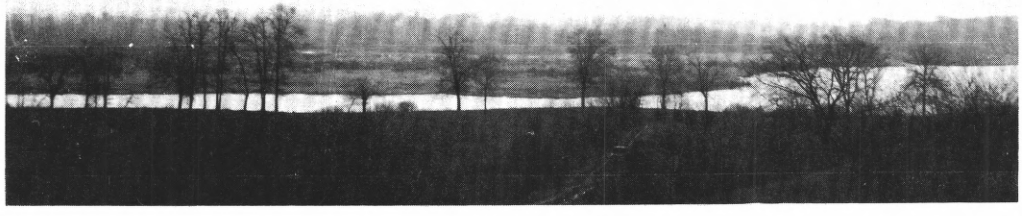
ASSESSMENT OF WATER QUALITY IN STREAMS DRAINING COAL-PRODUCING AREAS IN OHIO

U.S. GEOLOGICAL SURVEY

WATER-RESOURCES INVESTIGATIONS

Open-file report 81-409



Prepared in cooperation with the

U.S. ENVIRONMENTAL PROTECTION AGENCY

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

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by Christine L. Pfaff, Dennis R. Helsel,
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Columbus, Ohio

October 1981

UNITED STATES DEPARTMENT OF THE INTERIOR

JAMES G. WATT, Secretary

GEOLOGICAL SURVEY

Dallas L. Peck, Director

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CONVERSION FACTORS

The inch-pound units used in this report may be converted to (SI) metric units by the following conversion factors:

To convert from	To	Multiply by
inch (in)	millimeter (mm)	25.4
foot (ft)	meter (m)	0.3048
mile (mi)	kilometer (km)	1.609
acre	hectare (ha)	0.4047
gallon (gal)	liter (L)	3.785
mile^2 (mi^2)	kilometer^2 (km^2)	2.590
foot^3 per second (ft^3/s)	meter^3 per second (m^3/s)	0.02832
micromho (µmho)	microsiemens (µS)	1.000
micromho per centimeter at 25 degrees Celsius [(µmho/cm) at 25°C]	microsiemens per meter at 25 degrees Celsus [(µS/cm) at 25°C]	100

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ABSTRACT

Quality of water in 150 sites in the coal-producing areas of eastern Ohio was studied in a two-phase investigation between May 1975 and August 1976. Results of phase one, a reconnaissance to determine the occurrence of certain inorganic and organic constituents and to relate their occurrence to coal mining, indicated that acid mine drainage generally occurred where abandoned drift or abandoned strip mines were located. Streams affected by such mines contained concentrations of dissolved sulfate and iron greater than 250 milligrams per liter and 5,000 micrograms per liter, respectively, and exhibited pH values less than 4.5. Areas characterized by reclaimed or active strip mines showed few instances of acid drainage (pH values were generally greater than 7.0). Iron concentrations in these regions generally were less than 500 micrograms per liter, with dissolved-sulfate concentrations ranging from 22 to 7,100 milligrams per liter.

Phase two was a detailed study of four small basins sampled during the first phase and found to represent different types of mining. The objective was to determine whether water-quality degradation within the basins was due to coal mining. Flows from two basins, one containing abandoned drift mines and the other abandoned strip mines, became increasingly acidic (pH values less than 4.5) downstream, and had high iron and dissolved sulfate concentrations (above 5,000 micrograms per liter and 250 milligrams per liter, respectively). Sources of acidity were tributaries that drained directly from the mines. The other two basins, one containing reclaimed strip mines and the other active strip mines, exhibited no acidic drainage; streams in both basins had pH values greater than 7.0 and iron concentrations below 500 micrograms per liter. Presence of active surface mining seemed to have little effect on dissolved sulfate concentrations, as only streams in the reclaimed basin had high concentrations (usually over 2,000 milligrams per liter).

INTRODUCTION

The eastern third of Ohio contains extensive bituminous coal deposits which have been mined since the early 1800's. Mining has ranged from small, hand-dug workings to underground and surface operations encompassing several square miles and utilizing mammoth equipment.

In 1975, with support of the U.S. Environmental Protection Agency, a project was begun to provide information on several aspects of coal hydrology in Ohio. The first phase was a reconnaissance of water-quality conditions in coal-mining regions. Phase one had two primary objectives; to document the occurrence of certain inorganic and organic constituents in waters of the coal-mining regions and to determine if the concentrations of those constituents were related to coal mining. The second phase of the project was a more detailed study of four basins sampled during the first phase.

History of Mining and the Acid-Drainage Problem in Ohio

Coal has been mined in Ohio since 1804. The first mines were small hand operations in which exposed coal was removed by pick and shovel (Eavenson, 1942). Drift mines, tunneled into the essentially horizontal coal seams, were next developed. As demand for coal increased, seams too deep for drift mining were reached by vertical shafts. As drift and deep mines were located below the water table, water accumulated which had to be removed. Water could drain from drift mines, but pumping was necessary in deep mines. Most underground mines in Ohio were drift mines (Ohio Geological Survey, 1967 to 1975).

Strip mining in Ohio began on a small scale in 1913. As the supply of easily obtainable coal in the older deep coal fields dwindled and deep mining became less economical, surface mining attracted more interest. Equipment and techniques for extensive strip mining were developed, enabling mining companies to recover more coal quickly and efficiently. As of 1979, 68 percent of all coal produced in Ohio was strip mined (Ohio Division of Mines Annual Report, 1979).

The problem of acid drainage from coal mines received little official attention until the 1930's, when the Federal government formulated a program for sealing abandoned drift mines in the Ohio River basin (Federal Water Pollution Control Administration, 1968). In 1943, the U.S. Public Health Service reported an overall 28 percent acid load reduction in the basin (U.S. Public Health Service, 1943). Energy demands created by World War II caused abandonment of the sealing program, and reopening of many sealed mines. Since then, little has been done to alleviate drainage from drift mines in Ohio.

After World War II, surface mining became increasingly popular. Until 1948, no laws requiring reclamation existed, and drainage from surface mines added to acid mine-drainage problems (Ohio Board on Unreclaimed Strip Mined Land, 1974). The first surface mine law, passed in 1948, required mine operators to post reclamation bonds before permits were issued. Bonds were forfeited if the operators failed to reclaim mined land. The 1948 law proved inadequate, as some operators found bond forfeiture less expensive than reclamation. In 1972, a second law (Section 1513.16 of Revised Code, Ohio Strip Mine Law) was passed which established more stringent reclamation requirements, more expensive reclamation bonds, and penalties for failure to reclaim.

Numerous studies have been made of the effectiveness of various methods of strip-mine reclamation; this report will not attempt to describe or evaluate those methods. Nearly every method includes the following basic elements: (1) Immediate reclamation to reduce the time spoil is exposed; (2) burial of highly pyritic spoil to reduce sulfide oxidation; (3) stabilization of slopes through contouring and revegetation to reduce erosion; and (4) construction of drainage structures and channels, also to reduce erosion (Grim and Hill, 1974).

Environmental Setting

The area studied includes most of the coal-producing part of Ohio, the eastern third of the State. This area lies within the Appalachian physiographic province (fig. 1), which is a well dissected plateau (Peattie, 1923). Relief ranges between 200 to 300 feet in the upper Muskingum River valley and 300 to 600 feet in the lower Muskingum and Hocking River basins and lesser Ohio River tributaries. Slopes in the upper Muskingum River basin are generally 10° to 20°, those in the lower Muskingum River, Hocking River, and tributary basins range from 10° to 35°. The northern counties and western fringe of the study area have been glaciated (fig. 2).

The climate in eastern Ohio is characterized by moderate extremes of humidity and temperature. Mean daily temperatures to the north range between -6.7°C in January and 26.7°C in July, temperatures to the south between -2.2°C and 32.2°C (Pierce, 1959). Annual precipitation averages 40 inches and is generally greatest in early spring and least in autumn. The entire coal-producing region drains toward the Ohio River, contributing average annual runoff of 14 inches (Ohio Department Natural Resources, 1962).

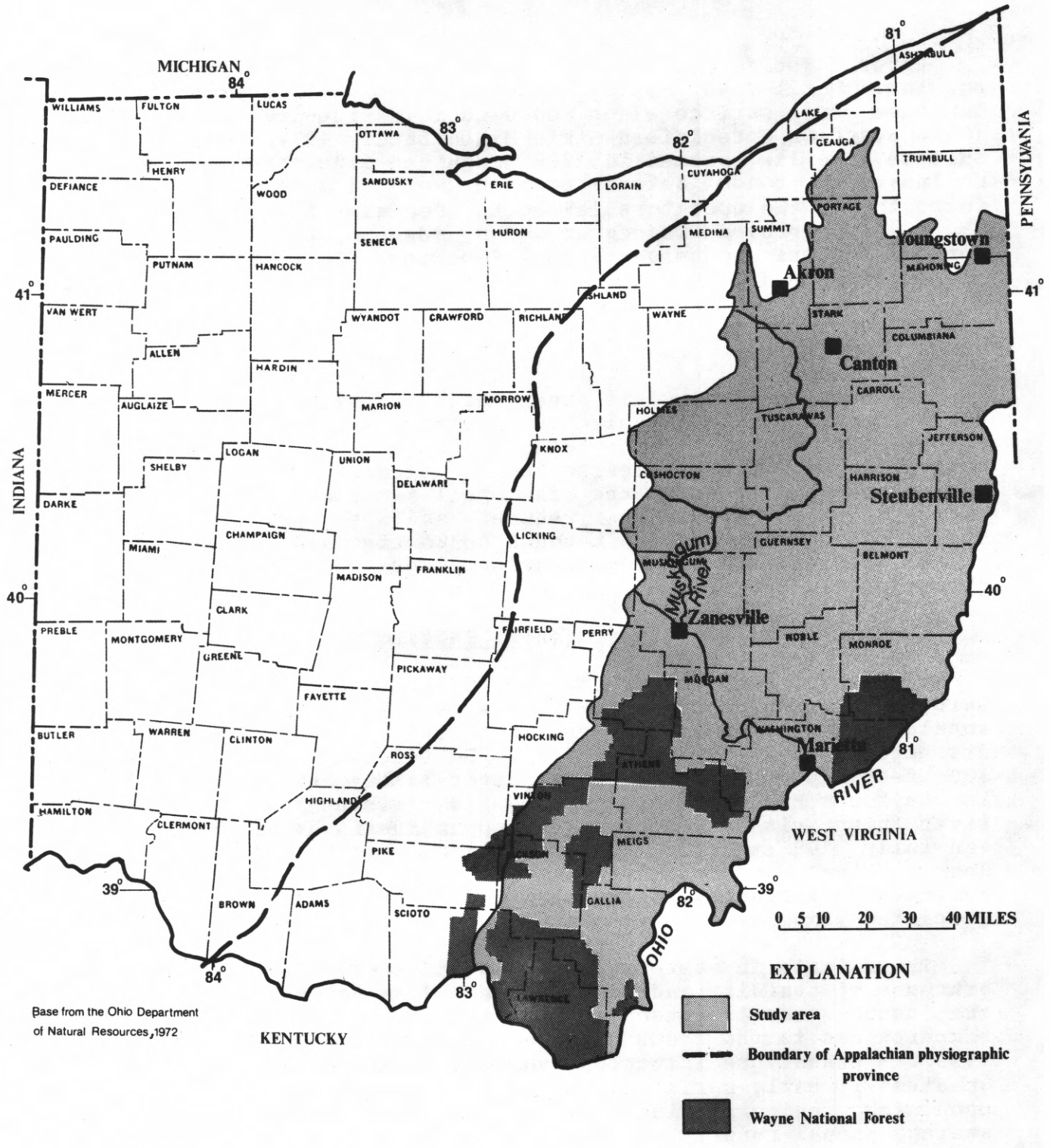

Figure 1.--Boundary of study area, approximate boundary of Appalachian physiographic province, location of the Wayne National Forest, and location of principal rivers and cities in the study area.

The population of eastern Ohio is concentrated in the large industrial cities of the north (Youngstown, Canton, and Akron) and along the Ohio and Muskingum Rivers (Steubenville, Zanesville, and Marietta) (fig. 1). The remainder of the area is rural and sparsely populated; farming and coal mining constitute the principal types of land use. The Wayne National Forest, in the southeastern counties, occupies about one-fourth of the State's coal-producing area (fig. 1).

Geology

The Ohio coals are found in strata of Pennsylvanian and Permian age. These strata represent a fluvial-deltaic (river-and-delta) depositional environment and are characterized by alternating sandstone, shale, mudstone, coal, and marine, brackish, and freshwater limestone. The Pennsylvanian, Pottsville, Allegheny, Conemaugh, and Monongahela Formations and the Pennsylvanian / Permian Dunkard Group crop out in Ohio (figs. 2 and 3).

The Cincinnati arch (fig. 2) causes the Pennsylvanian and Permian formations to crop out in northeast-southwest-trending bands (fig. 2) and to dip 25 to 40 feet per mile southeast (Bownocker and Dean, 1930).

Fifty-two coal beds are recognized and named in the State (Bownocker, 1929; Bownocker and Dean, 1930); most are thin, discontinuous, or of poor quality. Mining has traditionally concentrated on the "numbered" coals (Sharon No. 1 through Waynesburg No. 11, fig. 4), which still supply most coal mined in Ohio. The coals of the Allegheny and Monongahela Formations are especially productive because of their fairly uniform thickness and distribution; consequently, most coal mines in Ohio are distributed in parallel bands following the outcrop of the two formations.

Chemistry of Acid Mine Drainage

Acid mine drainage is produced by oxidation of the iron sulfide minerals pyrite and marcasite (hereafter referred to as "pyrites"). These minerals are disseminated in varying amounts throughout the coal-bearing formations, especially in sandstones associated with and overlying the coals (Wiram, 1974). Coal mining exposes rocks containing pyrites to air and water and, especially in strip mining, increases the surface area available for reaction.

The oxidation of pyrite involves several reactions (Stumm and Morgan, 1970) :

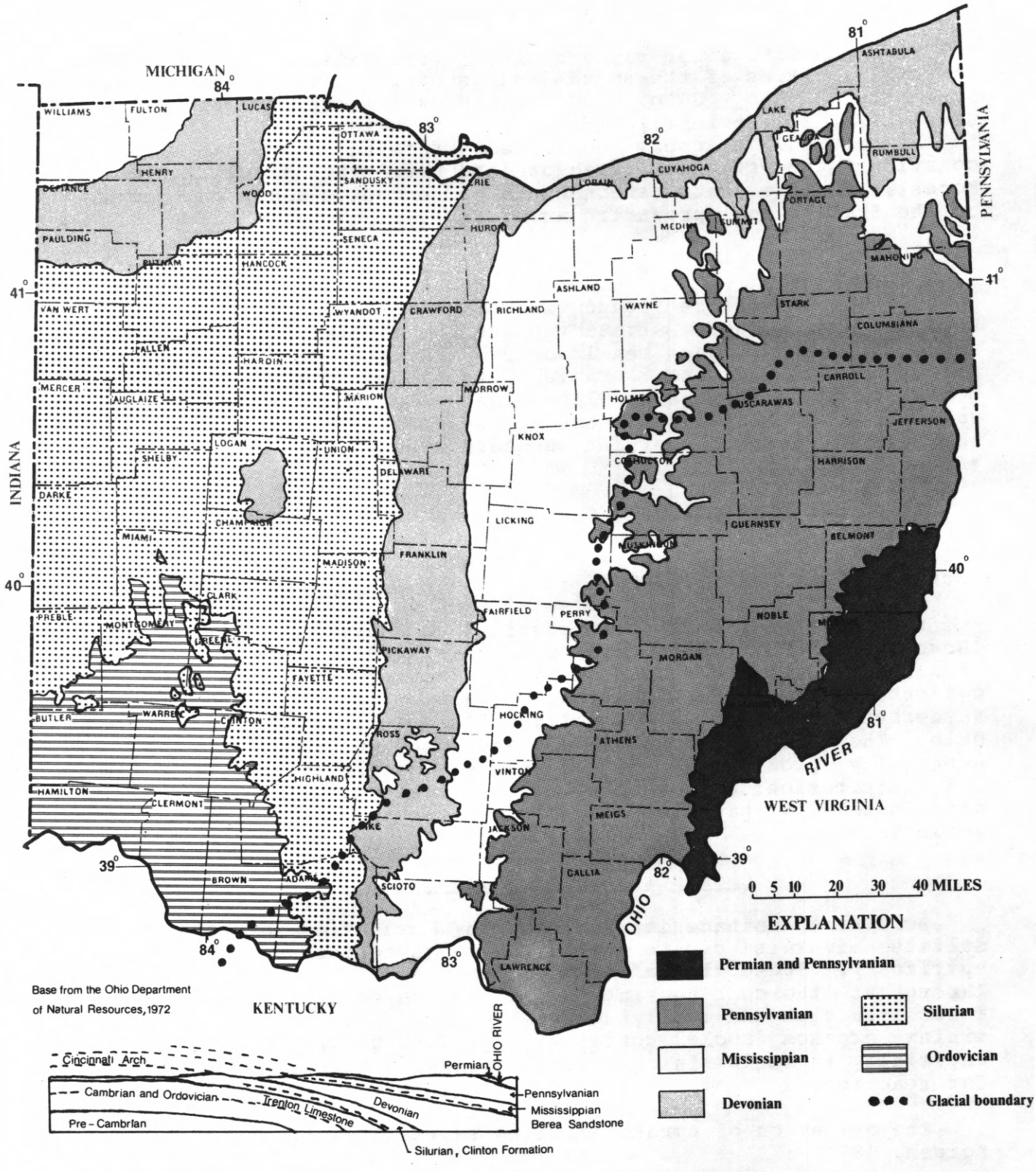

Figure 2.--Geologic map of Ohio, showing location of formation outcrops and glacial boundary; geologic section, showing the Cincinnati arch, (modified from Ohio Department of Natural Resources, Division of Geological Survey).

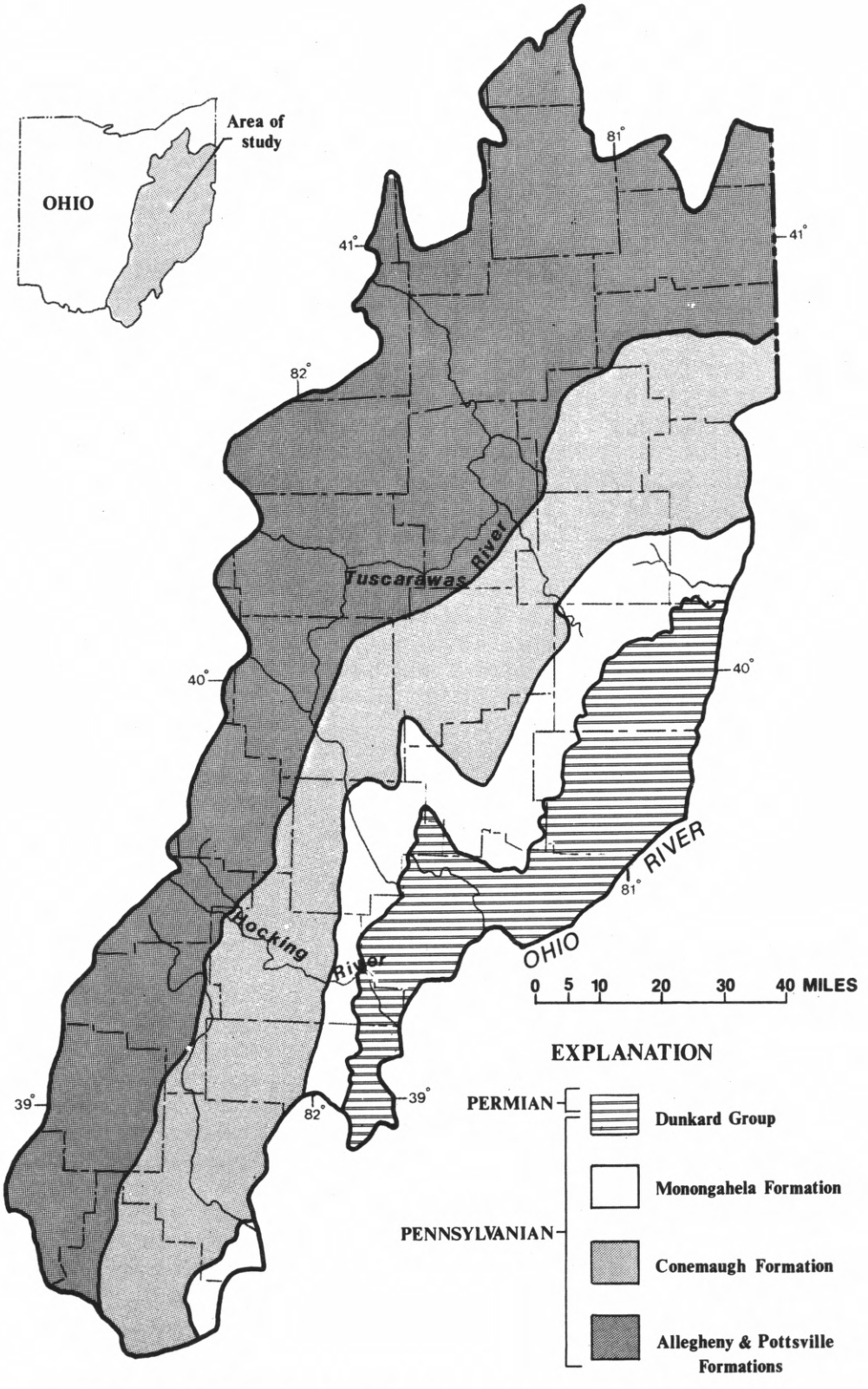

Figure 3.--Geologic map showing approximate boundaries of the Pottsville, Allegheny, Conemaugh, and Monongahela Formations and the Dunkard Group (from Bownocker, 1965).

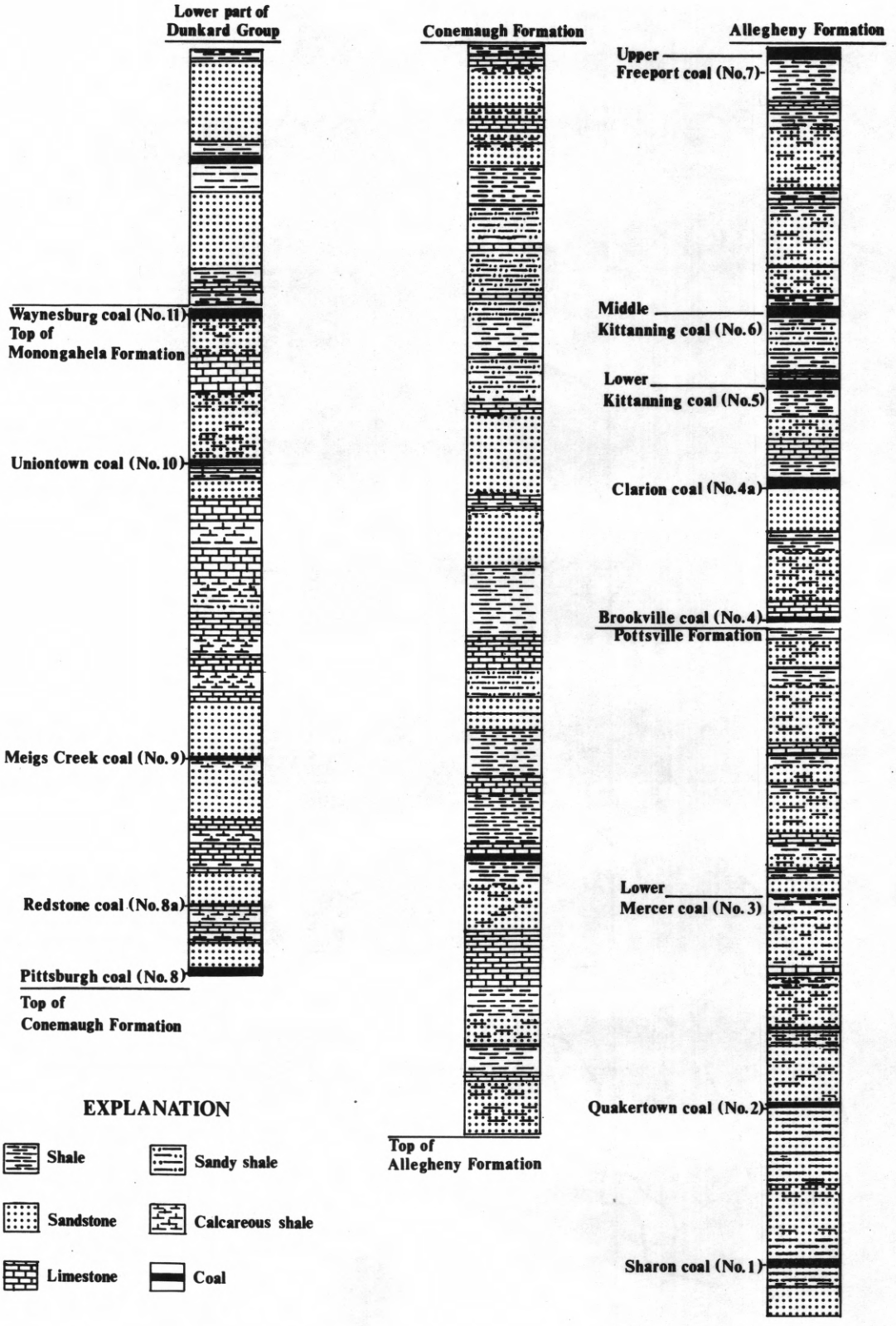

Figure 4.--Generalized stratigraphic sections of the Pennsylvanian and Permian Formations in Ohio (from description by Stout, 1930).

