.72
MANGANESE T	µg/L	< 10	661	523	58	397	64	173	< 10	< 10	91	160	116
NICKEL D	µg/L	< 4	11.3	20.2	5.7	11.4	< 4	5.9	< 4	< 4	4.9	14.3	4.7
NICKE T	µg/L	< 4	11.6	23.1	6	11.4	< 4	6.4	< 4	< 4	5.4	16.3	7.1
SULFATE T	mg/L	10	20	11	< 10	< 10	12	18	19	16	14	22	21
ZINC D	µg/L	< 5	***44.6***	***70.3***	***23.6***	***42***	14.4	23.1	< 5	7.7	22.3	35.5	19.9
ZINC T	µg/L	< 5	***40.5***	***82.8***	***23.6***	***44.6***	17.3	23.5	< 5	7.7	24.6	40.6	25.3

"<" indicate concentrations below the reporting limi

Table 4. Dunbar Creek Spruell Strip Mine Area 1996-2002 – Water Chemistry

STATION	PARAMETER	UNITS	2/14/1996	9/26/1996	12/12/1996	11/7/1997	3/30/2000	-	-	8/28/2002
1SS	pH	pH units	***5.0***	***4.4***	***4.8***	6.2	***4.2***	-	-	6
1SS	ALKALINITY	mg/L	7.4	4.8	7.0	15.2	4.6	-	-	-
1SS	ACIDITY T	mg/L	11.60	11.40	13.60	2.60	26.00	-	-	70.20
1SS	ALUMINUM T	µg/L	595.00	< 500.000	543.000	< 500.000	***3450.000***	-	-	< 500.000
1SS	IRON T	µg/L	< 300.00	377.000	< 300.000	683.000	< 300.000	-	-	***17500.00***
1SS	MANGANESE T	µg/L	276.00	***1300.000***	184.000	<50.000	***2610.000***	-	-	***5310.00***
1SS	SODIUM T	mg/L	< 10.00	< 10.00	< 10.00	< 10.00	< 10.00	-	-	-
1SS	SULFATE T	mg/L	20.00	37.3	20.00	20.00	73.0	-	-	156.9
1SS	TSS	mg/L	< 3	< 3	< 3	4.0	4.0	-	-	6.0
STATION	**PARAMETER**	**UNITS**	**2/14/1996**	**9/26/1996**	**-**	**-**	**3/30/2000**	**-**	**-**	**-**
2SS	pH	pH units	***5.9***	6.2	-	-	***4.3***	-	-	-
2SS	ALKALINITY	mg/L	10.6	12.4	-	-	6.0	-	-	-
2SS	ACIDITY T	mg/L	2.40	1.40	-	-	11.60	-	-	-
2SS	ALUMINUM T	µg/L	500.00	< 500.000	-	-	***1390.000***	-	-	-
2SS	IRON T	µg/L	300.00	< 300.000	-	-	< 300.000	-	-	-
2SS	MANGANESE T	µg/L	< 50.000	< 50.000	-	-	***2990.000***	-	-	-
2SS	SODIUM T	mg/L	< 10.00	< 10.00	-	-	< 10.00	-	-	-
2SS	SULFATE T	mg/L	20.00	22.6	-	-	117.3	-	-	-
2SS	TSS	mg/L	< 3	< 3	-	-	4.0	-	-	-
STATION	**PARAMETER**	**UNITS**	**2/14/1996**	**9/26/1996**	**-**	**-**	**3/30/2000**	**8/9/2001**	**12/18/2001**	**-**
3SS	pH	pH units	6.0	6.3	-	-	***4.2***	***4.4***	***4.3***	-
3SS	ALKALINITY	mg/L	10.8	15.4	-	-	4.8	6.0	11.0	-
3SS	ACIDITY T	mg/L	2.20	0.00	-	-	24.00	49.2	48.40	-
3SS	ALUMINUM T	µg/L	< 500.00	< 500.00	-	-	***2320.000***	592.0	< 500.000	-
3SS	IRON T	µg/L	< 300.00	< 300.000	-	-	482.000	839.0	< 300.000	-
3SS	MANGANESE T	µg/L	< 50.000	< 50.000	-	-	***1890.000***	282.0	82.00	-
3SS	SODIUM T	mg/L	< 10.00	< 10.00	-	-	< 10.00			-
3SS	SULFATE T	mg/L	20.00	22.5	-	-	47.4	20.0	20.0	-
3SS	TSS	mg/L	< 3	< 3	-	-	4.0	4.0	96.0	-

"<" indicate concentrations below the reporting limit

Table 4 (cont.). Dunbar Creek Spruell Strip Mine Area 1996-2002 – Water Chemistry

