EXECUTIVE SUMMARY

to the Upper Mahoning Creek Watershed

Rivers Conservation Plan

Prepared by:
Jefferson County
Department of Development

September, 1997

I. PENNSYLVANIA RIVERS CONSERVATION PLAN SUMMARY

The Keystone Recreation, Park and Conservation Fund Act (Act 50 of July 2, 1993, PL 35) authorized the Department of Conservation and Natural Resources (DCNR) to make grants available to municipalities and appropriate organizations for the purpose of rivers protection and conservation. In 1995 the Jefferson County Department of Development with the assistance of the Jefferson Conservation District received a River Conservation Planning Grant through the DCNR's Pennsylvania Rivers Conservation Program.

The purpose of the grant was to develop a Rivers Conservation Plan and provide the necessary information and documentation for the Upper Mahoning Creek Watershed to be included in the Pennsylvania Rivers Conservation Registry. As part of the Conservation Plan, significant environmental, recreational, economic and cultural resources of the watershed have been identified. In addition, identified issues and concerns have been inventoried and policies and management actions have been recommended to conserve, restore, and enhance the watershed's resources and values.

II. STUDY AREA

This plan concentrates on the Upper Mahoning Creek Watershed which lies in northeastern Pennsylvania. Portions of the watershed fall into Clearfield, Indiana, and Jefferson Counties. More specifically, the watershed encompasses 207$\pm$ square miles upstream from the confluence of Little Mahoning Creek in Indiana County. The Upper Mahoning Creek Watershed consists of sixteen named major tributaries. Of those, the East Branch of the Mahoning Creek and Stump Creek, which both originate in Clearfield County, constitute the headwaters. The watershed lies in the headwaters of the Ohio River and the Mahoning Creek flows in a westerly direction and empties into the Allegheny River near Templeton, Pennsylvania, outside the study area.

III. STUDY METHODOLOGY

Once the Jefferson County Department of Development was approved for the Pennsylvania Rivers Conservation Planning Grant, a project team was organized. The team consists of representatives from federal, state and local government, advocacy groups and local industry. A list of members along with their corresponding affiliation has been included in Section VII. The purpose of the project team was to assist with the development of the Conservation Plan, as well as the Management Options, that address the issues and concerns which have been identified by the public. In addition, after completion of the Plan the project team will continue to meet periodically in order that the plan can be updated annually.

The overall "planning" process for the Upper Mahoning Creek Watershed Conservation Plan began with an informational public meeting in Punxsutawney on October 30, 1996. At that meeting, public comment concerning the entire watershed was recorded and these "Issues and Concerns" were later grouped and categorized into six main focus areas, as identified in Section V.

After compiling the issues and concerns summary a "Preliminary Findings Report" was prepared and submitted to DCNR which summarized the "Issues and Concerns" and their respective potential "Management Options". The so called "Management Options" are potential solutions that address each "Issue and Concern" voiced. A special open public meeting with Trout Unlimited was held to discuss the Preliminary Findings Report in January, 1997. A complete listing of potential Management Options has been included in Section VI.

In order to prepare the Conservation Plan, resource data such as environmental, recreational, and cultural has been gathered to determine how the identified "Issues and Concerns" are affecting the watershed's resources. Resource data has been gathered from the U.S. Army Corps of Engineers, Pennsylvania Department of Environmental Protection - Bureau of Water Quality. U.S. Geological Survey - Water Resources Division, Pennsylvania Fish and Boat Commission, Pennsylvania Game Commission, Pennsylvania Department of Conservation and Natural Resources, U.S. Environmental Protection Agency, Pennsylvania Historical and Museum Commission, County Planning Commissions, and County Conservation Districts. The resource data was analyzed and evaluated by County staff and the project team.

A Draft Rivers Conservation Plan was completed in June 1997 that included all relevant resource data; identified "Issues and Concerns"; and potential "Management Options" for the watershed. In addition, as required by the grant an open public meeting was held on June 4, 1997 in Punxsutawney to receive public comment on the Draft Rivers Conservation Plan. At this time the plan was placed on a 30 day public display for comments, at each of Clearfield, Indiana and Jefferson County Planning Offices.

After a review was completed by the DCNR, and the public displays ended, a final report was prepared which addressed all comments. Once the changes satisfied the DCNR than a final public hearing was scheduled in Punxsutawney on September 3, 1997 to present the Final River's Conservation Plan.

The final stages of the planning process will be to gather and submit municipal resolutions of support and a Pennsylvania Rivers Conservation Registry Petition requesting DCNR to place the Upper Mahoning Creek Watershed onto the State's River Conservation Registry. The entire planning process shall be completed by December, 1997.

IV. FINDINGS

Many "Issues and Concerns", as summarized in the next section, resulted from the public and project team meetings. The most frequently identified issues were water quality related. The public as well as the project team have been very outspoken concerning the water quality of the Upper Mahoning Creek Basin. The most common causes for the water quality degradation appears to be acid mine drainage and to a lesser extent sewage pollutants. Nevertheless, other pertinent issues have been included that reflect upon the land use practices, flooding frequency, and recreational opportunities throughout the Upper Mahoning Creek Watershed.

V. ISSUES, CONCERNS AND CONSTRAINTS

The following summary table lists the "Issues and Concerns" that were identified within the Upper Mahoning Creek Watershed. The table was generated from public comment at the open informational public meeting that was held in Punxsutawney and the numerous project team workshops that have been held for the development of the Upper Mahoning Creek Rivers Conservation Plan. During the presentation of the Draft Rivers Conservation Plan and the following 30 day public comment period, no additional issues or concerns were identified.

The project team along with County personnel have considered each issue and concern voiced, and have taken measures of grouping similar issues and concerns together into one of six main focus areas. Even though the project team feels that they have touched on all relevant concerns, the summary table should be considered a working document with the possibility of being updated annually.

The six main focus area of the summary table include: water quality, flooding frequency, land use management, recreational opportunities, wildlife habitat, and public education. In order to receive comment on the preliminary findings, the identified issues and concerns were presented at a specially advertised Trout Unlimited Meeting. The discussion that followed reinforced the project team's efforts, and surprisingly, no additions or corrections were identified or suggested. The summary table of identified issues and concerns is as follows:

I. Degraded Water Quality

1). Acid mine drainage (AMD)
   a). Active sites
   b). Old sites

2). Storm water runoff
   a). Sediment load (i.e. farming, development, unimproved roads)
   b). Storm water pollutants (i.e. road oils, salt, pesticides)

3). Sewage

4). Point source pollution (i.e. industrial sites, brine plants)

II. Flooding Frequency

1). Storm water management issues
2). Flood control reservoir lacking on headwaters
3). Channel not regularly maintained (sediment/debris)
4). Poor land use management practices
   a). Floodplain management
   b). Logging/stripping debris

III. Land Use Management Practices

1). Current ordinances lacking
2). Public attitudes
    a). illegal dumping
    b). logging/stripping practices
    c). farming procedures which lack:
        1). stream bank fencing
        2). contour planting
        3). nutrient management

3). Floodplain management (i.e. development, soil and vegetation stripping)
    a). Preserve and/or enhance riparian forest and vegetative buffers

4). Transportation network within watershed

IV. Lack of Recreation Opportunities

1). Rails-to-Trails being developed
2). Greenway concept has potential (i.e. trail, picnic areas)
3). Access to stream/trail lacking
4). Canoe launches not designated
5). Reservoir/Dam would serve as a multipurpose recreational facility

V. Protection and/or Enhancement of Critical Wildlife Habitats

1). Spawning beds on Stump Creek
2). Expansion into watershed of State's elk range

VI. Lack of Public Education/Involvement

1). Public attitudes
2). Children/Youth education may be lacking
3). Current base data within watershed lacking (i.e. micro invertebrate studies)
4). Promotion of existing recreational resources within watershed are inadequate

VI. MANAGEMENT OPTIONS

The "Management Options" that have been identified to address or correct the issues, concerns and constraints of the Upper Mahoning Creek Watershed are listed within this Section. These Management Options have in some part been identified during the public comment process of the development of the Upper Mahoning Creek Rivers Conservation Plan, and also through the numerous project team workshops that have been held.

Each issue and concern voiced has been considered to determine if a possible Management Option(s) exist to connect them. The Management Options follow the same six main focus groups format as the issues, concerns and constraints.

These Management Options have been given tentative prioritization. (see Summary Matrix) Nevertheless, it is difficult to fully prioritize these programs since time and financial commitments, as well as events, and circumstances change.

Management Options Summary

I. Degraded Water Quality

- Acid Mine Drainage

The discharge of acid mine drainage from the active and old mining sites across the basin is one of the watershed's most obvious "Issues", to both the residents of the watershed as well as the project team members. It was concluded that the most obvious (visible), and accessible areas of the watershed should be looked at initially. The study team feels that several discharges along Canoe Creek, Big Run, and Stump Creek could potentially be eliminated or reduced. Consequently, the water quality of these tributaries, would have a positive influence on the Mahoning downstream of their confluence. More data will be collected relative to these projects.

- Storm Water Runoff (Unimproved Roads Inventory)

An effort initiated by several of the Conservation Districts within the basin, considers the inventorying of all unimproved roads. The roads are a huge source of sediment during each storm event. Potentially road maintenance funds and implementation grant money could be utilized to improve the existing conditions, thereby reducing the sediment loads to nearby tributaries of the Upper Mahoning Creek Watershed. A public education program initiated through the Conservation Districts to distribute Best Management Practices (BMP) information to township supervisors will be considered.

- Sewage Issues

Currently only Punxsutawney Borough and the Village of Stump Creek have operational sewage treatment facilities within the watershed. However, an expansion at the Punxsutawney facility along with a new facility being constructed in the village of Rossiter are planned and should be operational within the next several years. In addition, Sykesville Borough and Big Run Borough have initiated their sewage plans by preparing Act 537 Plans over the last several years. Other municipalities (villages) that should/could consider sewage include, Sportsburg, and the Valier/Fordham area.

II. Flooding Frequency

♦ Storm Water Management

Jefferson County recognizes the importance of storm water management as a means of deterring flooding. Consequently, in December 1996 the County executed into an agreement to prepare an Act 167 Plan on the Upper Mahoning Creek Basin including the Big Run, Elk Run, Canoe Creek, Stump Creek and East Branch Mahoning Creek Watersheds. With the completion of the plan and implementation of the ordinance, large volumes of additional run-off will be regulated and correctly managed.

♦ Multi-purpose Reservoir

A study that was completed in the 1970's relative to a proposed reservoir for the East Branch of Mahoning Creek has been revisited. Although such a large project is probably infeasible due to funding restrictions it is important enough to be mentioned as a potential flood protection project. This collection reservoir could possibly reduce much of the flooding concerns of Big Run, Punxsutawney, Sportsburg, and other communities downstream who were severely flooded in 1972, 1977, and 1996. In addition, such a multipurpose reservoir could also provide an alternative water resource for three different water supplies, and additional recreational opportunities.

♦ Stream Channel Maintenance

The project study team recognizes that the current obstructions within the channels influence the flooding potential along some sections of the waterways. Because of the January and July 1996 floods, some large areas of debris (i.e. boards, metal, branches, logs, garbage, etc.) has accumulated at some less accessible areas within the watershed. Several areas have been identified and include the confluence of Mahoning and Canoe Creek; Elk Run, between T-456 and Punxsutawney; and Canoe Creek between Cloe and the Rossiter Road.

III. Land Use Management Practices

♦ County Land Use Ordinances

Currently, Indiana and Clearfield counties administer countywide land use controls. Jefferson County has failed to get countywide subdivision regulations put into place. The Jefferson County Planning Commission continues to support this effort.

♦ Illegal Dumping

Illegal dumping is a large problem throughout the Upper Mahoning Creek Watershed. Several areas are clearly visible along the Mahoning Creek Corridor. The idea of a "river sweep" has good potential. The areas that are larger and more dense may be considered for clean-up by The Jefferson County Chapter of PA Cleanways. This group is sponsored by the Jefferson County Solid Waste Authority, who provides clean-up materials (i.e. gloves, bags, containers) and landfill space. A

cooperative effort between each County's Solid Waste Authority and DCNR's Rivers Implementation Grants would provide substantial effort in correcting this problem.