(1) $FeS_2(s) + 7/2O_2 + H_2O \rightleftharpoons Fe^{+2} + 2SO_4^{-2} + 2H^+$

(2) $Fe^{+2} + 1/4O_2 + H^+ \rightleftharpoons Fe^{+3} + 1/2H_2O$

(3) $Fe^{+3} + 3H_2O \rightleftharpoons Fe(OH)_3\ (s) + 3H^+$

(4) $FeS_2(s) + 14Fe^{+3} + 8H_2O \rightleftharpoons 15Fe^{+2} + 2SO_4^{-2} + 16H^+$

In reaction 1, the sulfide in pyrite is oxidized to sulfate, releasing ferrous iron and acidity (as H^+) into the water. In reaction 2, ferrous iron is oxidized to ferric iron. Reaction 3 is the hydrolysis of ferric iron to ferric hydroxide, an insoluble substance commonly referred to as "yellow-boy." Reaction 3 also produces more acidity. Reaction 4 is another means by which sulfide can be oxidized, with subsequent production of sulfate, acidity, and ferrous iron.

As soon as Fe^{+3} has been produced by reactions 1 to 3, pyrite can continue to be oxidized (reaction 4) without the direct involvement of oxygen. However, oxygen is necessary for the oxidation of Fe^{+2} to Fe^{+3}, so that exclusion of oxygen from a mine inhibits the production of acid mine drainage.

In mining situations from which oxygen is not excluded the rate of acid drainage production is limited by the rate of Fe^{+2} oxidation. This rate is related directly to pH; the higher the pH, the greater the rate of oxidation (Wiram, 1974). Below pH 4.5, the rate of oxidation would be extremely slow without microbial catalysis by the iron bacteria Thiobacillus and Ferrobacillus ferrooxidans, which thrive in low-pH water (Stumm and Morgan, 1970).

Other factors are also important in determining acid-drainage production. Rock texture (size, shape, and arrangement of constituent particles), porosity, and permeability determine the amount of oxidizing agents able to reach pyrites, particularly in drift mines and strip-mine highwalls. The mineralogy of the exposed rock is important; a high calcareous content can provide enough carbonate to neutralize any acidity produced, while a small calcareous content (3 percent or less) may actually increase acidity production by temporarily increasing pH (Wiram, 1974). The most important additional factor is the mineralogy of the pyrite itself. Caruccio (1968) has demonstrated that "framboidal," or fine-grained (<0.25 microns) "raspberry-textured" pyrite is more reactive than coarse-grained (>50 microns) euhedral pyrite or marcasite. Rocks containing as little as 0.5 percent framboidal pyrite have been found to produce acidity (Wiram, 1974).

RECONNAISSANCE PHASE, MAY-DECEMBER, 1975

Purpose and Scope

The purpose of the reconnaissance phase was to document the occurrence of certain inorganic and organic constituents in waters in the coal-producing region of Ohio, and to determine if the concentrations of those constituents were related to coal mining.

The number of sampling sites for the reconnaissance was limited to 150, each of which was to be sampled twice. Sites were chosen to represent both unmined and mined basins, including active and abandoned strip mines, and abandoned drift and underground mines. To limit the number of mining-activity types influencing water quality within one basin, most basins chosen were less than 100 square miles in area. Locations of the 150 sampling sites are shown in figure 5.

Samples were analysed for the following parameters: Specific conductance, dissolved oxygen, pH, acidity (as H^+) or alkalinity (as HCO_3^-), sulfide, dissolved sulfate, chloride, phenols, organic carbon (total), aluminum (total), arsenic (total), chromium (total), copper (total), iron (total), manganese (total), mercury (total), and zinc (total).

Method of Sampling

On-site measurements of water temperature, specific conductance, dissolved oxygen, and pH were made at each sampling site, by techniques described in Brown, Skougstad, and Fishman (1970). The Ohio district lab analyzed samples for sulfide, dissolved sulfate, and chloride, and the Regional lab in Albany, New York, analyzed samples for phenols, total organic carbon, total arsenic, chromium, copper, iron, manganese, mercury, and zinc. Discharge estimates, based on 5 to 10 velocity-and-depth measurements, were made at each sampling site.

Samples were collected during late spring and autumn. Those time periods generally represent low-flow regimes; however, sampling was not suspended when precipitation occurred. Samples collected during runoff from recent rainfall are indicated in appendix 1 by an asterisk (*).

Sampling Results

Results of sample analyses are given in appendix 1. Water quality varies considerably in the study area. Some constituents showed distinct relationships to coal mining; others seemed to be related to such factors as type of bedrock, or oil-well brine pits. Several showed such random occurrences that possible sources could not be determined.

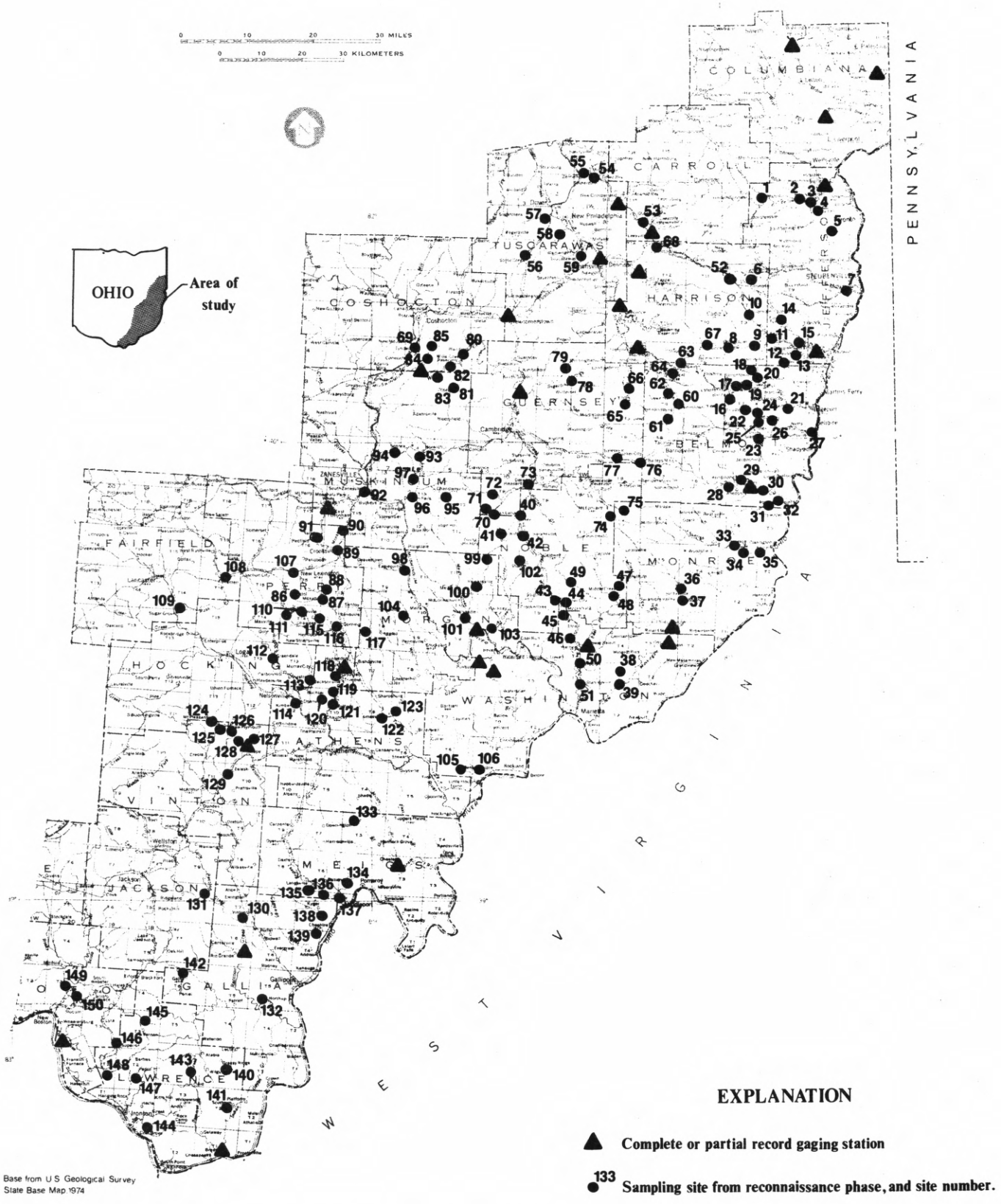

Figure 5.--Location of stream sampling sites from the reconnaissance phase, May-December, 1975.

pH and Acidity

pH ranged from 1.9 at site 3 to 8.9 at site 138 (appendix 1). Acidity was found where pH was less than than 4.5 and ranged in concentration from 292 milligrams per liter (mg/L) at site 3 to 0.2 mg/L at site 114. The low pH and accompanying acidity occurred in basins where abandoned coal mines were predominant. Site 3 data describes drainage issuing directly from an abandoned drift mine.

Bicarbonate

Bicarbonate (HCO_3^-) concentrations throughout the study area ranged from 1 mg/L at site 92 to 525 mg/L at site 8 (appendix 1). Bicarbonate was present at all unmined areas. Concentrations averaged 144 mg/L in the unmined basins underlain by the highly calcareous Monongahela Formation and 100 mg/L in unmined basins underlain by the Allegheny Formation (figs. 3 and 4). The difference between the bicarbonate concentrations of water from the two formations was more pronounced in areas where reclaimed strip mines were predominant; bicarbonate concentrations averaged 100 mg/L in the Allegheny basins and 215 mg/L in the Monongahela basins. Streams receiving acid-mine drainage exhibited the greatest variation in bicarbonate concentrations (ranging from 0 to 394 mg/L) due to varying amounts of acid drainage received. Bicarbonate correlated inversely with pH, resulting in a -0.90 Spearman correlation coefficient (explained in Sokal and Rohlf, 1969).

Dissolved Sulfate

Dissolved-sulfate concentrations ranged from 22 mg/L at site 78 and site 117 to 7,100 mg/L at site 3 (appendix 1). High dissolved sulfate served as the most reliable indication of coal mining in a basin; concentrations averaged 75 mg/L in samples from unmined basins and 629 mg/L in samples from mined basins. In general, any dissolved sulfate concentrations greater than the Ohio Environmental Protection Agency (Ohio EPA) public water supply limit of 250 mg/L (Ohio EPA, 1978) were found in mined areas. Sulfate strongly correlated with specific conductance (Spearman coefficient=0.96), and varied linearly with iron (Pearson coefficient=0.69) and aluminum concentrations (Pearson coefficient=0.75) (Sokal and Rohlf, 1969).

Phenol

Phenol concentrations ranged from 0 (undetected) at 73 sites to 32 micrograms per liter (µg/L) at site 46 (appendix 1). Most concentrations were less than 10 µg/L; however the Ohio EPA (1978) limit for phenol concentration is 1 µg/L. Phenol was found throughout the study area but its occurrence seems unrelated to mining, geology, other chemical parameters, or flow regime; it was seldom detected twice at any site.

Total Organic Carbon

Total organic carbon concentrations ranged from undetected to 35 mg/L at site 3 (appendix 1); most concentrations were less than 10 mg/L. Organic carbon occurred with no apparent pattern throughout the study area. However, all samples having concentrations greater than 10 mg/L were collected in mined basins.

Arsenic

Arsenic was undetected at 59 sites, was found in concentrations less than 10 µg/L at 79 sites, and exceeded the Ohio EPA (1978) limit of 50 µg/L at only three sites (sites 3, 120, and 138) (appendix 1). Site 138 represents a basin containing abandoned strip mines. Site 3 is drainage from an abandoned drift mine, and site 120 is an artesian well supplied by a flooded deep mine. Arsenic concentrations at site 3 (2,100 and 1,600 µg/L) were more than twenty times higher than the next-highest concentrations, at site 138 (95 and 75 µg/L).

Chloride

Chloride was found at all sites, in concentrations ranging from 2 mg/L at site 128 to 340 mg/L at site 29 (appendix 1). Concentrations were less than 50 mg/L at most sites and exceeded the Ohio EPA (1978) limit of 250 mg/L at only four sites. Chloride concentrations showed no relation to mining; higher concentrations might be attributed to oil wells and accompanying brine pits, which are found throughout eastern Ohio.

Chromium

Chromium was undetected at 12 sites (appendix 1); at the remaining sites, concentrations generally were less than the Ohio EPA (1978) limit of 50 µg/L. Most sites showed higher concentrations during late spring sampling than during autumn. Site 24, site 86, site 88, site 118, and site 120 had the highest concentrations (respectively 230, 140, 290, 440, and 600 µg/L) occurring in late spring. No consistent explanation for such concentrations was discovered. Concentrations were uniformly high at three sites--drainage from two abandoned drift mines (sites 3 and 19) and one abandoned tailings pile (site 26).

Copper

Copper concentrations ranged from undetected at 14 sites to 1,200 µg/L at site 3 (appendix 1). Only two sites (3 and 114) exhibited concentrations greater than the Ohio EPA (1978) limit of 1,000 µg/L; most concentrations were less than 50 µg/L. Most concentrations had decreased at the autumn sampling, including those at site 3 and site 114.

Iron

Iron occurred at all sites, in concentrations ranging from 40 µg/L at sites 33 and 35 to 4,400,000 µg/L at site 3 (appendix 1). Iron concentrations were inversely correlated with pH (Spearman coefficient=-0.70) and directly correlated with sulfate, aluminum, and conductivity. Concentrations in unmined basins were variable, commonly exceeding the Ohio EPA (1978) limit of 300 µg/L but seldom exceeding 1,000 µg/L. Concentrations in mined basins were more variable, had greater range, and generally exceeded 1,000 µg/L. The highest concentrations were found in streams having pH values less than 4.5. This relation was anticipated since reactions maintaining low pH produce ferrous and ferric iron (p. 9), and since iron is very soluble at low pH (Hem, 1970, p. 120).

Manganese

Manganese concentrations ranged from 10 µg/L at several sites to 160,000 µg/L at site 128 (appendix 1), and commonly exceeded the Ohio EPA (1978) limit of 50 µg/L. Concentrations followed those of iron with respect to pH. Manganese, like iron, occurs as the dissolved cation in waters of low pH (Hem, 1970, p. 128).

Mercury

All but five sites (sites 2, 3, 55, 69, and 83) exhibited mercury concentrations less than the Ohio EPA limit of 2 µg/L (appendix 1). The highest concentration, 20 µg/L, was found at site 3. These large concentrations were found only during the spring sampling; no source was determined.

Zinc

Zinc was found at all sites in concentrations ranging from 10 µg/L at several sites to 11,000 µg/L at site 3 (appendix 1). Zinc concentrations exhibited a strong relationship to pH; concentrations were generally less than 50 µg/L, when pH was greater than 7.0, and were greater than 200 µg/L, when pH was less than 4.5. This is consistent with the solubility of zinc (Stumm and Morgan, 1970, p. 173, p. 202). Zinc concentration exceeded the Ohio EPA (1978) limit of 5,000 µg/L only at site 3.

Sulfide

According to Stumm and Morgan (1970, p. 310), sulfide cannot exist in the presence of dissolved oxygen; however, sulfide concentrations ranging from 0.1 to 2.0 mg/L were determined in many samples that also contained dissolved oxygen. All but five of these were of low enough concentration (0.5 mg/L or less) to be attributed to interference from reducing substances such as Fe^{+2} (Dennis A. Wentz, written communication, 1978). Of the remaining five, three (at sites 33, 119, and 149, table 1) could

not be reasonably explained. The sulfide found at site 114 may result from the slow oxidation of S^- at low pH, while that at site 128, a drift mine, might result from nonequilibrium at the mine mouth. The highest sulfide concentrations (17 and 26 mg/L) found during this study were found at site 3, which contained no dissolved oxygen.

Aluminum

Aluminum concentrations ranged from undetected at sites 28 and 150 to 490,000 µg/L at site 3 (appendix 1). No limit for aluminum in public water supplies has been established. Aluminum concentrations rose with falling pH (Spearman correlation coefficient=-0.71), and correlated to other pH-dependent parameters (sulfate, iron, and bicarbonate). Linear correlation with specific conductance was tentative (Pearson coefficient =0.64).

Statistical Analysis of Selected Water-Quality Parameters

Statistical analyses were made using data for several water-quality parameters to determine what relationships might exist between water quality, mining categories, and geologic formations. Interrelations between parameters were mentioned in the previous section. Water-quality parameters tested were specific conductance, pH, iron, aluminum, bicarbonate alkalinity, and dissolved sulfate; mining categories included unmined areas, reclaimed strip mines and abandoned strip and drift mines; geologic categories were the Allegheny and Monongahela Formations. To determine whether mining and geologic influences could be discerned, factorial analysis of variance (ANOVA) tests were performed. Sample sizes were unequal, and a 0.05 significance level was chosen. Linear regression analysis also was used to show the relationship between specific conductance and dissolved sulfate. Additional information concerning these types of analyses may be found in Li(1964).

Table 1 shows the results obtained from the ANOVA test. For each water-quality parameter, the influences of mining operation and geologic formation were evaluated. A significance level of 0.05 or less indicates a significant difference exists in water quality between categories, due to the appropriate influence. For example, table 1 shows that dissolved sulfate concentrations differ between mining categories at the 0.05 level. Therefore, at least certain mining influenced dissolved sulfate. The two underlying rock types had sulfate concentrations that did not significantly differ; there was no effect, therefore, due to geologic formation. From table 1, it can be seen that mining was a factor in the concentrations of pH, specific conductance, sulfate, aluminum, and bicarbonate alkalinity. Alkalinity and pH were shown to be influenced by rock type.

Table 1.--Results of analysis of variance test on water quality parameters from the reconnaissance phase.

Chemical analysis	Factor	Degree of freedom	F ratio	Significance level	Significant at 0.05 level (*)
pH	Mining	237	71.26	0.0001	*
	Geology	237	15.23	.0001	*
Specific conductance	Mining	237	9.79	.0001	*
	Geology	237	.70	.4044	--
Sulfate	Mining	237	9.92	.0001	*
	Geology	237	.54	.4632	--
Iron	Mining	237	.97	.3812	--
	Geology	237	.54	.4635	--
Aluminum	Mining	237	3.58	.0294	*
	Geology	237	.25	.6202	--
Alkalinity	Mining	236	35.79	.0001	*
	Geology	236	57.12	.0001	*

Where the ANOVA tests indicated that differences existed, a Duncan's multiple range test (Sokal and Rohlf, 1969) was performed to show which mining or geologic categories did differ. In table 2, the results are given.

Referring to table 2, water from abandoned mines has significantly lower pH values, lower alkalinity, and higher aluminum concentrations than that from reclaimed or unmined sites. Reclamation restores the pH and aluminum concentrations to levels not distinguishable from unmined conditions. Alkalinities in reclaimed regions become greater than those in unmined basins. Perhaps this is due to a greater infiltration capacity and surface area exposure of underlying rocks and soil after reclamation.

Reclamation does not decrease the specific conductance and dissolved sulfate concentrations, as compared to abandoned mining sites. Both abandoned and reclaimed basins produce significantly higher conductivities and dissolved sulfate than unmined areas.

Total iron concentrations did not show clear differences between mining categories. Although 88 percent of all large (greater than 10,000 ug/L) iron concentrations occurred in abandoned mine basins, enough lower concentrations also occurred in these basins to preclude significant differences between mining categories based on total iron.

The more calcareous Monongahela Formation produced waters of higher pH and alkalinity than the Allegheny Formation. This is consistent with the differences in mineralogy.

Results of the regression analysis are shown in table 3 and figures 6 to 12. Analyses 1 to 3 (table 3) and figure 6 show the relationship between dissolved sulfate and specific conductance for the Allegheny Formation, Monongahela Formation, and for both formations. The standard errors of estimate are 40 percent, 38 percent and 40 percent, respectively. Analyses 4 to 9 and figures 7 to 12 show the relationship between specific conductance and dissolved sulfate for the combinations of mining category and geologic formation. The standard errors of estimates vary from 23 percent for reclaimed areas in the Monongahela and abandoned areas in the Allegheny to 53 percent for unmined areas in the Allegheny. The results indicate that variations in dissolved sulfate concentrations can be predicted by variations in specific conductance. However, the prediction of dissolved sulfate by specific conductance is more reliable after mining, because the resulting larger sulfate concentrations become a larger percentage of the total ions causing conductance. This is indicated by the lower standard errors of estimate for the mined basins.

Table 2.--Duncan's multiple range test on water-quality parameters from the reconnaissance phase.