STATION	PARAMETER	UNITS	2/14/1996	9/26/1996	12/12/1996	6/30/1997	9/4/1997	11/7/1997	6/22/1999	3/30/2000	8/9/2001	12/18/2001
5SS	pH	pH units	6.1	***5.1***	***4.5***	***4.2***	6.0	***4.6***	***5.5***	***4.4***	***4.4***	***4.1***
5SS	ALKALINITY	mg/L	10.6	6.6	6.0	4.6	9.6	6.8	8.4	6.6	7.6	5.6
5SS	ACIDITY T	mg/L	1.00	7.20	14.00	26.00	6.00	14.80	1.00	6.00	59.8	58.60
5SS	ALUMINUM T	µg/L	< 500.00	505.000	557.000	511.000	< 500.00	***873.000***	< 500.00	576.000	< 500.00	678.00
5SS	IRON T	µg/L	< 300.000	< 300.000	< 300.000	1060.000	< 300.000	***1550.000***	514.000	< 300.000	392.0	***1660.00***
5SS	MANGANESE T	µg/L	< 50.000	322.000	692.000	***3330.000***	61.000	660.000	***3330.000***	935.000	***5330.0***	633.00
5SS	SODIUM T	mg/L	< 10.00	< 10.00	< 10.00	< 10.00	< 10.00	< 10.00	< 10.00	< 10.00	-	-
5SS	SULFATE T	mg/L	20.00	27.4	23.9	98.3	23.0	20.00	23.3	35.0	145.5	20.0
5SS	TSS	mg/L	< 3	< 3	< 3	< 3	< 3	16.0	< 3	< 3	< 3	12.0
STATION	**PARAMETER**	**UNITS**	**2/14/1996**	**12/12/1996**	**-**	**6/30/1997**	**9/4/1997**	**-**	**6/22/1999**	**-**	**-**	**12/18/2001**
8SS	pH	pH units	6.1	***4.6***	-	***5.7***	***4.6***	-	***4.4***	-	-	***4.0***
SS5	ALKALINITY	mg/L	11.0	6.8	-	9.2	6.6	-	6.0	-	-	3.4
8SS	ACIDITY T	mg/L	0.80	16.60	-	3.80	16.60	-	9.60	-	-	54.60
8SS	ALUMINUM T	µg/L	< 500.00	***975.000***	-	< 500.000	< 500.000	-	< 500.000	-	-	***1170.00***
8SS	IRON T	µg/L	300.00	< 300.000	-	< 300.000	1180.000	-	< 300.000	-	-	1090.00
8SS	MANGANESE T	µg/L	< 50.000	309.000	-	89.000	***2970.000***	-	< 50.000	-	-	425.00
8SS	SODIUM T	mg/L	< 10.00	< 10.00	-	< 10.00	< 10.00	-	< 10.00	-	-	-
8SS	SULFATE T	mg/L	20.00	20.00	-	24.7	102.2	-	115.9	-	-	20.0
8SS	TSS	mg/L	< 3	4.0	-	< 3	4.0	-	< 3	-	-	18.0

"<" indicate concentrations below the reporting limit

Table 5. Dunbar Creek Water Chemistry 4/11/2006 – Water Chemistry

PARAMETER	UNITS	STATIONS							
		1DC	5GR	6LR	7DC	8TR	9EER	11IR	12DC
pH	pH units	7.4	6.2	6.9	7	7.3	7.6	7.1	6.8
ALKALINITY	mg/L	21	1.8	6.6	6.8	21.8	36.4	13.8	5.6
ACIDITY	mg/L	-15.2	11.4	0.4	0.2	-15.4	-28.8	-7.4	5
HARDNESS	mg/L	41	19	21	22	41	60	34	39
TDS	mg/L	74	48	56	62	82	122	74	102
TSS	mg/L	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
AMMONIA T	mg/L	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
NITRITE T	mg/L	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
NITRATE T	mg/L	0.64	0.12	0.27	0.26	0.49	0.82	0.4	0.46
PHOSPHORUS T	mg/L	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.026
ALUMINUM D	µg/L	< 200	< 200	< 200	< 200	< 200	< 200	< 200	< 200
ALUMINUM T	µg/L	49.1	327	187	218	48.5	63.3	152	149
ARSENIC D	µg/L	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4
ARSENIC T	µg/L	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4
CADMIUM D	µg/L	< 0.2	0.26	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
CADMIUM T	µg/L	< 0.2	0.28	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
CALCIUM T	mg/L	13.8	5.068	5.988	6.556	13	20.2	10.6	9.6
CHLORIDE T	mg/L	4.6	1.9	2.9	2.3	1.9	11.4	3.9	7.3
CHROMIUM HEX	µg/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
CHROMIUM T	µg/L	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
COPPER D	µg/L	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4
COPPER T	µg/L	< 4	< 4	< 4	4.4	< 4	< 4	< 4	4.9
IRON D	µg/L	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
IRON T	µg/L	47	70	48	46	67	101	82	183
LEAD D	µg/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
LEAD T	µg/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
MAGNESIUM T	mg/L	1.548	1.471	1.359	1.382	1.971	2.293	1.702	3.523
MANGANESE T	µg/L	< 10	180	41	94	< 10	< 10	55	41
NICKEL D	µg/L	< 4	6.6	< 4	4.2	< 4	< 4	< 4	8.3
NICKEL T	µg/L	< 4	6.8	< 4	4.4	< 4	< 4	< 4	9.1
SULFATE T	mg/L	< 20	< 20	< 20	< 20	< 20	< 20	< 20	27.9
ZINC D	µg/L	< 5	24	10.9	14.8	< 5	< 5	9.4	22.2
ZINC T	µg/L	17.4	26.7	12	17.2	< 5	< 5	9.6	25.1