♦ Stream Bank Stabilization Projects

These projects have demonstrated considerable need throughout the watershed. Several obvious areas within the Mahoning Creek watershed include: the Twin Bridges area of East Branch, the Crawfordtown area of Elk Run, the confluence of Canoe Creek and Ugly Run, and the area north of Big Run along U.S. 119 and the Mahoning Creek. Also under consideration are smaller tributaries especially in agricultural and mining landuse settings whose protective stream bank fencing would benefit the overall watershed. The study team is continuing to identify these areas which should receive top priority. The sponsor agency for each project would likely be the County Conservation Districts.

♦ Riparian Forest Buffers

By preserving and/or enhancing riparian buffers along applicable areas of the Mahoning Creek Watershed, the water quality and temperature may be improved by the trapping and filtering of non-point source pollutants and presence of shaded forested areas paralleling the stream. Fish and wildlife would also benefit from the additional shelter, pathways, and travel corridors the riparian buffers create. With much of the basin falling in rural areas it is possible that some of the more critical corridors could be identified and preserved and/or enhanced. More data will be collected relative to these projects.

IV. Lack of Recreational Opportunities

♦ Rails-to-Trails

Efforts by the Punxsutawney Area Rails-to-Trails Association to acquire and develop the Mahoning Shadow Trail have been successful. The Trail parallels the Mahoning Creek for approximately 12 of its 16 miles in length. Currently, the Association has a Key 93 acquisition grant to acquire the trail and trailheads. Individual projects such as improving drainage and minimizing erosional areas along the trail corridor would have a dual positive influence on the Mahoning Creek. Not only would this exceptional multi-purpose recreational facility be enhanced but some existing water quality concerns could also be addressed and corrected at the same time.

♦ Greenway Corridor Development

An area along the Mahoning Shadow Trail in or near Punxsutawney makes the most sense for a greenway corridor. The trail in this area parallels Mahoning Creek. Initial planning has indicated that picnic areas along with informative signage would greatly enhance the trail corridor. Development of the greenway could provide recreation, education and relaxation interaction for its users.

♦ Stream or Trail Access Improvements

Access areas or "trailheads" are being proposed along the Mahoning Shadow Trail. These areas include: an area adjacent to SR 2001 in Gaskill Township (Devil's Elbow), township roads 431, and 494 (Elbell Area), P&N Commerce Park (Punxsutawney) and off SR 3008 in Perry Township (Rose Run Area). The development of these accesses will provide parking for users of the Mahoning Shadow Trail, Mahoning Creek, and the Greenway Corridor.

- Canoe Access Areas

Canoeing on the Mahoning is becoming more and more common during the Spring months; however, designated launches and take outs are lacking. With a small amount of resources and a little effort three or more launches/take outs could be strategically located. Launches that have been identified include: Water Street (Punxsutawney), Guzzo Road (Sportsburg) and the SR 3015 Bridge (Valier).

- Multipurpose Reservoir

Revisiting a study form the 1970's indicated that a reservoir was proposed for the East Branch of Mahoning Creek. Although funding for such a project is probably nonexistent, the project team felt the project was worthy of being mentioned. Not only would the reservoir be a recreational asset to the area but it would also provide, to some degree, flood protection to Big Run, Punxsutawney and communities downstream. Also, water quality improvements may result from less sediment and colder water being discharged this providing more ideal fishing habitat throughout the year.

V. Protection and/or Enhancement of Critical Wildlife Habitats

- None Identified

VI. Lack of Public Education/Involvement

- Education Programs (Conservation)

The project study team feels the best way to continue to educate the public about conservation is through each County's Conservation District. Issues such as floodplain management, logging, stripping and farming practices are critical to the watershed and are addressed through their ongoing education missions. The project team will continue to support these efforts of the Conservation District Offices.

- Education Programs (Children/Youth)

It appears that school districts' curriculums are lacking conservation type activities/studies. If implemented into the school districts, the students would gain more appreciation of the natural environment and its sensitivity to environmental influences. The project team will continue to explore the most practical and effective options available.

- College/University Involvement

With the presence of two universities and several branch campuses within 45 minutes of the watershed, the potential exists to work together with the institutions on incorporating some studies on the Mahoning Creek Watershed into their curriculums. The studies could include a wide range of observations, from routine water quality gatherings to more detailed micro or macro-invertebrate surveys just to name a few. This involvement could produce a long range data base for the watershed. The project team will continue to explore the most practical and effective options available.

SUMMARY MATRIX

MANAGEMENT OPTION GROUPED BY ISSUE/CONCERN	MANAGEMENT OPTION SITES	TIME TABLE	POTENTIAL FUNDING SOURCES *
I. Degraded Water Quality			
Acid Mine Drainage	Canoe Creek Basin	1998 - 2000	DEP, NRCS, Trout Unlimited
	Big Run Basin	2000 - 2002	
	Stump Creek Basin	2000 - 2002	
Stormwater Runoff Sediment Loading	Basin wide	1997 - ongoing	DEP (Act 167) Funding, NEXTEA (Enhancements), Liquid Fuels, Developers
Sewage Issues	Village of Rossiter	1997 - ongoing	DEP (Act 537) Funding, PennVEST, CDBG, Farmers Home
	Punxsutawney Borough	1997 - ongoing	
	Big Run Borough	1997 - ongoing	
	Sykesville Borough	1997 - ongoing	
II. Flooding Frequency			
Stormwater Management Planning & Implementation	Basin wide	1997 - ongoing	DEP (Act 167) Funding, PennVEST Municipalities, Developers
Multi-Purpose Reservoir	E. Branch Mahoning Watershed	2002 - 2010	U.S. Army Corps of Engineers
Stream Channel Maintenance	Confluence of Mahoning/Canoe Creek	1999 - 2001	U.S. Army Corps of Engineers PADOT, DEP, Municipalities
	Elk Run from T-456 to Punxsutawney	1997 - ongoing	
	Canoe Creek from Cloe to SR 2011	1999 - 2001	
III. Land Use Management Practices			
County Land Use Ordinances	Jefferson County	2000 - 2004	County
Illegal Dumping	Basin wide	1997 - ongoing	DEP, JCSWA, PADOT, PA Cleanways, Punxsutawney Area Rails-to-Trails

MANAGEMENT OPTION GROUPED BY ISSUE/CONCERN	MANAGEMENT OPTION SITES	TIME TABLE	POTENTIAL FUNDING SOURCES *
Stream Bank Stabilization	Twin Bridges area E. Branch	1998 - 2002	Conservation Districts
	Crawfordtown area of Elk Run	1998 - 2002	
	Confluence of Canoe Creek and Ugly Run	1998 - 2002	
Riparian Buffers 1). Forested	Basin wide * (Determine need & potential locations)	1998 - 2000	Key 93 Grants, Conservation Districts County, NRCS
	Basin wide * (Construction)	1999 - 2010	
2). Vegetative	Basin wide * (Determine need & potential locations)	1998 - 2000	Key 93 Grants, Conservation Districts, County, Trout Unlimited, NRCS, PA Fish & Boat Commission, PA Game Commission
	Basin wide * (Construction)	1999 - 2010	
IV. Lack of Recreational Opportunities			
Rails-To-Trails	Mahoning Shadow Corridor	1997 - ongoing	KEY 93 Grants, Symms Grants, NEXTEA, Trail Association
Greenway Corridor Development	Punxsutawney Area	1999 - 2003	KEY 93 Grants County, Trail Association
Stream/Trail Access Improvements	Gaskill Township along SR 2001	1998 - 2000	KEY 93 Grants County, Trail Association
	Elbell Area - Township Roads 431, 494	1998 - 2000	
	Punxsutawney - P&N Commerce Park	1998 - 2000	
	Perry Township - along SR 3008	1998 - 2000	
Canoe Access Areas	Water Street - Punxsutawney	1998 - 2000	KEY 93 Grants
	Guzzo Road - Sportsburg	1998 - 2000	
	SR 3015 Bridge - Valier	1998 - 2000	

MANAGEMENT OPTION GROUPED BY ISSUE/CONCERN		MANAGEMENT OPTION SITES	TIME TABLE	POTENTIAL FUNDING SOURCES *
		SR 3015 Bridge - Valier	1998 - 2000	
	Multipurpose Reservoir	E. Branch Mahoning Watershed	2002 - 2010	U.S. Army Corps of Engineers
V.	Protection and/or Enhancement of Critical Wildlife Habitats	None	N/A	N/A
VI.	Lack of Public Education/Involvement			
	Education Programs (Conservation)	Across Basin	1997 - ongoing	DEP Environmental Education Grants, League of Women's Voters
	Education Programs (Children/Youth)	Punxsutawney Area School District	1999 - 2001	DEP, School Districts
		DuBois Area School District	1999 - 2001	
	College/University Involvement	Indiana University of Pennsylvania	1999 - 2005	Universities
		Penn State University	1999 - 2005	
		Clarion University	1999 - 2005	

* Rivers Implementation Grants are a possible funding source for each management option!

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I. PROJECT AREA CHARACTERISTICS

A. LOCATION

The Upper Mahoning Creek Watershed is located in the northwest region of Pennsylvania within Clearfield, Indiana, and Jefferson Counties (see Figures 1 and 2). The Borough of Punxsutawney is roughly the center of the watershed. Portions of five municipalities fall within the Clearfield County area of the Upper Mahoning Creek Watershed and include: Bell, Brady, Penn, and Sandy Townships along with the Borough of Troutville. The Indiana County area of the watershed includes portions of the townships of Banks, Canoe, North Mahoning, and West Mahoning. Nevertheless, the largest portion of the watershed is located within Jefferson County. Municipalities such as Punxsutawney, Big Run and Sykesville Boroughs along with Bell and Young Townships lie entirely in the watershed, while portions of Gaskill, Henderson, McCalmont, Oliver, Perry, Porter and Winslow Townships also fall within the boundaries of the Upper Mahoning Creek Watershed.

B. SIZE

In the Upper Mahoning Creek Watershed, the drainage area upstream from the confluence of Little Mahoning Creek consists of 207$\pm$ square miles. The Mahoning Creek forms at the confluence of Stump Creek and the East Branch of Mahoning just north of Big Run, Gaskill Township, Jefferson County, Pennsylvania, and flows in a southwesterly direction (see Figure 3). The length of the "Mahoning Creek" corridor in the study area, is roughly 33.5 miles.

C. TOPOGRAPHY

The Upper Mahoning Creek Watershed lies within the Allegheny Plateau Section of the Appalachian Plateau's Physiographic Providence (Fenneman, 1938). The watershed is strongly dissected by ridges, rolling hills, and stream-lain valleys. The ridge tops are very uniform in elevation and average 1,500 - 1,600 feet above sea level.

With the different relief, many different land uses are found throughout the watershed. Forested areas constitute the largest percentage of land with farmland ranking second. Other common land uses include open, shrub, mining and residential. The larger population centers of Punxsutawney, Big Run, and Sykesville, were founded along the banks of the waterways within the basin.

D. MAJOR TRIBUTARIES

According to the Pennsylvania Department of Environmental Protection's Title 25, Chapter 93, Water Quality Standards, the Mahoning Creek watershed falls within Drainage List S, which is also known as the Ohio River Basin (Allegheny River Division). Within Chapter 93, the Mahoning Creek itself is classified as a third order stream. Consequently, the Mahoning's major tributaries are all fourth order streams within the study area. These streams include: the East Branch of Mahoning Creek, Stump Creek, Big Run, Rock Run, Canoe Creek, Elk Run, Sawmill Run, Rose Run, Nicely Run, Dutch Run, Perryville Run, Foundry Run, Steer Run, Carr Run, Hamilton Run, Sugarcamp Run, and several unnamed fourth order tributaries. (see Figure 4).

The lengths of these tributaries varies greatly with Stump Creek having the greatest length of 13.83 miles and Rock Run with the shortest length of 1.61 miles within the study area. The lengths of the tributaries generally decreases as one goes downstream or from the east to the west.