(Categories connected by lines are not significantly different)

Parameter	Category	n	Mean
pH	Reclaimed	62	7.43
	Unmined	53	7.36
	Abandoned	128	4.85
Specific conductance	Abandoned	128	1,512.2
	Reclaimed	62	1,405.5
	Unmined	53	426.2
Sulfate	Abandoned	128	653.7
	Reclaimed	62	578.6
	Unmined	53	75.2
Aluminum	Abandoned	128	15,738.6
	Reclaimed	62	991.9
	Unmined	53	542.3
Alkalinity	Reclaimed	62	189.4
	Unmined	53	131.4
	Abandoned	127	41.5
pH	Monongahela Formation	120	7.0
	Allegheny Formation	123	5.1
Alkalinity	Mongahela Formation	119	160.7
	Allegheny Formation	123	39.5

Table 3.--Regression results of specific conductance versus sulfate

Analysis number	Formation	Mining category	r	Equation $Y=a(x)^b$	Standard error of estimate	Mean Y	Standard deviation Y	Standard error in percent
1	Allegheny and Monongahela Formations, undivided	All	0.95	$SO_4=0.0107(\text{Sp Cond})^{1.48}$	0.17	2.41	0.54	40
2	Monongahela	All	0.95	$SO_4=0.0032(\text{Sp Cond})^{1.65}$	0.16	2.38	0.53	38
3	Allegheny	All	0.95	$SO_4=0.0234(\text{Sp Cond})^{1.38}$	0.17	2.43	0.55	40
4	Monongahela	Abandoned	0.93	$SO_4=0.0263(\text{Sp Cond})^{1.37}$	0.15	2.56	0.40	35
5	Monongahela	Reclaimed	0.96	$SO_4=0.0056(\text{Sp Cond})^{1.58}$	0.10	2.70	0.37	23
6	Monongahela	Unmined	0.76	$SO_4=0.0015(\text{Sp Cond})^{1.75}$	0.20	1.81	0.30	48
7	Allegheny	Abandoned	0.96	$SO_4=0.0813(\text{Sp Cond})^{1.21}$	0.10	2.59	0.47	23
8	Allegheny	Reclaimed	0.98	$SO_4=0.0016(\text{Sp Cond})^{1.77}$	0.11	2.23	0.52	26
9	Allegheny	Unmined	0.52	$SO_4=0.3236(\text{Sp Cond})^{0.84}$	0.22	1.62	0.25	53

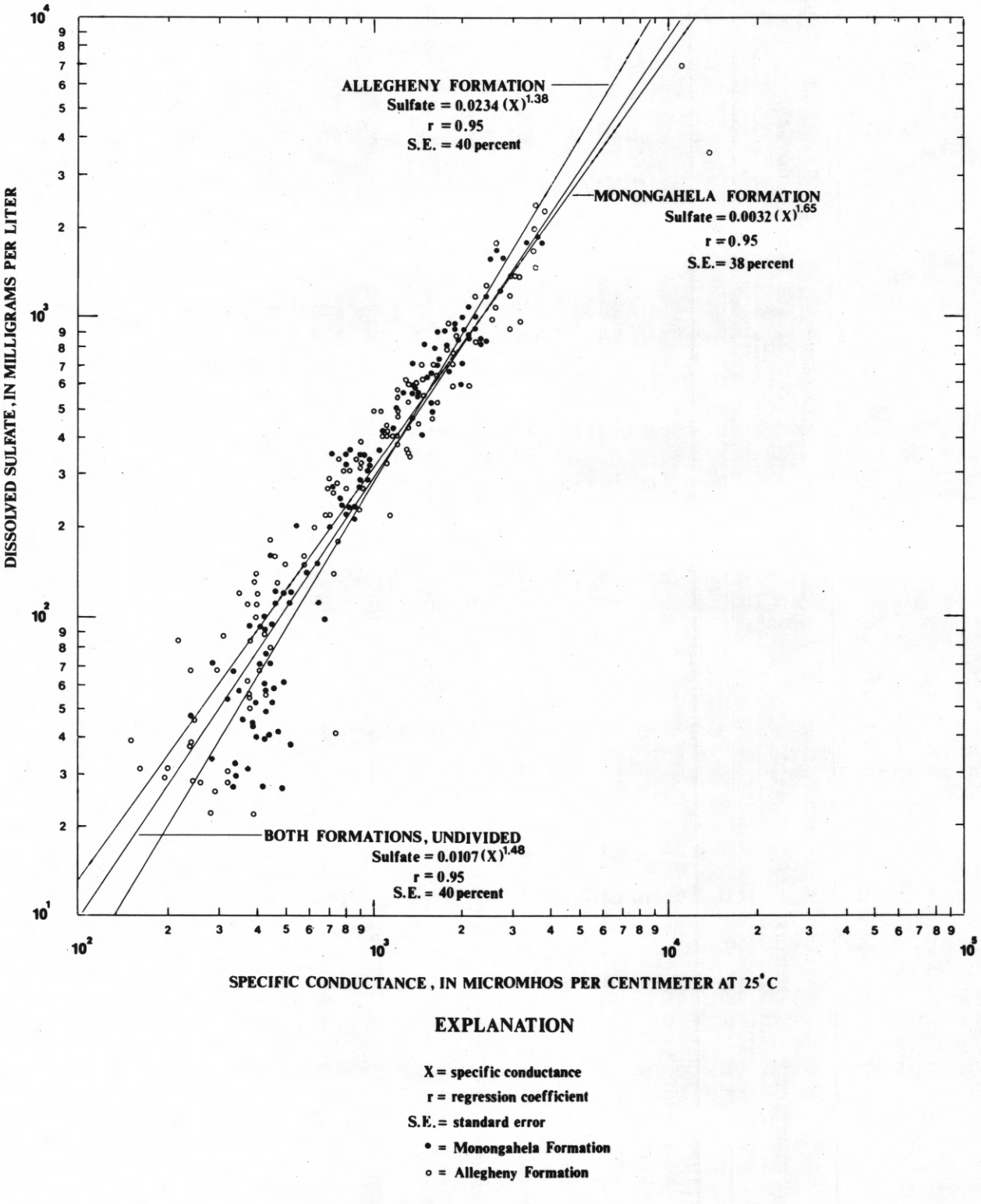

Figure 6.--Relationship between specific conductance and dissolved-sulfate concentration for the Allegheny Formation, Monongahela Formation, and for both formations undivided.

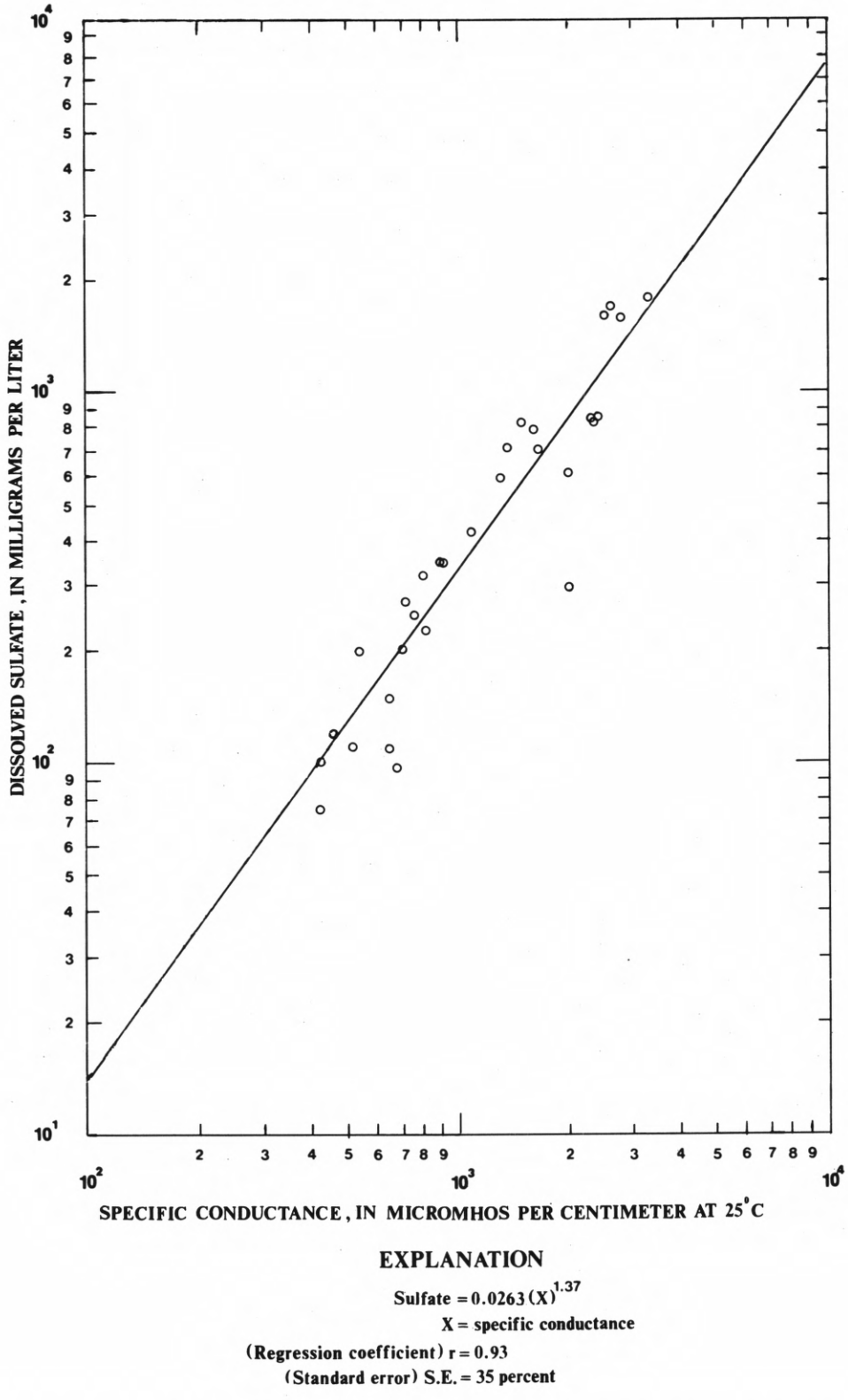

Figure 7.--Relationship between specific conductance and dissolved-sulfate concentration for the abandoned mined areas in the Monongahela Formation.

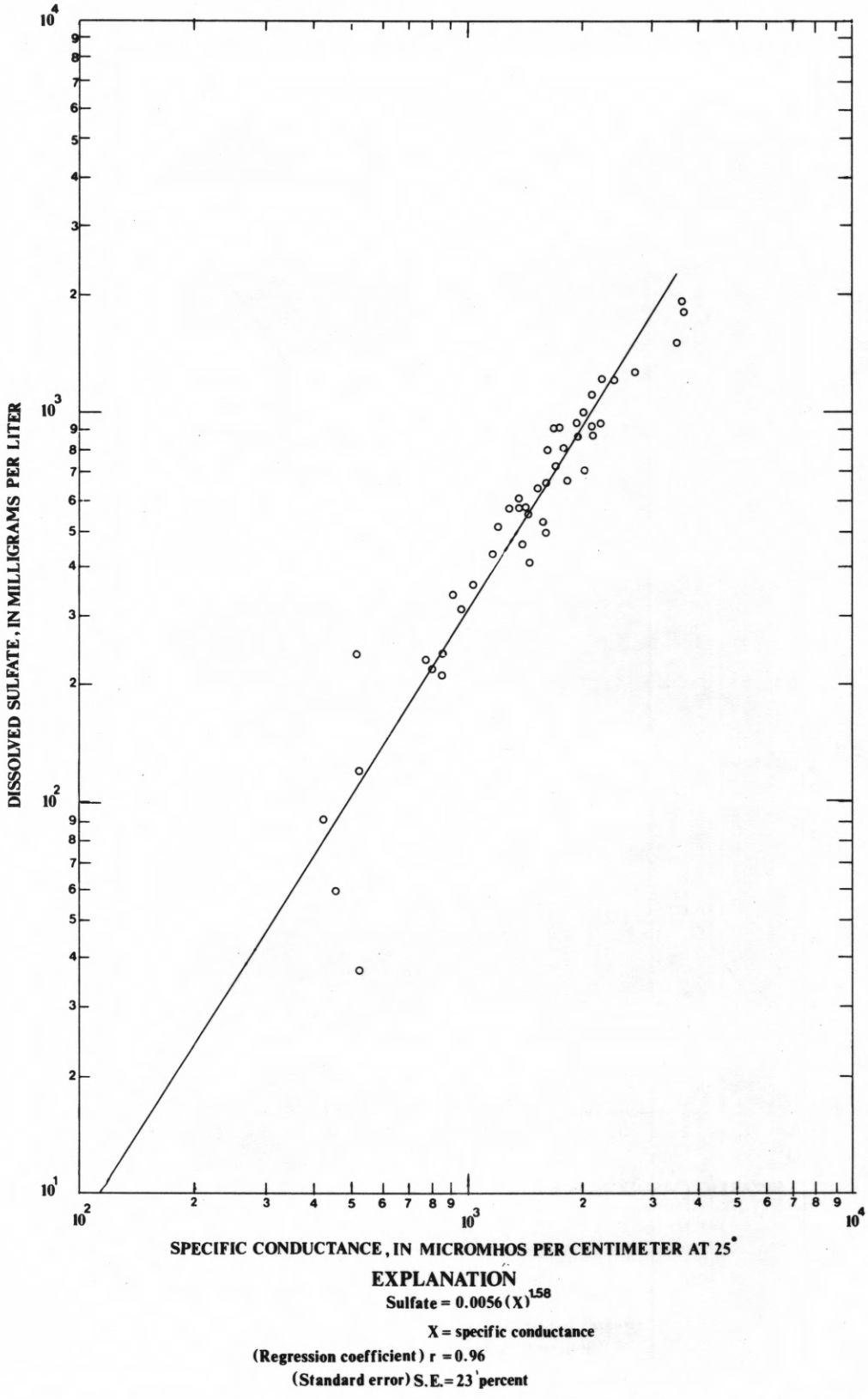

Figure 8.--Relationship between specific conductance and dissolved-sulfate concentration for reclaimed strip-mined areas in the Monongahela Formation.

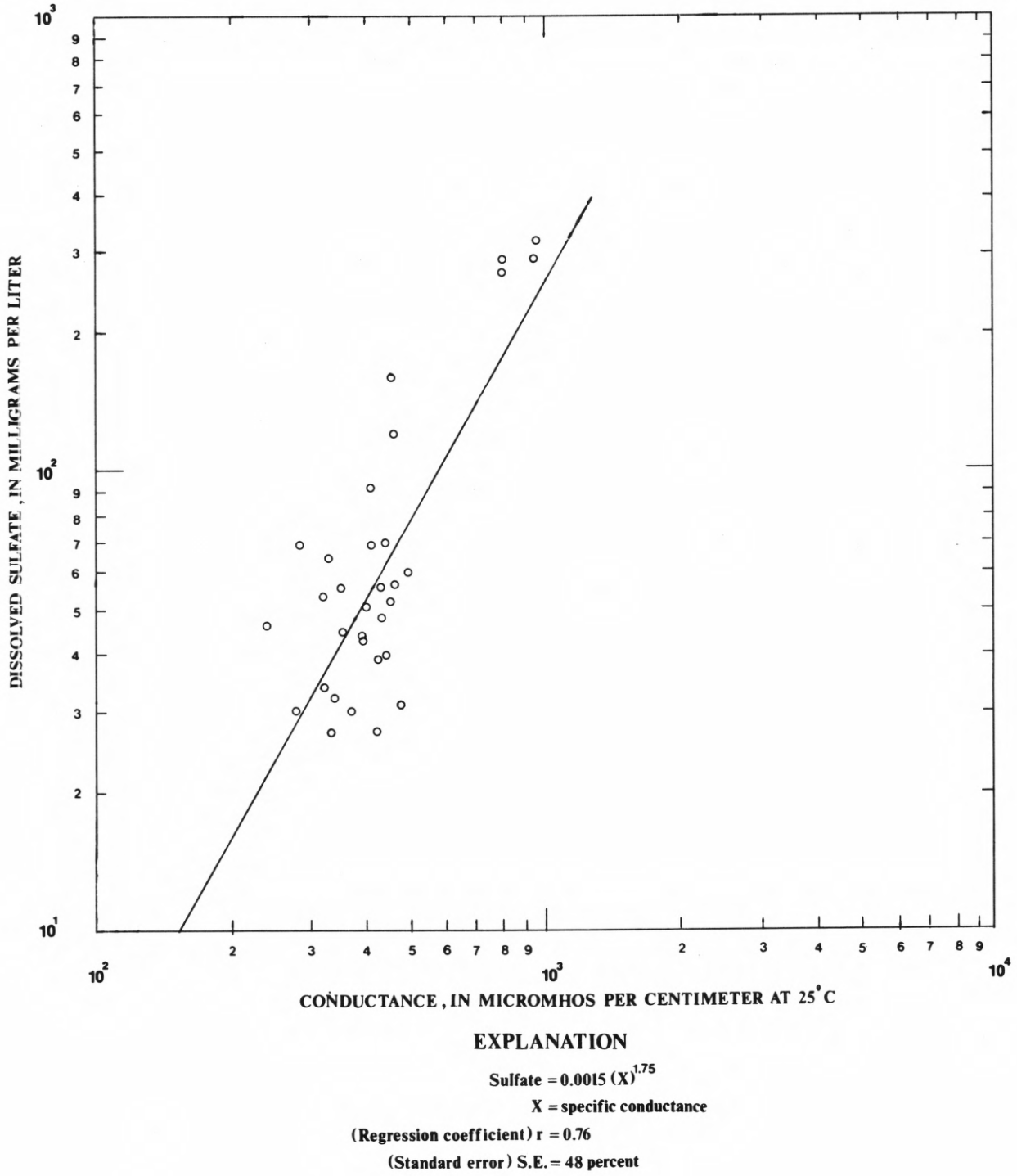

Figure 9.--Relationship between specific conductance and dissolved-sulfate concentration for unmined areas in the Monongahela Formation.

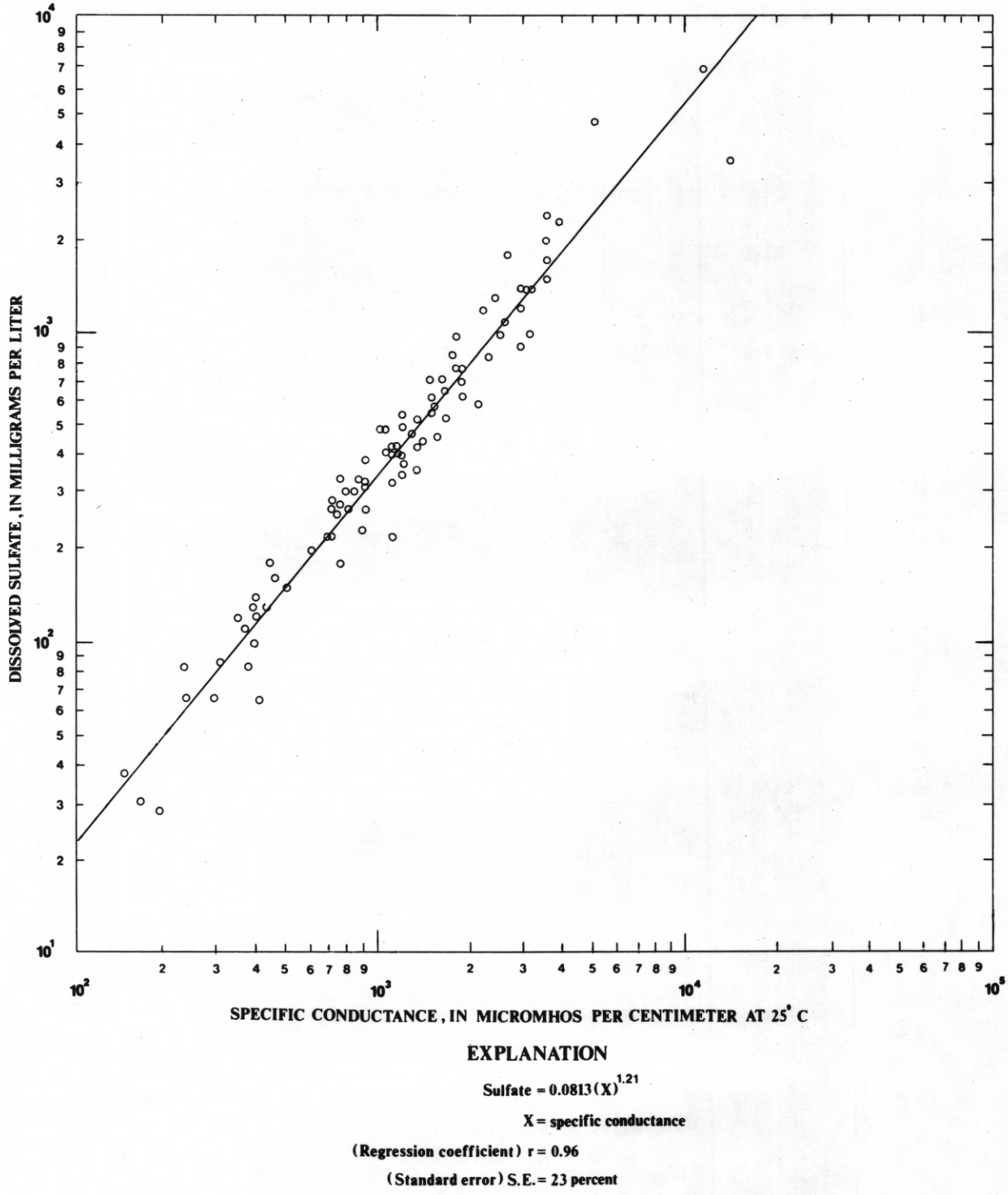

Figure 10.--Relationship between specific conductance and dissolved-sulfate concentration for abandoned mined areas in the Allegheny Formation.

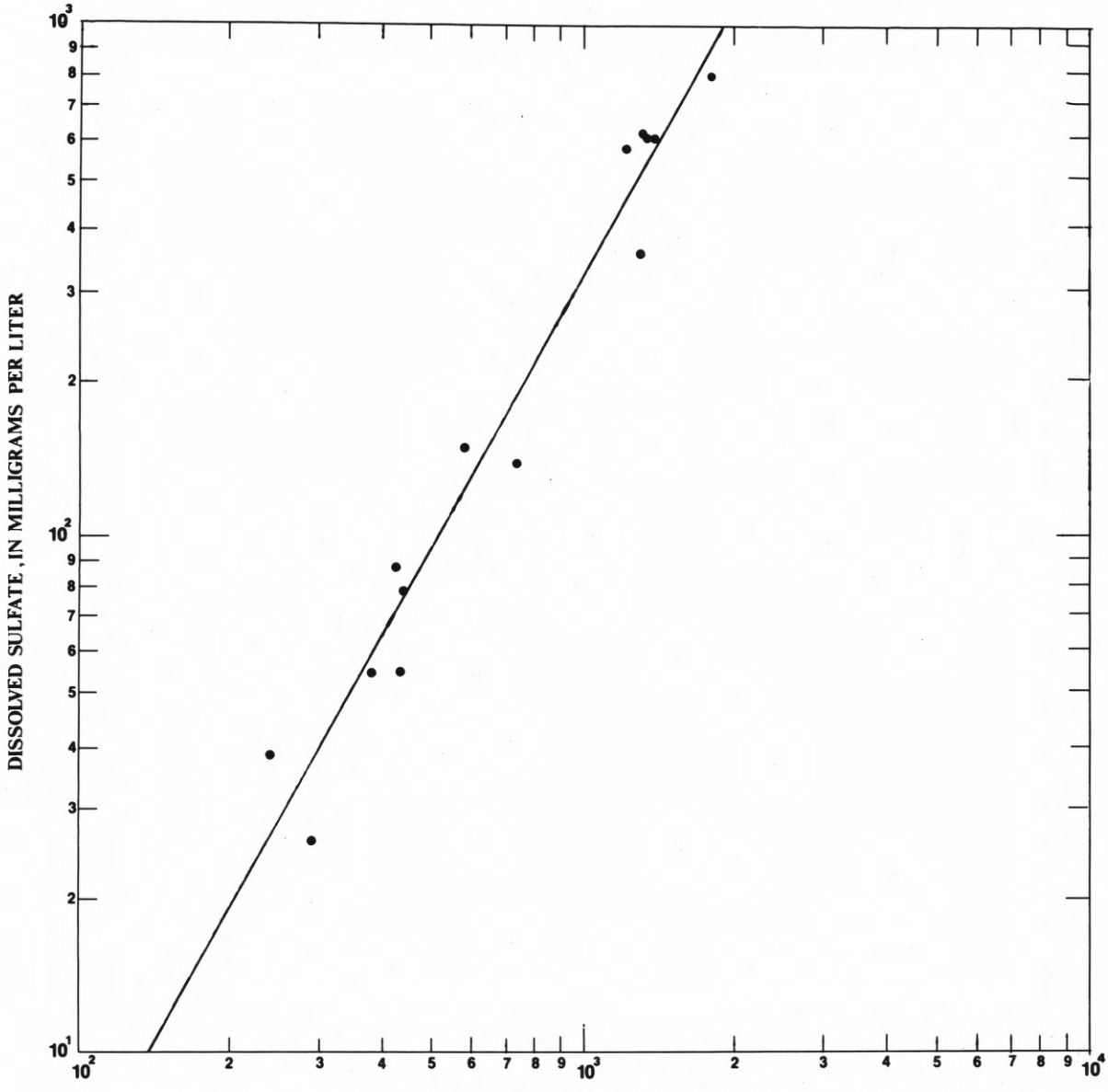

Figure 11.--Relationship between specific conductance and dissolved-sulfate concentration for reclaimed strip-mined areas in the Allegheny Formation.

