

Sub-watershed 12R (War Branch Run)

General Discussion

This sub-watershed encompasses 1.68 square miles or 1,075.90 acres of land area, approximately 2.60% of the total study area. This basin is drained by 8.19 miles of tributaries (3.04% of the total length of all watershed tributaries) and contains 1 acre of lakes and ponds (0.09% of the total sub-watershed land area). State records indicate 4 surface mines and 2 deep mines. Our field survey found 5 surface mines, all flowing, and no deep mines.

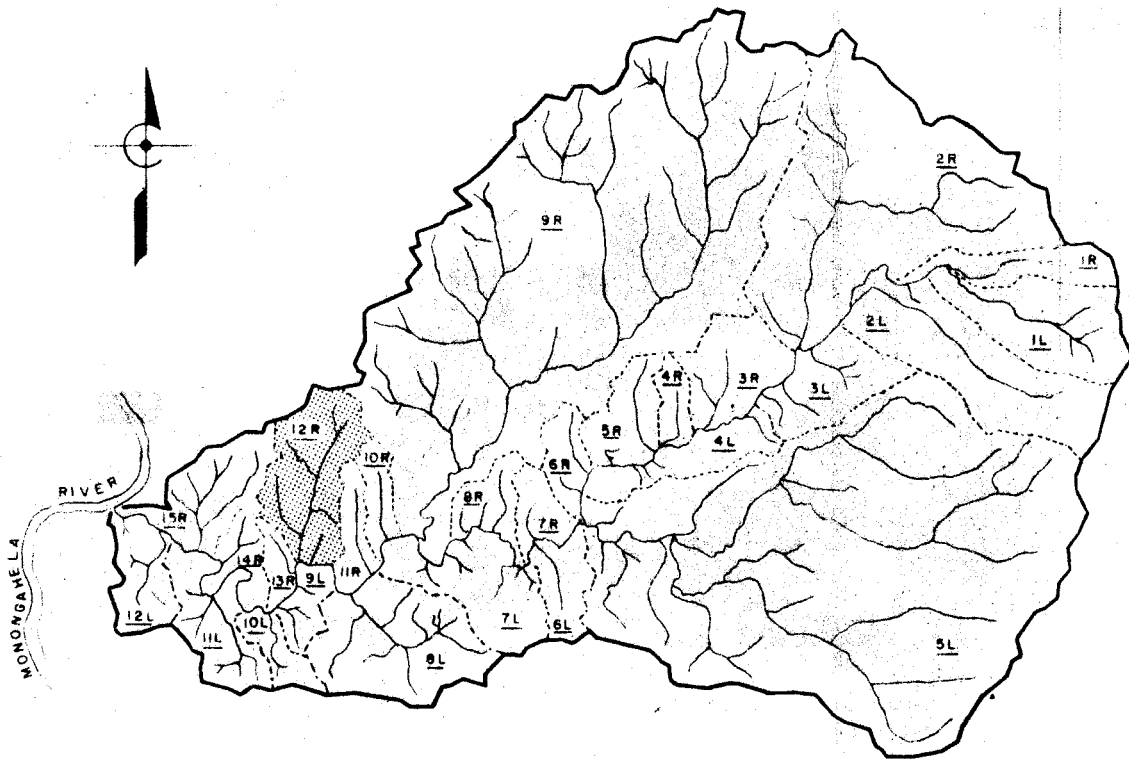
The following information gives the combined averages of the sampling stations designated as GC12R2, un-named, GC12R3, un-named, and GC12R4, War Branch Run. These stations are located on Drawing 7316-7, while their individual averages are shown in Table 99. In the case where more than one tributary contributes to a sub-watershed, the values have been combined. The percentages of pollution load and flow that this sub-watershed contribute to Monitoring Station GC8 near the mouth of Georges Creek are also given.