"<" indicate concentrations below the reporting limit

Table 6. Dunbar Creek Additional Chemistry 7/12/2016 – Water Chemistry

PARAMETER	UNITS	STATIONS							
		2SS	3SS	4SS	5SS	6SS	7SS	8SS	9SS
pH	pH units	***5.40***	***5.90***	***4.99***	***5.63***	6.12	***4.64***	***4.44***	***5.13***
SP COND	µS/cm[C]	23.2	***211.8***	22.7	***130.2***	34.6	31.2	60.7	25.8
ALKALINITY	mg/L	0.6	1.6	0.0	2.4	5.2	0.0	0.0	0.4
ACIDITY	mg/L	0.60	4.00	6.20	9.60	4.20	5.80	18.80	9.00
T SUSP SOLID	mg/L	< 5	10	< 5	< 5	90	< 5	10	6
ALUMINUM ACID SOL	µg/L	< 200	< 200	< 200	< 200	335.000	399.000	439.000	307.000
ALUMINUM D	µg/L	< 200	< 200	< 200	< 200	< 200	365.000	374.000	< 200
ALUMINUM T	µg/L	< 200	< 200	< 200	< 200	447.000	416.000	469.000	438.000
IRON D	µg/L	79.000	22.000	100.000	589.000	***1593.000***	104.000	107.000	211.000
IRON T	µg/L	203.000	694.000	221.000	***2708.000***	***3859.000***	178.000	272.000	610.000
MANGANESE D	µg/L	61.000	480.000	85.000	656.000	110.000	122.000	462.000	121.000
MANGANESE T	µg/L	60.000	498.000	85.000	649.000	117.000	120.000	453.000	128.000
SULFATE T	mg/L	< 20.0	89.0	< 20.0	49.8	< 20.0	< 20.0	20.5	< 20.0

"<" indicate concentrations below the reporting limit

primarily limited to unreclaimed spoil piles and a few iron seeps with insignificant flow volumes. The inactive mining areas of UNT 38212 have had iron seeps occurring sporadically since the area was mined. Even though the substrates at 3UNT were only mildly coated with ferric hydroxide ($FeOH_3$) at the time of the DEP's 1996 survey, significant amounts of the orange flocculent may occasionally be transported downstream during seasonal flushing.

The United States Geological Survey (USGS) 7.5' topographic map for the area indicates several disturbed areas just upstream of station 3GR that are not depicted on the DEP's mine reclamation maps. These areas have been delineated on Figures 1 and 2 as 'Mine Areas'. According to the DEP's geospatial information the Spruell Strip Mine Area, located in the Glade Run headwaters is identified as "Reclamation Complete", but not in compliance. An acid mine drainage (AMD) treatment project and an alkaline sand addition treatment are currently active and maintained by Trout Unlimited in the vicinity of the Spruell Strip Mine Area. An additional alkaline sand addition treatment is actively maintained by Trout Unlimited on Glade Run in the vicinity of Flat Rock Run. The Horwath Strip Mining Area, located just northwest of the Rock Run/Glade Run confluence, is identified as "Reclamation Complete" and in compliance.

In the past, Glade Run may have been affected by AMD which may have diminished in recent years. The DEP's 1996 water chemistry results (Table 3) indicate that iron concentrations are not elevated in Glade Run tributaries (3UNT & 4RR) but were elevated at 5GR (9030 µg/L). However, $FeOH_3$ deposits did not significantly impact the substrate at 5GR. Conversely, even though the iron at 2GR was only moderately elevated (524 µg/L), the substrate was coated with $FeOH_3$. These deposits were a soft flocculent. When the substrate was kicked during benthic sampling, the gravel materials were loose, unconsolidated, and easily disturbed. The soft, $FeOH_3$ flocculent was easily dislodged. This indicates that this flocculent had deposited recently and has not had the time to consolidate in the substrate interstitial spaces, which eventually results in compacted, lifeless substrates that characterize streams degraded by long term AMD. The area upstream of 2GR has experienced periodic land disturbances in the past. Station 2GR is downstream of a beaver dam that existed in 1996. One of the speculated iron excavation sites in the study area is located immediately upstream of this beaver dam. Areas further upstream of this site had recently been disturbed by timbering activities (hauling and log skidding trails). Episodes of iron discharges entering upper Glade Run were noticed during these logging operations. The headwaters of Glade Run had been strip mined since 1975 that resulted in low volume iron discharges. A very small (10-15 gpm) AMD deep mine discharge is located further upstream.