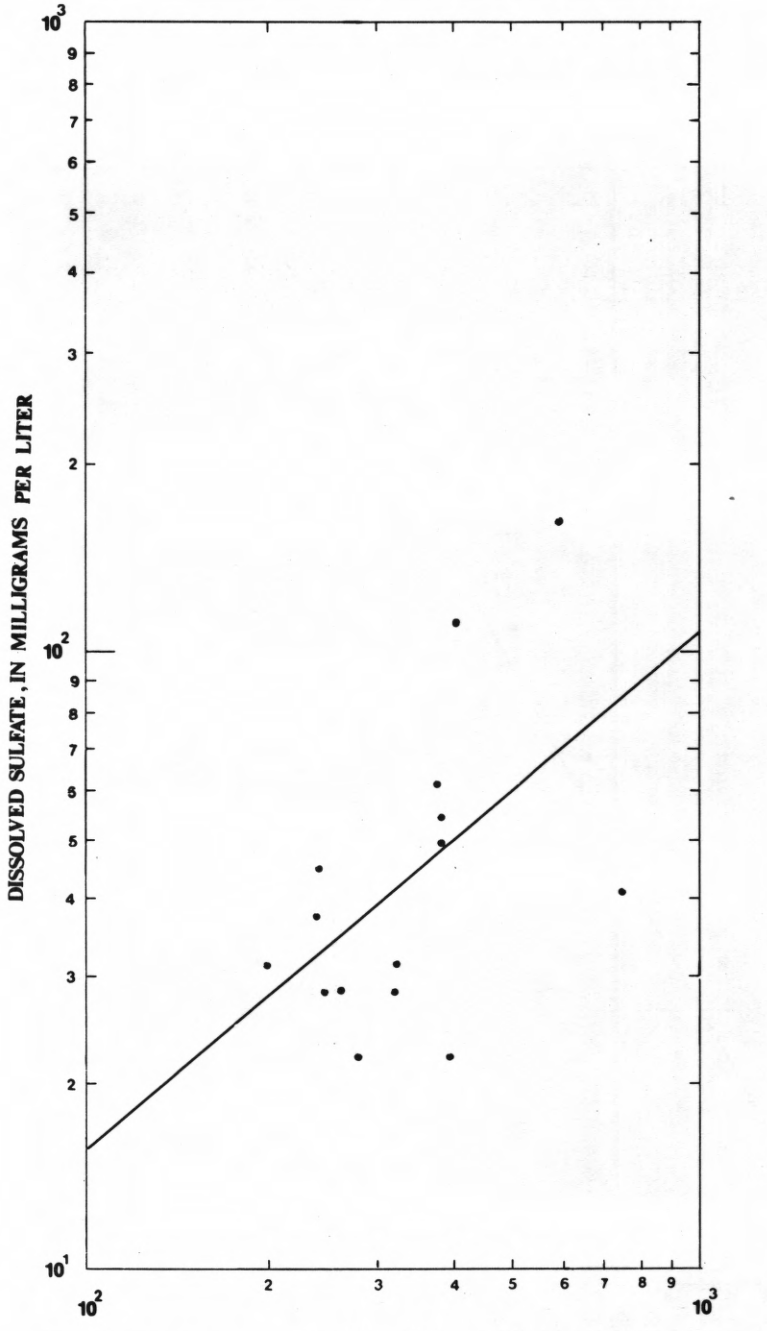

Figure 12.--Relationship between specific-conductance and dissolved-sulfate concentration for unmined areas in the Allegheny Formation.

Conclusions--Reconnaissance Phase

The data obtained during the reconnaissance phase show that pH, alkalinity, aluminum, specific conductance, and dissolved sulfate are affected by coal mining in Ohio. Dissolved sulfate and specific conductance are the best indicators of coal mining, both before and after reclamation. Sulfate concentrations greater than 250 mg/L and specific conductances greater than 800 µmho/cm were usually attributable to mining disturbances. Reclamation returned the pH and aluminum to levels near those of unmined basins, while increasing alkalinity above unmined conditions.

High iron, manganese, and zinc concentrations were found when pH was low (typically in basins draining abandoned mines). Approximately 88 percent of all iron concentrations greater than 10,000 µg/L and manganese concentrations exceeding 1,000 µg/L were found in abandoned mine basins. All zinc concentrations greater than 1,000 µg/L were found in basins influenced by abandoned mines.

Bicarbonate alkalinity and pH values were found to vary not only with mining operations but also with geologic formation. The highly calcareous Monongahela Formation supplies more bicarbonate to streams than does the relatively noncalcareous Allegheny Formation.

Regression analysis showed that dissolved sulfate could be reliably predicted by specific conductance in basins that have been mined. Larger standard errors of estimate for unmined basins show that prediction in these basins is less reliable because sulfate is a smaller percentage of the total ions in those waters.

DETAILED STUDY, MAY-AUGUST 1976

Purpose and Scope

In the second phase of the investigation, four mined basins sampled during the reconnaissance phase were selected for more detailed study. The objective was to determine whether water-quality degradation within the basins was definitely related to coal mining.

Basins sampled in the second phase included Snow Fork (site 113 in the reconnaissance phase, containing abandoned drift mines), Huff Run (site 55, containing abandoned strip mines), South Fork Short Creek (sites 8 and 9, containing reclaimed strip mines), and Spencer Creek (site 61, containing active strip mines) (fig. 13).

Method of Sampling

The more intensive nature of the second phase study required that each basin be accessible and relatively small (less than 30 square miles) so that tributaries and several reaches of the main stem could be sampled readily. As much as possible, each basin selected contained only one type of mining activity to reduce the number of potential variables affecting stream quality.

An attempt was made to confine sampling in each basin to the shortest possible time, so that climate and flow conditions would be relatively constant during sampling. A working definition of "degradation" was established according to Ohio Environmental Protection Agency (1978) standards, which limit dissolved-solids concentrations at 500 mg/L (as a monthly average) and 750 mg/L (at any one time). These concentrations correspond approximately to specific conductances of 800 and 1,200 µmho (Ohio EPA, 1978), respectively, so specific conductances greater than 800 µmho were considered evidence of "degradation". A pH of 4.5 is used by the U.S. Geological Survey as the end point in alkalinity titrations; below pH 4.5, dissociated bicarbonate does not exist (Rainwater and Thatcher, 1960). Water having a pH of less than 4.5 was thus considered "degraded" or "acidic".

Each basin was sampled in a downstream direction along the main stem. Tributaries were sampled at their confluence with the main stem, while the main stem itself was sampled at intervals intended to represent a doubling of discharge.

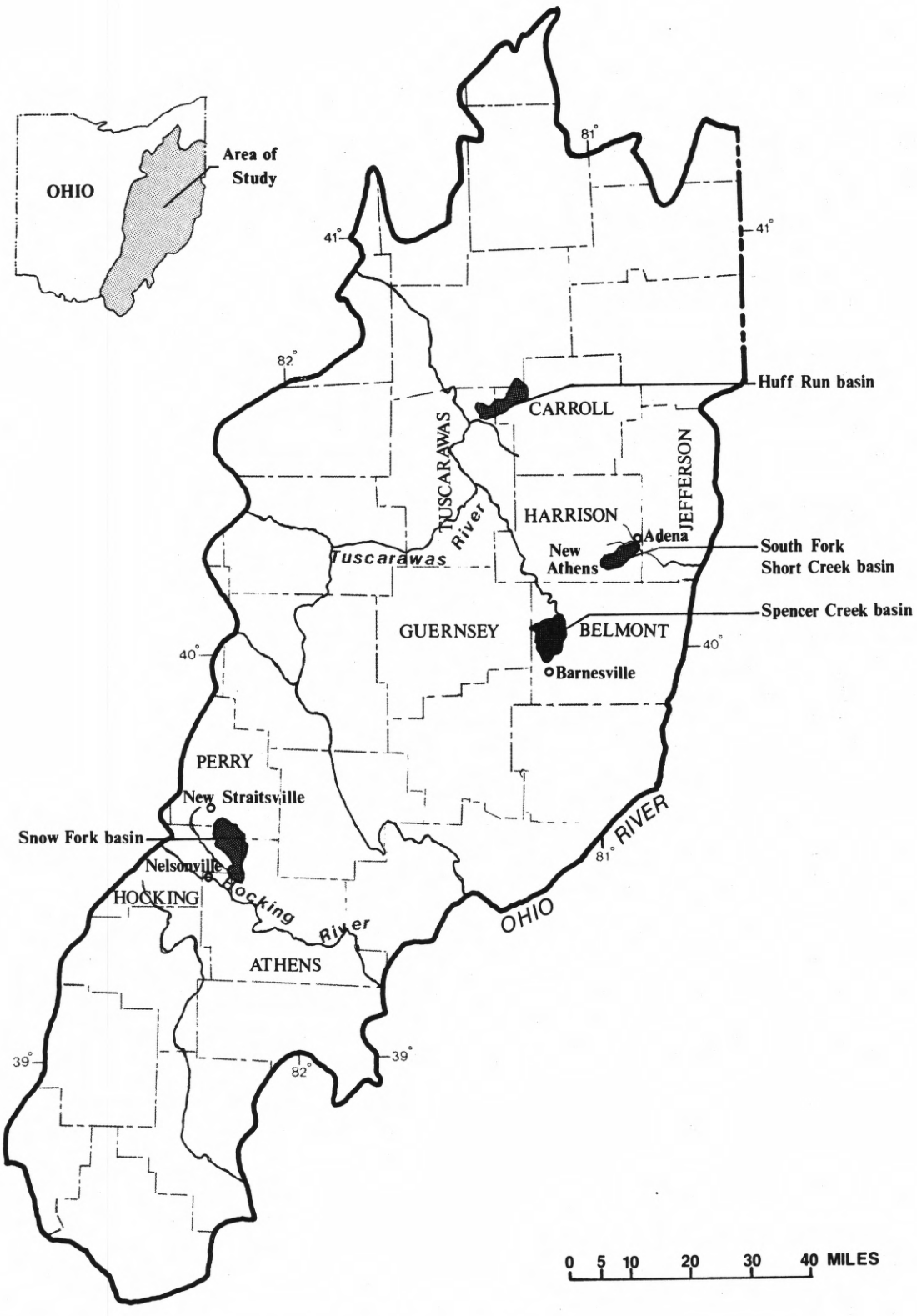

Figure 13.--Location of basins studied in detailed phase, May-August 1976.

At each main-stem sampling site, complete discharge measurements and measurements of specific conductance, pH, acidity or bicarbonate alkalinity and temperature were made. Water samples were analyzed in the Ohio district lab for sulfate and total iron. Samples collected at the most downstream sites were analyzed in the U.S. Geological Survey, Water Resources Division regional lab in Albany, N.Y., for phenol, organic carbon, and trace elements.

Tributary sampling was done somewhat differently from main-stem sampling. The specific conductance and pH of each tributary were measured; if these parameters did not meet the above criteria for "degradation", the tributary was not sampled further. If, however, either parameter did indicate "degradation", the tributary was measured for discharge and acidity or alkalinity and sampled for dissolved sulfate and total iron. The source of the tributary also was determined.

Figures 14 through 17 and tables 4 through 7 show water-quality data obtained during this investigation. Sampling points on the main stems are designated by the prefix "Sta" followed by a number. Tributaries designated "T---", exhibited "degradation" at time of sampling, whereas undesignated tributaries exhibited no "degradation". Numbers following the "T" designation represent miles upstream from the basin mouth.

Snow Fork - A Basin Containing Abandoned Drift Mines

Snow Fork (fig. 14), a stream in the Hocking River basin, originates in southern Perry County near New Straitsville and flows south through eastern Hocking County, then abruptly west to its confluence with Monday Creek in northern Athens County near Nelsonville. The topography is rugged. Valleys are typically less than 0.1 mile wide, and slopes are steep, ranging from 30° to 35°. The drainage area is 27 square miles and is entirely within the Wayne National Forest.

Strata of the Allegheny and Conemaugh Formations (figs. 3 and 4) constitute the bedrock. Abandoned drift mines underlie about 60 percent of the basin; most are in the southern half. Most of the northern half has never been mined because of the interruption of the Middle Kittanning (No. 6) coal by a stratigraphic phenomenon known to miners as the "Jumbo Fault" (fig. 14). Not a fault in the structural sense, the Jumbo consists of coarse-grained sandstone and is probably a channel deposit (Flint, 1951, p. 49-51). A small part of the basin, about 1 percent, has been mined by stripping but not reclaimed. Most of the abandoned drift mines are in the Middle Kittanning coal; several also are in the Upper Freeport (No. 7) coal, exposed near the southeast edge of the basin.

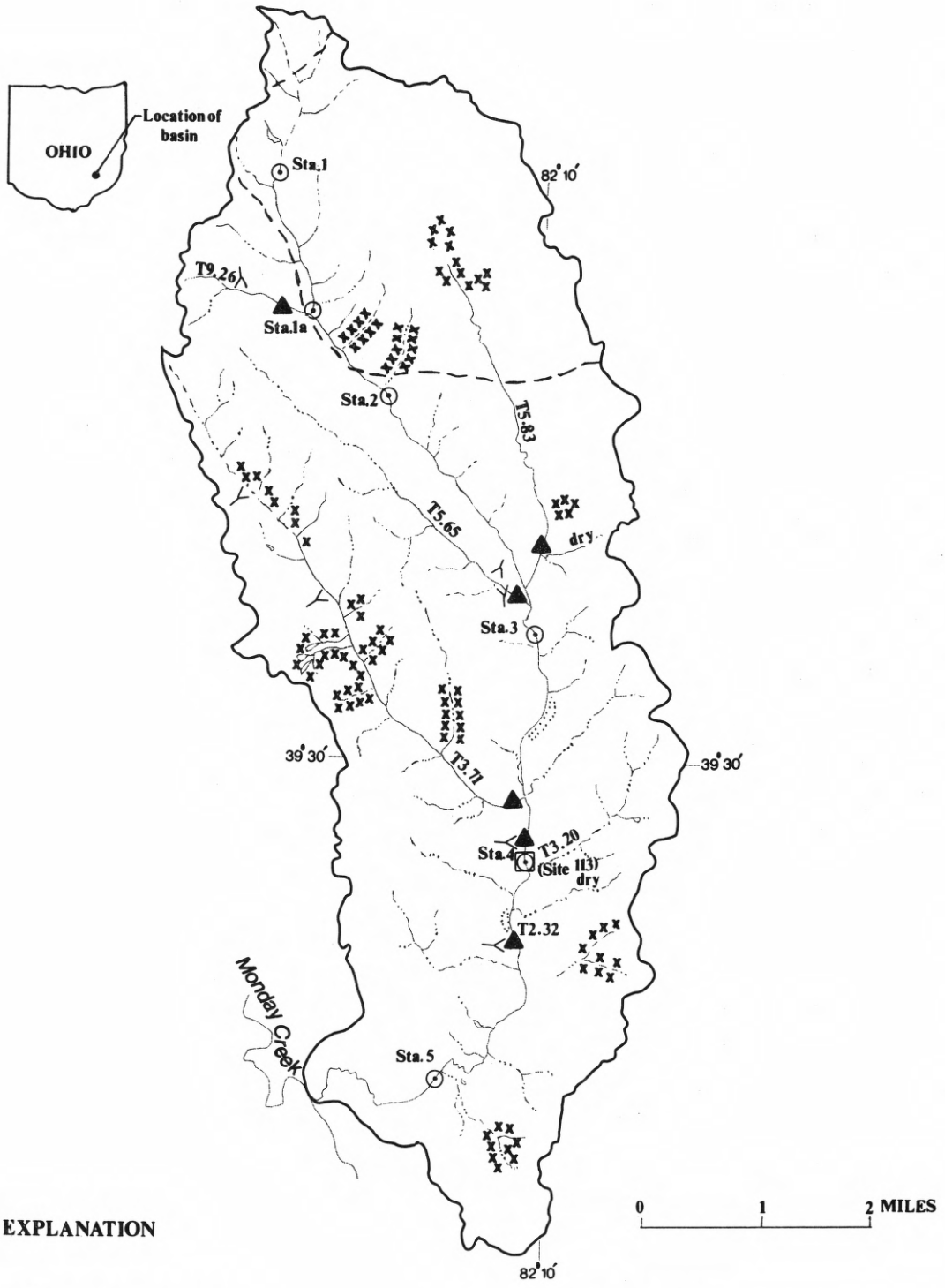

Figure 14.--Location of sampling sites in the Snow Fork basin, Ohio, June 8-17, 1976.

The Snow Fork basin was sampled during June 8-17, 1976. The data are listed in table 4.

In the 2.5 mile reach from headwaters to the confluence with tributary T9.26, the chemical quality of Snow Fork was similar to that of unmined basins underlain by the Allegheny Formation which were sampled during the reconnaissance phase (appendix 1). At Sta. 1, specific conductance measured 340 µmho, and pH measured 7.6; bicarbonate and dissolved sulfate concentrations were 116 and 52 mg/L, respectively. Specific conductance, pH, and discharge were checked at Sta. 1a, just upstream from the confluence with T9.26, and measured 260 µmho, 7.3 and 0.45 ft^3/s, respectively.

At the time of investigation, four tributaries were contributing significantly to the degradation of Snow Fork. The first of these, T9.26, with a pH of 4.1 and dissolved sulfate concentration of 570 mg/L, changed the chemical quality of Snow Fork so much that, at Sta. 2, the pH of Snow Fork was 3.3, and the sulfate concentration was 530 mg/L. Tributary T9.26 had such great impact because, when sampled, its discharge was nearly four times that of Snow Fork at Sta. 1a. The tributary received most of its flow from an abandoned drift mine midway up the tributary basin.

Tributary T5.83 (pH 6.4, specific conductance 775 µmho) contributed 320 mg/L dissolved sulfate to Snow Fork. The sources of this tributary were several abandoned strip mines.

Tributary T3.71, the tributary having the largest drainage area, received acid drainage from several abandoned drift mines and abandoned strip mines. At the time of sampling, T3.71 had a pH of 2.6, specific conductance of 1950 µmho, sulfate concentration of 1,040 mg/L, and discharge of 1.4 ft^3/s.

Tributary T2.32, with pH 2.8, specific conductance 1,850 µmho, and discharge 0.42 ft^3/s, issued directly from a drift mine.

Two other tributaries of lesser discharges (T5.65 and T3.20) also contained water of poor quality; drift mines were the sources of degradation. Additional sources may have been seepage from old tailings piles and pyrites in coal refuse that littered the streambed at various points along Snow Fork.

Tributaries having low acidity and sulfate were small, intermittent streams, with discharges of less than 0.1 ft^3/s; many were dry. By contrast, "degraded" tributaries flowed even during dry periods. The bedrock, composed primarily of sandstones and shales, is a poor source of dissolved bicarbonate. Such small discharges from the tributaries having higher pH and low bicarbonate concentrations were insufficient to neutralize the pH of Snow Fork.

Table 4.--Chemical quality at stream sampling sites in the Snow Fork basin, Ohio, June 8-17, 1976

Station and tributary number	Date	Time	Discharge (ft^3/s)	Water temperature (^oC)	Specific conductance ($\mu mho/cm$ at 25^oC)	pH (units)	Dissolved oxygen (mg/L)	Total acidity as H^+ (mg/L)	Bicarbonate (mg/L)
Sta. 1 -------	6-08-76	1115	0.11	17.5	340	7.6	8.2	--	116
T9.26 ------	6-08-76	1205	1.7	11.5	1,125	4.1	--	2.8	--
Sta. 2 -------	6-09-76	1210	1.9	16.5	1,100	3.3	7.4	2.8	--
T5.83 ------	6-10-76	1130	0.59	20.0	775	6.4	--	--	8
T5.65 ------	6-15-76	1220	0.16	22.0	900	3.0	--	3.5	--
Sta. 3 -------	6-15-76	1100	2.6	21.0	1,300	3.0	7.4	3.7	--
T3.71 ------	6-16-76	1130	1.4	20.0	1,950	2.6	--	9.6	--
T3.20 ------	6-16-76	1240	0.008	22.5	2,500	2.3	--	21	--
Sta. 4 -------	6-16-76	1345	5.1	21.5	1,700	2.7	6.9	6.8	--
T2.32 ------	6-17-76	1230	0.42	14.0	1,850	2.8	--	7.4	--
Sta. 5 -------	6-17-76	1420	9.2	19.5	1,475	2.9	6.8	4.9	--
									--
Site 113 -----	5-21-75	1210	27	20.0	1,190	3.9	9.1	0.8	--
(reconnais-	9-16-75	1220	13	16.0	1,850	2.9	8.4	6.6	--
sance phase)									
Same as Sta. 4 above									
Sta. 1a ------	6-08-76	--	0.45	not recorded	260	7.3	--	--	--

Sulfate (mg/L)	Chloride (mg/L)	Total iron ($\mu g/L$)	Total aluminum ($\mu g/L$)	Total arsenic ($\mu g/L$)	Total organic carton ($\mu g/L$)	Total chromium ($\mu g/L$)	Total manganese ($\mu g/L$)	Total mercury ($\mu g/L$)	Total zinc ($\mu g/L$)	Phenol ($\mu g/L$)
52	10	70	--	--	4.9	--	--	--	--	0
570	12	17,000	--	--	--	--	--	--	--	--
530	18	4,500	--	--	1.3	--	--	--	--	0
320	14	--	--	--	--	--	--	--	--	--
880	14	7,600	--	--	--	--	--	--	--	--
600	50	9,700	--	--	3.6	--	--	--	--	2
1,040	8	21,000	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--
780	24	11,000	--	--	5.3	--	--	--	--	0
820	24	19,000	--	--	--	--	--	--	--	--
640	36	14,000	20,000	0	8.9	10	4,600	<0.5	390	0
410	11	19,000	17,000	0	1.6	30	430	<0.5	340	0
710	30	25,000	42,000	0	1.9	10	8,300	<0.5	550	2
--	--	--	--	--	--	--	--	--	--	--

Huff Run - A Basin Containing Abandoned Strip Mines

Huff Run (fig. 15), a tributary to Conotton Creek in the Tuscarawas River basin, originates in northwestern Carroll County and flows southwest to its confluence with Conotton Creek in Tuscarawas County. The basin has an area of 14 square miles and relief of 150 to 200 feet.

Strata of the Allegheny Formation (fig. 4) constitute the bedrock. The upstream third of the basin is unmined, but the downstream two-thirds contain both underground mines, developed in the Lower Kittanning (No. 5) coal during the early 1900's, and strip mines, developed in the Middle Kittanning (No. 6) coal during the 1950's. None of the mines have been reclaimed. The brine pits of numerous oil wells in the basin also probably contribute to the degradation of Huff Run.

Huff Run basin was sampled during August 25-31, 1976. The undisturbed part of the basin (above Sta. 2) had no "degraded" tributaries (table 5). The disturbed part of the basin had approximately three times as many tributaries as the undisturbed part; most exhibited degradation in both pH and specific conductance. Most tributary discharges averaged around 0.1 ft^3/s at the time of sampling. All but three of the degraded tributaries were traced to abandoned strip mines, where they originated from holding ponds or as seepage flow from tailings piles. The three others (T3.80, T2.38, and T0.68) issued from drift mines, which, according to local information, had been dynamited shut in the 1930's as a safety measure by the U.S. Army Corps of Engineers. However, closing the mine entrances failed to prevent the discharge of acid mine drainage.

Because the degraded tributaries had small discharges, Huff Run exhibited gradual changes in chemical quality as it flowed through the disturbed part of the basin. With few carbonates in the bedrock to contribute bicarbonate alkalinity (68 mg/L at Sta. 1), Huff Run had little buffer capacity. At Sta. 4, the buffer capacity was exceeded, the pH dropping to 3.3.

South Fork Short Creek - A Basin Containing Reclaimed Strip Mines

South Fork Short Creek (fig. 16), a minor Ohio River tributary, originates in Harrison County near New Athens, flows eastward, and joins the Middle Fork Short Creek at Adena. The basin has a drainage area of about 14 square miles. Most of this area consists of strip mines reclaimed before 1972; the southern half of the basin has been reforested, the northern half planted with grasses and legumes.