	<u>Averages</u>		<u>Percent of Total Watershed</u>
pH	6.6		
Net Hot Acidity	0	PPD	0 %
Ferrous Iron	1	PPD	3.12%
Total Iron	4	PPD	0.12%
Sulfate	545	PPD	0.80%
Flow	414,720	GPD	0.70%





TABLE 99
 TRIBUTARY AVERAGE WATER QUALITY DATA
 Sub-watershed
 12R

Station	pH	Hot Acid		Alkalinity		Net Hot Acid		Ferrous Iron		Iron as Fe		Sulfate		Flow	
		PPM	#/Day	PPM	#/Day	PPM	#/Day	PPM	#/Day	PPM	#/Day	PPM	#/Day	GPM	G.F.D.
GC12R2	6.6	15.33	4.06	63.33	16.75	0	0	0	0	0	0	26.33	6.97	13	18,720
GC12R3	6.4	15.33	.37	94.00	2.26	0	0	0	0	.05	0	26.67	.64	1	1,440
GC12R4	6.9	3.71	6.53	77.57	277.74	0	0	.01	.01	1.39	3.37	178.00	537.01	274	394,560

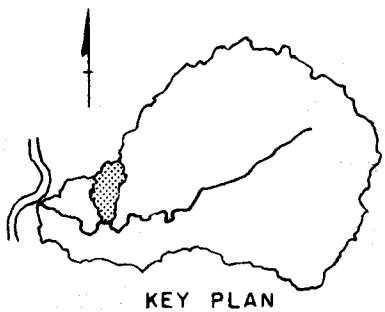
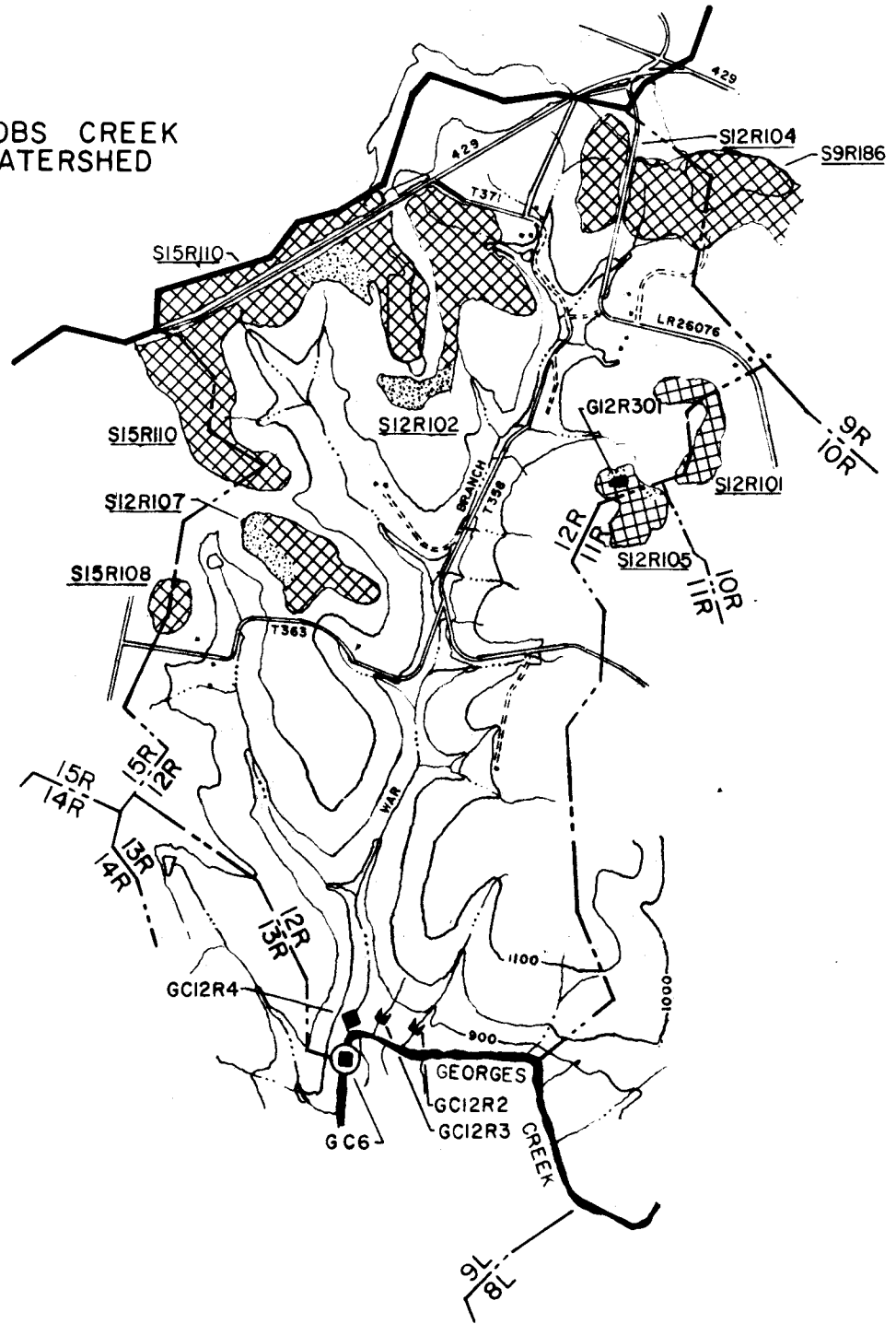
Location Plan



