

**GREEN LICK RUN**

**FAYETTE COUNTY**

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

**SEGMENT BASIN**

**DRAINAGE LIST: V**

**STREAM CODE: 37946**

**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**

**JANUARY 2001**

**REVISED OCTOBER 2002**

## **GENERAL WATERSHED DESCRIPTION**

Green Lick Run is a tributary to Jacobs Creek in the Youghiogheny River watershed (Figure 1). This basin covers an area of 7.2 square miles and contains 14.9 stream miles. It is located in Bullskin Township, Fayette County. The Green Lick Run basin currently has the protected water use designation Warm Water Fishes (WWF) and was evaluated for redesignation as Exceptional Value Waters (EV) as a result of a petition submitted by the Rural Area Concerned Citizens. This report is based on a field survey conducted in October of 2000.

The upper half of the watershed is covered by mostly second growth hardwood forest with little human disturbance. A mining company has applied for a permit to operate a large limestone quarry in this area. Land use in the lower half of the basin is mostly a mixture of low density residential and agriculture, including cropland and pasture. Green Lick Reservoir used to be located upstream of State Route 982, but the dam washed out over 20 years ago and the stream has reverted back to its natural condition. The National Resources Conservation Service (NRCS) built a replacement reservoir downstream of SR 982 in 1971. The new dam runs underneath T810 and the impoundment stretches back almost to the T753 bridge.

## **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 collected at 3 stations in the Green Lick Run basin during the October 2000 survey (Tables 1 & 2). These samples indicated that water quality was generally good. The indigenous aquatic community is a better indicator of long-term conditions than one-time grab samples and is used as a measure of ecological significance.

No surface water withdrawals for public water supply and only one NPDES permitted discharge to surface waters are located in this watershed. The Bullskin Swimming Pool Club has a discharge on Latta Run (PA0090450). This facility has a seasonal discharge with a limit of 4,500 gallons/day. This business went bankrupt in 2000 and did not discharge.

### **Aquatic Biota:**

Habitat assessments and biological samplings were conducted at 4 stations (3 candidate and a reference station) during the October 2000 survey. An evaluation of physical habitat assessments revealed that Stations 1GLR and 2GLR and reference station R1 scored in the Optimal category and Station 3LR scored in the Suboptimal category for benthic macroinvertebrates and fish (Table 3). Habitat scores ranged from 168 to 213 for the Green Lick Run stations. Low scoring parameters included lack of an adequate riparian zone, vegetative disruptive pressure, and limited velocity/depth regimes. The reference station habitat score was 214.

Benthic macroinvertebrate samples were collected at 3 candidate stations and a reference station (Table 4). Sampling techniques adapted from the EPA Rapid Bioassessment Protocols were used during this survey. Taxonomic diversity was average with a mean of 23.3 total taxa per

candidate station. Individuals from several genera that are sensitive to water quality degradation such as *Ephemerella*, *Aconeuria*, and *Diplectrona*, were common at Stations 1GLR and 2GLR. The total number of individuals/station was unusually low at Stations 1GLR, 2GLR, and R1. This probably results from acid precipitation and the lack of a natural buffering capacity in these basins.

Between both Pennsylvania Fish and Boat Commission (PFBC) and Ecosolutions, a private consulting firm, a total of 4 species of fish were collected at three stations (Figure 1 & Table 5). Wild rainbow trout were present at Stations 101 and 1ECO and wild brook trout were present at Station 2ECO. The other species collected were also cold-water species. Waters in all portions of the basin were found to support their designated uses.

### **BIOLOGICAL USE QUALIFICATIONS**

The biological use qualifying criterion applied to Green Lick Run was the integrated benthic macroinvertebrate score test described at § 93.4b(a)(2)(i)(A). This score is calculated from the macroinvertebrate samples referenced above. Because total numbers were low at Stations 1GLR, 2GLR and R1 the total sample was enumerated following the EPA's RBP III protocol (Table 6). A 100-count subsample was used for Station 3LR. Selected benthic macroinvertebrate community metrics were compared to a reference station with a comparable drainage area (Table 7). Both Green Lick Run and the reference stream, Bear Run (38455) are located in the Forested Hills and Mountains subcoregion (69a). Bear Run is a cold water fishery with an Exceptional Value (EV) designation in Chapter 93. 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 1GLR and 2GLR had biological condition scores greater than 92% of the reference station score which qualifies for an EV designation under the Department's regulatory criterion (§ 93.4b(b)(1)(v)). Station 3LR had a score of 40% of the reference station score. This score does not meet the 83% threshold required for designation as High Quality Waters (§ 93.4b(a)(2)(i)(A)).