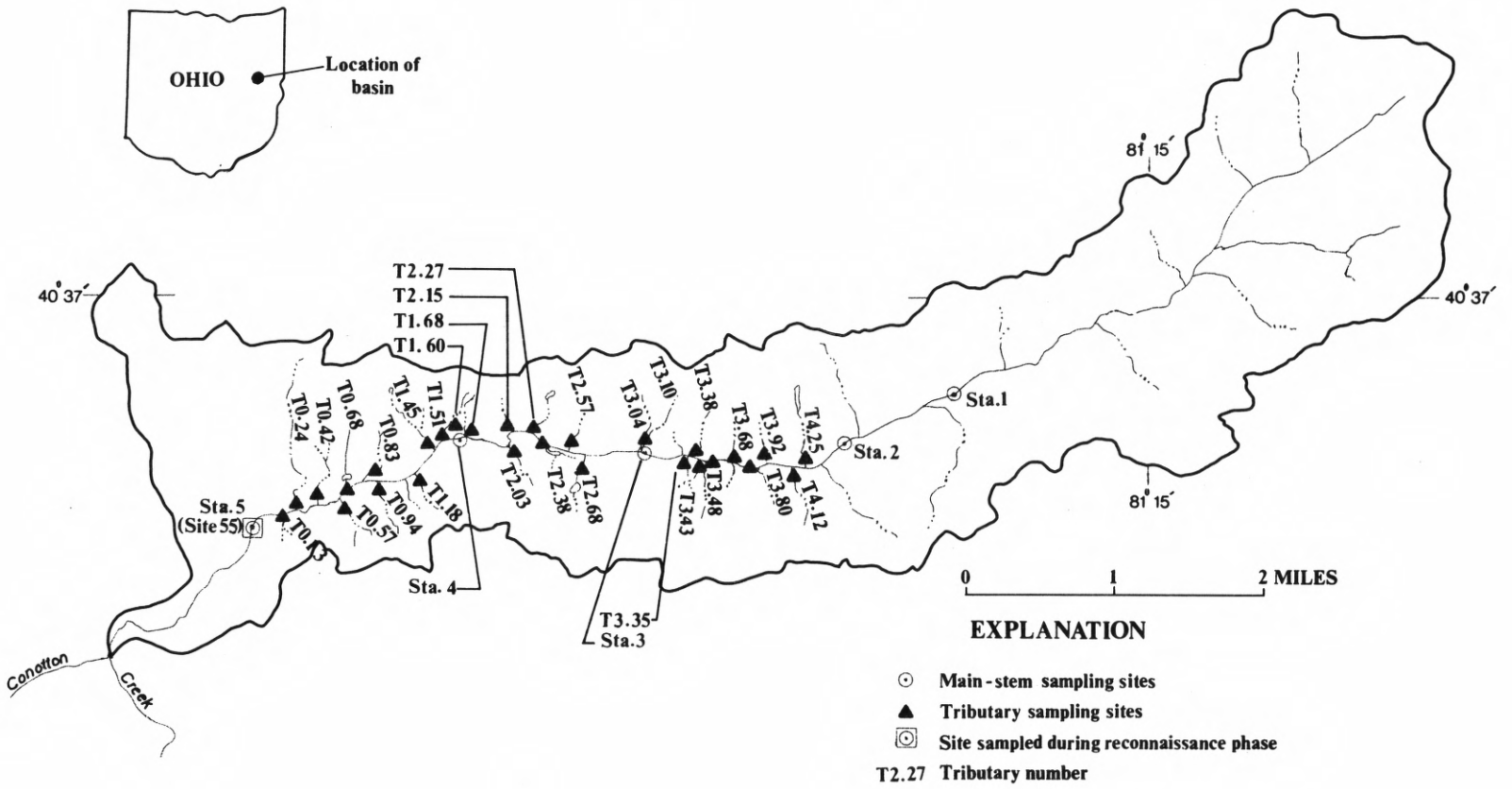

Figure 15.--Location of sampling sites in the Huff Run basin, Ohio, August 25-31, 1976.

Table 5.--Chemical quality of stream sampling sites in the Huff Run basin, Ohio, August 25-31, 1976

Station and tributary number	Date	Time	Discharge (ft^3/s)	Water temperature (^oC)	Specific conductance ($\mu mho/cm$ at 25^oC)	pH (units)	Dissolved oxygen (mg/L)	Total acidity as H^+ (mg/L)	Bicarbonate (mg/L)
Sta. 1	8-25-76	0830	1.4	18.5	475	7.1	6.9	--	68
Sta. 2	8-25-76	0930	1.8	19.0	560	7.2	7.5	--	64
T4.25	8-24-76	1520	0.007	24.5	1,030	5.8	--	--	16
T3.48	8-25-76	1605	0.05	23.0	3,000	2.8	--	6.4	--
T3.43	8-25-76	1615	0.02	24.0	2,900	6.5	--	--	68
T3.38	8-24-76	1550	0.24	23.5	2,700	2.9	--	4.6	--
T3.35	8-25-76	1625	0.035	24.0	2,800	6.8	--	--	116
T3.10	8-25-76	1100	0.01	23.5	2,400	6.5	--	--	32
Sta. 3	8-25-76	1045	2.6	20.0	1,000	6.6	7.9	--	36
T3.04	8-25-76	1115	0.13	23.5	3,000	3.2	--	3.4	--
T2.68	8-31-76	1420	0.06	22.0	4,400	3.0	--	9.5	--
T2.57	8-25-76	1145	0.04	21.0	2,600	3.1	--	3.9	--
T2.38	8-26-76	1400	0.03	23.0	3,400	2.9	--	10.0	--
T2.27	8-25-76	1215	0.01	20.0	2,400	3.4	--	2.3	--
T2.15	8-25-76	1235	0.12	23.0	2,600	3.0	--	4.5	--
T2.03	8-26-76	1415	0.04	22.0	3,500	3.0	--	5.4	--
T1.68	8-25-76	1250	0.15	18.0	2,200	4.2	--	4.9	--
Sta. 4	8-26-76	1200	3.3	19.0	1,550	3.8	7.5	1.5	--
T1.60	8-25-76	1315	0.01	26.0	1,600	3.2	--	2.0	--
T1.51	8-25-76	1350	0.10	22.0	1,800	3.4	--	4.8	--
T1.45	8-25-76	1420	0.015	21.0	2,000	2.9	--	4.0	--
T1.18	8-31 76	1330	0.01	23.5	5,000	2.9	--	11.0	--
T0.94	8-31-76	1315	0.24	23.5	2,500	3.0	--	8.6	--
T0.83	8-25-76	1440	0.07	26.0	2,600	2.9	--	6.8	--
T0.68	8-25-76	1500	0.02	30.5	2,200	2.9	--	4.1	--
T0.57	8-25-76	1710	0.35	27.0	2,600	2.8	--	6.4	--
T0.42	8-25-76	1520	0.06	18.0	850	3.5	--	1.3	--
T0.13	8-25-76	1750	0.008	25.0	2,400	2.9	--	7.8	--
Sta. 5	8-26-76	1315	4.0	20.0	1,600	3.4	7.8	2.4	--
Site 55 (reconnaissance phase)	7-09-75	1530	5.3	23.0	1,640	3.4	7.0	2.1	--
	10-23-75	1220	8.4	12.5	1,100	4.1	9.7	1.0	--

Table 5.--Continued.

Sulfate (mg/L)	Chloride (mg/L)	Total iron (µg/L)	Total aluminum (µg/L)	Total arsenic (µg/L)	Total organic carton (µg/L)	Total chromium (µg/L)	Total manganese (µg/L)	Total mercury (µg/L)	Total zinc (µg/L)	Phenol (µg/L)
48	94	--	--	--	--	--	--	--	--	--
130	72	--	--	--	--	--	--	--	--	--
600	30	--	--	--	--	--	--	--	--	--
1,600	150	--	--	--	--	--	--	--	--	--
2,100	16	--	--	--	--	--	--	--	--	--
1,900	40	--	--	--	--	--	--	--	--	--
2,000	15	--	--	--	--	--	--	--	--	--
1,900	25	--	--	--	--	--	--	--	--	--
480	78	--	--	--	--	--	--	--	--	--
2,400	140	--	--	--	--	--	--	--	--	--
2,900	130	--	--	--	--	--	--	--	--	--
1,800	10	--	--	--	--	--	--	--	--	--
240	20	--	--	--	--	--	--	---	--	--
1,100	200	--	--	--	--	--	--	--	--	--
--	10	--	--	--	--	--	--	--	--	--
240	65	--	--	--	--	--	--	--	--	--
1,600	25	--	--	--	--	--	--	--	--	--
840	34	--	--	--	--	--	--	--	--	--
850	25	--	--	--	--	--	--	--	--	--
1,100	6	--	--	--	--	--	--	--	--	--
1,100	4	--	--	--	--	--	--	--	--	--
3,500	210	--	--	--	--	--	--	--	--	--
1,600	25	--	--	--	--	--	--	--	--	--
1,600	8	--	--	--	--	--	--	--	--	--
1,200	6	--	--	--	--	--	--	--	--	--
1,400	70	--	--	--	--	--	--	--	--	--
400	10	--	--	--	--	--	--	--	--	--
1,500	45	--	--	--	--	--	--	--	--	--
880	Sample lost	21,000	4,200	0	5.6	<10	22,000	<0.5	230	0
650	75	25,000	5,200	0	4.6	10	23,000	3.2	370	3
430	70	13,000	3,500	0	7.2	0	12,000	<0.5	160	0

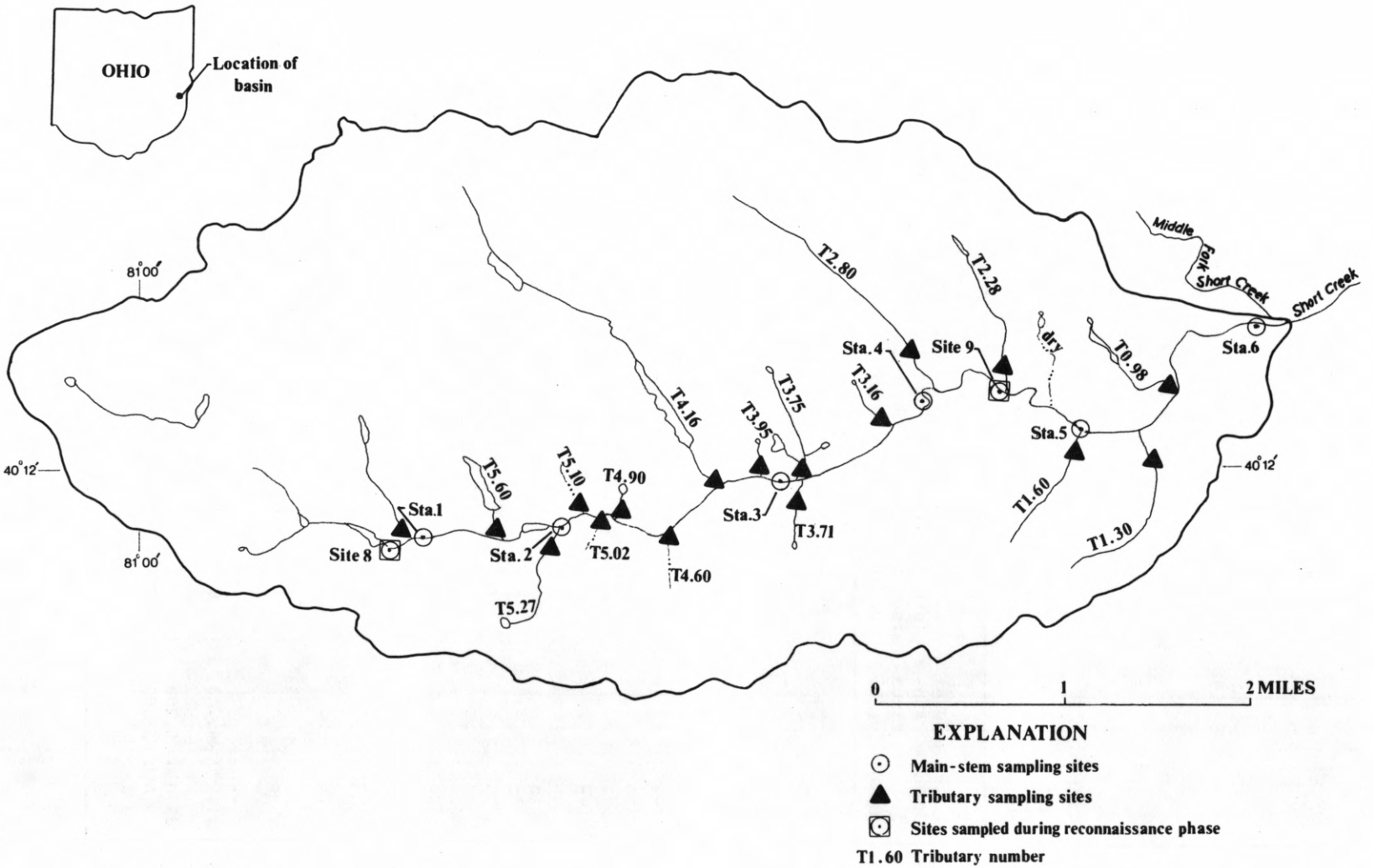

Figure 16.--Location of sampling sites in the South Fork Short Creek basin, Ohio, June 1-7, 1976.

The topography was disrupted by extensive strip mining. Relief ranges from 200 to 250 feet. The basin exhibits the characteristic asymmetrical drainage development of the area, with long southward-flowing and short northward-flowing tributaries, due to the southeast dip of the bedrock (Lamborn, 1930).

The highly calcareous Monongahela Formation forms the bedrock (fig. 3). The Meigs Creek (No. 9) coal crops out at a level suitable for strip mining and thus has been the primary coal mined (Smith and others, 1952).

South Fork Short Creek was sampled during June 1-7, 1976. The data obtained are listed in table 6.

The South Fork basin owes most of its hydrologic character to strip mining. Most tributaries are perennial, supplied by water stored in strip ponds and reclaimed overburden. Tributary discharges averaged 0.5 ft^3/s when sampled. South Fork near its mouth (Sta. 6) had a discharge nearly equal to that of Snow Fork, a stream having double the drainage area.

Although all tributaries in the basin had a pH greater than 7.0, all were considered degraded because of their specific conductance, which ranged from 1,850 to 5,000 µmho. Analyses of tributary samples revealed high bicarbonate and dissolved sulfate concentrations (averaging 360 and 2,000 mg/L, respectively) and low iron concentrations (averaging 90 µg/L). The high dissolved sulfate concentrations indicated pyrite oxidation in the reclaimed overburden, even though no acid drainage resulted. These conditions may be attributed to the predominantly calcareous (limestone) overburden. Any H^+ ions produced by reactions 1 and 3 (p. 9) would react with limestone as follows: $H^+ + CaCO_3 \rightleftharpoons HCO_3^- Ca^{+2}$. Such reactions maintain neutral pH (around 7.0) and increase bicarbonate concentrations. At the same time, any Fe^{+3} produced is converted to insoluble $Fe(OH)_3$ (reaction 3) and remains in the reclaimed overburden, so that iron concentrations in the streams were low.

Reclamation of South Fork basin seemed to be relatively successful. Vegetation and wildlife seemed to be thriving. The water quality, except for high dissolved sulfate concentrations, was within the Ohio EPA standards for dissolved constituents.

Spencer Creek - A Basin Containing Active Strip Mines

Spencer Creek (fig. 17), a tributary to the Piedmont Reservoir (Stillwater Creek) in the Tuscarawas River basin, rises in western Belmont County near Barnesville and flows north to the reservoir. The stream is divided into north and south forks, which drain approximately equal areas and join near the midpoint of the basin. The 24-square-mile basin is underlain by the Monongahela Formation and is being mined for Pittsburgh (No. 8)

Table 6.--Chemical quality at stream sampling sites in the South Fork Short Creek basin, Ohio, June 1-7, 1976

Station and tributary number	Date	Time	Discharge (ft^3/s)	Water temperature (^oC)	Specific conductance ($\mu mho/cm$ at 25^oC)	pH (units)	Dissolved oxygen (mg/L)	Total acidity as H^+ (mg/L)	Bicarbonate (mg/L)
Sta. 1 -------	6-01-76	1220	1.7	20.0	3,000	7.9	7.4	--	432
T5.60 ------	6-01-76	1340	0.61	20.0	4,200	7.7	--	--	432
T5.27 ------	6-01-76	1520	2.0	22.5	3,700	7.8	--	--	364
Sta. 2 -------	6-02-76	0845	3.7	19.0	3,500	7.9	7.5	--	424
T5.10 ------	6-01-76	1445	0.55	20.0	5,000	7.9	--	--	536
T5.02 ------	6-03-76	1450	0.02	24.5	3,400	7.4	--	--	124
T4.90 ------	6-02-76	0920	0.01	20.5	2,500	7.6	--	--	296
T4.60 ------	6-02-76	1100	0.24	21.5	3,200	7.6	--	--	396
T4.16 ------	6-02-76	1305	1.2	21.0	3,500	7.9	--	--	360
T3.95 ------	6-02-76	1430	0.05	22.0	4,500	7.7	--	--	394
Sta. 3 -------	6-02-76	1625	6.5	20.0	3,600	7.8	8.3	--	484
T3.75 ------	6-03-76	1130	0.44	22.0	5,000	7.8	--	--	452
T3.71 ------	6-03-76	1045	0.32	17.5	2,500	7.7	--	--	252
T3.16 ------	6-07-76	1330	0.004	13.0	3,000	7.7	--	--	220
Sta. 4 -------	6-03-76	0910	7.3	16.0	3,500	7.9	8.4	--	376
T2.80 ------	6-03-76	1340	0.42	22.5	3,900	7.8	--	--	448
T2.28 ------	6-03-76	1655	0.20	20.5	3,500	7.7	--	--	320
Sta. 5 -------	6-03-76	1615	8.8	18.0	3,500	8.0	7.7	--	368
T1.60 ------	6-04-76	1000	0.61	20.5	2,500	7.8	--	--	284
T1.30 ------	6-04-76	0820	0.28	13.5	1,850	7.8	--	--	280
Sta. 6 -------	6-04-76	1245	8.2	21.5	3,500	7.9	8.8	--	336
Site 8 -------	6-30-75	1230	1.2	27.0	4,290	8.1	8.6	--	490
(reconnais-	11-04-75	1200	0.87	16.5	4,500	7.4	8.2	--	525
sance phase)									
Site 9 -------	6-30-75	1420	5.9	24.5	3,670	8.1	8.3	--	420
	11-04-75	1340	3.7	15.5	3,600	7.8	8.1	--	464

Table 6.--Continued.

Sulfate (mg/L)	Chloride (mg/L)	Total iron (µg/L)	Total aluminum (µg/L)	Total arsenic (µg/L)	Total organic carton (µg/L)	Total chromium (µg/L)	Total manganese (µg/L)	Total mercury (µg/L)	Total zinc (µg/L)	Phenol (µg/L)
2,010	18	80	--	--	--	--	--	--	--	0
2,330	6	--	--	--	--	--	--	--	--	--
2,050	12	240	--	--	--	--	--	--	--	--
2,030	18	260	--	--	--	--	--	--	--	0
2,630	8	20	--	--	--	--	--	--	--	--
2,110	8	--	--	--	--	--	--	--	--	--
1,270	6	--	--	--	--	--	--	--	--	--
1,680	14	1,300	--	--	--	--	--	--	--	--
2,000	10	390	--	--	--	--	--	--	--	--
2,510	8	--	--	--	--	--	--	--	--	--
2,030	16	50	--	--	--	--	--	--	--	0
2,530	18	20	--	--	--	--	--	--	--	--
1,380	12	60	--	--	--	--	--	--	--	--
820	8	--	--	--	--	--	--	---	--	--
2,030	14	210	--	--	--	--	--	--	--	0
2,130	20	40	--	--	--	--	--	--	--	--
2,070	6	70	--	--	--	--	--	--	--	--
2,010	14	100	--	--	--	--	--	--	--	0
1,200	26	--	--	--	--	--	--	--	--	--
860	14	--	--	--	--	--	--	--	--	--
1,910	16	180	160	0	--	40	240	1.5	20	0
2,500	16	300	30	0	4.8	30	110	<0.5	10	1
2,400	20	380	10	1	1.9	20	960	<0.5	20	6
1,800	12	150	310	0	4.2	20	260	<0.5	10	0
1,900	10	580	500	1	4.1	10	520	<0.5	30	1

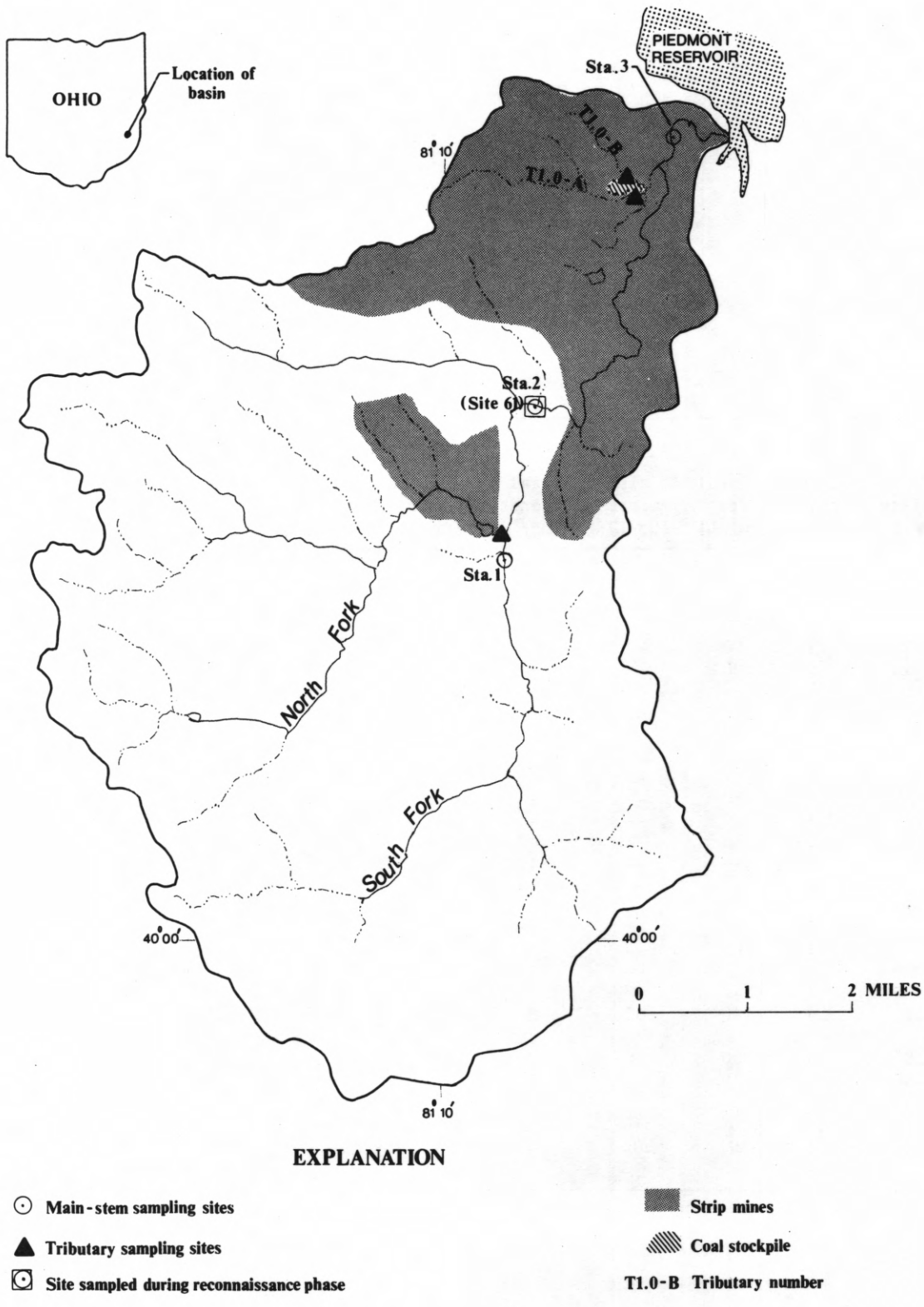

Figure 17.--Location of sampling sites in the Spencer Creek basin, Ohio, June 21-25, 1976.

(fig. 4) and Meigs Creek (No. 9) coals, (Ohio Division of Mines, 1975).

Mining activity has centered in the downstream part of the basin. Approximately one-fourth of the basin was currently being strip mined, or had been reclaimed within a year, at the time of sampling (June 21-25, 1976). Spencer Creek upstream from Sta. 2 was sampled by June 24, during dry weather. Downstream from Sta. 2, samples were taken after a night of heavy rain. Higher flows at these stations made it difficult to compare upstream and downstream data.

Tributaries upstream from Sta. 2 exhibited no "degradation" as defined (table 7). Yet specific conductance of the north and south forks near their confluence was 710 and 750 µmho, respectively, near the limit of 800 µmho defined as "degraded". The north fork was sampled just downstream and close to its impoundment as a strip pond. The reactions that produced high bicarbonate and sulfate concentrations in Short Creek basin (p. 39) were probably identical to those here. The resulting concentrations (e.g. dissolved sulfate concentration in the north fork of 250 mg/L) were lower than those in Short Creek basin. Perhaps the reactants had been exposed for shorter times. No specific source was determined for the specific conductance in the south fork.