LEGEND FOR THE FOLLOWING PLATES

- Y DEEP MINE OPENING (M9R59A)
- ▲ DEEP MINE PIPE (SAMPLE STATIONS - MP5L2A, or BH9R2)
- ▼ WEIR (TRIBUTARY SAMPLE STATION - GC7L1)
- CROSS-SECTION (TRIBUTARY SAMPLE STATION - GC9R1)
- ⊙ GEORGES CREEK CROSS-SECTION (SAMPLE STATION - GC5)
-  STRIP MINE (ABANDONED-UNRECLAIMED - S11L102)
-  STRIP MINE (ACTIVE - S4R107)
-  STRIP MINE (ABANDONED-RECLAIMED - S7L106)
-  GOB PILE (G9R301)
- A, B, C UNDERLINED SUFFIX
INDICATES FLOWING DEEP MINE SAMPLE STATIONS - M9R74A, B, C
- S7L101 UNDERLINE - INDICATES FLOWING STRIP MINE, GOB PILE, OR
BORE HOLE SAMPLE STATION

JACOBS CREEK
WATERSHED



**MAP OF
SUB-WATERSHED 12R
(WAR BRANCH)**
SCALE: 1" = 2000'

strip Mines

The Commonwealth records indicate there are 4 strip mines in this sub-watershed. Our field investigations located 5 surface mines with each having a flow. Table 100 lists the abandoned strip mines within the sub-watershed with the following information: the name of the mine or operator if known, permit numbers, the acres of area mined and which seam was mined, the designation we give the mine, whether or not there is a flow, and whether there are any deep mine connections.

The total acreage of abandoned surface mines in Sub-watershed 12R is 100.06 acres or 9.30% of the total sub-watershed land area.

Table 101 gives the averages of the abandoned surface mine flows. Directly under the averages are the percentages of flows and pollution loads that each contributes to the pollution load of the sub-watershed as measured at the following sampling stations: GC12R2, GC12R3, and GC12R4 (War Branch Run).

Where a single surface mine has more than one flow, the averages of the flows are added together.

Where more than one major tributary drains a sub-watershed, the averages of each are also combined.

Following Table 1m are the descriptions of the flowing strip mines along with abatement recommendations.

TABLE 100
Abandoned Surface Mines
Sub-watershed
12R

Mine Number	Name of Mine or Operator	Permit No.	Area Mined (Acres)	Seam Mined	Flowing	Connection w/Deep Mine
S12R101	Unknown	--	18.36	PGH*	Yes	MLOR1
S12R102	Jem Coal Co.	10982	42.23	RED	Yes	--
S12R104	John B. Reese	17159	13.77	PGH	Yes	--
S12R105	Pontorero & Sons	17967	9.18	PGH	Yes	--
S12R107	Unknown	--	16.52	PGH*	Yes	--