The basin size's of the fourth order tributaries to Mahoning Creek also vary greatly. The two largest are, the East Branch of Mahoning Creek (49.27 square miles) and Stump Creek (28.00 square miles) respectively. These basins compose the headwaters of the Mahoning Creek and are the most eastward lying within the watershed. In contrast, Nicely Run (1.33 square miles), Rock Run (1.44 square miles) and Steer

Run (1.48 square miles) basins are the smallest within the Upper Mahoning Creek Watershed respectively. These basins are near the confluence of Little Mahoning Creek at the westward extreme of the watershed. For more detailed information on the major tributaries of the Upper Mahoning Creek Watershed refer to Section IV - Water Resources.

E. CORRIDOR

1. Zoning/Landuse

Currently, Indiana and Clearfield Counties enforce countywide subdivision and land development ordinances. Jefferson County does not. As recently as 1995 the Jefferson County Planning Commission (JCPC) pushed for countywide landuse regulations but were overwhelmingly outspoken by opposition during the public involvement process. Consequently, the measure failed to be voted upon by the then exiting Jefferson County Board of Commissioners. Nevertheless, the JCPC continues to support this effort.

Within Jefferson County, Punxsutawney Borough does, however, enforce local zoning regulations. This represents the only area within the Jefferson County portion of the Upper Mahoning Creek Watershed to have some sort of landuse regulations in place.

Many different land uses are found throughout the Upper Mahoning Creek Watershed. According to a U.S. Geological Survey Study on the same watershed, they have indicated that forested and agricultural areas constitute the two largest sectors. In fact, according to their report entitled "Quality of Groundwater of Selected Sites in the Upper Mahoning Creek Basin, Pennsylvania", approximately 58% of the basin is forested and another 32% is agricultural. Other common land uses such as mining (surface), residential, open and shrub, also exist.

F. SOCIAL/ECONOMIC PROFILE

1. Population Centers

Much of the 207 square mile Upper Mahoning Creek Watershed is very rural and undeveloped. Only one small borough (Troutville) and several villages are located in the Clearfield and Indiana County portion of the watershed. The population centers of the watershed, such as Sykesville, Big Run and Punxsutawney Boroughs are located within Jefferson County. Theses communities have been founded along the banks of the waterways of the Upper Mahoning Creek Watershed.

The population trends of the population centers and much of the remaining watershed shows a gradual decrease over the past 40 years (see Table I-1) This decrease can be attributed to the lack of sustainable employment. For a century or more this region relied heavily on the mining and timbering industries for employment. Consequently, many of the boroughs and villages throughout this area were founded as coal mining or lumbering towns. Nevertheless, the resources (i.e. coal and timber) are no longer as abundant and the industries no longer flourish as they once did during their hayday.

TABLE I - 1
Population Trends of Population Centers
within the Upper Mahoning Creek Watershed

		Population		
	Location	1950	1970	1990
Sykesville	along Stump Creek	1652	1311	1387
Big Run	along Mahoning	896	826	699
Punxsutawney	along Mahoning	8969	7792	6782

Source: U.S. Department of Commerce, Bureau of The Census, 1950-1990 Census of Population and Housing

2. Transportation Facilities

The transportation infrastructure that is present within the watershed includes: railroads, roadways, and an airport. The region around Punxsutawney Borough is serviced by a general service airport. Located in Bell Township, the Punxsutawney Airport does not provide any commuter service, only private flights. Unlike many years ago when numerous railroads criss-crossed this area carrying coal and lumber, now only a few active lines remain and are owned and operated by Conrail and the Buffalo & Pittsburgh Railroad. The most accessible transportation facilities within the watershed are the highways. Currently, no four-lane limited access highways are present but many two-lane state roads such as U.S. 119, SR 0036, SR 0436, SR 0536, SR 0310 and SR 0410 are present and function at acceptable levels.

3. Major Sources of Employment

Within Jefferson County the top employment sectors are manufacturing, services, and retail trade respectively. Within the Upper Mahoning Creek Watershed, similar findings would be expected but cannot be verified. Nevertheless, the top five employers within the watershed are included in Table I-2.

TABLE I-2
Top Employers Across the Upper Mahoning Creek Watershed

Employer	Employees
1. Punxsutawney Area School District	220
2. Punxsutawney Area Hospital	200
3. International Jensen	181
4. Femco Machine	167
5. Thermal Guard	145

Source: Jefferson County Department of Development

G. OUTSTANDING OR UNIQUE FEATURES

None have been identified within the Upper Mahoning Creek Watershed.

II. ISSUES, CONCERNS AND CONSTRAINTS

The following summary table lists the issues and concerns that were identified within the Upper Mahoning Creek Watershed. The table was generated from public comment at the open informational public meeting that was held in Punxsutawney and the numerous project team workshops that have been held for the development of the Upper Mahoning Creek Rivers Conservation Plan. During the presentation of the Draft Rivers Conservation Plan and the following 30 day public comment period, no additional issues or concerns were identified.

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The six main focus areas of the summary table include: water quality, flooding frequency, land use management, recreational opportunities, wildlife habitat, and public education. In order to receive comment on the preliminary findings, the identified issues and concerns were presented at a specially advertised Trout Unlimited Meeting. The discussion that followed reinforced the project team's efforts, and surprisingly, no additions or corrections were identified or suggested. The summary table of identified issues and concerns is as follows:

I. Degraded Water Quality

1). Acid mine drainage (AMD)
   a). Active sites
   b). Old sites

2). Storm water runoff
   a). Sediment load (i.e. farming, development, unimproved roads)
   b). Storm water pollutants (i.e. road oils, salt, pesticides)

3). Sewage

4). Point source pollution (i.e. industrial sites, brine plants)

II. Flooding Frequency

1). Storm water management issues
2). Flood control reservoir lacking on headwaters
3). Channel not regularly maintained (sediment/debris)
4). Poor land use management practices
   a). Floodplain management
   b). Logging/stripping debris

III. Land Use Management Practices

1). Current ordinances lacking
2). Public attitudes
   a). illegal dumping
   b). logging/stripping practices

c). farming procedures which lack:
    1). stream bank fencing
    2). contour planting
    3). nutrient management

3). Floodplain management (i.e. development, soil and vegetation stripping)
    a). Preserve and/or enhance riparian forest and vegetative buffers

4). Transportation network within watershed

IV. Lack of Recreation Opportunities

1). Rails-to-Trails being developed
2). Greenway concept has potential (i.e. trail, picnic areas)
3). Access to stream/trail lacking
4). Canoe launches not designated
5). Reservoir/Dam would serve as a multipurpose recreational facility

V. Protection and/or Enhancement of Critical Wildlife Habitats

1). Spawning beds on Stump Creek
2). Expansion into watershed of State's elk range

VI. Lack of Public Education/Involvement

1). Public attitudes
2). Children/Youth education may be lacking
3). Current base data within watershed lacking (i.e. micro invertebrate studies)
4). Promotion of existing recreational resources within watershed are inadequate

III. LAND RESOURCES

A. SOIL CHARACTERISTICS

Upon review of the U.S. Department of Agricultural Soil Survey's General Soils Maps for Clearfield, Indiana and Jefferson Counties, the Gilpin and Ernest soil associations are the most common soils found within the Upper Mahoning Creek Watershed.

Gilpin soils were formed from weathered shale, siltstone and sandstone that were typically yellowish or olive green in color. The soil survey identifies the Gilpin series soils as being shallow to moderately deep, well-drained soils of the uplands. Consequently, these soils are found on nearly level areas, and in rolling areas on ridgetops and plateaus. These area can vary from gently sloping (0-5% slopes) to very steep (20-35% slopes). The Gilpin soils series are the most extensively found soils within the watershed.

In comparison, the Ernest series soils are dark grayish-brown and yellowish-brown silt loams and have formed from weathered acid shale and sandstone. Typically, these soils have migrated down steep slopes and are located at nearly level (0 - 3% slopes) to moderately sloping (8 - 15% slopes) areas. The Ernest series are composed of deep, moderately well drained or somewhat poorly drained soils.

The soils that are along the Mahoning Creek Corridor are designated as Silt Loams. These soils are alluvial deposits and include: Monogahela Silt Loams, Atkins Silt Loams, Purdy Silt Loams, Philo Silt Loams, Chavies Silt Loams and Zoar Silt Loams. These soils are poorly drained and flat laying soils on alluvial terraces and floodplains.

1. Limitations/Suitability

The Gilpin and Ernest soil associations that are found throughout he Mahoning Creek Watershed are mostly listed as capability units II, III, and IV. These capability units are assigned classes and sub-classes in order to distinguish between their different characteristics and limitations. Those soils that fall under Capability unit II are Class II soils, under Capability unit III are Class III soils and so forth. A description of each follows:

Class II Soils: Soils that have some limitations that reduce the choice of plants or that require moderate conservation practices.

Class III Soils: Soils that have severe limitations that reduce the choice of plants, or that require special conservation practices, or both.

Class IV Soils: Soils that have very severe limitations that restrict the choice of plants, require very careful management, or both.

Source: U.S. Department of Agriculture Soil Survey

B. OWNERSHIP

The ownership of the land within the Upper Mahoning Creek Watershed was determined through review of U.S.G.S. 7.5 minute quadrangle mappings, the Pennsylvania Atlas and Gazette (Dehorme, 1991), Pennsylvania's Recreation Plan 1991-1997 (Pennsylvania Bureau of State Parks, no date), county highway maps, and county and local planning departments. The basin is mainly private with most parcels being less than 100 acres in size. The 207 square mile (approx. 132,480 acre) Upper Mahoning Creek Watershed contains approximately 1500 acres that are publicly owned.

These areas are the Pennsylvania Fish and Boat Commission's Cloe Lake Recreation Area (148 acres) which is located in Bell Township, Jefferson County and the Pennsylvania Game Commission's State Game Lands, No. 195 (approximately 1300 acres) that are located entirely within Gaskill Township, Jefferson County.

C. CRITICAL AREAS

No known critical areas are located within the Upper Mahoning Creek Watershed.

D. LANDFILLS/HAZARD AREAS

The Pennsylvania Department of Environmental Protection (PADEP) and the United States Environmental Protection Agency (USEPA) were consulted regarding any known landfills (old or active) and the presence of any known hazardous waste sites within the study area. Records from the PADEP were received, the USEPA failed to respond.

1. Landfills

According to the PADEP records, two municipal waste landfills were once operational in the Upper Mahoning Creek Watershed. The Winslow Township Landfill was operational for two years, between 1982-1984, south of Reynoldsville in Winslow Township, Jefferson County. In addition, the Wazelle Landfill was in existence for 10 years, between 1978-1988, and was located south of the Village of Anita, in McCalmont Township, Jefferson County. These landfills have been sealed and are no longer in use.

2. Dump Sites

Numerous private and/or fugitive dump sites currently exist in various areas, from former strip mine sites, and private property, to along the roadside in the more rural areas of the Upper Mahoning Creek Watershed in Jefferson, Indiana, and Clearfield Counties. The County Solid Waste Authorities are attempting to identify these sites and organize cleanup efforts.

3. Hazardous Areas

A large cleanup effort took place in the mid 1980's in Punxsutawney at he BFG Electroplating & Manufacturing Company. The Superfund Site consisted of toxic and hazardous cleanup with remediation. Contaminated soil in and around the company's premises was removed. The cleanup was coordinated by the USEPA and the PA Department of Environmental Resources now known as PADEP.

IV. WATER RESOURCES

A. MAJOR TRIBUTARIES

The surface water resources within the watershed have been identified from U.S.G.S. 7.5 minute quadrangles. According to Pennsylvania Code Title 25, Chapter 93, Water Quality Standards (Amended May 18, 1996) the Mahoning is identified as a 3rd order basin under Drainage List S of the Ohio River Basin (Allegheny River). The Allegheny River Basin is the major system that drains the Mahoning Creek Watershed, along with the other 3rd order basins of Western Pennsylvania.