None of the other antidegradation qualifying requirements listed in § 93.4b applies to this watershed.

### **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 April 22, 2000 (30 Pa.B 2071). A similar notice was also published in the The Daily Courier, Connellsville on April 21, 2000. In addition, Bullskin Township was notified of the evaluation

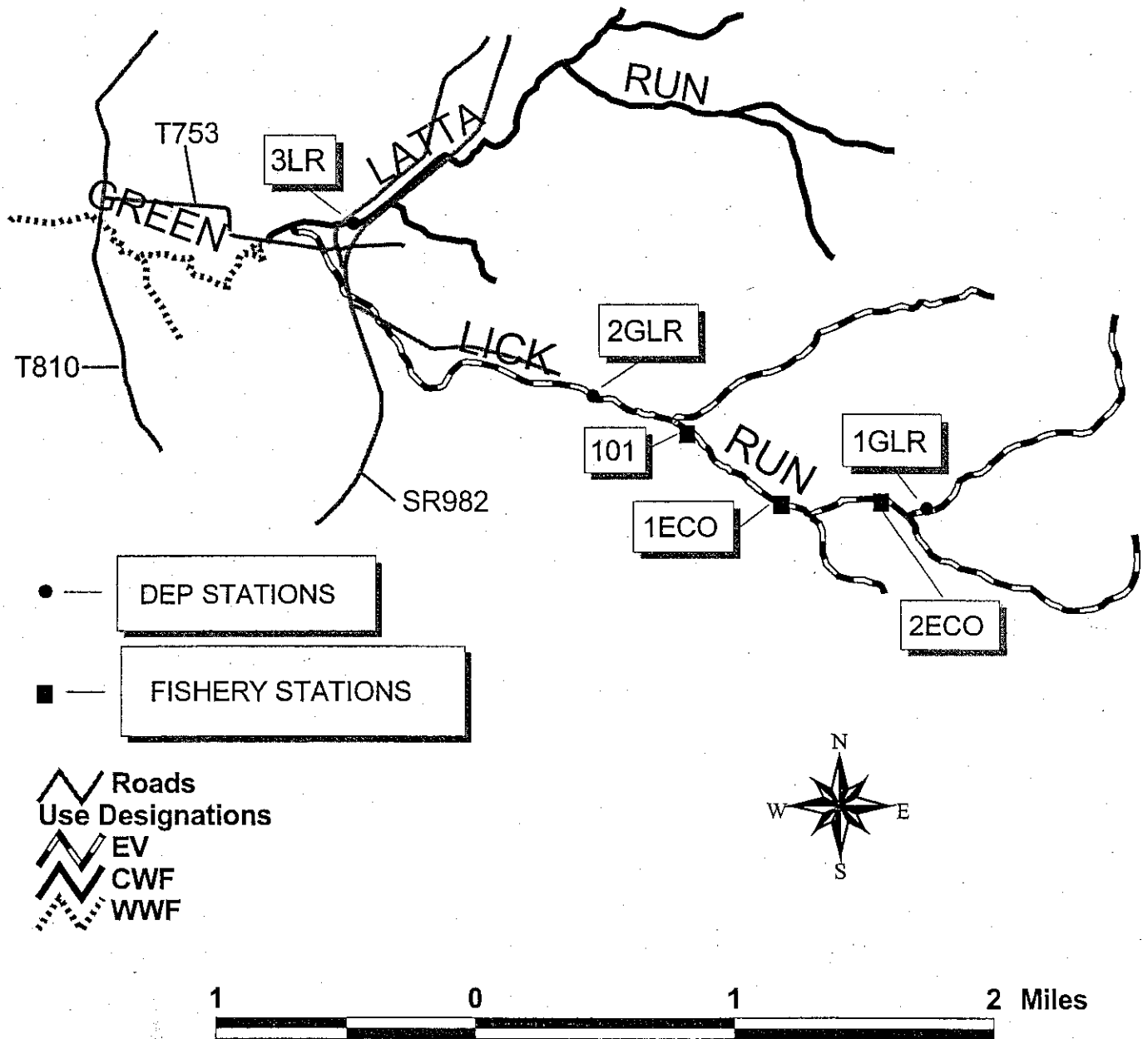
in a letter dated April 19, 2000. No data on water chemistry, instream habitat, or the aquatic community were received in response to these notifications.