*Assumed

TABLE 101
 ABANDONED SURFACE MINE AVERAGE WATER QUALITY DATA
 Sub-watershed
 12R

Station	pH	Hot Acid		Alkalinity		Net Hot Acid		Ferrous Iron		Iron as Fe		Sulfate		Flow	
		PPM	#/Day	PPM	#/Day	PPM	#/Day	PPM	#/Day	PPM	#/Day	PPM	#/Day	GPM	G.P.D.
SL2R101	3.0	1270	19.47	0	0	1270	19.47	.56	0	98.09	1.36	1900	30.95	3	4,320
%	-	-	-	-	-	-	-	-	0%	-	4.25%	-	5.68%	-	1.04%
SL2R102	3.0	841.5	22.84	0	0	841.5	22.84	.28	.01	27.05	1.18	1169	51.22	4	5,760
%	-	-	-	-	-	-	-	-	100%	-	35.01%	-	9.40%	-	1.39%
SL2R104	3.6	2322	172.5	0	0	2322	172.5	4.91	.07	27.14	1.3	4265	382.6	45	64,800
%	-	-	-	-	-	-	-	-	700%	-	35.58%	-	70.25%	-	15.62%
SL2R105	2.9	625	42.37	0	0	625	42.37	0	0	23.62	1.7	731.3	44.62	5	7,200
%	-	-	-	-	-	-	-	-	0%	-	50.44%	-	8.19%	-	1.74%
SL2R107	2.7	7815	294	0	0	7815	294	5.41	.17	703.1	26.31	8846	329.5	15	21,600
%	-	-	-	-	-	-	-	-	1700%	-	780.71%	-	60.50%	-	5.21%

Strip Mines S12R101

General Description:

This strip mine is located about 3,500 feet northwest of the intersection between L.R. 26076 and T 363. Another reference point is the T 363 and T 358 intersection which is 3,800 feet southwest of the strip. War Branch Run is 2,000 feet west of S12R101. The mine encompasses 18.36 acres and is assumed to have mined the Pittsburgh coal seam. The strip is 100% reclaimed through grading and revegetation. Vegetation covers the entire strip and consists primarily of grasses. A connection with Deep Mine M10R1 has been established. Two leaches were found on the northern edge of the strip. The mine is shown on the map of Sub-watershed 12R.

Recommendations:

The flows can be eliminated or reduced by preventing surface runoff from entering the area. A ditch system will accomplish this. A better vegetative cover in the leach areas is also required.

Costs:

Vegetation	1 acre @ \$600/acre	\$ 600
Ditch	1,000 @ \$1/foot	<u>1,000</u>
		\$1,600

Strip Mine S12R102 (permit number 10982)

General Description:

This mine is located immediately south of the intersection between T 429 and T 371. It consists of 42.23 acres and mined the Redstone coal seam. No deep mine connection was determined. Approximately 90% of the strip is reclaimed through grading and revegetation. About 90% of the strip is sparsely vegetated with grasses and trees, both natural and planted. A 15 foot highwall exists on the southern abandoned portion of the strip. The leach originates here from spoil piles and from the base of the highwall. The strip mine is shown on the map of Sub-watershed 12R.

Recommendations:

The spoil piles will need to be graded and revegetated. A ditch system at the base of the highwall will remove the water quickly from the area and reduce the amount of water for percolation.

Costs:

Grading	5 acres @ \$1,800/acre	\$ 9,000
Vegetation	5 acres @ \$600/acre	3,000
Ditch	1,500 feet @ \$1/foot	<u>1,500</u>
		\$13,500

Strip Mine 12R104 (Permit number 17159)

General Description:

This mine is located about 1,000 feet south of the T 429 and L.R. 26076 intersection. In fact, L.R. 26076 bisects the mine. The strip extends into Sub-watershed 9R where it was given the number S9R186 and sampled separately. Therefore, this description pertains only to the portion in Sub-watershed 12R. S12R104 is 100% reclaimed and revegetated. Three leaches were found on the southern edge. No highwall or spoil piles remain. No evidence of deep mining was discovered in the area. The strip mine contains 13.77 acres, mined the Pittsburgh coal seam, and is shown on the map of Sub-watershed 12R.

Recommendations:

From our field reconnaissance, we could not determine the cause of the leaches. The possibilities of either deep mining or natural springs present themselves but have no basis in fact. Therefore, no recommendations are made at this time until further study is completed.