Consequently, we are considering all 4th order streams (basins) to Mahoning Creek as major tributaries. There are 16, and they are east to west as follows: East Branch of Mahoning Creek, Stump Creek, Big Run, Rock Run, Canoe Creek, Elk Run, Sawmill Run, Rose Run, Nicely Run, Dutch Run, Perryville Run, Foundry Run, Steer Run, Carr Run, Hamilton Run, and Sugarcamp Run. (see Figure 4).

1. Tributary Lengths

The length of the Mahoning Creek within the study area from its headwaters at the confluence of East Branch of Mahoning Creek and Stump Creek in Gaskill Township, Jefferson County, to the confluence with Little Mahoning in West Mahoning Township, Indiana County, is approximately 33.14 miles; much longer than any of the 4th order streams of the basin. The length of the named 4th order tributaries varies greatly across the basin with Stump Creek having the greatest length of 13.83 miles, and Rock Run having the shortest with a length of 1.61 miles. In general, the tributary length decreases as one proceeds downstream on the Mahoning Creek.

Table IV-1 summarizes the stream lengths of the Upper Mahoning Creek Watershed. No unnamed 4th order tributaries were considered. The tributary was measured from its mouth to its longest branch upstream.

The table is as follows:

TABLE IV-1

Lengths of Major Tributaries (4th Order)
Within the Upper Mahoning Creek Watershed

Stream Name	Length-Longest Branch (miles)
Mahoning Creek	33.14
East Branch Mahoning Creek	12.41
Stump Creek	13.83
Big Run	7.77
Rock Run	1.61
Canoe Creek	8.90
Elk Run	6.25
Sawmill Run	4.17
Rose Run	3.22
Nicely Run	1.99
Dutch Run	3.60
Perryville Run	3.13
Foundry Run	3.13
Steer Run	2.18
Carr Run	3.44
Hamilton Run	3.52
Sugarcamp Run	2.94

2. Tributary Drainage Areas

The basin sizes of the 4th order tributaries to the Mahoning Creek also varies substantially. The three largest basins include East Branch Mahoning Creek (42.27 square miles), Canoe Creek (29.72 square miles) and Stump Creek (28.00 square miles). These basins represent the headwater areas of the watershed and are the most eastward lying within the watershed. In comparison, Nicely Run (1.33 square miles), Rock Run (1.44 square miles), and Steer Run (1.48 square miles) basins are the smallest within the Upper Mahoning Creek Watershed. These basins are those downstream closer to the confluence of the Little Mahoning Creek whose lengths are also smaller than others within the watershed. Similar to stream lengths, the drainage areas of the basins generally decrease as one goes downstream toward the confluence of Little Mahoning Creek.

Table IV-2 lists the basin sizes of the tributaries to Mahoning Creek in the Upper Mahoning Creek Watershed. All the areas of unnamed tributaries were grouped together so an entire watershed drainage area could be calculated. The table is as follows:

Table IV - 2 - Drainage Areas of
Major Tributaries (Fourth Order) within the Upper Mahoning Creek Watershed

	Area (Sq. Miles)
East Branch Mahoning Creek	42.27
Stump Creek	28.00
Big Run	19.35
Rock Run	1.43
Canoe Creek	29.72
Elk Run	13.14
Sawmill Run	4.22
Rose Run	3.99
Nicely Run	1.33
Dutch Run	5.80
Perryville Run	2.34
Foundry Run	3.76
Steer Run	1.48
Carr Run	3.55
Hamilton Run	3.84
Sugarcamp Run	2.71
Unnamed Tributaries	40.07
TOTAL	207±

* Drainage areas derived from G.I.S. calculations.

3. Tributary Classifications and Protected Uses

a). PA Department of Environmental Protection's Chapter 93

Surface waters of the Upper Mahoning Creek Watershed are protected under the Department of Environmental Protection's Title 25, Chapter 93 Water Quality Standards Rules and Regulations. Water quality criteria has been established for specific protected uses. Water uses protected throughout the watershed include cold water fishes (CWF), warm water fishes (WWF), and high quality waters and cold water fishes (HQ-CWF).

As stated in Chapter 93.3 Protected water-uses, water uses which shall be protected, and upon which the development of water quality criteria shall be based are set forth, and accompanied by their identifying symbols, in Table IV - 3.

Table IV - 3 - Protected Uses Index

Symbol	Protected Use
	Aquatic Life
CWF	Cold Water Fishes-Maintenance and/or propagation of fish species including the family Salmonidae and additional flora and fauna which are indigenous to a cold water habitat.
WWF	Warm Water Fishes-Maintenance and propagation of fish species and additional flora and fauna which are indigenous to a warm water habitat.
MF	Migratory Fishes-Passage, maintenance and propagation of anadromous and catadromous fishes and other fishes which ascend to flowing waters to complete their life cycle.
TSF	Trout Stocking-Maintenance of stocked trout from February 15 to July 31 and maintenance and propagation of fish species and additional flora and fauna which are indigenous to a warm water habitat.
	Water Supply
PWS	Potable Water Supply-Used by the public as defined by the Federal Safe Drinking Water Act, or by other water users that require a permit from the Department under The Pennsylvania Safe Drinking Water Act or the Act of June 24, 1939, after conventional treatment, for drinking, culinary, and other domestic purposes, such as inclusion into foods, either directly or indirectly.
IWS	Industrial Water Supply-Use by industry for inclusion into non-food products, processing and cooling.
LWS	Livestock Water Supply- Use by livestock and poultry for drinking and cleansing.
AWS	Wildlife Water Supply - Use for waterfoul habitat and for drinking and cleansing by wildlife.
IRS	Irrigation-Used to supplement precipitation for growing crops.
	Recreation
B	Boating-Use of water for power boating, sail boating, canoeing, and rowing for recreational purposes when surface water flow or impoundment conditions allow.

Table IV - 3 - Protected Uses Index, con't.

F	Fishing-Use of the water for legal taking of fish.
WC	Water Contact Sports-use of the water for swimming and related activities.
E	Esthetics-Use of the water as an esthetic setting to recreational pursuits.
	Special Protection
HQ	High Quality Waters-A stream or watershed which has excellent quality waters and environmental or other features that require special water quality protection.
EV	Exceptional Value Waters-A stream or watershed which constitutes an outstanding national, State, regional or local resource, such as waters of national, State or county parks or forests, or waters which are used as a source of unfiltered potable water supply, or waters of wildlife refuges or State game lands, or waters, or waters which have been characterized by the Fish Commission as "Wilderness Trout Steams," and other waters of substantial recreational or ecological significance.
	Other
N	Navigation-Use of the water for the commercial transfer and transport of persons, animals, and goods.

The protected use as identified within the Water Quality Standards (Chapter 93) for each individual surface water resource within the Upper Mahoning Creek Watershed can be found on Table IV - 4.

TABLE IV - 4 - Streams of the Upper Mahoning Creek Watershed and Corresponding Protected Uses

Stream Name-Order	Zone	County	Water Uses Protected	Exceptions To Specific Criteria
3-Mahoning Creek				
4-East Branch Mahoning Creek	Basin, Source to Clover Run	Jefferson	HQ-CWF	None
5-Clover Run	Basin	Jefferson	HQ-CWF	None
4-East Branch Mahoning Creek	Basin, Clover Run to Confluence with Stump Creek	Jefferson	CWF	None
4-Stump Creek	Main Stem, Source to Confluence with East Branch Mahoning Creek	Jefferson	CWF	None
5-Unnamed Tributaries to Stump Creek	Basins, Source to Confluence with East Branch Mahoning	Clearfield-Jefferson	CWF	None
5-Limestone Run	Basin	Clearfield	CWF	None
5-Sugarcamp Run	Basin, Source to the Helvetia Portal of the R&P Coal Co. Mine (Cert.#196)	Jefferson	HQ-CWF	None
5-Sugarcamp Run	Basin, Helvetia Portal of the R&P Coal Company Mine to Mouth	Jefferson	CWF	None
5-Poose Run	Basin	Jefferson	CWF	None
3-Mahoning Creek	Main Stem, Confluence of East Branch Mahoning Creek and Stump Creek to Mouth	Jefferson	WWF	None
4-Unnamed Tributaries to Mahoning Creek	Basins, Confluence to East Branch Mahoning Creek and Stump Creek to Mouth	Jefferson-Indiana-Armstrong	CWF	None

Stream Name-Order	Zone	County	Water Uses Protected	Exceptions To Specific Criteria
4-Big Run	Basin	Jefferson	CWF	None
4-Rock Run	Basin	Jefferson	CWF	None
4-Canoe Creek	Basin	Jefferson	CWF	None
4-Elk Run	Basin	Jefferson	CWF	None
4-Sawmill Run	Basin	Jefferson	CWF	None
4-Rose Run	Basin	Jefferson	CWF	None
4-Nicely Run	Basin	Jefferson	CWF	None
4-Dutch Run	Basin	Jefferson	CWF	None
4-Perryville Run	Basin	Jefferson	CWF	None
4-Foundry Run	Basin	Jefferson	CWF	None
4-Steer Run	Basin	Indiana	CWF	None
4-Carr Run	Basin	Indiana	CWF	None
4-Hamilton Run	Basin	Indiana	CWF	None
4-Sugarcamp Run	Basin	Indiana	CWF	None

Source: PA DEP Chapter 93

In summary, Mahoning Creek is classified as the only warm water fishery (WWF) for its entire length in the watershed, East Branch of Mahoning Creek, Clover Run and the headwaters of Sugarcamp Run are all considered high quality - cold water fisheries (HQ-CWF) and the remaining named and unnamed tributaries located within the Upper Mahoning Creek Watershed are cold water fisheries (CWF),

b. Pennsylvania Fish and Boat Commission Classifications

The Pennsylvania Fish and Boat Commission officially classifies some streams as "approved trout waters". This classification means that they met minimum criteria qualifying them to be stocked with trout by the Fish and Boat Commission. The 1997 Pennsylvania Summary of Fishing Regulations and Laws identifies these waters and the counties they reside within the Upper Mahoning Creek Watershed (see Table IV - 5).

TABLE IV - 5 - APPROVED TROUT WATERS OF THE UPPER MAHONING CREEK WATERSHED

Stream Name	County(ies)
Laurel Run	Clearfield
Big Run	Jefferson
East Branch Mahoning	Jefferson
Canoe Creek	Jefferson/Indiana

No waterways within the Upper Mahoning Creek Watershed participate in the PA Fish and Boat Commission's Selective Harvest Program, Delayed Harvest Fly-Fish Only Program, Heritage Trout Angling Program, Catch and Release Program, Delayed Harvest Artificial Lures Only Program, Trophy Trout Projects Program, or the All Tackle Trophy Trout Program.

With mention of trout stocked waters one must also mention those streams that support native trout. This classification of streams as native reproducing are becoming quite scarce throughout much of Western Pennsylvania. A recently acquired listing of such streams from the Pennsylvania Fish and Boat Commission identifies several within the Upper Mahoning Creek Watershed. Three of the small tributaries - Beech Run, Clover Run, and Laurel Run within Clearfield and Jefferson Counties, are tributaries to the East Branch of Mahoning Creek. In addition, the East Branch of Mahoning Creek from its headwaters to the confluence with Beech Run, in Clearfield County, is also designated a native trout stream.

B. WETLANDS

The wetlands in the study area, were identified by reviewing the U.S. Fish and Wildlife Service's (USFWS) National Wetlands Inventory (NWI) mapping and the U.S. Department of Agricultural (USDA) Soil Conservation Service's Soil Surveys for Jefferson, Clearfield, and Indiana Counties. Also referenced were the respective lists of hydric soils and soils with hydric inclusions from each county. No field observations were conducted to identify wetland type areas.

The wetland classifications throughout the Upper Mahoning Creek Watershed, are mainly riverine and palustrine. Riverine wetlands include areas such as flowing bodies of water-streams, creeks and rivers. Many of the major tributaries are classified as upper and lower perennial riverine wetlands with unconsolidated bottoms that are typically permanently flooded. Table IV-6 identifies the larger riverine wetland courses within the watershed and its particular classification according to the NWI mapping. Considering the Upper Mahoning Creek Watershed falls onto 11 different U.S.G.S. quadrangles (a figure depicting this area is not included).