A draft of this report was submitted to the above stakeholders including the petitioner, along with a request for comments, on September 20, 2002. No comments were received in response to this request.

### **RECOMMENDATIONS**

Based on applicable regulatory criteria, the Department recommends that the use designation of the Green Lick Run basin from the source to Latta Run be changed from WWF to EV based on biological condition scores greater than 92% of the reference station score. Also the use designation of the Latta Run basin and Green Lick Run from Latta Run to the T753 Bridge should be changed from the current WWF to CWF based on the presence of reproducing cold-water fish species. These recommendations affect 7.5 stream miles and satisfy the original request by the petitioner since the petition only covered the upper part of the basin.

# FIGURE 1. GREEN LICK RUN FAYETTE COUNTY



**TABLE 1**  
**STATION LOCATIONS**  
**GREEN LICK RUN**  
**FAYETTE COUNTY**

<b>STATION</b>	<b>LOCATION</b>
<b>1GLR</b>	Unnamed tributary to Green Lick Run (37957) approximately 100 meters upstream of the mouth. Bullskin Township, Fayette County Lat: 40 05 54 Long: 79 28 25 RMI: 0.07
<b>2GLR</b>	Green Lick Run (37946) approximately 600 meters downstream of the confluence with UNT 37955. Bullskin Township, Fayette County Lat: 40 06 19 Long: 79 29 54 RMI: 3.00
<b>3LR</b>	Latta Run (37949) approximately 30 meters upstream of the T733 crossing. Bullskin Township, Fayette County Lat: 40 06 52 Long: 79 30 57 RMI: 0.23
<b>R1</b>	Bear Run (38455) approximately 100 meters upstream from the confluence with UNT 38459. Stewart Township, Fayette County. Lat: 39 53 56 Long: 79 27 27 RMI: 1.67

**TABLE 2**  
**WATER CHEMISTRY<sup>1</sup>**  
**GREEN LICK RUN, FAYETTE COUNTY**  
**OCTOBER 19, 2000**

STATION	1GLR	2GLR	3LR
<b>Field Parameters</b>			
Temp (°C)	11.3	11.0	12.3
pH	6.8	6.9	6.7
Cond (µmhos)	71	88	176
Diss. O <sub>2</sub>	9.8	9.8	9.0
<b>Laboratory Parameters</b>			
pH	6.5	6.7	6.8
Alkalinity	7.6	14.2	32
Acidity	0	0	0
Hardness	22	31	59
T Diss. Sol.	60	66	116
Susp. Sol.	<2	<2	14
NH <sub>3</sub> -N	<.02	<.02	0.04
NO <sub>2</sub> -N	<.01	<.01	0.04
NO <sub>3</sub> -N	0.32	0.54	2.02
Total P	0.01	<0.01	0.06
Ca	6.23	9.28	16.9
Mg	1.47	1.88	4.1
Cl	4	3	13
SO <sub>4</sub>	<20	<20	<20
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
Cu*	< 4.0	< 4.0	< 4.0
Cu Diss	< 4.0	< 4.0	< 4.0
Fe*	191	165	731
Pb*	< 1.0	< 1.0	< 1.0
Pb Diss	< 1.0	< 1.0	< 1.0
Mn*	32	15	132
Ni*	< 4.0	< 4.0	< 4.0
Ni Diss	< 4.0	< 4.0	< 4.0
Zn*	11.4	6.7	< 5.0
Zn Diss	9.5	< 5.0	< 5.0
Al*	147	111	390

<sup>1</sup> - 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  
GREEN LICK RUN  
FAYETTE COUNTY  
OCTOBER 19, 2000**

HABITAT PARAMETER	STATIONS <sup>1</sup>			
	1GLR	2GLR	3LR	R1
1. instream cover	18	18	14	18
2. epifaunal substrate	17	18	15	18
3. embeddedness	18	17	13	17
4. velocity/depth	12	15	14	16
5. channel alterations	19	19	17	17
6. sediment deposition	18	18	16	18
7. riffle frequency	18	19	15	19
8. channel flow status	15	13	17	17
9. bank condition	18	18	14	18
10. bank vegetation protection	19	19	15	18
11. grazing/disruptive pressures	20	20	12	18
12. riparian vegetation zone width	20	19	6	20
Total Score	212	213	168	214
Rating <sup>2</sup>	OPT	OPT	SUB	OPT

<sup>1</sup> Refer to Figure 1: and Table 1. for station locations.