Few tributaries entered Spencer Creek downstream from Sta. 2. The main tributary, T1.0, which partly formed the boundaries of a coal stockpile, contained high dissolved sulfate and iron concentrations (1,300 mg/L and 20,000 µg/L, respectively). These concentrations were attributed to seepage from the base of the stockpile.

Conclusions-Detailed Study

Data obtained in the detailed study indicated that water quality in each of the four basins was significantly affected by coal mining. The substances entering the streams differed, depending on the type of mining predominant in the basin.

Drainage from abandoned drift and strip mines contributed acidity and high concentrations of sulfate to Snow Fork and Huff Run. Specific conductance rose and alkalinity fell as a result of mine drainage. The relative discharges of streams and mine-drainage and the buffer capacity of the streams determined the rate and extent of change in stream quality.

Table 7.--Chemical quality at stream sampling sites in the Spencer Creek basin, Ohio, June 21-25, 1976

Station and tributary number	Date	Time	Discharge (ft^3/s)	Water temperature (^oC)	Specific conductance ($\mu mho/cm$ at 25^oC)	pH (units)	Dissolved oxygen (mg/L)	Total acidity as H^+ (mg/L)	Bicarbonate (mg/L)
Sta. 1									
(South Fork)-	6-24-76	1220	2.0	19.0	750	7.9	9.8	--	172
(North Fork)-	6-24-76	1300	2.5	21.5	710	7.7	--	--	136
Sta. 2 -------	6-25-76	1200	14	21.5	900	7.8	10.3	--	166
T1.0-A -----	6-25-76	1325	0.32	25.5	2,000	7.8	---	--	144
T1.0-B -----	6-25-76	1510	0.05	23.5	2,200	7.4	--	--	196
Sta. 3 -------	6-25-76	1440	19	22.5	1,000	7.6	9.4	--	164
Site 61 ----- (reconnaissance phase)	10-15-75	1115	6.3	16.5	1,180	7.7	8.8	--	248

Sulfate (mg/L)	Chloride (mg/L)	Total iron ($\mu g/L$)	Total aluminum ($\mu g/L$)	Total arsenic ($\mu g/L$)	Total organic carton ($\mu g/L$)	Total chromium ($\mu g/L$)	Total manganese ($\mu g/L$)	Total mercury ($\mu g/L$)	Total zinc ($\mu g/L$)	Phenol ($\mu g/L$)
230	26	230	--	--	--	--	--	--	--	--
250	12	1,100	--	--	--	--	--	--	--	--
320	22	2,000	--	--	--	--	--	--	--	--
1,300	--	--	--	--	--	--	--	--	--	--
150	8	20,000	--	--	--	--	--	--	--	--
370	24	2,600	--	--	8.5	--	--	--	--	0
410	20	300	180	1	2.4	20	310	<0.5	170	0

Drainage from reclaimed strip mines contributed high concentrations of bicarbonate and sulfate to South Fork Short Creek. The high sulfate concentrations indicated pyrite oxidation in the reclaimed overburden; the high bicarbonate and neutral pH indicated that acidity (H^+) produced during pyrite oxidation had been neutralized. Sulfate and bicarbonate concentrations in the Spencer Creek tributaries were much lower. This is consistent with lower sulfate concentrations in drainage from active surface mines, as compared to that from reclaimed mines, as indicated in the reconnaissance phase (appendix 1). Some surface mines within the Spencer Creek basin had been recently reclaimed. Perhaps oxidation of pyrites in the reclaimed overburden will increase with time, and Spencer Creek waters will then resemble those of South Fork Short Creek.

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Appendix 1. Water-quality data from the reconnaissance phase, May-December, 1975

Mining category symbols: AD, abandoned drift or deep mines; AS, abandoned strip mines; CN, combination (always includes some type of abandoned mine); RS, reclaimed strip mines; UN, unmined; WD, active deep mines; WS, active strip mines.

Geologic formation symbols: A, Allegheny; M, Monongahela.

Note: Mining category and geologic formation symbols are combined in the data table. Mining category symbols are listed first; thus, RSM, reclaimed strip mine Monongahela; UNA, unmined Allegheny.

Precipitation symbols: *, precipitation occurring during first sampling at site; **, precipitation occuring during second sampling; ***, precipitation occurring during both samplings.

Discharge symbols: E, discharge measured using 10 or fewer sections.

Appendix 1.--Water quality data from the reconnaissance phase, May-December, 1976.--Continued

1 UNA ** YELLOW CREEK AT BERGHOLZ

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL , 1975											
08...	1145	E6.0	23.5	585	6.5	7.9	--	54	27	160	30
OCT											
28...	1600	E22	12.5	400	6.9	10.0	--	64	13	110	22

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL , 1975											
08...	800	0	10	10	600	840	<.5	100	2.6	6	.0
OCT											
28...	1800	1	0	10	3200	320	<.5	30	2.7	0	.2

2 ADA ** ROACH RUN NEAR BERGHOLZ OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL , 1975											
08...	1030	E.20	19.0	2210	2.7	6.2	20	0	.0	1200	20
OCT											
28...	1500	E1.2	15.0	900	2.7	8.6	4.0	0	.0	320	6.0

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL , 1975											
08...	46000	3	50	30	260000	5000	4.5	550	7.5	6	.0
OCT											
28...	990	4	0	10	60000	1700	<.5	140	3.6	0	.0

3 ADA MINE SHAFT NEAR NEW SOMERSET OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL , 1975											
08...	0930	E.10	16.0	13700	1.9	--	292	0	.0	3600	200
OCT											
28...	1400	E.01	15.0	11200	1.9	--	238	0	.0	7100	50

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL , 1975											
08...	62000	2100	330	1200	4400000	20000	20	11000	35	5	17
OCT											
28...	490000	1600	290	690	3700000	12000	<.5	8000	5.3	5	26

4 CNA ** YELLOW CREEK NEAR NEW SOMERSET OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL 1975											
07...	1445	E20	22.5	589	6.6	7.0	--	28	11	220	26
OCT											
28...	1300	E37	12.5	500	6.8	9.6	--	54	14	150	20

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL 1975											
07...	350	0	0	10	3900	360	1.3	50	1.4	7	.0
OCT											
28...	950	0	0	0	3400	540	<.5	20	1.9	0	.0

5 WSM ISLAND CREEK NEAR PEKIN OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL 1975											
07...	1310	E2.0	24.0	1280	6.8	5.6	--	172	44	500	35
OCT											
28...	1200	E6.8	13.0	960	8.0	12.3	--	164	2.6	310	16

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL 1975											
07...	50	0	10	10	90	10	<.5	20	6.0	10	.0
OCT											
28...	630	0	0	10	1300	60	<.5	20	2.6	0	.0

6 WDM CROSS CREEK NEAR HOPEDALE OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL 1975											
02...	0945	E4.0	21.0	833	7.2	7.6	--	154	16	250	16
OCT											
29...	1000	E5.2	12.0	625	7.2	9.7	--	112	11	190	14

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL 1975											
02...	200	0	10	0	650	470	<.5	10	10	4	.2
OCT											
29...	50	1	10	0	330	340	<.5	10	3.4	4	.3

10 WDM NORTH FORK SHORT CREEK NEAR UNIONVALE OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL , 1975											
01...	1520	E10	26.5	2880	7.0	7.4	--	160	26	930	300
NOV											
04...	1600	E4.6	15.0	2400	6.8	7.7	--	156	40	870	170

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL , 1975											
01...	2000	0	30	20	5300	1400	.8	70	3.8	7	.2
NOV											
04...	630	0	<10	10	6300	1100	<.5	70	1.2	1	.5

11 CNM SHORT CREEK AT ADENA OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUN , 1975											
30...	1545	E20	27.0	2890	8.3	8.8	--	325	2.6	1400	24
NOV											
04...	1445	E12	15.5	3000	7.9	9.2	--	316	6.4	1000	30

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUN , 1975											
30...	140	0	30	20	220	110	<.5	10	4.4	1	.0
NOV											
04...	170	0	10	10	90	220	<.5	20	3.9	2	.2

12 ASM *** OLD FARM RUN NEAR DILLONVALE OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
AUG , 1975											
11...	1200	E.20	21.0	2000	8.0	7.5	--	272	4.4	610	14
SEP											
26...	1630	E4.0	14.5	2400	7.9	9.2	--	394	7.9	850	50

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
AUG , 1975											
11...	150	0	10	10	520	150	<.5	10	13	0	.0
SEP											
26...	160	1	30	0	9900	200	<.5	20	14	0	.0

7 CNM CROSS CREEK NEAR MINGO JUNCTION OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
NOV • 1975											
05...	0930	E14	13.5	1430	7.2	8.2	--	162	16	580	20

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
NOV • 1975											
05...	1100	0	0	10	1400	630	<.5	40	2.6	1	.3

8 WSM SOUTH FORK SHORT CREEK NEAR NEW ATHENS OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUN • 1975											
30...	1230	E1.0	27.0	4290	8.1	8.6	--	490	6.2	2500	16
NOV											
04...	1200	E.87	16.5	4500	7.4	8.2	--	525	33	2400	20

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUN • 1975											
30...	30	0	30	20	300	110	<.5	10	4.8	1	.0
NOV											
04...	10	1	20	20	360	960	<.5	20	1.9	6	.0

9 RSM SOUTH FORK SHORT CREEK AT GEORGETOWN OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUN • 1975											
30...	1420	E6.0	24.5	3670	8.1	8.3	--	420	5.3	1800	12
NOV											
04...	1340	E3.7	15.5	3600	7.8	8.1	--	464	12	1900	10

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUN • 1975											
30...	310	0	20	20	150	260	<.5	10	4.2	0	.0
NOV											
04...	500	1	10	20	580	520	<.5	30	4.1	1	.2

13 ASM OLD FARM SPRING NEAR DILLONVALE OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
AUG , 1975											
11...	1230	E.01	19.0	2320	7.6	--	--	380	15	830	24
SEP											
26...	1645	E.02	12.0	2300	7.1	--	--	388	49	850	15

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
AUG , 1975											
11...	5800	16	<10	20	23000	780	<.5	50	6.8	5	.0
SEP											
26...	50	0	10	10	100	20	<.5	10	3.2	0	.0

14 RSM ** PINEY FORK AT PINEY FORK OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL , 1975											
01...	1145	E2.0	23.5	1800	7.6	8.7	--	300	12	670	12
SEP											
26...	1445	E10	15.5	1200	7.4	8.8	--	184	12	490	25

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL , 1975											
01...	490	1	10	20	600	450	<.5	10	1.0	0	.0
SEP											
26...	530	5	20	0	3200	270	<.5	20	--	0	.0

15 CNM ** PINEY FORK AT DILLONVALE OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL , 1975											
01...	1315	E7.0	25.5	2020	7.2	7.7	--	200	20	790	14
SEP											
26...	1330	E20	15.5	1300	7.4	8.6	--	184	12	540	15

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL , 1975											
01...	7300	1	40	20	25000	870	<.5	120	3.4	6	.0
SEP											
26...	2800	5	30	10	8800	640	<.5	40	--	1	.0

16 WSM ** WHEELING CREEK ATBANNOCK OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUN , 1975											
25...	1130	E10	24.5	1690	8.2	9.3	--	356	3.6	510	38
SEP											
23...	1130	E20	14.5	1300	7.7	10.4	--	248	7.9	430	20

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUN , 1975											
25...	220	0	10	0	260	380	<.5	40	6.2	1	.2
SEP											
23...	360	0	<10	10	930	1100	<.5	30	7.1	0	.2

17 RSM ** CRABAPPLE CREEK NEAR FAIRPOINT OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUN , 1975											
26...	1430	E6.0	23.5	3520	7.2	6.5	--	288	29	1500	14
SEP											
24...	1145	E20	14.0	2000	7.5	8.8	--	234	12	710	15

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUN , 1975											
26...	5700	1	60	20	33000	810	.7	130	3.2	0	.2
SEP											
24...	5800	8	80	10	28000	1400	<.5	80	7.6	0	.0

18 RSM ** MCCRACKEN RUN ABOVE FAIRPOINT OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUN , 1975											
26...	1230	E.20	23.0	2200	7.5	6.2	--	256	13	930	4.0
SEP											
23...	1530	E1.0	16.0	1900	7.3	7.8	--	226	18	930	6.0

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUN , 1975											
26...	70	0	<10	10	440	290	.5	60	2.4	3	.1
SEP											
23...	190	1	20	10	1200	750	<.5	40	4.1	0	.5

19 CNM ** MCCRACKEN RUN AT FAIRPOINT OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUN 1975											
26...	0945	E1.0	21.0	2910	6.8	6.5	--	178	45	1300	12
SEP											
24...	0930	E6.0	14.0	1900	7.2	8.6	--	240	24	470	15

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUN 1975											
26...	9500	3	110	20	66000	530	.6	220	6.7	0	.2
SEP											
24...	2000	4	60	10	20000	300	<.5	60	12	0	.2

20 RSM ** COX RUN NEAR MIDWAY OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUN 1975											
26...	1130	E.50	20.5	1560	8.1	8.4	--	278	3.5	520	8.0
SEP											
26...	1100	E5.0	15.0	1400	7.8	8.9	--	252	6.4	570	15

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUN 1975											
26...	260	0	10	10	380	280	<.5	60	4.0	4	.2
SEP											
26...	330	0	20	0	650	170	<.5	10	--	0	.0

21 CNM WHEELING CREEK AT BLAINE OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
SEP 1975											
23...	1300	E30	15.0	2000	7.5	9.4	--	228	12	300	25

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
SEP 1975											
23...	4400	2	40	10	13000	670	<.5	80	3.2	0	.0

22 WSM ** BRUSH RUN NEAR ST CLAIRSVILLE OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL , 1975											
02...	1315	E.10	23.5	1140	7.2	8.4	--	320	32	270	80
SEP											
24...	1600	E2.0	13.5	290	7.1	8.2	--	48	6.1	52	9.0

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL , 1975											
02...	180	1	0	0	450	4200	<.5	10	7.6	0	.1
SEP											
24...	970	1	<10	10	1300	710	<.5	40	5.7	0	.3

23 UNM ** MCMAHON CREEK NEAR WARNOCK OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUN , 1975											
25...	1320	E9.0	27.0	459	8.1	8.8	--	182	2.3	57	22
SEP											
23...	1410	E20	14.5	430	7.6	10.8	--	168	6.8	48	16

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUN , 1975											
25...	320	0	<10	10	470	50	<.5	50	4.4	4	.5
SEP											
23...	120	0	<10	0	230	20	<.5	20	2.5	1	.2

24 WDM ** LITTLE MCMAHON CREEK NEAR ST CLAIRSVILLE OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUN , 1975											
24...	1320	E.30	27.5	3210	2.7	6.4	21	0	.0	340	40
SEP											
23...	1230	E1.0	15.5	1150	4.3	9.2	5.6	0	.0	330	40

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUN , 1975											
24...	55000	15	230	40	290000	10000	1.9	580	4.6	2	.0
SEP											
23...	21000	24	10	20	130000	3100	<.5	180	3.6	1	.0

25 CNM ** LITTLE MCMAHON CREEK BELOW AULTS RUN NEAR ST CLAIRSVILLE OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUN , 1975											
25...	1525	E3.0	26.5	1120	8.4	7.5	--	176	1.1	1500	60
SEP											
23...	1100	E8.0	13.5	960	7.4	9.9	--	188	12	230	38

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUN , 1975											
25...	1100	1	10	10	2100	870	.7	70	2.6	7	.3
SEP											
23...	3200	4	0	10	20000	880	<.5	50	4.0	0	.0

26 ASM ** KINGS RUN AT WILLOW GROVE OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUN , 1975											
25...	1615	E.10	24.5	3300	3.0	6.6	23	0	.0	1800	45
SEP											
24...	1400	E2.0	14.5	800	6.0	8.0	--	30	48	320	10

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUN , 1975											
25...	95000	4	210	20	310000	4000	1.2	1400	12	3	.3
SEP											
24...	25000	43	180	80	85000	1900	<.5	420	2.1	0	.0

27 ADM MCMAHON CREEK AT BELLAIRE OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
NOV , 1975											
05...	1100	E19	14.5	820	7.4	7.8	--	200	13	230	20

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
NOV , 1975											
05...	530	0	<10	10	1400	210	<.5	20	2.1	0	.5

28 UNM CAPTINA CREEK ABOVE ALLEDONIA OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL , 1975											
21...	1215	E6.0	29.5	440	8.1	10.1	--	208	2.6	40	18
NOV											
05...	1620	E7.3	15.5	390	8.1	10.6	--	176	2.2	43	14

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL , 1975											
21...	190	1	<10	0	290	50	<.5	10	1.8	0	.0
NOV											
05...	0	0	0	10	80	20	<.5	20	4.2	1	.5

29 WDM HUNTER RUN NEAR ALLENDONIA OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL , 1975											
21...	1435	E.30	29.5	2800	7.8	7.1	--	168	4.3	820	165
NOV											
05...	1515	E.15	18.0	3500	7.7	7.6	--	212	6.8	1000	340

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL , 1975											
21...	830	3	10	10	2300	470	<.5	40	1.8	5	.0
NOV											
05...	320	1	<10	0	1500	830	<.5	40	13	0	.2

30 WDM CAPTINA CREEK NEAR CAPTINA OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL , 1975											
21...	1605	E10	30.5	625	7.5	8.2	--	180	9.1	120	24
NOV											
05...	1400	E15	14.5	610	7.3	8.6	--	176	14	130	24

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL , 1975											
21...	330	0	0	0	880	100	<.5	10	1.6	0	.0
NOV											
05...	180	0	0	0	770	100	<.5	20	2.6	0	.3

31 UNM CAT RUN ABOVE MINE NEAR STEINERSVILLE OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL , 1975											
21...	1730	E1.0	28.5	400	7.9	7.6	--	176	3.5	51	6.0
NOV											
05...	1215	E.98	15.5	430	8.0	8.8	--	196	3.1	56	6.0

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL , 1975											
21...	8300	5	10	50	36000	910	.5	250	1.0	0	.0
NOV											
05...	80	1	0	0	50	10	<.5	20	3.5	0	.0

32 WDM CAT RUN BELOW MINE NEAR STEINERSVILLE OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL , 1975											
21...	1855	E2.0	27.0	1000	4.7	5.8	--	2	64	370	25
NOV											
05...	1245	E1.2	16.0	800	6.3	8.8	--	56	45	320	18

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL , 1975											
21...	80	0	<10	0	110	10	<.5	10	1.4	0	.0
NOV											
05...	9000	13	10	40	39000	530	<.5	160	1.6	0	.0

33 UNM SUNFISH CREEK NEAR CAMERON OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL , 1975											
22...	1330	E31	27.0	420	7.7	6.3	--	176	5.6	27	32
NOV											
06...	1430	E18	15.5	340	7.5	9.0	--	144	7.3	32	24

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL , 1975											
22...	120	1	0	0	200	40	.5	10	2.0	0	.0
NOV											
06...	150	0	0	10	40	20	<.5	20	5.9	0	1.0

34 UNM FLATROCK CREEK NEAR CAMERON OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL , 1975											
21...	1245	E.10	22.5	410	7.3	6.4	--	158	13	69	6.0
NOV											
06...	1240	E.03	15.5	410	7.2	8.4	--	140	14	92	8.0

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL , 1975											
21...	440	0	<10	0	680	20	<.5	10	2.0	0	.0
NOV											
06...	50	0	<10	0	60	10	<.5	10	2.7	0	.2

35 UNM NIGGER RUN NEAR CLARINGTON OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL , 1975											
22...	1045	E2.0	23.5	350	7.4	7.1	--	152	9.7	45	6.0
NOV											
06...	1030	E.32	16.0	350	8.1	9.2	--	132	1.7	56	8.0

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL , 1975											
22...	800	0	<10	0	1200	50	<.5	10	1.0	0	.0
NOV											
06...	20	0	0	0	40	10	<.5	20	2.3	0	.3

36 UNM CRANENEST FORK NEAR WOODSFIELD OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUN , 1975											
13...	1315	E10	19.5	370	7.4	7.4	--	102	6.5	31	32
NOV											
20...	1500	E15	8.0	280	7.6	11.4	--	100	4.0	33	22

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUN , 1975											
13...	140	1	20	10	270	40	<.5	10	7.0	1	.2
NOV											
20...	90	0	0	10	120	40	<.5	20	4.4	4	.0

37 UNM RICH FORK NEAR WOODSFIELD OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUN , 1975											
13...	1445	E20	20.5	340	7.7	7.7	--	142	4.5	28	12
NOV											
20...	1630	E17	8.0	335	8.0	11.8	--	160	2.6	27	14

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUN , 1975											
13...	100	1	30	20	350	30	<.5	20	2.1	1	.0
NOV											
20...	30	0	<10	0	60	20	<.5	20	2.5	3	.5

38 UNM MOSS RUN NEAR MOSS RUN OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUN , 1975											
12...	1330	E.30	22.0	460	7.0	7.8	--	100	16	120	6.0
NOV											
19...	0930	E.45	5.0	455	6.7	10.5	--	55	18	160	8.0

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUN , 1975											
12...	3800	1	30	20	4500	2400	<.5	50	6.5	0	.0
NOV											
19...	1300	0	0	0	1200	380	<.5	40	3.2	0	.0

39 UNM MOSS RUN TRIBUTARY AT MOSS RUN OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUN , 1975											
12...	1445	E.20	21.0	330	7.2	6.9	--	86	8.7	65	10
NOV											
19...	1030	E.40	6.0	285	6.9	10.6	--	70	14	69	6.0

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUN , 1975											
12...	950	0	10	10	520	270	<.5	20	4.1	1	.0
NOV											
19...	1000	0	0	0	380	280	<.5	50	1.8	0	.0

40 UNM WEST FORK DUCK CREEK NEAR AVA OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
MAY , 1975											
22...	1200	E.50	21.0	455	7.6	8.3	--	155	6.2	52	22
SEP											
23...	1530	E2.0	14.0	390	7.5	9.4	--	140	7.1	44	17

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
MAY , 1975											
22...	360	1	0	10	490	90	<.5	20	9.7	0	.0
SEP											
23...	30	0	<10	0	200	70	<.5	20	--	1	.5

41 RSM COAL RUN AT HIRAMSBURG OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
MAY , 1975											
22...	1700	E4.0	22.0	1580	7.8	7.8	--	163	4.1	660	10
NOV											
18...	1230	E2.7	9.0	1660	7.6	11.4	--	194	7.8	910	15

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
MAY , 1975											
22...	940	0	10	10	430	1500	<.5	20	8.0	4	.0
NOV											
18...	1200	0	0	10	490	2000	<.5	50	2.3	0	.0

42 RSM WEST FORK DUCK CREEK AT BELLE VALLEY OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
MAY , 1975											
22...	1400	E20	22.0	800	7.6	7.6	--	199	8.0	220	16
NOV											
18...	1400	E12	6.5	770	7.5	11.2	--	202	10	230	18

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
MAY , 1975											
22...	640	1	<10	10	750	240	<.5	20	12	0	.0
NOV											
18...	120	0	0	0	190	150	<.5	10	3.5	0	.0

43 RSM W F DUCK C AT DEXTER CITY OH

WATER QUALITY DATA

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE, WATER (DEG C)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH FIELD (UNITS)	OXYGEN, DIS-SOLVED (MG/L)	BICAR-BONATE (MG/L AS HCO3)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	ALUMI-NUM, TOTAL (UG/L AS AL)
JUN , 1975											
13...	1000	E70	19.5	580	7.4	7.7	179	11	110	18	2600
NOV											
20...	0930	E40	6.0	690	7.1	10.5	251	33	160	38	410

DATE	ARSENIC TOTAL (UG/L AS AS)	CHRO-MIUM, TOTAL (UG/L AS CR)	COPPER, TOTAL (UG/L AS CU)	IRON, TOTAL (UG/L AS FE)	MANGA-NESE, TOTAL (UG/L AS MN)	MERCURY TOTAL (UG/L AS HG)	ZINC, TOTAL (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	PHENOLS (UG/L)	HYDRO-GEN SULFIDE DISS. (MG/L AS H2S)
JUN , 1975										
13...	1	30	20	3200	430	<.5	40	4.5	0	.0
NOV										
20...	1	NO	<20	280	370	<.5	30	2.9	0	.0