The concentrations of other metals often associated with mine drainage (aluminum, cadmium, copper, manganese, and zinc) were elevated from the 1996 survey but sulfates, another important parameter associated with AMD, did not reflect results typical of mine drainage. Sulfate concentrations in mine-related discharges are usually very high. Though slightly elevated at 2GR, the sulfate concentrations found during the DEP's 1996 survey were much lower than normally found in surface waters receiving mine drainage (Table 3).

Water chemistry samples collected in 2006 throughout the Dunbar Creek basin continue to show the lowest concentrations of alkalinity (1.8 mg/L), lowest pH values (6.2) and acidity exceeding alkalinity at

Glade Run (5GR). The remaining seven stations sampled had alkalinities ranging 5.6-36.4 mg/L, pH ranging 6.8-7.6, and alkalinity exceeding acidity. Zinc, total and dissolved concentrations, are also highest at Glade Run (5GR) (Table 5), consistent with comparatively higher concentrations at Glade Run and Glade Run tributary stations (2GR, 3UNT, 4RR, 5GR) in 1996 (Table 3).

Water chemistry samples collected in 2016 indicate water quality conditions in most reaches of the Glade Run basin are similar to those documented 1996 – 2002 (Table 4). All samples collected in July 2016 had pH < 6.0 with the exception of UNT 38220 (6SS), with a pH of 6.12. Aluminum concentrations for those stations upstream of UNT 38220 (2SS, 3SS, 4SS, 5SS) were below the reporting limit. Station 1SS was not sampled in 2016 due to an extremely reduced discharge at the time of sampling. Aluminum concentrations were detected, but not elevated at stations 6SS, 7SS, 8SS, and 9SS. Acidity continues to exceed alkalinity at all stations except UNT 38220 (6SS). Iron concentrations generally increase upstream to downstream and exceed water quality criteria at 5SS and 6SS (Table 6).

Aquatic Biota

The indigenous aquatic community is an excellent indicator of long-term conditions and is used as a measure of water quality. DEP staff collected habitat and benthic macroinvertebrate data at 13 stations (12 candidate and 1 reference) during the April 2006 survey (Figure 1, Table 1).

Habitat. Instream habitat was assessed at each station where benthic macroinvertebrates were sampled (Table 7). The habitat evaluation consists of rating twelve parameters to derive a station habitat score. The total habitat scores ranged from 168 (2GR) to 226 (1DC) with suboptimal scores at 2GR, 11IR and 12DC. Suboptimal scores at 2GR were a result of low scores for embeddedness, sediment deposition and riffle frequency as a result of both $FeOH_3$ deposits and limestone sand inundation as a result of alkaline sand treatment. The suboptimal score at 12DC was a result of low scores for riparian vegetation zone width and channel alterations due to the proximity of the road to Dunbar Creek. The suboptimal score at 11IR was a result of low scores for embeddedness, velocity/depth, sediment deposition, bank condition, bank vegetative protection, and riparian vegetation zone width due to a small residential area in close proximity to the lower reaches of Irishtown Run.

Benthos. Benthic macroinvertebrate samples were collected at all stations using the DEP's Rapid Bioassessment Protocols (RBP) benthic macroinvertebrate sampling technique, which is a modification of the US Environmental Protection Agency's (EPA) RBPs (Plafkin et al. 1989 and Barbour et al. 1999). Glade Run at 5GR was sampled once during the April 2006 survey and again in November 2007.

The Dunbar Creek basin supports a diverse benthic macroinvertebrate population dominated by genera sensitive to organic pollution, with the exception of the Glade Run basin upstream of Rock