<sup>2</sup> OPT=Optimal; SUB=Suboptimal



**TABLE 4**  
**BENTHIC MACROINVERTEBRATE TAXA LIST**  
**GREEN LICK RUN, FAYETTE COUNTY**  
**OCTOBER 19, 2000**

TAXA	STATION			
	1GLR	2GLR	3LR	R1
<b>Ephemeroptera (mayflies)</b>				
Baetidae; <i>Baetis</i>	R	R		P
Caenidae; <i>Caenis</i>			R	
Ephemerellidae; <i>Ephemerella</i>	C	R		R
<i>Eurylophella</i>			P	R
Ephemeridae; <i>Ephemera</i>		P		
Heptageniidae; <i>Epeorus</i>				R
<i>Stenonema</i>	R	P		
Leptophlebiidae; <i>Paraleptophlebia</i>	R	P		
<b>Plecoptera (stoneflies)</b>				
Capniidae; <i>Paracapnia</i>	R			
Chloroperlidae; <i>Alloperla</i>	R			
<i>Sweltsa</i>	R	R		
Leuctridae; <i>Leuctra</i>		R		
Peltoperlidae; <i>Pelto/Tallaperla</i>	P	R	R	P
Perlidae; <i>Acroneuria</i>	P	C		P
Perlodidae; <i>Diploperla</i>				R
<i>Isoperla</i>	R			
Pteronarcyidae; <i>Pteronarcys</i>				R
Taeniopterygidae; <i>Taeniopteryx</i>		R		
<b>Tricoptera (caddisflies)</b>				
Hydropsychidae; <i>Cheumatopsyche</i>			VA	R
<i>Diplectrona</i>	A	C		A
<i>Hydropsyche</i>	C	C	A	R
Philopotamidae; <i>Chimarra</i>			R	
<i>Dolophilodes</i>	C	C		P
Polycentropodidae; <i>Polycentropus</i>		R		R
Psychomiidae; <i>Lype</i>	P			
Rhyacophilidae; <i>Rhyacophila</i>	P	P		P
<b>Diptera (true flies)</b>				
Empididae; <i>Hemerodromia</i>			P	
Simuliidae; <i>Simulium</i>		R	P	
Tabanidae; <i>Chrysops</i>			R	
Tipulidae; <i>Hexatoma</i>		P	R	P
<i>Limnophila</i>	R	R		
<i>Pilaria</i>			R	
<i>Tipula</i>	R	R	R	
Chironomidae	P	P	VA	P
<b>Megaloptera (dobson-, fishflies)</b>				
Corydalidae; <i>Nigronia</i>	R	R	R	
Sialidae; <i>Sialis</i>			R	

TAXA	STATION			
	1GLR	2GLR	3LR	R1
<b>Odonata (dragon-, damselflies)</b>				
Aeshnidae; <i>Boyeria</i>			R	
Gomphidae; <i>Lanthus</i>				R
<b>Coleoptera (aquatic beetles)</b>				
Dytiscidae			R	
Dryopidae; <i>Helichus</i>			P	
Elmidae; <i>Dubiraphia</i>			P	
<i>Optioservus</i>		P	P	
<i>Oulimnius</i>		P		P
<i>Promoresia</i>				R
<i>Stenelmis</i>			C	
Psephenidae; <i>Psephenus</i>			R	
<i>Ectopria</i>				R
Ptilodactylidae; <i>Anchytarsus</i>			P	
<b>Non-Insect Taxa</b>				
Oligochaeta		R	A	P
Isopoda (aquatic sowbugs)				
Asellidae; <i>Caecidotea</i>	R		P	R
Gastropoda (univalves, snails)				
Physidae			C	
Pelecypoda (bivalve clams)				
Sphaeriidae			R	
Number of taxa in total sample	20	24	27	22

VA = very abundant, > 99 organisms

A = abundant, 25-99 organisms

C = common, 10-24 organisms

P = present, 3-9 organisms

R = rare, < 3 organisms

**TABLE 5  
FISHES  
GREEN LICK RUN  
FAYETTE COUNTY**

SPECIES NAME	STATION		
	101 <sup>1</sup>	1ECO <sup>2</sup>	2ECO <sup>2</sup>
Brook trout, <i>Salvelinus fontinalis</i>			X
Rainbow trout, <i>Oncorhynchus mykiss</i>	X	X	
Blacknose dace, <i>Rhinichthys atratulus</i>	X	X	
Mottled sculpin, <i>Cottus bairdi</i>	X	X	