TABLE IV-6 Wetland Classifications within the Upper Mahoning Creek Watershed

Stream Name	Classification
East Branch of Mahoning Creek	R5UBH, Riverine, unknown perennial, unconsolidated bottom, permanently flooded
Stump Creek	R2UBH, Riverine, lower perennial, unconsolidated bottom, permanently flooded
Big Run	R3UHB, Riverine, upper perennial, unconsolidated bottom, permanently flooded
Elk Run	R3UBH, Riverine, upper perennial, unconsolidated bottom, permanently flooded
Canoe Creek	R3UBH, Riverine, upper perennial, unconsolidated bottom, permanently flooded
Mahoning Creek	R2UBH, Riverine, lower perennial, unconsolidated bottom, permanently flooded

Palustrine wetland areas are typically much smaller and include everything from farm ponds to saturated creek bottoms. The palustrine wetlands within the Upper Mahoning Creek Watershed are typically open water, intermittently exposed (POWZ), emergent saturated; and persistent, temporary flooded (PEMY and PEMIA, respectively) and diked/impounded areas (PUBHh). No large continuous areas of palustine wetlands exist within the project study area.

Wetland soils or what is typically called hydric soils are found along alluvial terraces and floodplains paralleling streams. These soils are flat lying and poorly drained loams and silt loams. Severe limitations exist due to the flooding, permeability, the high water table and low strength of the soils. With the soil classification map symbols changing from county to county a list of hydric soils within each county is as follows:

Hydric Soils - Clearfield County

Map Symbol	Descriptive Name
AR	Armagh silt loam
AT	Atkins silt loam
BRA	Brinkerton silt loam, 0 to 3 percent slopes
BRB	Brinkerton silt loam, 3 to 8 percent slopes
BXB	Brinkerton very stony silt loam, 0 to 8 percent slopes
NOA	Nolo loam, 0 to 3 percent slopes
NOB	Nolo loam, 3 to 8 percent slopes
NXB	Nolo very stony loam, 0 to 8 percent slopes
PU	Purdy silt loam

Hydric Soils - Indiana County

Map Symbol	Descriptive Name
ARA	Armagh silt loam, 0 to 3 percent slopes
ARB2	Armagh silt loam, 3 to 8 percent slopes, moderately eroded
AT	Atkins silt loam
BKA	Brinkerton silt loam, 0 to 3 percent slopes
BKB2	Brinkerton silt loam, 3 to 8 percent slopes, moderately eroded
BNA	Brinkerton silt loam, very wet, 0 to 3 percent slopes
BNB	Brinkerton silt loam, very wet, 3 to 8 percent slopes
BSB	Brinkerton very stony silt loam, 0 to 8 percent slopes
BTB	Brinkerton very stony silt loam, very wet, 0 to 8 percent slopes
NOA	Nolo silt loam, 0 to 3 percent slopes
NOB	Nolo silt loam, 3 to 8 percent slopes
PUA	Purdy silt loam, 0 to 5 percent slopes

Hydric Soils - Jefferson County

Map Symbol	Descriptive Name
AW	Atkins silt loam
BRA	Brinkerton silt loam, very wet, 0 to 3 percent slopes
BRB	Brinkerton silt loam, very wet, 3 to 8 percent slopes
BSA	Brinkerton and Armagh silt loam, 0 to 3 percent slopes
BSB	Brinkerton and Armagh silt loam, 3 to 8 percent slopes
BVB	Brinkerton and Armagh, very stony silt loam, 0 to 8 percent slopes
NOA	Nolo silt loam, 0 to 3 percent slopes
NOB	Nolo silt loam, 3 to 8 percent slopes
NSB	Nolo very stony silt loam, 0 to 8 percent slopes
PU	Purdy silt loam

Soils with hydric soil inclusions also are capable of supporting wetland environments; however, they are very numerous and are not included with this report.

C. FLOODPLAINS

The floodplains of the Upper Mahoning Creek Watershed are generally quite narrow, which is consistent within the rolling hill type setting of western Pennsylvania. In the Boroughs of Big Run and Punxsutawney the floodplains are much wider and the U.S. Army Corp. of Engineers have constructed retaining walls to protect against periodic flood events. Since their construction in 1950 the Punxsutawney retaining walls have been proven enormously valuable.

1. Water Levels/Flood Events

For much of the state and especially the area of the Mahoning Creek Watershed, 1996 was an extremely wet year. In fact, according to a news release from the U.S. Geological Survey on January 8, 1997 entitled Stream Flow and Ground-Water Levels During 1996 Among the Highest Ever Recorded for Much of Pennsylvania, suggested that the Ohio River below the confluence of the Allegheny and Mongohela Rivers at Sewickley had the highest annual mean flow in 63 years of record. The recorded 1996 annual mean flow of 37.5 inches is about 10 percent higher than the previous highest annual mean flow recorded in 1972 when Hurricane Agnus devastated much of Pennsylvania.

During the two highest flow events on the Mahoning Creek in 1996, the U.S. Geological Survey's river gage in Punxsutawney, Pennsylvania recorded enormous flows. The peak gage heights and flows recorded for the two 1996 flood events were 14.10 or 10,700 cubic feet per second for January 19, 1996 and 17.80 feet feet or 20,400 cubic feet per second for July 19, 1996. The U.S. Army Corps of Engineers flood protection projects of 1950 designed a channel to hold 15,000 cubic feet per second through Punxsutawney Borough. This would essentially handle a flood greater than the March, 1936 flood when the maximum of record for Mahoning Creek was set (12,500 cubic feet per second). (U.S. Dept. of HUD, 1978). Nevertheless, Punxsutawney, as well as Big Run, was severely flooded in July, 1996 due to persistent heavy thunder storms that dumped as much as an estimated seven inches of rainfall overnight across much of the Upper Mahoning Creek Watershed (See Photograph's and news clipping in Appendix D).

The 1996 events as well as the flood of 1936 and the, 10, 50, 100, and 500 year peak discharges can be seen on Table IV - 7.

TABLE IV - 7 - SUMMARY OF DISCHARGES

Flood Source	Peak Discharges (cfs) 10 year	50 year	100 year	500 year
Mahoning Creek	6,700	11,000	13,600	21,800

1936	Jan., 1996	July, 1996
12,500	10,700	20,400

cfs = cubic feet per second

As a result of the July flood, the Jefferson County Planning Commission initiated a Phase I DEP Stormwater Management Plan for the Upper Mahoning Creek Watershed. For DEP's purpose the "Upper Mahoning Creek Watershed" includes the basin area upstream from the Borough of Punxsutawney. Five major tributaries, the East Branch of Mahoning Creek, Stump Creek, Elk Run, Big Run and Canoe Creek will be studied. The Phase II, where the actual data gathering and structure inventorying is completed, will likely be started late this summer (1997). The entire project is anticipated to be completed by December, 1999. The Management Plan is expected to have a positive influence on stormwater run-off across the basin after its completion and implementation.

D. LAKES AND PONDS

According to a report prepared by the U.S. Army Corps of Engineers, there are only two impoundments in the entire Mahoning Creek Basin other than Mahoning Lake with surface areas larger than ten acres. The largest is Cloe Lake, located in Bell Twp., Jefferson County on Jackson Run, a small tributary which enters Mahoning Creek on the left bank about three miles upstream from Punxsutawney, PA.

The Cloe Lake Recreational Area consists of 148 acres and is owned and operated by the Pennsylvania Fish and Boat Commission. The drainage area of Cloe Lake is 2.7 square miles. The lake's surface area is 29 acres and has a capacity of approximately 350 acre feet. The other larger surface water resource is the Punxsutawney Reservoir in Gaskill Township, Jefferson County. The reservoir is located on Clover Run, a tributary to the East Branch of Mahoning Creek, about seven miles east of Punxsutawney, PA. It is owned by Pennsylvanian American Water Company. Originally the reservoir consisted of an area of about 15 acres and had a capacity of 95 acre feet. With strip mining in the reservoir area for the last twenty years, some of the reservoir has been filled with silt sediments so its capacity has undoubtedly decreased. Nevertheless, the drainage area above the dam is 7.39 square miles. Numerous private ponds and lakes, which provide water for irrigation, recreation, and aesthetic values are also located throughout the Upper Mahoning Creek Watershed.

E. WATER QUALITY

As a result of an intensive sampling study in 1995 the U.S. Geological Survey's Water Resource Division has stated that the water quality of the basin is not significantly different from the water quality of other similar shale and sandstone aquifers across Pennsylvania. In general, the range in concentrations of chloride, hardness, and dissolved solids varies little between the Upper Mahoning Creek Basin and other statewide sampling locations. In addition, the nutrient concentrations were substantially less than other samples due to the lack of intensive agricultural uses across the basin. The

iron concentrations show the greatest variability due in part to naturally occurring concentrations as well as mining activities that generate acid mine drainage (AMD). Acid mine drainage is the number one issue and concern affecting the water quality of the Upper Mahoning Creek Watershed.

1. Upper Mahoning Creek Watershed

Some general water quality conclusions can be made on the entire Upper Mahoning Creek Watershed. First of all, its important to recognize that the Mahoning Creek Watershed (SWP #17D) is considered a high priority watershed on the state's water plan for highly degraded watersheds. This plan, compiled in May 1994, indicates that the Mahoning scores 9.0. Those watersheds that score between 12.0 and 8.5 in the study are put into the group of the highest priority watersheds within the state. Thirty-six such watersheds are located across the state.

Prior to 1995, no extensive inventorying of water quality had occurred across the Mahoning Creek Watershed on a watershed basis. However, the U.S. Geological Survey took substantial measures in 1995 to generate some baseline groundwater quality data for the Upper Mahoning Creek Watershed. Until then the groundwater quality of the Upper Mahoning Creek Watershed was largely unknown. Nevertheless, some degradation was anticipated due to the presence of coal mining, oil and gas exploration, on-lot septic systems; as well as wildcat systems, and land uses such as commercial and agricultural.

The study resulted from a 50/50 grant between Jefferson County (Department of Development) and the U.S. Geological Survey. The study called for the sampling of 50 domestic wells (and springs) across the watershed, in the summer of 1995. The County provided staff to assist with identification of sampling sites as well as the sampling itself.

By its completion, 47 wells were sampled along with 3 springs in areas where well samples were not obtainable. The entire watershed was divided into 40 sampling blocks of equal size (6 square miles). One sample from each was collected so the entire geographic extent of the basin was represented. Also to provide randomness within the sampling, different land use settings as well as major rock formations were sampled. Ten individual "special sites" were sampled where a known water quality problem already existed.

The sampling procedures required raw water samples. Immediately before collecting a water sample, each well was purged until temperature dissolved oxygen, specific conductance, and Ph stabilized. Raw water samples were collected from the homeowners plumbing system nearest to the well to eliminate false readings (i.e. lead from plumbing). All sampling constituents except coliform bacteria were analyzed at U.S.G.S. laboratories. The Department of Environmental Protection assisted with the analyzing of the coliform bacteria. A complete copy of the report is included in Appendix B.

Findings (Reprinted from: Quality of Groundwater at selected sites in the Upper Mahoning Creek Basin, Pennsylvania).

Of the 50 sampled sites, 38 sites had at least 1 constituent concentration that exceeded 1 maximum contaminant level (MCL) or secondary maximum contaminant level (SMCL) as established by the U.S. E.P.A. Coliform bacteria and iron and manganese concentrations most often exceeded the guidelines. No volatile organic compounds (VOC's), nutrients, or triazine herbicide concentrations exceeded any guidelines.