Table 7. Dunbar Creek Basin – Habitat Assessment Results

PARAMETER	STATIONS[1]												REFERENCE[2]
	1DC	2GR	3UNT	4RR	5GR	6LR	7DC	8TR	9ERR	10DC	11IR	12DC	CSC
1. instream cover	20	15	20	15	19	19	19	19	19	19	16	18	15
2. epifaunal substrate	18	13	15	15	17	17	17	19	19	18	16	16	13
3. embeddedness	18	2	16	17	18	18	18	18	18	18	13	13	17
4. velocity/depth	20	18	20	15	20	20	20	16	19	18	15	15	16
5. channel alterations	19	15	20	20	18	18	19	19	20	15	16	13	19
6. sediment deposition	19	6	18	18	18	18	18	17	18	18	15	16	17
7. riffle frequency	19	10	18	15	19	20	20	19	19	20	18	18	12
8. channel flow status	19	19	19	16	19	19	19	19	20	19	20	19	19
9. bank condition	19	17	19	16	19	16	19	18	18	17	14	15	17
10. bank vegetative protection	18	18	17	15	18	16	17	18	17	16	15	17	20
11. grazing/disruptive pressures	18	17	20	20	20	19	16	17	19	16	16	16	20
12. riparian vegetation zone width	19	18	20	20	20	20	18	15	19	18	14	5	20
Total Score	226	168	222	202	225	220	220	214	225	212	188	181	205
Rating[3]	OPT	SUB	OPT	OPT	OPT	OPT	OPT	OPT	OPT	OPT	SUB	SUB	OPT

[1] Refer to Figure 1 & Table 1 for station locations
[2] Reference Station – Refer to Table 1 for location
[3] OPT=Optimal (≥192); SUB=Suboptimal (132-192)

Run. Taxa richness for Glade Run basin stations 2GR, 3UNT and 4RR ranged 11 - 18 with no Ephemeroptera (mayflies) present in any of the three samples. Taxa richness for the remainder of the candidate stations ranged 26 – 36 with sensitive mayfly taxa represented at each station. The farthest downstream Glade Run station (5GR) with a taxa richness of 26 and with only 2 mayfly taxa does indicate recovery when compared to upstream stations (Table 8).

AQUATIC LIFE USE ASSESSMENT

Glade Run from UNT 38221 to the confluence with Dunbar Creek, including UNT 38221 and UNT 38220, had been listed on Pennsylvania's list of impaired waters (Category 5 of the Pennsylvania Water Quality Monitoring and Assessment Integrated Report, developed pursuant to section 303(d) of the federal Clean Water Act (CWA)) for Source – Abandon Mine Drainage and Cause – Metals and pH. The listing was a result of a 2004 DEP Statewide Surface Water Assessment Protocol (SSWAP) survey that was a less rigorous evaluation than the DEP's current macroinvertebrate data collection protocols (Shull and Lookenbill 2018) and Index of Biotic Integrity (IBI) described in the DEP's *An Index of Biotic Integrity for Benthic Macroinvertebrate Communities in Pennsylvania's Wadeable, Freestone, Riffle-Run Streams* (Chalfant 2015). An IBI score of 36.6 and a significantly reduced abundance of organisms for station 2GR indicates impairment and is consistent with the 2004 impairment listing for the respective reach of Glade Run. Station 3UNT also has a low IBI score (46.6) and reduced abundance of organisms (122) that indicates impairment and is not consistent with the 2004 assessment that indicates attainment of the aquatic life use for UNT 38212. Stations 5GR, located at the mouth of Glade Run, with an IBI score of 75.6 as well as station 4RR on Rock Run, downstream Glade Run tributary, with an IBI score of 63.6 both indicate attainment of the aquatic life use. The subsequent 5GR sample collected in November 2007 had an IBI score of 69.2 affirming the attaining score from April 2006 (Table 8). Rock Run was listed as attaining, but the lower reach of Glade Run was listed as impaired.

Based on IBI scores of 75.6 and 69.2 at 5GR (Table 8), approximately **1.2** miles of Glade Run from the confluence of Rock Run to mouth (Figures 1 - 3) has been removed (delisted) from Pennsylvania's list of impaired waters, developed pursuant to section 303(d) of the CWA.

Based on an IBI score of 46.5, a reduced abundance of organisms, and an absence of mayflies at 3UNT (Table 8), approximately **4.7** miles of UNT 38212 basin (Figures 1 & 2) has been added to Pennsylvania's list of impaired waters for Source – Abandon Mine Drainage and Cause – Metals and pH.

Table 8. Dunbar Creek Basin – Semi-Quantitative Benthic Macroinvertebrate Data

TAXA		STATIONS[1]													REFERENCE[2]
		1DC	2GR	3UNT	4RR	5GR	5GR[3]	6LR	7DC	8TR	9ERR	10DC	11IR	12DC	CSC
Ephemeroptera (Mayflies)															
Ameletidae	***Ameletus***									1			1		
Baetidae	***Acentrella***	5						2		20	3	11		24	
	Acerpenna	1					1		1	1		1		1	
	Baetis	2						1			4	1		1	
	Diphetor											2	2		
	Pseudocloeon														2
Isonychiidae	***Isonychia***												1		
Heptageniidae	***Epeorus***	5						18		46	28	14	3	5	8
	Leucrocuta						1								
	Stenacron					6	2	5			1	4	1	1	2
	Stenonema	1				1		2	3			10	2	23	18
	Cinygmula							4	1	6	34	2	7	3	
Ephemerellidae	***Drunella***							3		4	6	1			
	Ephemerella	5						5	1	14	17	12	16	7	2
	Eurylophella											8		16	5
	Serratella							1				13		6	
Leptophlebiidae	***Habrophlebiodes***							4							11
	Paraleptophlebia	3					1			5	26	14		2	
Ephemeridae	***Ephemera***	1													9