1 - Data collected by the Pennsylvania Fish and Boat Commission (Jun 1996)

2 - Data collected by Ecosolutions (Nov 1998)

**TABLE 6**  
**SEMI-QUANTITATIVE BENTHIC MACROINVERTEBRATE DATA**  
**GREEN LICK RUN, FAYETTE COUNTY**  
**OCTOBER 19, 2000**

TAXA	STATION			
	1GLR	2GLR	3LR	R1
<b>Ephemeroptera (mayflies)</b>				
Baetidae; <i>Baetis</i>	1	2		3
Ephemerellidae; <i>Ephemerella</i>	10	1		1
<i>Eurylophella</i>			1	1
Ephemeridae; <i>Ephemera</i>		3		
Heptageniidae; <i>Epeorus</i>				1
<i>Stenonema</i>	2	3		
Leptophlebiidae; <i>Paraleptophlebia</i>	1	5		
<b>Plecoptera (stoneflies)</b>				
Capniidae; <i>Paracapnia</i>	1			
Chloroperlidae; <i>Alloperla</i>	1			
<i>Sweltsa</i>	1	2		
Leuctridae; <i>Leuctra</i>		1		
Peltoperlidae; <i>Pelto/Tallaperla</i>	8	1		7
Perlidae; <i>Acroneuria</i>	5	18		8
Perlodidae; <i>Diploperla</i>				1
<i>Isoperla</i>	2			
Pteronarcyidae; <i>Pteronarcys</i>				2
Taeniopterygidae; <i>Taeniopteryx</i>		1		
<b>Tricoptera (caddisflies)</b>				
Hydropsychidae; <i>Cheumatopsyche</i>			28	1
<i>Diplectrona</i>	25	20		30
<i>Hydropsyche</i>	10	21	7	1
Philopotamidae; <i>Dolophilodes</i>	10	16		8
Polycentropodidae; <i>Polycentropus</i>		1		1
Psychomiidae; <i>Lype</i>	7			
Rhyacophilidae; <i>Rhyacophila</i>	4	4		4
<b>Diptera (true flies)</b>				
Simuliidae; <i>Simulium</i>		1	1	
Tipulidae; <i>Hexatoma</i>		3	1	3
<i>Limnophila</i>	1	1		
<i>Tipula</i>	2	1		
Chironomidae	3	4	43	4
<b>Megaloptera (dobson-, fishflies)</b>				
Corydalidae; <i>Nigronia</i>	2	2		
<b>Odonata (dragon-, damselflies)</b>				
Gomphidae; <i>Lanthus</i>				2

TAXA	STATION			
	1GLR	2GLR	3LR	R1
<b>Coleoptera (aquatic beetles)</b>				
Elmidae; <i>Optioservus</i>		3	1	
<i>Oulimnius</i>		5		3
<i>Promoresia</i>				1
<i>Stenelmis</i>			5	
Psephenidae; <i>Psephenus</i>			1	
<i>Ectopria</i>				1
<b>Non-Insect Taxa</b>				
Oligochaeta		2	11	3
Isopoda (aquatic sowbugs)				
Asellidae; <i>Caecidotea</i>	1		1	1
Gastropoda (univalves, snails)				
Physidae			7	

**TABLE 7**  
**RBP METRIC COMPARISON**  
**GREEN LICK RUN, FAYETE COUNTY**  
**OCTOBER 19, 2000**

METRIC	STATION			
	1GRL	2GLR	3LR	R1
1. TAXA RICHNESS	20	24	12	22
Cand/Ref (%)	91	109	54	xxx
Biol. Cond. Score	6	6	0	6
2. MOD. EPT INDEX	13	12	1	10
Cand/Ref (%)	130	120	10	xxx
Biol. Cond. Score	6	6	0	6
3. MOD. HBI	1.4	2.1	6.3	1.7
Cand-Ref	<0	0.4	4.6	xxx
Biol. Cond. Score	6	6	0	6
4. % DOMINANT TAXA	26	17	40	34
Cand-Ref	<0	<0	6	xxx
Biol. Cond. Score	6	6	6	6
5. % MOD. MAYFLIES	13	10	1	3
Ref-Cand	<0	<0	2	xxx
Biol. Cond. Score	6	6	6	6
TOTAL BIOLOGICAL CONDITION SCORE	30	30	12	30
% COMPARABILITY TO REFERENCE	100	100	40	