Of the 56 constituents analyzed and discussed, 28 constituents were found in detectable

concentrations (see Table IV-8). Three of the 26 VOC's analyzed were measured above the detection limit, however, none were measured above the MCL or SMCL. Toluene, a solvent generally obtained from coal tar, was detected at two sites, one mining site and one "special site" located on a flood plain. Ammonia was detected at 21 sites; the highest concentration occurred at a residential site. Sixteen of the nineteen metals and trace elements analyzed were detected. All are naturally present in the rocks and soils in the basin. The widespread detection of barium, iron, lithium, manganese, strontium, and zinc indicates natural sources not associated with a specific land use. The detection of cobalt and silver probably also represents natural background concentrations. Two trace metals, arsenic and beryllium, were detected at sites associated with mining activities. The highest copper concentrations were detected in samples that were acidic (low Ph). The acidic water may have leached copper from plumbing systems. Zinc was detected at 34 sites, including the 8 sites were cooper was detected, indicating zinc may also be leaching from plumbing systems.

Additionally, water was considered "hard" (greater than 120 milligrams per liter as calcium carbonate) at 29 sites. Hard water usually indicates high concentrations of dissolved solids and major ions, such as chloride and sulfate.

Of the 28 constituents detected, 12 were found in concentrations exceeding 1 MCL or SMCL (see Table IV-9). Although exceedances [value greater 0(or less for Ph) than USEPA guidelines] occurred in all land uses and rock types, 41 percent of the exceedances occurred at sites associated with mining activities. Maximum exceedance values for all 12 constituents, except bacteria, cadmium, and radon, were also associated with mining activities. In mining areas where large volumes of rock and soil have been disturbed, the oxidation of pyrite (a common iron ore) produces acidic water. This resultant acidic water is available to chemically react with and dissolve many natural elements. One-half of the Ph exceedances were in mining areas. At all these sites except one, iron and manganese exceeded the SMCL. Lead concentrations generally were related to leaching of domestic plumbing by acidic water (six of nine sites) regardless of a specific land use. Chloride, sulfate, and three of four dissolved solids exceedances occurred in the areas associated with mining activities.

Proposed radon standards were exceeded in water samples for 28 percent of the sites. Radon is a naturally occurring radioactive gas produced by the decay of the element radium. Natural factors control the occurrence of uranium and the formation and movement of radon in soils and water. Radon exceedances were associated more with rock type than land use; 18 of 21 exceedances were in the Glenshaw Formation.

The MCL for coliform bacteria was exceeded at 74 percent of the sites. This percentage is higher than other similar studies in Pennsylvania were coliform bacteria was exceeded in about 42 percent of the sampled wells (Sharpe and others, 1985). Coliform usually is and indicator of the presence of human or animal contamination. High bacteria counts generally indicate a contaminated water source. Sources of contamination could include improperly functioning septic systems, improperly sealed wells, and runoff from barnyards.

TABLE IV - 8

Constituents Sampled for on the U.S.G.S. Groundwater Study
Across the Upper Mahoning Creek Basin

Constituent	No Detects
Volatile Organic Compounds	
1,1,1-Trichloroethane	0
1,1-Dichloroethane	0
1,1-Dichloroethylene	0
1,2-Dichlorobenzene	0
1,2 -Dichloroethane	0
1,2-Dichloropropane	0
1,2-Transdichoroethylene	0
1,3-Dichloro-Benzene	0
1,4-Dichloro-Benzene	0
Benzene	0
Bromoform	0
Carbontetrachloride	0
Chlorobenzene	0
Chlorodibromomethane	0
Chloroform	1 of 30
CIS-1, 2-Dichloroethene	0
Dichlorobromomethane	0
Dichlorodifloromethane	0
Ethylbenzene	0
Methylene-Chloride	0
Styrene	0
Tetrachloroethylene	1 of 30
Toluene	2 of 30
Trichloroethylene	0
Trichorofluoromethane	0
Vinylchloride	0
Metals and Trace Elements	
Aluminum Dissolved	13 of 50
Arsenic Dissolved	5 of 50
Barium Dissolved	49 of 50

Constituent	No Detects
Beryllium Dissolved	1 of 50
Cadmium Dissolved	10 of 50
Chromium Dissolved	0 of 50
Cobalt Dissolved	6 of 50
Copper Dissolved	8 of 50
Iron Dissolved	45 of 50
Lead Dissolved	13 of 50
Lithium Dissolved	38 of 50
Manganese Dissolved	48 of 50
Molybdenum Dissolved	12 of 50
Nickel Dissolved	6 of 50
Silica Dissolved	0 of 50
Silver Dissolved	13 of 50
Strontium Dissolved	50 of 50
Vanadium Dissolved	0 of 50
Zinc Dissolved	34 of 50
Nutrients	
Ammonia Nitrogen	21 of 50
Nitrate Nitrogen	22 of 50
Nitrite Nitrogen	0 of 50
Orthophosphorus	7 of 50
Miscellaneous	
Chloride	50 of 50
Coliform Bacteria	17 of 50
Dissolved Solids	50 of 50
pH	50 of 50
Radon	50 of 50
Triazine Herbicide	0 of 50
Sulfate	50 of 50
Triazine Herbicide	0 of 50

TABLE -IV - 9 CONSTITUENTS WITHIN THE UPPER MAHONING CREEK WATERSHED THAT EXCEEDED USEPA GUIDELINES

Constituent	Number of detects	Type of guideline	USEPA guideline	Percentage of sites exceedances	Maximum exceedance value
pH	NA	SMCL	<6.5 or >8.5	20	3.3
Chloride	50	SMCL	250 mg/L	2	300
Sulfate	50	SMCL	250 mg/L	4	440
Dissolved solids	50	SMCL	500 mg/L	10	677
Aluminum	13	SMCL	50 microg/L	12	5,500
Cadmium	10	MCL	5 microg/L	2	7
Iron	45	SMCL	300 microg/L	30	60,000
Lead	13	MCL	15 microg/L	18	50
Manganese	48	SMCL	50 microg/L	54	5,100
Nickel	6	MCL	100 microg/L	2	100
Radon	50	MCL	'300pCi/L	28	1,400
Coliform bacteria	17	MCL	1 Colony	74	TNTC

' - Proposed MCL

As previously mentioned, the water quality of the Upper Mahoning Creek Watershed is considered similar to that of other watersheds with the same characteristics across the state of Pennsylvania. The study showed that many of the exceedances were found in samples of both human induced as well as naturally occurring areas. Nevertheless, one cannot fail to mention the correlation that mining activities had across the basin. In fact, 41 percent of the total exceedances were associated with mining activities. In addition, of the 12 constituents that exceeded the USEPA guidelines nine of the maximum occurrences were also found within mining areas.

2. Canoe Creek

The Pennsylvania Fish and Boat Commission's Bureau of Fisheries assessed the waters of Canoe Creek in 1990 to determine if the waterway met the criteria for inclusion in the catchable trout program. During the assessment physical, social, chemical and biological characteristics were examined. See Appendix C to review entire study.

The study concluded that the characteristics were acceptable for the waterway to be named to the catchable trout program. Nevertheless, the chemical characteristics exhibited some influences from acid mine drainage. According to the study, iron deposition was observed on the substrate but didn't appear to be a serious problem.

The Pennsylvania Fish and Boat Commission only tested for several constituents, however this is all the more water quality data that is known to exist. Table IV - 10 summarizes the sampling.

REPORT 1 - CANOE CREEK INVESTIGATION, 1990

Table IV-10 - Water Quality Data Collected from Canoe Creek

Water Temperature (C)	-	8.8
pH	-	6.8
Specific Conductance (umhos)	-	185
Total Alkalinity (mg/L)	-	48
Total Hardness (mg/L)	-	152

3. East Branch Mahoning Creek

In 1979, the Pennsylvania Fish Commission completed an assessment of the East Branch of the Mahoning Creek. The assessment was completed to determine if appropriate stocking practices were taking place within the waterway. Some questions concerning the limited accessibility to the stream as well as the ongoing acid mine drainage problems prompted the study.

As mentioned within the summary report (see Appendix C), strip mining in the past as well as presently allows for the discharge of highly acidic waters to the East Branch from its tributaries. In a report prepared in 1950, three major tributaries to the East Branch of Mahoning had a pH of 4.5 or less (Bradford, 1950). As of 1984, (see next investigation) none of the sampled tributaries to the East Branch had pH's below 6.0.

The water quality data that was collected during the study is summarized in Table IV-11. Three locations were sampled and their range of results listed.

REPORT 2 EAST BRANCH OF MAHONING CREEK, 1979

Table IV-11 - Water Quality Data Collected from the East Branch of Mahoning Creek

		Range
Water Temperature (C)	-	14-18
pH	-	6.8-7.1
Specific Conductance (umhos)	-	425-530
Total Alkalinity (ppm)	-	8-14
Total Hardness (ppm)	-	180-208
Dissolved Oxygen (ppm)	-	9.0-9.2

4. East Branch Mahoning and Tributaries

A study conducted in 1984 by the Pennsylvania Fish Commission to investigate and inventory the general condition of East Branch Mahoning Creek and its tributaries in Clearfield and Jefferson Counties provides us with the most detailed water quality data for this basin. Twelve sampling stations (see Figure 5) were established in the effort to characterize as much of the East Branch and as many of its tributaries as possible. The twelve sites are as follows:

MAH 1	-	East Branch Mahoning Creek, just upstream from its confluence with Clover Run
CLO 0	-	Clover Run, just upstream from its confluence with East Branch Mahoning Creek
LOS 0	-	Lost Run, Approx. 0.25 mile upstream form confluence with Clover Run
CLO 3	-	Clover Run, just downstream from confluence with Lost Run
CLO 5	-	Clover Run, at the Clearfield/Jefferson County line
MAH 4	-	East Branch Mahoning Creek, at the T-622 bridge
LRL	-	Laural Run at the Clearfield/Jefferson County line
MAH 6	-	East Branch Mahoning Creek at the SR 3009 bridge
BCH 0	-	Beech Run, about 0.5 mile upstream form confluence with East Branch Mahoning Creek
LRB 0	-	Laurel Branch Run, at T-336 bridge
BCH 2	-	Beech Run, at T-336 bridge
MAH 9	-	East Branch Mahoning Creek at the SR 4006 bridge.

The chemical characteristics found throughout the twelve sampling locations are listed on Table IV-12. Of the tributaries it appears Laurel Run Branch (LRBO) and Beech Run (BCHO) were the most degraded in the study, apparently from acid mine drainage and siltation. This in turn causes the Clearfield County reaches of East Branch Mahoning Creek (MAH6 and MAH9) to become degraded. Problems in the East Branch headwaters include silted substrate and high levels of metals. Nevertheless, it appeared the stream somewhat recovered in Jefferson County (MAH4 and MAH1) and was in fair condition.

At the time, the Pennsylvania Fish Commission felt that mining both old and new operations were the primary cause of the water degradation throughout the East Branch Watershed. Other activities such as oil and gas exploration and logging practices also added to the degradation through the erosion and sedimentation that are typically associated with such land uses.