[1] Refer to Figure 1 & Table 1 for station locations
[2] Reference Station – Refer to Table 1 for location
[3] Sample Collected November 2007

Table 8 (cont.). Dunbar Creek Basin – Semi-Quantitative Benthic Macroinvertebrate Data

TAXA		STATIONS[1]													REFERENCE[2]
		1DC	2GR	3UNT	4RR	5GR	5GR[3]	6LR	7DC	8TR	9ERR	10DC	11IR	12DC	CSC
Plecoptera (Stoneflies)															
Capniidae	***Allocapnia***						1								
	Paracapnia						9								
Pteronarcidae	***Pteronarcys***	1						1				1			
Peltoperlidae	***Peltoperla***	1			1										
	Tallaperla										1		1		
Nemouridae	***Amphinemura***	2		2	37	14	4	9	10	3	9		7	4	8
	Ostrocerca			1		1	1								2
Leuctridae	***Leuctra***	20	18	12	34	76	25	36	37	46	12	5	3	6	18
Perlidae	***Paragnetina***								2			1			
	Acroneuria	1				3		5	1	1	2	2	2	3	1
	Eccoptura												2		
Perlodidae	***Malirekus***							1							
	Isoperla							1			8	3	2	2	2
Taeniopterygidae	***Taeniopteryx***						1								
Chloroperlidae	***Alloperla***					1									
	Haploperla	8				17		6		3		9	20	3	24
	Suwallia						1								
	Sweltsa	1			17	5	7		22		12			1	

[1] Refer to Figure 1 & Table 1 for station locations
[2] Reference Station – Refer to Table 1 for location
[3] Sample Collected November 2007

Table 8 (cont.). Dunbar Creek Basin – Semi-Quantitative Benthic Macroinvertebrate Data

TAXA		STATIONS[1]												REFRENCE[2]
		1DC	2GR	3UNT	4RR	5GR	5GR[3]	6LR	7DC	8TR	9ERR	10DC	11IR	12DC	CSC
Tricoptera (Caddisflies)															
Philopotamidae	***Philopotamidae***									1					
	Chimarra			1											
	Dolophilodes					1	5								4
	Wormaldia				6		3								
Psychomyiidae	***Lype***						1							1	
Polycentropodidae	***Polycentropus***		1		2	7	3	2	4	3		6	4	2	5
	Nyctiophylax														2
Hydropsychidae	***Diplectrona***	4	4	2	3	1	5	7	7	16	2	7	23	1	
	Cheumatopsyche						2		4			11		9	3
	Hydropsyche	1					1	2	6			18	3	9	9
Rhyacophilidae	***Rhyacophila***	1		3	8	6		3	1		1	1	4		
Glossosomatidae	***Agapetus***										5			1	
Lepidostomatidae	***Lepidostoma***	1		3	4	5		2	3		2	1		1	1
Limnephilidae	***Pycnopsyche***	1							1					1	
Uenoidae	***Neophylax***	1						2		2					1

[1] Refer to Figure 1 & Table 1 for station locations
[2] Reference Station – Refer to Table 1 for location
[3] Sample Collected November 2007

Table 8 (cont.). Dunbar Creek Basin – Semi-Quantitative Benthic Macroinvertebrate Data

TAXA		STATIONS[1]													REFERENCE[2]
		1DC	2GR	3UNT	4RR	5GR	5GR[3]	6LR	7DC	8TR	9ERR	10DC	11IR	12DC	CSC
Coleoptera (Aquatic Beetles)															
Psephenidae	***Psephenus***												1		
	Ectopria	2						1					4		
Elmidae	***Dubiraphia***													1	
	Optioservus								4	3		4	5		4
	Oulimnius	38			1		1	29	15	22	23	15	30	10	12
	Promoresia											1			17
	Stenelmis		2										2		1
Diptera (True Flies)															
Ceratopogonidae	***Bezzia***								1						
	Probezzia	1	1	5	2	3	1								2
Dolichopodidae	***Dolichopodidae***				1										
Empididae	***Chelifera***	4			1	1		1		1	1				
	Clinocera	1													
	Hemerodromia										1			6	1
Tabanidae	***Tabanus***		1	2											1
Tipulidae	***Tipula***					2	1					1	1		
	Antocha									1		1		7	1
	Dicranota	2						1							1
	Hexatoma	8			3	2	1	2		1	2	5	4	1	9
	Molophilus	1		5		2	11					2	1		
Simuliidae	***Prosimulium***						1								1
	Simulium	4		1							2				
Chironomidae		95	20	55	42	53	123	56	57	20	19	28	37	43	36