44 ASM BUFFALO RUN NEAR DEXTER CITY OH

WATER QUALITY DATA

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	TEMPER-ATURE (DEG C)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	DIS-SOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)
MAY , 1975											
28...	1400	E2.0	26.0	1600	3.2	7.3	3.0	0	.0	800	6.0
NOV											
18...	1730	E3.3	9.0	1480	4.5	10.1	3.7	0	.0	830	15

DATE	TOTAL ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDRO-GEN SULFIDE (MG/L)
MAY , 1975											
28...	17000	0	30	30	2500	9000	.5	420	.9	0	.0
NOV											
18...	14000	1	10	10	2700	7100	<.5	320	.9	1	.0

45 ASM GOOSE HOLLOWRUN NEAR MACKSBURG OH

WATER QUALITY DATA

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	TEMPER-ATURE (DEG C)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	DIS-SOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)
MAY , 1975											
28...	1630	E.70	25.0	1640	3.1	7.6	4.3	0	.0	700	38
NOV											
19...	1730	E1.5	8.0	1350	4.1	9.0	2.1	0	.0	710	35

DATE	TOTAL ALUM-INUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDRO-GEN SULFIDE (MG/L)
MAY , 1975											
28...	20000	0	30	50	6000	9000	.8	440	11	0	.1
NOV											
19...	14000	0	0	30	5400	6200	<.5	280	4.5	0	.0

46 CNM WEST FORK DUCK CREEK NEAR WARNER OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
MAY											
29...	1130	E60	21.0	690	7.1	7.4	--	143	18	180	16
NOV											
19...	1630	E54	8.0	800	7.0	10.4	--	137	22	290	22

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
MAY											
29...	1200	1	10	10	460	1100	<.5	20	9.4	32	.0
NOV											
19...	1900	0	0	0	670	2000	.5	60	3.5	0	.0

47 UNM FLAG RUN NEAR FLAG OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
MAY											
29...	1630	E.80	24.0	495	7.6	8.1	--	110	4.4	120	3.0
NOV											
20...	1300	E2.8	10.0	385	7.5	10.4	--	122	6.2	93	6.0

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
MAY											
29...	190	0	10	10	160	290	<.5	0	9.3	0	.0
NOV											
20...	300	0	0	0	200	430	<.5	10	2.1	0	.0

48 UNM ROAD FORK AT ROAD FORK OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
MAY											
29...	1730	E3.0	24.0	590	7.5	7.7	--	121	6.1	140	12
NOV											
20...	1200	E6.4	8.0	450	7.4	10.8	--	147	9.4	93	10

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
MAY											
29...	250	0	<10	10	250	280	<.5	10	16	3	.0
NOV											
20...	390	0	0	0	440	250	<.5	20	2.8	0	.0

49 ASM MIDDLE FORK DUCK CREEK NEAR MIDDLEBURG OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
MAY , 1975											
28...	1300	E6.0	27.5	900	6.1	7.1	--	47	60	350	9.0
NOV											
18...	1600	E8.4	10.0	910	6.6	10.1	--	76	31	350	12

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
MAY , 1975											
28...	7200	1	40	20	5600	5000	1.6	180	14	8	.5
NOV											
18...	6800	1	10	10	3700	5200	<.5	160	2.5	2	.0

50 UNM WHIPPLE RUN NEAR WHIPPLE OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
MAY , 1975											
29...	0900	E1.0	18.0	495	7.7	7.3	--	218	7.0	60	11
NOV											
19...	1500	E3.8	8.0	440	7.8	12.0	--	186	4.7	71	12

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
MAY , 1975											
29...	90	32	10	20	160	70	<.5	10	4.1	0	.0
NOV											
19...	90	0	0	0	60	40	<.5	20	1.5	0	.0

51 CNM DUCK CREEK AT STANLEYVILLE OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUN , 1975											
12...	1600	E338	20.5	750	7.1	7.1	--	98	12	230	14

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUN , 1975											
12...	800	2	20	20	490	220	<.5	40	6.0	0	.0

52 UNM CONOTTON CREEK NEAR CADIZ JUNCTION OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL , 1975											
02...	1100	E.40	19.0	938	7.7	8.8	--	180	5.7	290	18
OCT											
29...	1120	E.75	12.5	800	7.5	9.5	--	136	6.9	270	16

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL , 1975											
02...	100	0	<10	10	410	130	<.5	10	8.8	8	.0
OCT											
29...	40	0	0	0	210	160	<.5	10	3.0	0	.0

53 RSA THOMPSON RUN AT SHERRODSVILLE OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL , 1975											
16...	1405	E1.0	21.5	732	6.6	8.1	--	96	39	140	70
OCT											
22...	1600	E3.6	16.0	425	7.0	9.2	--	52	8.3	88	40

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL , 1975											
16...	140	3	0	10	810	1800	<.5	20	8.0	0	.1
OCT											
22...	330	0	0	0	980	760	<.5	20	7.1	0	.0

54 ASA X RUN NEAR MINERAL CITY OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL , 1975											
09...	1315	E.40	25.5	3500	3.8	7.1	1.2	0	.0	2000	40
OCT											
23...	1045	E1.6	12.5	1800	6.4	9.8	--	22	14	970	55

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL , 1975											
09...	3600	0	30	20	4800	46000	1.5	300	3.6	13	.0
OCT											
23...	2100	1	10	0	5200	16000	<.5	110	8.0	1	.0

55 CNA HUFF RUN AT MINERAL CITY OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL , 1975											
09...	1530	E5.0	23.0	1640	3.4	7.0	2.1	0	.0	650	75
OCT											
23...	1220	E8.4	12.5	1100	4.1	9.7	1.1	0	.0	430	70

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL , 1975											
09...	5200	0	10	10	25000	23000	3.2	370	4.6	3	.1
OCT											
23...	3500	0	0	0	13000	12000	<.5	160	7.2	0	.2

56 UNA STONE CREEK NEAR STONE CREEK OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL , 1975											
15...	1150	E2.0	23.0	380	7.5	7.6	--	96	4.9	54	24
OCT											
22...	1145	E5.2	14.0	240	6.5	9.7	--	52	26	45	12

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL , 1975											
15...	200	0	0	0	660	200	<.5	10	5.0	0	.1
OCT											
22...	160	1	0	0	710	190	<.5	20	4.5	0	.0

57 CNA CROOKED RUN NEAR NEW PHILADELPHIA OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL , 1975											
15...	1400	E.40	25.5	1850	3.0	6.9	4.9	0	.0	630	86
OCT											
22...	1310	E2.1	16.5	700	4.3	9.3	1.0	0	.0	270	28

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL , 1975											
15...	20000	2	10	30	22000	5600	<.5	320	11	0	.0
OCT											
22...	5400	0	0	0	6500	1900	<.5	90	8.6	0	.0

58 CNA OLDTOWN CREEK NEAR NEW PHILADELPHIA OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL , 1975											
15...	1545	E3.0	19.5	1370	6.6	6.7	--	18	7.2	430	16
OCT											
23...	0850	E7.7	11.5	785	6.6	9.6	--	36	14	310	20

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL , 1975											
15...	1800	0	<10	10	1100	5200	<.5	100	7.8	3	.0
OCT											
23...	1200	1	0	10	4600	2700	<.5	60	7.7	0	.0

59 CNA MUD RUN NEAR TUSCARAWAS OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL , 1975											
16...	0945	E.60	20.5	2920	2.8	5.5	15	0	.0	1400	14
OCT											
22...	1720	E2.3	16.5	1200	3.2	8.7	4.0	0	.0	550	15

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL , 1975											
16...	32000	4	20	30	300000	15000	1.1	660	15	0	.0
OCT											
22...	990	3	10	10	72000	3800	<.5	160	3.5	0	.0

60 WSM STILLWATER CREEK NEAR MORRISTOWN OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL , 1975											
02...	1430	E3.0	27.0	1500	7.5	7.8	--	215	11	560	11
SEP											
23...	1550	E7.0	17.5	1350	7.4	9.6	--	192	12	490	15

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL , 1975											
02...	230	3	20	10	670	550	<.5	20	3.6	0	.1
SEP											
23...	200	1	20	10	290	630	<.5	20	6.8	3	.2

61 WSM SPENCER CREEK NEAR HENDRYSBURG

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
OCT , 1975											
15...	1115	E6.3	16.5	1180	7.7	8.8	--	248	7.9	410	20

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
OCT , 1975											
15...	180	1	20	10	300	310	<.5	170	2.4	0	.0

62 RSM SIXTEEN VALLEY CREEK NEAR HENDRYSBURG OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
OCT , 1975											
15...	1400	E1.8	19.5	2100	7.1	8.7	--	132	17	1100	15

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
OCT , 1975											
15...	220	0	10	10	240	370	<.5	20	1.8	0	.0

63 RSM BOGGS FORK NEAR HOLLOWAY OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL , 1975											
28...	1400	E3.0	25.0	2100	8.2	8.5	--	240	2.4	880	25
NOV											
03...	1250	E3.3	13.5	1740	6.9	9.9	--	294	59	910	20

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL , 1975											
28...	120	0	10	10	250	350	<.5	20	1.8	7	.0
NOV											
03...	30	0	<10	10	230	380	<.5	20	2.6	10	.0

64 RSM TRAIL RUN AT HOLLOWAY OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL 28...	1130	E.90	24.0	2100	8.1	7.8	--	266	3.4	870	16
NOV 03...	1120	E2.5	13.5	1680	7.3	12.4	--	226	18	730	20

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL 28...	140	1	10	10	360	620	<.5	20	2.2	4	.0
NOV 03...	40	0	0	10	210	520	<.5	20	2.1	2	.0

65 RSM SKULL FORK NEAR LONDONDERRY OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL 28...	1510	E1.0	25.5	2230	7.6	7.9	--	88	3.5	1020	18
OCT 15...	1620	E1.2	18.5	2000	7.2	9.0	--	116	12	1000	20

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL 28...	760	0	10	290	290	9300	<.5	230	1.8	4	.0
OCT 15...	9200	22	30	30	3900	10000	<.5	150	4.6	0	.0

66 RSM CROSSONBES RUN NEAR LONDONDERRY OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
OCT 15...	1515	E.80	18.0	425	7.1	8.2	--	136	17	90	12

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
OCT 15...	230	0	10	0	290	3400	<.5	60	1.4	0	.0

67 RSM ** SOUTH FORK NEAR FLUSHING OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL 1975											
28...	1245	E3.0	23.0	2700	8.0	7.3	--	268	4.3	1250	8.0
OCT											
29...	1240	E7.3	12.5	2400	7.8	9.8	--	284	7.2	1200	20

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL 1975											
28...	100	0	10	10	210	500	<.5	30	11	5	.0
OCT											
29...	180	0	10	10	280	420	<.5	10	6.4	0	.0

68 CNA PLUM RUN NEAR BOWERSTON OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL 1975											
16...	1130	E.40	25.0	1150	5.2	7.8	--	4	40	410	12
OCT											
22...	1440	E1.7	15.5	460	6.6	8.9	--	42	17	160	10

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL 1975											
16...	840	0	10	10	640	9000	<.5	100	5.0	0	.0
OCT											
22...	360	1	0	0	1900	1100	<.5	30	4.4	0	.0

69 CNA ROBINSON RUN NEAR COSHOCTON OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL 1975											
10...	1130	E3.0	18.0	1200	3.7	8.3	1.7	0	.0	500	12
SEP											
29...	1045	E6.0	12.0	1050	4.4	10.4	1.7	0	.0	490	25

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL 1975											
10...	4200	0	20	10	21000	5900	2.1	170	9.4	0	.0
SEP											
29...	4800	0	10	20	26000	6700	<.5	100	2.2	1	.0

70 RSM MILLER CREEK NEAR CUMBERLAND OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
MAY , 1975											
21...	1700	E10	24.0	2010	7.8	8.6	--	142	3.6	920	12
SEP											
23...	1130	E10	14.5	1920	7.5	7.4	--	182	35	860	25

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
MAY , 1975											
21...	1600	0	10	10	580	2700	<.5	40	9.0	0	.0
SEP											
23...	2100	1	20	10	1300	3200	<.5	40	3.9	0	.3

71 RSM RANNELS CREEK NEAR CUMBERLAND OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
MAY , 1975											
22...	1000	E6.0	19.0	1580	7.7	7.9	--	208	6.6	490	8.0
SEP											
23...	1400	E5.0	14.5	1440	7.6	9.2	--	229	9.2	410	15

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
MAY , 1975											
22...	2900	6	10	20	8400	1200	<.5	40	18	0	.5
SEP											
23...	290	1	20	0	330	1000	<.5	10	14	0	.0

72 RSM YOKER CREEK NEAR CUMBERLAND OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL , 1975											
17...	1050	E2.0	22.0	1770	7.4	7.3	--	150	9.6	810	12
NOV											
18...	1100	E5.7	10.5	1180	7.6	10.8	--	214	8.6	510	20

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL , 1975											
17...	270	0	10	10	250	3100	<.5	20	11	0	.2
NOV											
18...	420	0	0	0	200	3500	<.5	30	4.5	0	.0

73 RSM BUFFALO FORK AT PLEASANT CITY OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
AUG , 1975											
06...	1400	E22	21.0	1430	7.3	6.7	--	130	10	550	16
NOV											
03...	1500	E27	13.5	1270	6.8	9.0	--	180	46	570	30

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
AUG , 1975											
06...	1900	2	0	10	2800	1300	<.5	30	3.8	7	.0
NOV											
03...	80	0	0	10	560	770	<.5	20	3.2	0	.0

74 UNM SOUTH FORK WILLS CREEK NEAR SUMMERFIELD OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
OCT , 1975											
14...	1520	E7.2	18.0	425	7.6	11.8	--	216	8.7	39	14

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
OCT , 1975											
14...	120	0	0	10	50	0	<.5	30	1.6	0	.0

75 UNM PAYNES FORK WILLS CREEK AT CALAIS OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
OCT , 1975											
14...	1330	E7.6	18.5	475	7.3	10.6	--	252	20	41	8.0

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
OCT , 1975											
14...	160	0	0	0	320	70	<.5	10	1.6	0	.0

76 UNM LEATHERWOOD CREEK AT BAILEYS MILLS OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL , 1975											
22...	1535	E1.0	27.0	960	7.2	8.0	--	112	11	320	8.0
OCT											
15...	1240	E.95	17.0	800	7.1	8.7	--	148	19	290	10

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL , 1975											
22...	220	1	<10	10	430	1200	<.5	20	1.4	0	.0
OCT											
15...	130	0	0	20	510	890	<.5	20	2.8	0	.0

77 RSM LEATHERWOOD CREEK AT QUAKER CITY OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL , 1975											
17...	1345	E6.0	23.0	1030	7.1	7.3	--	108	14	360	8.0
OCT											
14...	1100	E5.8	17.0	900	7.1	9.6	--	132	17	340	10

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL , 1975											
17...	290	0	<10	10	280	1800	<.5	30	8.8	0	.0
OCT											
14...	240	0	0	0	340	1700	<.5	30	1.8	0	.0

78 UNA SUGARTREE FORK NEAR WINTERSET OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
AUG , 1975											
07...	1055	E3.0	19.0	390	7.5	7.6	--	152	7.7	22	34
OCT											
30...	1130	E6.5	9.5	245	7.4	11.5	--	105	6.7	28	9.0

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
AUG , 1975											
07...	250	0	<10	10	800	180	<.5	10	4.2	0	.0
OCT											
30...	50	0	0	10	390	70	<.5	10	3.0	0	.0

79 UNA CLEAR FORK NEAR BIRMINGHAM OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
AUG , 1975											
07...	1210	E2.0	20.0	740	7.4	8.2	--	136	8.8	41	130
OCT											
30...	1310	E3.2	9.5	260	7.0	10.6	--	89	14	28	16

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
AUG , 1975											
07...	290	0	<10	10	1100	340	<.5	10	5.8	5	.0
OCT											
30...	20	0	0	0	530	130	<.5	10	2.7	1	.0

80 RSA RECLAIM RUN NEAR PLAINFIELD OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL , 1975											
10...	1710	E.30	24.5	1770	6.7	7.4	--	68	22	800	6.0
SEP											
29...	1530	E1.0	17.5	1300	6.8	8.4	--	76	19	620	8.0

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL , 1975											
10...	50	0	10	10	600	2600	.7	40	9.4	0	.0
SEP											
29...	490	0	10	20	1800	2800	<.5	30	2.6	0	.0

81 ADA LITTLE WHITE EYES RUN NEAR OTSEGO OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
AUG , 1975											
07...	1430	E.10	26.0	3100	2.4	7.1	18	0	.0	1400	15
SEP											
30...	1230	E.30	19.0	1800	2.7	8.4	10	0	.0	870	6.0

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
AUG , 1975											
07...	37000	0	30	50	220000	10000	<.5	1000	1.0	0	.0
SEP											
30...	22000	0	20	40	120000	7700	<.5	660	1.2	0	.0

82 UNA ELUSIVE RUN NEAR PLAINFIELD OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
SEP • 1975											
30...	1100	E.70	15.5	200	7.2	9.0	--	68	6.9	31	3.0

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
SEP • 1975											
30...	1200	2	10	20	2800	900	<.5	30	2.0	2	.0

83 CNA DUMP RUN NEAR WILLS CREEK OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL • 1975											
10...	1555	E.10	19.0	1480	2.9	--	7.4	0	.0	560	5.0
SEP											
29...	1420	E.10	16.0	1000	3.8	9.2	4.9	0	.0	490	3.0

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL • 1975											
10...	1300	2	30	10	20000	4000	2.5	310	5.4	0	.0
SEP											
29...	28000	0	20	20	63000	3000	<.5	210	14	0	.0

84 RSA Z RUN NEAR WILLS CREEK OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL • 1975											
10...	1430	E2.0	22.0	1370	6.1	7.7	--	38	48	610	8.0
SEP											
29...	1310	E5.0	14.5	1200	6.3	9.5	--	38	30	580	15

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL • 1975											
10...	580	0	10	10	19000	4100	1.6	120	4.8	0	.0
SEP											
29...	580	0	10	20	14000	3700	<.5	90	4.0	0	.0

85 CNA Y RUN NEAR WILLS CREEK OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL 1975											
10...	1305	E.30	21.0	1470	3.3	7.5	2.2	0	.0	630	16
SEP											
29...	1215	E.60	14.0	1450	3.4	9.4	1.9	0	.0	710	20

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL 1975											
10...	2300	0	10	0	20000	6900	1.7	80	7.0	5	.0
SEP											
29...	2400	0	10	20	23000	8400	<.5	100	19	0	.0

86 CNA MOXAHALA CREEK NEAR BRISTOL OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
MAY 1975											
07...	1435	E1.0	19.0	1560	3.0	9.8	7.0	0	.0	470	74
SEP											
08...	1415	E.50	23.0	2900	2.5	6.9	14	0	.0	930	200

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
MAY 1975											
07...	20000	9	140	120	82000	3200	<.5	280	2.1	0	.0
SEP											
08...	42000	0	30	60	140000	14000	<.5	700	2.8	0	.0

87 CNA MOXAHALA CREEK AT MOXAHALA OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
MAY 1975											
08...	1130	E10	17.5	1120	3.8	9.8	1.3	0	.0	430	22
SEP											
08...	1505	E5.0	23.5	2500	2.7	8.4	5.0	0	.0	1000	200

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
MAY 1975											
08...	8000	0	10	20	4100	10000	<.5	240	.6	4	.0
SEP											
08...	22000	0	10	10	11000	19000	<.5	550	3.0	0	.0

88 WDA UNNAMED TRIBUTARY TO MOXAHALA CREEK NEAR MOXAHALA OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
MAY , 1975											
08...	1330	E6.0	24.0	3700	3.0	7.7	16	0	.0	1900	48
SEP											
15...	1310	E7.0	21.0	3800	2.9	7.6	15	0	.0	1800	35

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
MAY , 1975											
08...	55000	2	290	30	25000	61000	<.5	1700	1.9	0	.0
SEP											
15...	49000	5	10	30	240000	55000	<.5	1400	3.7	1	.0

89 CNA MOXAHALA CREEK AT CROOKSVILLE OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
MAY , 1975											
13...	1200	E50	15.0	1850	3.3	8.2	4.8	0	.0	770	22
SEP											
09...	1205	E50	20.0	2900	2.6	7.4	9.6	0	.0	1200	35

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
MAY , 1975											
13...	21000	0	80	30	37000	19000	<.5	420	1.3	4	.1
SEP											
09...	38000	10	20	30	81000	20000	<.5	780	6.2	0	.0

90 CNA MOXAHALA CREEK AT ROSEVILLE OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
MAY , 1975											
14...	1350	E58	18.0	1790	3.7	8.4	4.6	0	.0	770	20
SEP											
09...	1445	E54	23.0	2600	2.6	7.8	7.7	0	.0	1100	30

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
MAY , 1975											
14...	22000	2	80	30	36000	16000	<.5	400	6.6	9	.0
SEP											
09...	30000	0	10	20	32000	18000	<.5	560	1.6	0	.0

91 CNA BUCKEYE FORK AT SALTILLO OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
MAY , 1975											
14...	1135	E8.0	14.0	2280	3.9	8.9	5.0	0	.0	840	32
SEP											
09...	1030	E7.0	18.0	3000	2.7	8.6	7.8	0	.0	1400	20

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
MAY , 1975											
14...	31000	0	50	30	18000	3200	<.5	900	1.0	8	.0
SEP											
09...	45000	1	10	30	21000	45000	<.5	1100	2.1	0	.0

92 CNA MOXAHALA CREEK NEAR ZANESVILLE OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
MAY , 1975											
14...	1615	E201	19.0	1060	4.1	9.3	3.5	0	.0	410	28
SEP											
15...	1530	E138	16.0	1100	4.7	9.2	--	1	32	330	32

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
MAY , 1975											
14...	6700	1	20	800	10000	8200	<.5	2500	1.6	12	.0
SEP											
15...	5000	0	<10	10	7500	8900	<.5	170	11	0	.0

93 UNA SALT CREEK NEAR BRIDGEVILLE OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
MAY , 1975											
28...	1345	E10	22.0	320	7.1	8.6	--	114	14	28	28
OCT											
03...	1230	E12	11.5	320	7.0	11.0	--	110	18	31	22

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
MAY , 1975											
28...	240	0	<10	10	950	270	.5	10	3.4	0	.0
OCT											
03...	170	0	10	10	840	170	<.5	20	6.4	0	.0

94 RSA ** LITTLE SALT CREEK NEAR ZANESVILLE OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
MAY , 1975											
28...	1200	E2.0	21.0	442	7.0	8.5	--	108	17	79	30
SEP											
18...	1045	E20	17.5	290	7.2	7.0	--	66	6.7	26	24

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
MAY , 1975											
28...	470	1	20	10	1300	470	.9	20	4.5	0	.0
SEP											
18...	6100	12	10	10	12000	1700	<.5	70	18	4	.0

95 RSM FREELAND FORK NEAR CHANDLERSVILLE OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
MAY , 1975											
29...	1130	E.30	21.0	950	7.8	8.2	--	208	5.3	310	19
SEP											
30...	1430	E.70	18.5	850	7.7	10.2	--	214	6.8	239	20

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
MAY , 1975											
29...	70	0	<10	0	80	20	<.5	10	4.0	16	.0
SEP											
30...	30	0	10	20	90	10	<.5	20	4.2	0	.0

96 RSA SALT CREEK NEAR DUNCAN FALLS OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
MAY , 1975											
29...	1430	E20	21.0	430	7.2	7.8	--	150	15	55	24
OCT											
03...	1045	E22	10.0	380	7.1	9.8	--	142	18	55	26

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
MAY , 1975											
29...	260	2	0	10	940	300	.5	20	3.0	0	.0
OCT											
03...	190	0	<10	10	930	190	<.5	20	4.2	11	.0

97 RSA ** BOGGS CREEK NEAR GRIFFIN OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
MAY , 1975											
29...	1000	E.60	18.0	580	7.1	6.8	--	108	14	150	26
SEP											
18...	1220	E7.0	18.0	240	7.3	7.6	--	64	5.1	38	7.0

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
MAY , 1975											
29...	670	1	20	0	1500	1400	.6	20	3.7	29	.0
SEP											
18...	4800	8	10	10	10000	860	<.5	60	8.0	2	.0