Table IV-12 - Water Quality Data Collected from the East Branch of Mahoning Creek Watershed

Parameter	MAH 1	CLO 0	LOS 0	CLO 3	CLO 5	MAH 4	LRL 1	MAH 6	BCH 0	LRB 0	BCH 2	MAH 9
Temperature °C(Field)	7	6	8	9	4	11	5	4	4	7	4	4
pH (Field)	6.8	7.0	6.7	6.8	7.0	6.4	7.0	6.8	6.5	6.3	6.9	7.0
D.O. (Field)	12.0	12.6	11.2	11.8	9.6	11.0	9.2	12.4	12.2	-	11.9	11.2
Special Condition	320	305	265	440	725	-	495	385	250	330	85	445
Turbidity	0	3.8	2.2	1.6	4.3	-	3.8	6.1	2.2	6.0	2.6	19.7
pH	6.6	6.6	6.7	7.0	7.5	-	7.1	6.3	6.4	6.3	6.0	6.3
Alkalinity	18	22	11	36	84	-	36	13	12	6	3	8
Acidity	0	0	0	0	0	-	0	6	8	12	9	10
Dissolved Solids	224	202	206	350	544	-	284	296	192	286	72	336
Hardness	144	144	114	200	358	-	248	175	108	146	30	208
SO_4	138	150	98	203	314	-	198	-	-	162	25	198
Cl	15	8	10	10	12	-	16	14	10	7	10	7
Fe (Total)	470	760	230	350	430	370	260	610	310	1020	270	2570
Fe (Dissolved)	100	120	220	<100	400	190	250	190	120	660	250	1390
Mn (Total)	880	420	110	310	240	1170	170	2060	680	1500	60	2390
Cu (Total) Cd (Dissolved)	Less than defection level of 80 ug/l at all stations											
Zn (Total)	90	160	20	80	70	40	40	130	100	50	30	100
Zn (Dissolved)	90	150	20	80	70	40	40	120	100	10	30	100
Ni (Total) Ni (Dissolved)	Less than detection level of 140 ug/l at all stations.											
Al (Total)	420	740	340	570	240	1150	250	500	150	280	1460	1320
Al (Dissolved)	<150	<150	<150	<150	150	150	210	150	<150	<150	<150	160
Ba (Total)	60	60	90	<60	90	70	60	60	80	60	<60	70

5. Mahoning Creek

With a Corps of Engineers dam located downstream from the study area on the Mahoning Creek in Armstrong County, some water quality sampling has been compiled to determine the water quality of the stream as it enters the impoundment area. The U.S. Army Corps of Engineers provided us with their sampling data (Auras raw data reports) from ten different locations along Mahoning Creek between Big Run Borough and the confluence with Little Mahoning Creek. This data has been collected between 1973 and 1991 and is very intermittent. In fact, four sites, the bridge at Foxburg, the Bell Mills Area, the bridge at Rt 119 in Punxsutawney, and the bridge in Sportsburg were only sampled once in 1979 for only a few constituents, according to the data received. In addition, similar sampling practices occurred on Sugarcamp Run, a tributary to Mahoning Creek.

Several sites did provide substantial amounts of data; those sites include: the bridge at Hamilton, a site west of Hamilton, a site upstream 0.3 mile from North Point and a site 0.2 mile upstream with confluence of Little Mahoning Creek. The normal field characteristics (i.e. temperature, pH, dissolved oxygen, etc.) along with chemical characteristics such as nutrients, trace elements and metals were assessed. The complete raw Auras water quality reports for the ten identified sites can be found in Appendix B.

Some of the common water quality characteristics for the sites are included on Table IV-13. The most recently recorded data is listed for those sites with more than one sampling.

Table IV-13 - Water Quality Data (AURAS) Collected from Locations along Mahoning Creek

Site Name	Temp	Ph	Specific Conductance	Total Alkalinity	Total Hardness
Bridge @ Foxburg	N/A	6.80	352	4	170
Bell Mills Area	N/A	6.65	370	35	156
Bridge @ 119	N/A	6.70	370	44	148
Bridge @ Sportsburg	N/A	6.75	368	32	150
Bridge @ Hamilton	13.0	6.80	469	35	163
West of Hamilton	15.9	7.07	271	24	89
Upstream from N. Point	16.6	7.35	302	27	116
Upstream from Little Mahoning	26.6	7.70	622	57	189

Temperature in	=	Degrees Centigrade
Specific Conductance	=	Umhos
Total Alkalinity	=	mg/L
Total Hardness	=	mg/L
N/A	=	Not Available

In addition, to the Corps of Engineers data that is collected for the Mahoning Creek, the U.S. Environmental Protection Agency (USEPA) also samples Mahoning Creek downstream from Punxsutawney at the T-374 bridge in Sportsburg, PA. This data is part of Agency's Storet Database. The sampling program has been in place since 1988 and sampling occurs monthly at the Sportsburg location. A wide variety of constituents are assessed and a complete summary report of the monthly Storet data is included in Appendix B. Also, a master summary which includes the mean, maximum, and minimum constituent value for the entire sampling history of the site is included in Appendix B.

The most recent as well as the mean chemical characteristics of the water quality of Mahoning Creek are summarized on Table IV-14.

TABLE IV-14 - WATER QUALITY DATA (STORET)
COLLECTED FROM THE MAHONING CREEK
at Sportsburg, Pennsylvania

	Mean	Nov. 1996
Temperature C	9.69	9.5
Ph	6.92	7.05
Specific Conductance (umbo)	312.26	397
Total Alkalinity (mg/l)	44.51	46
Total Hardness (mg/1)	139.95	146

As one can see for over a period of eight years the mean or (average) differs little form the most recent sampling data. A sign hopefully of a more stable watershed than what existed 20-30 years ago.

F. WATER SUPPLY

1). Private Supplies

Most of the area of the Upper Mahoning Creek Watershed relies on private drinking water sources. The vast majority of these sources are wells. The wells are typically 120-160 feet deep and are drilled into the Conemaugh, Allegheny and Pottsville rock groups of Pennsylvanian Age. A typical producing well can yield 2-20 gallons per minute. Nevertheless, it also is not uncommon for some private wells to go temporarily dry during a hot, dry summer. Springs are also used throughout the basin but are not as highly concentrated. As previously mentioned in this section, a groundwater quality study was conducted by the U.S. Geological Survey that assessed the water quality of private drinking sources. The results indicated that the quality of the groundwater is much like that of other watersheds with similar characteristics.

2). Public Supplies

Within the Clearfield County portion of the Upper Mahoning Creek Watershed, Sandy Township is serviced by public water. The DuBois Water Company provides the water service to the township. The remainder of the area relies on private sources. Also, within Indiana county only the village of Rossiter is serviced by public water. Their water comes form the Indiana County Municipal Service Authority. Lastly, Jefferson County is serviced by three independent water providers. They consist of the Pennsylvania American Water Company, Sykesville Municipal Authority and Henderson Township Municipal Authority.

The Pennsylvania American Water Company is Jefferson County's largest water supplier. They supply water to the Boroughs of Big Run and Punxsutawney, as well as much of Bell, McCalmont, Young and Gaskill Townships. Their facility is located in Gaskill Township near the East Branch of Mahoning Creek. Their source are three drilled wells and an intake on the East Branch just upstream from the confluence with Clover Run. The East Branch intake is considered the primary source with the wells as back up sources when the creek has a high turbidity. Such a large system includes four water storage tanks throughout its service area. A total storage capacity of 2,500 tg provides sufficient amounts of water for the approximately 3,456 existing service connections throughout the system.

The Sykesville Municipal Authority provides water to the Borough of Sykesville and part of Winslow Township. All water is obtained from the DuBois Water Company where it is purchased in bulk and routed approximately 5 miles to Sykesville. Currently 300 tgd is allocated from the DuBois Water Company. The Sykesville Municipal Authority has one existing 250 tg storage tank that services the approximately 572 service connections on the system.

The Henderson Township Municipal Authority provides residential water service to the Village of Stump Creek. The system is supplied by the existing ground water wells which feed the distribution system and the existing 50 tg ground level, high volume storage tank. The average daily use is 14.5 tgd for the approximately 103 residential service connections on the system.

a. Wellhead Protection Program

Within the Upper Mahoning Creek Watershed, Jefferson County developed a Water Supply Plan and Wellhead Protection Program for the entire county in 1995. Indiana and Clearfield Counties have not completed such a plan. As a result, the only public water supplies within the Upper Mahoning Creek Watershed that participate in a "Wellhead Protection Program" are those of Jefferson County. Those three public water sources, as previously mentioned, are: The Pennsylvania American Water Company, The Henderson Township Municipal Authority, and the Sykesville Municipal Authority. Within the 1995 plan, a detailed wellhead protection area was delineated for the Henderson Township municipal Authority well site and a preliminary wellhead protection area was delineated for the Pennsylvania American Water Company site. No protection area was delineated for the Sykesville Municipal Authority since they actually purchase their water from DuBois in Clearfield County. Three areas have been delineated to identify the protection zones, they are listed in Table IV-15.

Table IV-15 - Wellhead Protection Zones Identified within the Upper Mahoning Creek Watershed

Zone	Representation
1	Contingency Action Zone
2	Well-Field Protection Zone
3	Rechange Area Protection Zone

These zones each increase in surface area. Zone 1 constitutes the smallest area, with Zone 3 providing the largest area. According to Title 25 of the Pennsylvania Code, Chapter 109 defines a wellhead protection area as:

"The surface and subsurface area surrounding a water supply well, well field, spring or infiltration gallery supplying a public water system, through which contaminants are reasonably likely to move toward and reach the water source. A wellhead protection area shall consist of the following zones:

(i) Zone I. The protective zone immediately surrounding a well, spring, or infiltration gallery which shall be a 100-to-400 foot radius depending on site-specific source and aquifer characteristics.

(ii) Zone II. The zone encompassing the portion of the aquifer through which water is diverted to a well or flows to a spring or infiltration gallery. Zone II shall be a 1/2 mile radius around the source unless a more detailed delineation is approved.

(iii) Zone III. The zone beyond Zone II that contributes surface water and groundwater to Zones I and II."

V. BIOLOGICAL RESOURCES

A. VEGETATION

The climate throughout the Upper Mahoning Creek Watershed can be classified as temperate and humid, which lends itself to growing a variety of herbaceous plants and, deciduous and/or evergreen forests. Rainfall precipitation averages more than 40 inches per year. Precipitation falls throughout the year with the summer months (June, July, Aug) receiving slightly more than other months.

According to a recently completed U.S. Geological Survey Groundwater Quality Study, (1995) approximately 58% of the Mahoning Creek Watershed is forested. These areas consist of privately owned stands of second and third growth trees. The principal forest cover types, as identified by the U.S. Forest Service, are: oaks, hickories and cherries (60%), sugar maple, beech and birches (12%), american elm, white ash and red maple (9%), aspens (9%), and eastern white pine (7%). These indexes represent the greatest concentration within the watershed. A list of the common deciduous and evergreen species within the U.S. Forest Service's forest cover types are listed in Table V-1.

TABLE V-1

Common Tree Species within the Upper Mahoning Creek Watershed

Common Name	Scientific Name
Red Oak	Quercus rubra
White Oak	Quercus alba
Black Cherry	Prunus serotina
Shagbark Hickory	Carya ovata
Sugar Maple	Acer sacharinum
Red Maple	Acer rubrum
American Beech	Fagus grandifolia
Paper Birch	Betula papyrifera
Yellow Birch	Betula alleghaniesis
American Elm	Ulmus americana
White Ash	Fraxinus americana
Bigtooth Aspen	Populus grandidentata
Quaking Aspen	Populus tremuloides
Flowering Dogwood	Cornus florida
Sycamore	Platanus occidentalis
Tuliptree	Liriodendron tulipifera
Eastern Hemlock	Tsuga canadensis
Eastern White Pine	Pinus strobus
Norway Spruce	Picea abies

B. WILDLIFE

1. Terrestrial

With a temperate humid climate and a diversity of landuses across the Upper Mahoning Creek Watershed, the wildlife species found are typical to those found elsewhere in the state of Pennsylvania. The common wildlife species that are found within the study area's forests, which compose the majority of the landuse, include: slimy salamanders (Plethodon glutinosus), eastern box turtles (Terapene carolina), ruffed grouse (Bonasa umbellus), wild turkeys (Meleagris gallopavo), red-tailed hawks (Buteo jamaicensis), chickadees (Porus spp.), whitetailed deer (Obocoileus virginianus), gray squirrels (Sciurus carolinensis), foxes (Vulpes spp.) and raccoons (Procyon lotor).

The use of agricultural areas by wildlife varies according to the type and intensity of agriculture. Nevertheless, common species include eastern garter snakes (Thamnophis sirtalis), black snakes (Coluber c. constrictor), red-winged blackbirds (Agelaius phoeniceus), american crows (Corvus brachyhynchos), eastern cottontails (Sylvilagus floriclana) and woodchucks (Marmota monax).

Palustrine wetland areas typically provide vital habitat for wetland species (i.e. amphibians and reptiles) such as the green frog (Rana palusris), northern water snakes (Natrix sipedon), and snapping turtles (Chelydra serpentina). However, these areas also provide a water supply and habitat diversity for species of adjacent uplands. Therefore, waterfowl such as the mallard (Anas platyrhyncos), and blue heron (Ardea herodias) are found along with muskrats (Ondatra zibethicus) and beavers (Castor canadensis) in wetland type settings.