[1] Refer to Figure 1 & Table 1 for station locations
[2] Reference Station – Refer to Table 1 for location
[3] Sample Collected November 2007

Table 8 (cont.). Dunbar Creek Basin – Semi-Quantitative Benthic Macroinvertebrate Data

TAXA		STATIONS[1]													REFERENCE[2]
		1DC	2GR	3UNT	4RR	5GR	5GR[3]	6LR	7DC	8TR	9ERR	10DC	11IR	12DC	CSC
Megaloptera (Dobson/ Fishflies)															
Sialidae	***Sialis***		1	1		1									
Corydalidae	***Nigronia***		1	3	1				4			1		1	1
Odonata (Dragon/ Damselflies)															
Gomphidae	***Lanthus***					2	1	1				2		1	1
Aeshnidae	***Boyeria***													1	
Non-Insect Taxa															
Gammaridae	***Gammarus***	3								2					
Hyalellidae	***Hyalella***			1		1									
Cambaridae	***Cambaridae***									1				1	
Cambaridae	***Cambarus***					8		2			1		1		2
Asellidae	***Caecidotea***	1	34	22	18	3	12						7	2	
Collembola				1											
Oligochaeta		8	1	2	4	11	8	10	12	6	3	4	16	6	
Richness		34	11	18	18	26	29	32	22	25	26	36	31	37	36
Total number of individuals		242	84	122	185	233	234	225	197	229	225	222	213	213	227
IBI Score		77.1	36.6	46.5	63.6	75.6	69.2	85.4	67.8	80.5	90.2	80.2	81.4	84.9	97.0

[1] Refer to Figure 1 & Table 1 for station locations
[2] Reference Station – Refer to Table 1 for location
[3] Sample Collected November 2007

BIOLOGICAL USE QUALIFICATIONS

The DEP applied its integrated benthic macroinvertebrate scoring test described at 25 Pa. Code § 93.4b(b)(1)(v) to the Dunbar Creek basin. Selected benthic macroinvertebrate community metrics calculated for the Dunbar Creek basin stations were compared to a station on Clear Shade Creek in Somerset County. Clear Shade Creek was chosen as an EV reference because it has comparable drainage area and is found in similar geologic settings as the candidate stations. In addition, Clear Shade Creek has served as an EV reference stream in other DEP surveys. The comparisons were done using the following metrics that were selected as being indicative of community health: taxa richness, modified Ephemeroptera (mayflies), Plecoptera (stoneflies), and Trichoptera (caddisflies) (EPT) index, modified Hilsenhoff Biotic Index (HBI), percent dominant taxon, and percent modified mayflies.

Based on these five metrics, candidate stations 6LR, 8TR, 9EER, 10DC, 11IR, and 12DC exceeded the EV qualifying criterion of 92% (§ 93.4b(b)(1)(v)) (Table 9).

A total of 22.9 stream miles qualify as EV Waters under this criterion.

ADDITIONAL EXCEPTIONAL VALUE WATERS QUALIFYING CRITERIA

Due to State Game Lands 51 encompassing approximately 63% of the Dunbar Creek basin the DEP evaluated additional antidegradation criteria listed in 25 Pa. Code § 93.4b(b)(1)(iii) – the water is an outstanding National, State, regional or local resource water [Appendix A].

Outstanding State Resource Waters

The DEP evaluated water quality protective measures developed by the Pennsylvania Game Commission (PGC) to protect aquatic and adjacent riparian areas as important habitats on state game lands. The PGC has issued aquatic habitat buffer guidelines with inner buffer zones of 100 feet for EV and 50 feet for HQ streams and with outer buffer zones of 50 and 100 feet respectively, for a total of 150 feet of protection. The management plans allow limited activities within the buffered areas, recommend elimination or minimization of existing roads or parking areas and encourage restoration of riparian areas.

The water quality protective measures described in PGC resource management plans meet the **“**outstanding National, State, regional or local resource waters” definition and apply to stream segments where State Game Lands 51 are situated along watershed corridors in a manner that provides protection to substantial reaches of the corridor within the Dunbar Creek basin.

A total of 24.6 stream miles qualify as EV waters under this criterion.