Strip Mine S12R105 (permit number 17967)

General Description:

This strip mine is located approximately 2,500 feet northeast from the intersection of T 358 and T 363. The area encompassed is 9.18 acres and the coal seam mined was the Pittsburgh. No deep mines were found in the area. The strip is 90% reclaimed through grading and revegetation. About 90% of the strip is vegetated with grasses and trees, both natural and planted. In two separate areas an 8 foot highwall still exists with the accompanying gob piles. One leach was found west of the strip, but was determined to be caused by the strip. The strip is shown on the map of Sub-watershed 12R.

Recommendations:

The two highwalls should be eliminated by a combination of backfilling and cutting above them. The gob piles should be leveled out and planted. A diversion ditch system should be placed upslope to prevent surface runoff from traversing the area. There is evidence of sink holes which should be backfilled.

Costs:

Grading	5 acres @ \$1,800/acre	\$ 9,000
Vegetation	5 acres @ \$600/acre	3,000
Ditch	1,500 feet @ \$1/foot	<u>1,500</u>
		\$13,500

Strip Mine S12R107

General Description:

This strip mine is located 1,000 feet west of the intersection between T 363 and T 358. It contains 16.52 acres and is assumed to have mined the Pittsburgh coal seam. No deep mine connection has been established. The strip is 50% reclaimed through some grading and revegetation. The vegetation covers the entire strip and consists of grasses and trees. There are five leaches on this strip, four on the southern side and one on the northern side. The southern leaches originate from spoil piles while the northern leach originates off the strip. The strip is badly scarred and has many areas that can retain water for percolation. The strip is shown on the map of Sub-watershed 12R.

Recommendations:

Even though some parts of the strip have been minimally graded, the entire area needs to be reclaimed. It would consist of grading, revegetating, and a ditch system. Some grubbing will be necessary.

Costs:

Grading	17 acres @ \$1,800/acre	\$30,600
Vegetation	17 acres @ \$600/acre	10,200
Ditch	2000 feet @ \$1/foot	<u>2,000</u>
		\$42,800

Recommendations

Table 102 gives the recommendations for the polluting deep and strip mines, along with the costs associated with each recommendation. The order in which they are placed is determined by the cost per pound of acid removal.

An estimated effectiveness of 75% reduction of pollution load is assigned for each recommendation.

Table 103 lists the sources abated, the amount of beneficiation, and the costs associated with each plan.

Although this sub-watershed is, by the Commonwealth's standards, a clean area, there are five strip mines that should be given attention due to the amount of AMD that is placed into this otherwise clean stream.

TABLE 102
 RECOMMENDED ABATEMENT PROCEDURES - COST BENEFICATION
 SUB - WATERSHED
 12R

Line No.	Site No.	TOTAL COSTS		COST \$/POUND ACID REMOVAL		Total Acid Abated	Total Iron Abated	% OF TOTAL SUB-WATERSHED	
		Known Sources	Potential Sources	Known Sources	Potential Sources	Ppd	Ppd	Acid	Iron
1	S12R101	\$ 1,600	\$ 1,600	\$ 109.59	\$ 109.59	14.6	1.02	-	26%
2	S12R107	42,800	42,800	194.10	194.10	220.5	19.73	-	493%
3	S12R105	13,500	13,500	424.80	424.80	31.78	1.28	-	32%
4	S12R102	13,500	13,500	788.09	788.09	17.13	1	-	25%

TABLE 103
 BENEFCATION - RECOMMENDED PLANS
 SUB-WATERSHED
 12R

Plan	Sources Abated	ACID		IRON		SULFATE		TOTAL CONS'T COSTS	
		Ppd	% of Total Sub-Watershed	Ppd	% of Total Sub-Watershed	Ppd	% of Total Sub-Watershed	Known Sources	Potential Sources
A	4	284.01	-	23.03	576%	342.33	63%	\$ 71,400	\$ 71,400
B	3	266.88	-	22.03	551%	303.91	56%	57,900	57,900

It is recommended Plan "B" be initiated for this Sub-Watershed