98 UNA ISLAND RUN AT EAGLEPORT OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
MAY , 1975											
30...	1045	E10	19.5	380	6.9	8.8	--	117	24	49	30
NOV											
11...	1400	E11	12.0	375	7.2	7.9	--	162	16	61	6.0

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
MAY , 1975											
30...	1800	2	20	10	3000	70	.5	20	4.5	13	.0
NOV											
11...	20	0	0	10	50	10	<.5	20	2.6	0	.0

99 RSM BRANNONS FORK NEAR REINERSVILLE OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUN , 1975											
06...	1330	E20	22.0	1510	7.8	7.4	--	166	4.2	640	10
NOV											
10...	1315	E9.2	14.5	1600	7.6	7.6	--	224	9.0	800	15

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUN , 1975											
06...	100	1	10	10	110	130	<.5	30	2.8	2	.0
NOV											
10...	20	1	10	10	90	200	<.5	20	3.5	0	.0

100 RSM HORSE RUN NEAR REINERSVILLE OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUN , 1975											
06...	1230	E20	20.5	1370	7.7	7.2	--	188	6.0	460	10
NOV											
10...	1100	E16	12.0	1350	7.5	7.9	--	232	12	570	15

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUN , 1975											
06...	180	0	10	10	220	210	<.5	20	2.4	0	.0
NOV											
10...	160	0	<10	10	330	310	<.5	10	3.5	0	.0

101 RSM DYES CREEK NEAR UNIONVILLE OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUN , 1975											
06...	1115	E70	20.0	1150	7.5	7.0	--	172	8.7	430	13
NOV											
10...	1530	E46	13.5	1350	7.7	8.4	--	232	7.4	600	15

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUN , 1975											
06...	1800	2	20	50	4500	500	<.5	30	4.8	0	.0
NOV											
10...	280	1	0	0	920	340	<.5	20	4.9	0	.0

102 RSM SHARON FORK NEAR SHARON OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
MAY , 1975											
28...	1100	E1.0	16.0	850	7.8	8.4	--	258	6.5	210	12
SEP											
24...	0930	E20	14.0	520	7.3	9.1	--	125	10	120	6.0

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
MAY , 1975											
28...	600	2	<10	10	900	200	<.5	0	13	0	.2
SEP											
24...	900	2	<10	10	1700	250	<.5	30	7.1	0	.0

103 RSM OLIVE GREEN CREEK NEAR BEVERLY OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUN , 1975											
05...	1245	130	19.0	428	7.9	6.7	--	190	3.8	59	10
NOV											
11...	0945	E103	12.0	520	7.7	8.5	--	308	9.8	37	12

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUN , 1975											
05...	1100	0	10	10	1500	100	<.5	30	3.1	0	.0
NOV											
11...	80	1	<10	10	70	10	<.5	10	2.0	0	.2

104 UNM WEST BRANCH WOLF CREEK NEAR MALTA OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
MAY , 1975											
30...	1230	E3.0	20.0	490	7.0	8.0	--	84	13	27	98
NOV											
11...	1200	E6.5	11.0	400	7.2	8.1	--	112	11	39	50

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
MAY , 1975											
30...	340	1	<10	0	560	40	<.5	20	7.0	0	.0
NOV											
11...	130	0	0	10	110	20	<.5	20	5.8	0	.2

105 UNM WEST BRANCH LITTLE HOCKING RIVER NEAR LITTLE HOCKING OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
DEC , 1975											
04...	1330	E25	4.0	240	6.7	10.2	--	82	26	46	12

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
DEC , 1975											
04...	220	0	10	0	480	60	<.5	10	4.7	0	.0

106 UNM EAST BRANCH LITTLE HOCKING RIVER NEAR PORTERFIELD OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
DEC , 1975											
04...	1230	E20	5.0	320	6.9	10.6	--	114	23	53	14

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
DEC , 1975											
04...	100	0	0	10	400	130	<.5	10	6.0	0	.0

107 ASA RUSH CREEK AT NEW LEXINGTON OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL , 1975											
29...	1420	E1.0	24.0	3850	2.8	6.6	13	0	.0	2300	46
OCT											
16...	1330	E1.8	14.5	2600	2.6	6.4	14	0	.0	1800	35

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL , 1975											
29...	49000	2	40	30	210000	79000	<.5	1200	.8	6	.0
OCT											
16...	80000	2	30	30	130000	50000	<.5	730	3.0	0	.0

108 ASA RUSH CREEK NEAR BREMEN OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL , 1975											
29...	1315	E10	21.5	1600	3.3	6.6	5.0	0	.0	710	82
OCT											
16...	1200	E9.0	14.5	1100	3.9	7.3	1.9	0	.0	410	100

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL , 1975											
29...	15000	0	20	10	13000	23000	.5	440	1.6	6	.0
OCT											
16...	9700	1	10	10	4800	11000	<.5	200	3.1	0	.0

109 ASA RUSH CREEK NEAR SUGAR GROVE OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL , 1975											
29...	1100	E46	23.0	885	6.5	5.8	--	74	37	230	62
OCT											
16...	1000	E35	15.5	750	6.7	6.1	--	116	37	180	64

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL , 1975											
29...	500	0	10	70	960	6600	<.5	170	2.8	5	.0
OCT											
16...	3400	3	10	10	4700	4600	<.5	80	3.0	0	.0

110 CNA MONDAY CREEK AT MC CUNEVILLE OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
MAY , 1975											
07...	1225	E4.0	15.0	1200	3.3	11.2	2.8	0	.0	380	36
SEP											
08...	1230	E2.0	21.0	2100	2.6	8.8	5.3	0	.0	600	200

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
MAY , 1975											
07...	11000	0	20	20	13000	5000	<.5	260	.8	8	.0
SEP											
08...	21000	0	10	20	11000	10000	<.5	420	1.6	1	.0

111 CNA LITTLE MONDAY CREEK NEAR MAXVILLE OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
MAY , 1975											
06...	1330	E6.0	19.0	1330	4.1	10.4	1.0	0	.0	360	160
SEP											
08...	1045	E3.0	12.5	1950	4.1	9.1	1.5	0	.0	400	300

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
MAY , 1975											
06...	8700	0	<10	0	1000	9000	<.5	280	1.8	0	.2
SEP											
08...	6000	1	10	10	550	12000	<.5	260	1.7	--	.0

112 CNA MONDAY CREEK NEAR GREENDALE OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
MAY , 1975											
06...	1615	E50	19.0	910	3.8	10.6	1.0	0	.0	270	68
SEP											
16...	1045	E50	15.5	1125	5.4	8.1	--	7	45	220	270

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
MAY , 1975											
06...	8000	1	20	10	1900	3400	<.5	170	1.7	0	.0
SEP											
16...	3700	0	<10	0	2000	4000	<.5	100	6.2	6	.0

113 ADA SNOW FORK NEAR MURRAY CITY OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
MAY , 1975											
21...	1210	E30	20.0	1190	3.9	9.1	.8	0	.0	410	11
SEP											
16...	1220	E10	16.0	1850	2.9	8.4	5.6	0	.0	710	30

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
MAY , 1975											
21...	17000	0	30	30	19000	530	<.5	340	1.6	0	.0
SEP											
16...	42000	0	10	20	25000	8300	<.5	550	1.9	2	.0

114 CNA MONDAY C AT DOANVILLE OH

WATER QUALITY DATA

DATE	TIME	STREAMFLOW, INSTANTANEOUS (CFS)	TEMPERATURE, WATER (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH FIELD (UNITS)	OXYGEN, DISSOLVED (MG/L)	ACIDITY TOTAL HEATED (MG/L AS H)	BICARBONATE (MG/L AS HCO3)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)
SEP , 1975											
17...	1115	E40	17.0	1200	3.5	7.9	2.0	0	.0	340	140

DATE	ALUMINUM, TOTAL (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	CHROMIUM, TOTAL (UG/L AS CR)	COPPER, TOTAL (UG/L AS CU)	IRON, TOTAL (UG/L AS FE)	MANGANESE, TOTAL (UG/L AS MN)	MERCURY TOTAL (UG/L AS HG)	ZINC, TOTAL (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	PHENOLS (UG/L)	HYDROGEN SULFIDE DISS. (MG/L AS H2S)
SEP , 1975											
17...	7900	<1	<20	20	5900	4500	<.5	190	1.1	0	2.0

115 CNA * PINE FORK NEAR HEMLOCK OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
MAY , 1975											
15...	1000	E.90	12.5	1270	4.2	5.2	2.6	0	.0	480	6.0
SEP											
15...	1030	E.70	13.5	1500	3.8	7.9	3.8	0	.0	580	5.0

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
MAY , 1975											
15...	10000	0	50	10	31000	2200	<.5	290	.6	0	.0
SEP											
15...	8600	0	<10	0	30000	2600	<.5	300	4.1	0	.0

116 CNA * WEST BRANCH SUNDAY CREEK AT DRAKES OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
MAY , 1975											
15...	1135	E8.0	13.5	828	4.6	8.9	--	14	563	310	22
SEP											
15...	1145	E5.0	15.5	900	4.3	8.6	.9	0	.0	330	26

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
MAY , 1975											
15...	5900	0	20	10	5000	2300	<.5	140	1.4	0	.1
SEP											
15...	4100	0	0	0	4400	4200	<.5	130	.8	1	.0

117 UNA EAST BRANCH SUNDAY CREEK ABOVE BURR OAK LAKE OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
MAY , 1975											
21...	1400	E10	21.0	238	6.7	8.5	--	88	28	37	8.0
SEP											
16...	1340	E7.0	17.0	280	6.9	7.9	--	98	20	22	12

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
MAY , 1975											
21...	370	1	<10	10	710	110	<.5	20	2.0	4	.0
SEP											
16...	110	0	<10	0	490	110	<.5	10	2.2	2	.0

118 CNA *** MUD FORK AT GLOUSTER OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
MAY , 1975											
15...	1440	E5.0	14.5	3070	5.8	8.1	--	30	76	990	6.0
SEP											
16...	1350	E4.0	16.5	5000	4.7	7.7	--	4	128	4700	20

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
MAY , 1975											
15...	13000	20	440	20	430000	10000	<.5	520	1.7	0	.0
SEP											
16...	23000	29	10	10	700000	15000	<.5	810	6.7	0	.0

119 CNA CARR BAILEY RUN NEAR MORRISTOWN OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
MAY , 1975											
22...	1415	E1.0	19.0	402	6.5	9.1	--	58	29	120	6.0
SEP											
17...	1240	E.30	18.5	750	5.2	6.9	--	14	141	280	10

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
MAY , 1975											
22...	1700	0	<10	10	310	1100	<.5	30	2.3	0	.9
SEP											
17...	2000	0	0	0	480	3100	<.5	50	1.5	2	.0

120 ADA K KOTTYAN PRIVATE WELL NEAR MILLFIELD OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
MAY , 1975											
22...	1015	E1.0	15.5	3500	4.7	--	--	10	319	1700	4.0
SEP											
17...	1550	E.60	15.0	3500	3.9	1.4	17	0	.0	1500	3.0

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
MAY , 1975											
22...	17000	79	600	20	460000	1000	<.5	690	8.6	0	.1
SEP											
17...	40000	60	20	10	460000	10000	<.5	940	5.2	0	.0

121 CNA SUNDAY CREEK AT MILLFIELD OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
MAY , 1975											
22...	1000	E80	18.0	736	5.2	7.8	--	8	81	260	20
SEP											
17...	1415	E40	17.0	1330	4.8	7.1	--	4	101	530	25

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
MAY , 1975											
22...	560	1	40	200	34000	1800	<.5	270	7.8	0	.0
SEP											
17...	2000	3	0	30	87000	4200	<.5	170	2.2	6	.0

122 ASM FEDERAL CREEK AT AMESVILLE OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
AUG , 1975											
06...	1045	E10	21.0	425	6.7	7.1	--	110	35	75	20
DEC											
04...	1100	E9.0	4.0	520	6.9	10.6	--	192	39	110	14

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
AUG , 1975											
06...	3900	3	20	10	6300	250	<.5	30	5.8	7	.0
DEC											
04...	180	0	20	10	360	120	<.5	20	2.3	0	.0

123 ASM SHARPS FORK NEAR AMESVILLE OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
AUG , 1975											
06...	1145	E9.0	20.5	428	7.0	7.2	--	106	17	100	14
DEC											
04...	1145	E7.0	4.0	650	7.1	10.4	--	208	26	150	24

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
AUG , 1975											
06...	4400	3	20	10	6000	420	<.5	30	16	9	.0
DEC											
04...	780	0	20	10	1700	840	<.5	20	4.8	0	.0

124 CNA ** BRUSHY FORK NEAR MT PLEASANT OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL , 1975											
23...	1050	E.20	27.5	401	4.7	7.1	--	1	32	120	16
OCT											
20...	1115	E1.7	12.0	235	5.0	9.9	--	2	32	83	6.0

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL , 1975											
23...	1500	0	<10	30	3100	4800	<.5	150	2.0	0	.0
OCT											
20...	4200	1	0	20	900	2300	<.5	140	3.2	0	.0

125 CNA ** RED RUN NEAR ORLAND OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL , 1975											
23...	1215	E.05	27.5	1650	2.8	5.8	10	0	.0	530	20
OCT											
20...	1245	E.43	12.0	390	3.3	9.6	1.8	0	.0	130	8.0

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL , 1975											
23...	35000	0	10	30	58000	7300	<.5	310	1.8	0	.0
OCT											
20...	5300	1	<10	10	12000	2400	<.5	110	2.0	0	.2

126 CNA ** RACCOON CREEK NEAR NEW PLYMOUTH OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL , 1975											
23...	1335	E20	23.5	803	3.5	7.1	.5	0	.0	270	22
OCT											
20...	1400	E56	11.5	445	3.9	9.4	1.4	0	.0	180	16

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL , 1975											
23...	10000	0	<10	10	2300	9700	<.5	300	.4	0	.0
OCT											
20...	7800	0	0	20	2900	4500	<.5	170	2.2	0	.0

127 ADA ** SANDY RUN ABOVE LAKE HOPE OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL , 1975											
23...	1420	E.05	28.0	516	5.3	6.3	--	3	24	200	22
OCT											
21...	1050	E.64	11.0	310	6.2	9.7	--	26	26	86	14

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL , 1975											
23...	3000	0	<10	10	32000	2600	<.5	130	.8	0	.1
OCT											
21...	1800	0	10	10	7800	560	<.5	60	10	0	.2

128 ADA ** MINE BIG FOUR HOLLOW ABOVE LAKE HOPE OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL , 1975											
23...	1530	E.01	22.5	3540	2.7	5.2	27	0	.0	2400	5.0
OCT											
21...	1220	E.01	13.0	2400	2.7	9.2	17	0	.0	1300	2.0

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL , 1975											
23...	78000	5	50	150	500000	160000	<.5	2200	10	0	1.7
OCT											
21...	37000	2	30	60	180000	6900	<.5	990	3.4	0	.2

129 CNA ** RACCOON CREEK NEAR ZALESKI OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL , 1975											
23...	1635	E40	25.5	700	4.0	7.2	1.6	0	.0	220	34
OCT											
21...	1415	E82	12.0	400	4.5	9.3	.8	0	.0	140	16

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL , 1975											
23...	5900	0	<10	10	1300	7600	.5	250	.4	0	.0
OCT											
21...	4100	0	<10	10	2200	3700	<.5	140	1.4	0	.0

130 CNA RACCOON CREEK AT VINTON OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
NOV , 1975											
13...	1145	E146	11.0	350	6.5	7.7	--	18	9.1	120	18

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
NOV , 1975											
13...	180	0	0	10	330	2300	<.5	50	2.2	0	.0

131 CNA LITTLE RACCOON CREEK NEAR WELLSTON OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
NOV , 1975											
13...	1015	E57	10.5	700	3.7	7.1	1.9	0	.0	290	12

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
NOV , 1975											
13...	8800	0	0	10	1000	5000	<.5	200	3.6	0	.3

132 CNA RACCOON CREEK AT NORTHUP OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
NOV , 1975											
13...	1230	E225	11.5	400	6.5	7.5	--	26	13	140	22

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
NOV , 1975											
13...	240	0	0	10	420	3000	<.5	70	3.8	0	.0

133 CNM WEST BRANCH SHADE RIVER NEAR BURLINGHAM OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL , 1975											
02...	1115	E.30	22.5	760	3.7	8.0	.6	0	.0	250	8.0
NOV											
17...	1100	E5.0	7.5	540	6.3	11.2	--	48	38	200	10

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL , 1975											
02...	1200	0	10	10	1800	6600	.5	100	2.6	0	.0
NOV											
17...	1900	0	0	10	2300	4400	<.5	70	6.0	1	.0

134 CNM KERR RUN AT POMEROY OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL , 1975											
03...	1000	E.10	19.5	721	4.7	8.6	--	4	128	270	10
NOV											
17...	1230	E.45	6.1	700	6.1	9.8	--	24	31	200	18

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL , 1975											
03...	3600	0	10	10	2100	1600	.5	110	1.6	0	.1
NOV											
17...	3400	1	<10	10	6600	1700	<.5	100	2.2	0	.0

135 CNM LEADING CREEK NEAR RUTLAND OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL , 1975											
03...	1200	E4.0	24.0	682	7.1	8.1	--	144	18	97	72
NOV											
17...	1550	E15	8.5	460	6.6	10.8	--	92	37	110	20

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL , 1975											
03...	520	2	10	20	1300	620	<.5	20	3.6	0	.1
NOV											
17...	390	0	0	0	870	560	<.5	20	2.4	1	.0

136 CNM LEADING CREEK NEAR MIDDLEPORT OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL , 1975											
02...	1545	E3.0	32.0	645	7.0	8.2	--	142	23	110	62
NOV											
17...	1500	E14	8.5	460	6.6	10.6	-	92	37	120	18

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL , 1975											
02...	300	0	10	0	610	550	<.5	10	3.6	0	.0
NOV											
17...	360	0	0	0	570	610	.5	20	2.8	0	.0

137 CNM THOMAS FORK NEAR MIDDLEPORT OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL , 1975											
02...	1430	E3.0	31.5	1380	3.5	7.3	.8	0	.0	590	35
NOV											
17...	1345	E9.7	11.0	820	4.1	10.2	1.2	0	.0	360	18

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL , 1975											
02...	15000	0	20	30	1600	6800	<.5	430	4.0	0	.0
NOV											
17...	1100	0	10	10	6600	4000	<.5	190	2.0	0	.0

138 ASM KYGER CREEK NEAR CHESHIRE OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL , 1975											
24...	1230	E7.0	29.0	1070	8.9	6.7	--	68	.1	420	44
NOV											
17...	1700	E6.2	14.0	2500	7.3	9.6	--	76	6.1	1600	50

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL , 1975											
24...	2000	95	90	10	320	110	<.5	20	2.6	0	.0
NOV											
17...	1400	75	60	10	480	1800	<.5	40	3.0	0	.0

139 ASM LITTLE KYGER CREEK NEAR CHESHIRE OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUL											
24...	1415	E.10	30.5	2770	3.3	7.1	1.6	0	.0	1600	10
NOV											
17...	1745	E.17	12.5	2600	3.3	9.6	6.4	0	.0	1700	20

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUL											
24...	37000	0	20	30	2500	52000	.6	1100	1.4	0	.0
NOV											
17...	40000	0	10	20	3200	47000	<.5	970	2.3	0	.0

140 ASM LITTLE INDIAN GUYAN CREEK NEAR RAPPSBURG OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUN											
19...	1400	E.10	27.0	800	3.8	7.5	1.7	--	--	350	8.0
OCT											
21...	1830	E1.4	14.0	710	4.0	8.6	1.6	0	.0	350	6.0

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUN											
19...	11000	1	20	10	320	7700	<.5	290	9.9	0	.0
OCT											
21...	1200	0	0	0	550	5900	<.5	220	4.2	0	.3

141 CNA INDIAN GUYAN CREEK NEAR SCOTTOWN OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUN											
19...	1600	E5.0	27.0	400	7.3	7.4	--	76	6.1	100	10
OCT											
21...	1700	E17	14.5	400	7.1	8.7	--	66	8.4	120	8.0

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUN											
19...	170	0	10	0	400	360	<.5	10	7.9	2	.0
OCT											
21...	350	1	0	0	480	580	<.5	20	3.1	0	.3

142 CNA BLACK FORK NEAR GALLIA OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
NOV , 1975											
13...	1345	E13	9.5	240	6.6	7.5	--	38	15	66	7.0

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
NOV , 1975											
13...	200	0	0	10	1100	700	<.5	30	5.8	0	.0

143 CNA SYMES CREEK AT AID OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUN , 1975											
19...	1130	E40	23.0	295	6.8	6.1	--	66	17	66	10
OCT											
21...	1500	E1790	11.5	150	6.1	8.0	--	20	25	38	4.0

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUN , 1975											
19...	400	0	20	0	1200	780	<.5	10	11	2	.0
OCT											
21...	600	1	0	0	1500	290	<.5	10	8.8	0	.0

144 CNA LITTLE ICE CREEK NEAR COAL GROVE OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUN , 1975											
19...	0830	E.80	19.0	410	7.2	6.4	--	118	12	66	16
OCT											
21...	1300	E4.4	13.0	380	7.2	9.2	--	114	12	83	12

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUN , 1975											
19...	130	1	10	0	370	210	<.5	10	15	1	.5
OCT											
21...	70	1	0	0	240	130	<.5	0	2.5	0	.0

145 ASA PINE CREEK NEAR BUCKHORN OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUN , 1975											
18...	1700	E2.0	26.0	435	6.5	7.1	--	36	18	130	13
OCT											
22...	1200	E4.9	14.0	370	6.7	8.7	--	70	22	110	12

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUN , 1975											
18...	820	0	20	10	2500	990	<.5	30	5.2	2	.1
OCT											
22...	760	0	0	0	1300	710	<.5	20	3.1	0	.0

146 RSA BEAR RUN AT SUPERIOR OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUN , 1975											
18...	1200	E2.0	23.0	1270	7.9	8.1	--	193	3.9	366	8.0
OCT											
22...	1030	E3.5	13.0	1330	7.6	8.6	--	200	8.0	610	10

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUN , 1975											
18...	80	2	30	0	8700	3400	<.5	30	12	0	.0
OCT											
22...	250	1	0	10	870	510	<.5	10	4.4	0	.2

147 ASA ELLISONVILLE CREEK NEAR ETNA OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUN , 1975											
18...	1400	E1.0	23.0	900	3.4	7.2	1.8	--	--	340	14
OCT											
22...	0900	E2.4	10.5	875	3.7	8.8	1.6	0	.0	340	18

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUN , 1975											
18...	9100	0	20	20	2000	5000	<.5	300	18	2	.0
OCT											
22...	950	0	0	0	3100	4800	<.5	260	2.6	0	.3

148 ASA UNION BRANCH SPERRY CREEK NEAR IRONTON OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUN 9 1975											
18...	1000	E1.0	20.0	900	7.1	7.5	--	64	8.1	390	3.0
OCT											
22...	1500	E1.9	15.0	760	6.7	8.8	--	47	15	340	10

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUN 9 1975											
18...	170	1	20	0	700	1100	<.5	20	5.2	0	.0
OCT											
22...	30	1	0	0	550	710	<.5	20	3.4	0	.0

149 CNA LITTLE SCIOTO RIVER NEAR FAIR OAKS OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUN 9 1975											
17...	1300	E40	21.0	195	7.1	8.5	--	38	4.3	29	12
NOV											
05...	1600	E43	16.0	170	6.5	9.2	--	34	17	31	13

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUN 9 1975											
17...	320	0	10	0	810	220	<.5	10	3.1	0	.1
NOV											
05...	30	0	0	0	580	100	<.5	10	2.6	2	.7

150 ADA TURNER MINE DRAIN AT GEPHART OH

WATER QUALITY DATA

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	DISSOLVED OXYGEN (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
JUN 9 1975											
17...	1430	E.02	13.0	1220	6.2	3.4	--	255	257	350	8.0
OCT											
22...	1700	E.02	13.0	1400	6.2	3.6	--	286	289	450	10

DATE	TOTAL ALUMINUM (AL) (UG/L)	TOTAL ARSENIC (AS) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	HYDROGEN SULFIDE (MG/L)
JUN 9 1975											
17...	160	6	10	10	500	460	<.5	10	21	0	.1
OCT											
22...	0	4	0	0	7300	3700	<.5	20	2.9	0	.2

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