Table 9. Dunbar Creek Basin – RBP Metric Comparison

METRIC	STATIONS[1]												REFERENCE[2]
	1DC	2GR	3UNT	4RR	5GR	6LR	7DC	8TR	9ERR	10DC	11IR	12DC	CSC
1. TAXA RICHNESS	34	11	18	18	26	32	22	25	26	36	31	37	36
Cand/Ref (%)	94	31	50	50	72	89	61	69	72	100	86	103	xxx
Biol. Cond. Score	8	0	0	0	5	8	1	5	5	8	8	8	8
2. MOD. EPT INDEX	18	2	7	8	13	19	12	14	17	19	19	20	17
Cand/Ref (%)	106	12	41	47	76	112	71	82	100	112	112	118	xxx
Biol. Cond. Score	8	0	0	0	7	8	5	8	8	8	8	8	8
3. MOD. HBI	4.39	4.39	4.88	3.09	2.94	3.37	3.56	2.09	2.05	3.33	3.62	4.05	3.16
Cand-Ref	1.23	1.23	1.72	-0.07	-0.22	0.21	0.40	-1.07	-1.11	0.17	0.46	0.89	xxx
Biol. Cond. Score	1	1	0	8	8	8	8	8	8	8	8	5	8
4. % DOMINANT TAXA	40.6	40.5	45.1	22.7	32.6	24.9	28.9	20.1	15.1	12.6	17.4	20.2	15.9
Cand-Ref	24.7	24.6	29.2	6.8	16.7	9	13	4.2	-0.8	-3.3	1.5	4.3	xxx
Biol. Cond. Score	0	0	0	8	8[3]	8	6	8	8	8	8	8	8
5. % MOD. MAYFLIES	8.5	0	0	0	3	17.8	2.5	41.9	51.1	40.1	14.6	40.8	21.1
Ref-Cand	12.6	21.1	21.1	21.1	18.1	3.3	18.6	-20.8	-30	-19	6.5	-19.7	xxx
Biol. Cond. Score	7	5	5	5	6	8	6	8	8	8	8	8	8
TOTAL BIOLOGICAL CONDITION SCORE	24	6	5	21	34	40	26	37	37	40	40	37	40
% COMPARABILITY TO REFERENCE	**60**	**15**	**13**	**53**	**85**	**100**	**65**	**93**	**93**	**100**	**100**	**93**	
IBI Score	77.1	36.6	46.5	63.6	75.6	85.4	67.8	80.5	90.2	80.2	81.4	84.9	97.0

[1] Refer to Figure 1 & Table 1 for station locations
[2] Reference Station – Refer to Table 1 for location
[3] Dominant Taxa ≤ 3 HBI

PUBLIC RESPONSE AND PARTICIPATION SUMMARY

The DEP provided public notice of this stream redesignation evaluation and requested any technical data from the general public through publication in the Pennsylvania Bulletin on April 22, 2000 (30 Pa.B 2071). A similar notice was also published in the Daily Courier newspaper (Connellsville, PA) on April 17, 2000. In addition, Dunbar and Wharton townships and the Fayette County Planning Commission were notified of the redesignation evaluation in a letter dated April 19, 2000. No data on water chemistry, instream habitat, or the aquatic community were received in response to these notices.

Final Draft Notice, Comments and Response. Once the final draft report was completed it was made available to affected municipalities, County Planning Commissions, County Conservation Districts, the Department of Conservation and Natural Resources, the PFBC, and the Pennsylvania Game Commission in a letter dated July 14, 2018 with a public comment period ending 30-days later. In addition, the DEP provided public notice of the draft report comment period on the DEP's website and in the Pennsylvania Bulletin on July 14, 2018 (48 Pa.B 4174). The PFBC offered comments in support of the recommendations. An additional 45 comments were received by local residents, Mountain Watershed Association, the Youghiogheny Riverkeeper and Trout Unlimited in support of the recommendations. All comments and data received throughout the public participation opportunities were considered in the evaluation and recommendations.

RECOMMENDATIONS

Based on applicable regulatory definitions and requirements of 25 Pa. Code § 93.4b(b)(1)(v) (the DEP's integrated benthic macroinvertebrate scoring test) the DEP recommends that Dunbar Creek basin from and including Limestone Run to Gist Run be redesignated EV; and Dunbar Creek basin from source to and including UNT 38188 and Irishtown Run basin, excluding the headwaters of Glade Run upstream of State Game Lands 51, be redesignated EV based on § 93.4b(b)(1)(iii) (outstanding State resource waters) (Figures 1 - 3).

This recommendation adds approximately **47.5** stream miles of EV waters to Chapter 93.

APPENDIX A

[1]Definition at 25 Pa. Code § 93.1: *Outstanding National, State, regional or local resource water*—A surface water for which a National or State government Agency has adopted water quality protective measures in a resource management plan, or regional or local governments have adopted coordinated water quality protective measures[2] along a watershed corridor.

[2]Definition at 25 Pa. Code § 93.1: *Coordinated water quality protective measures*—

(i) Legally binding sound land use water quality protective measures coupled with an interest in real estate which expressly provide long-term water quality protection of a watershed corridor.

(ii) Sound land use water quality protective measure include: surface or ground water protection zones, enhanced stormwater management measures, wetland protection zones or other measures which provide extraordinary water quality protection.

(iii) Real estate interests include:

(A) Fee interests.

(B) Conservation easements.

(C) Government owned riparian parks or natural areas

(D) Other interests in land whish enhance water quality in a watershed corridor area.

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