2. Aquatic

Within the streams and lakes that compose the Upper Mahoning Creek Watershed, many different species of fish abound. The basin flourishes with cold water fish species within all of the major tributaries. Nevertheless, according to Pennsylvania Code Title 25, Chapter 93, Water Quality Standards (amended May 18, 1996) the Mahoning Creek is a warm water fishery from the confluence of East Branch Mahoning Creek and Stump Creek to its mouth. This designated area is the only warm water fishery within the basin. Consequently, some different fish are found in Mahoning and no where else within the basin.

a). Cold Water Fisheries

Several studies completed within the last 10-15 years by the Pennsylvania Fish and Boat Commission have identified large quantities of cold water fish species along with numerous invertebrates within the major tributaries of Mahoning Creek. Three such reports have been gathered (see Appendix C) and the results tabulated below from each.

REPORT 1 - CANOE CREEK INVESTIGATION, 1990

TABLE V-2 - FISH SPECIES COLLECTED FROM CANOE CREEK

Common Name	Scientific Name
Brook Trout	Salvelinus fontinalis
Brown Trout	Salmo trutta
Common Shiner	Notropis cornutus
Blacknose Dace	Rhinichthys atratulus
White Sucker	Catostomus commersoni
Northern Hog Sucker	Hypentelium nigricans
Pumpkinseed	Lepomis gibbosus
Mottled Sculpin	Cottus bairdi

* No invertebrates were collected during this sampling.

REPORT 2 - EAST BRANCH MAHONING CREEK INVESTIGATION, 1979

TABLE V-3A-INVERTEBRATES COLLECTED FROM THE EAST BRANCH OF MAHONING CREEK

Taxon Name

Ephemeroptera
- Baetidae
- Ephemerellidae
- Heptageniidae
- Leptophlebiidae

Plecoptera
- Leuctridae
- Perlidae

Trichoptera
- Hydropsychidae
- Polycentropodidae

Diptera
- Chironomidae

Megaloptera
- Corydalidae

Hemiptera
- Gerridae

Decapoda
- Astacidae

TABLE V-3B-FISH SPECIES COLLECTED FROM THE EAST BRANCH OF MAHONING CREEK

Common Name	Scientific Name
Brown Trout	Salmo trutta
Blacknose Dace	Rhinichthys atratalus
Fall Fish	Semotilus corporalus
White Sucker	Catostomus commersoni
Northern Hogsucker	Hypentelium nigricans
Rainbow Darter	Etheostoma caeruleum
Johnny Darter	Etheostoma nigrum
Blackside Darter	Percina maculata
Mottled Sculpin	Cottus bairdi

REPORT 3 - EAST BRANCH MAHONING AND TRIBUTARIES INVESTIGATION, 1984

TABLE V-4A - INVERTEBRATES COLLECTED FROM THE EAST BRANCH MAHONING CREEK WATERSHED IN CLEARFIELD AND JEFFERSON COUNTIES

Taxon Name

Decapoda (Crayfish)
- Cambarus

Plecoptera (Stoneflies)
- Acroneuria carolinensis
- Allocapnia
- Amphinemura
- Chloroperlidae
- Isoperla
- Leuctra
- Papacapnia
- Peltopera
- Phasganophora capitata
- Pteronarcys
- Taenionema

Ephemeroptera (Mayflies)
- Ameletus
- Baetis
- Ephemera
- Ephemerella
- Eurylophella
- Epeorus
- Stenonema fuscum
- S. pulochellum gr.
- S. vicarium

Odonata (Dragonflies)
- Cordulegaster
- Lanthus

Megaloptera (Alderflies, Fishflies)
- Nigronia
- Sialis

Coleoptera (Beetles)
- Elmidae

Trichoptera (Caddisflies)
- Apatania
- Cheumatopsyche
- Chimara
- Diplectrona
- Dolophilodes
- Hydatophylax
- Hydropsyche betteni
- Rhyacophila
- Symphitopsyche alhedro
- S. bifida
- S. slossonae
- S. sparna

Diptera (Midges, Flies)
- Chrysops
- Hexatoma
- Parametriocnemus
- Simuliidae
- Tanypodinae
- Tipula

TABLE V - 4B - FISH SPECIES COLLECTED FROM THE EAST BRANCH MAHONING CREEK WATERSHED IN CLEARFIELD AND JEFFERSON COUNTIES

Common Name	Scientific Name
Rainbow Trout	Oncorhynchus mykiss
Brown Trout	Salmo trutta
Brook Trout	Salrelinus fontinalis
Stoneroller	Campostoma anomalum
Redside Dace	Chrosomus erythrogaster
Common Shiner	Luxilus cornotus
Rosyface Shiner	Notropis rubellus
Bluntnose Minnow	Pimephales notatus
Blacknose Dace	Rhinichthys atratalus
Creek Chub	Semotilus atromaculatus
White Sucker	Catostomus commersoni
Hog Sucker	Hypentelium nigricans
Johnny Darter	Esheostoma nigram
Banded Darter	Etheostoma zonale
Blackside Darter	Percina maculata
Mottled Sculpin	Cottus bairdi

b. Warm Water Species

As previously mentioned, in Section IV the Mahoning Creek is the only warm water fishery within the watershed. A complete evaluation of common species found within the stream has been done by the Pennsylvania Fish and Boat Commission in 1989. A summary of the findings are listed below (see entire report in Appendix C).

Table V-5 - WARM WATER FISH SPECIES COLLECTED FROM MAHONING CREEK

Common Name	Scientific Name
Muskellunge (T)	Esox masquinongy
Northern Pike	Esox lucius
Largemouth Bass	Micropterus salmoides
Smallmouth Bass	Micropterus dolomieui
Walleye	Stizostedion vitreum
Channel Catfish	Ictalurus punctatus
Yellow Bullhead	Ictalurus natalis
Brown Bullhead	Ictalurus nebulosus
Black Crappie	Pomoxis nigromaculatus
White Crappie	Promoxis annularis
Bluegill	Lepomis macrochirus
Pumpkinseed	Lepomis gibbosus
Rockbass	Ambloplites rupestris
Yellow Perch	Perca flavrscens
White Sucker	Catostomus commersonii
Redhorse Sucker	Moxostoma aureolum
Golden Shiner	Notemigonus crysoleucas
Common Carp	Cyprinus carpio

Within the headwater areas of Mahoning Creek it is also common to observe a mixture of cold water species. Any cold water species are generally seen upstream of Punxsutawney where trout stockings occur. The Pennsylvania Fish and Boat Commission regularly stocks the Big Run, Canoe Creek, and East Branch of the Mahoning tributaries with trout. These trout occasionally migrate downstream and find their way into the Mahoning and at times grow to trophy size (see photographs). Also, the Perry Township Sportsman's Club is active in stocking some portions of Mahoning Creek with trout. The stockings are unannounced and help yield trophy trout within the waterway. In addition, depending upon allocations some years the Mahoning receives a stocking of trout fry from the Pennsylvania Fish and Boat Commission. The following cold water trout species have been observed within the Mahoning Creek.

TABLE V-6 COLD WATER SPECIES FOUND WITHIN MAHONING CREEK

Common Name	Scientific Name
Brown Trout	Salmo trutta
Brook Trout	Salrelinus fontinalis
Rainbow Trout	Oncorhynchus mykiss

According to Environmental Protection Agency's Storet database between 1989-1993, as few as eleven and as many as twenty-two different taxon of invertebrates have been collected at a site on the Mahoning Creek downstream of Punxsutawney Borough. The invertebrate sampling occurs once a year, usually in early fall with the aid of a kicknet.

Please see Appendix C for a complete summary of the Storet Data. The 1990 sampling was the most successful in terms of diversity. The following list identifies those taxon collected during that sampling.

TABLE V-7 INVERTEBRATES COLLECTED FROM MAHONING CREEK (STORET DATA)

Taxon Name

Lumbricidae
Pisidiidae (Peaclams)
Gammarus
Cambaridae (Crayfishes)
Stenonema
Stenacron
Pseudocloeon
Baetis
Isonychia
Caonis
Ophiogomphus
Dineutus
Optioservus
Sialis
Nigronia
Cheumatopsyche
Hydropsyche
Ceratopsyche
Simulium
Chironomidae
Cricotopus
Atherix

C. PENNSYLVANIA NATURAL DIVERSITY INVENTORY (PNDI) SPECIES

Requests for information concerning the presence of federally and state listed endangered and threatened species within the study area were made to the U.S. Fish and Wildlife Service (all Federal lists), Pennsylvania Game Commission (birds and mammals), Pennsylvania Fish and Boat Commission (fish, reptiles, amphibians, and aquatic invertebrates) and the Pennsylvania Department of Conservation and Natural Resources (PNDI lists). Copies of response letters are in Appendix A.

The U.S. Fish and Wildlife Service indicated that except for occasional transient species, no federally listed or proposed threatened or endangered species under their jurisdiction are known to exist in the project area. The Pennsylvania Game Commission has record of the Osprey (Pandion halieatus, PA Endangered) occasionally occurring within the Mahoning Creek watershed. The PNDI review conducted by the Pennsylvania Department of Conservation and Natural Resources indicated that no occurrences of rare, threatened, or endangered species were found within a mile and a half of the watershed. Lastly, the Pennsylvania Fish and Boat Commission's reply indicated that under their jurisdiction the Ohio lamprey (Ichthyomyzon bdellium) and the timber rattlesnake (Crotalus horridus) are Pennsylvania Threatened Species that are known to occur occasionally around the vicinity of the project site.

D. IMPORTANT HABITATS

As a result of the series of public involvement opportunities a spawning area was identified as a potential critical habitat area. The area, adjacent to Stump Creek, north of Big Run, consists of a flooded weed bed. Annually, northern pike (Esox lucius) visit the area and spawn. Some individuals feel the spawning northern pike are full time residents of the Mahoning Creek while others feel some may migrate the 25+ miles from the Mahoning Lake Dam, in Armstrong County, south of the project study area. Nevertheless, the presence of these breeding fish in this area is unique and should be noted.

VI. CULTURAL RESOURCES

A. RECREATIONAL

As previously mentioned under Section III, Land Resources, approximately one percent (1%) of the Upper Mahoning Creek Watershed can be considered publicly owned. Nevertheless, the area is blessed with a diversity of recreational resources. Within the watershed, the State of Pennsylvania owns and operates State Game Lands No. 195 and the Cloe Lake Recreation Area. A 15 mile rails-to-trails multipurpose recreational facility called the Mahoning Shadow Trail is currently being acquired by Jefferson County. In addition, throughout the watershed many of the communities own and operate community parks and/or recreational areas. Some privately owned recreational facilities also exist.

1. State-Owned Recreational Resources

State Game Lands No. 195 contains 1298 acres and is located within the East Branch Mahoning Creek Basin in Gaskill Township, Jefferson County. The area consists mainly of strong (12 - 20%) and steep (20 35%) slopes and is nearly entirely forested with some active and non-active surface strip mines visible. The gamelands experience day usage throughout the year and are especially a favorite of hunters during the Pennsylvania antlered and anterless deer seasons. Table IV - 1 Summarizes what other recreational activities are available or can be conducted on State Game Lands No. 195.

The Pennsylvania Fish and Boat Commission's Cloe Lake Recreation Area lies within Bell Township, Jefferson County. The Lake and recreational area encompasses 148 acres within the Canoe Creek Basin. Cloe Lake is listed as an approved trout water and receives trout stockings by the Pennsylvania Fish and Boat Commission. The Lake not only receives the regular pre-season and in-season (summer) stockings but has also been named to the Late Winter - Extended Trout Fishing Program. Under this program, the Lake is open to fishing during March when other approved trout waters are closed. Needless to say, this recreational area is highly used by fisherman throughout the year. A more complete list of recreational opportunities at the Cloe Lake Recreation Area are available on Table VI-1.

2. County-Owned Recreational Resources

The Jefferson County Department of Development has been working closely with the Punxsutawney Area Rails-To-Trails Association in an attempt to acquire and develop a multipurpose rails-to-trails facility. In 1995, the County was successful in obtaining a Key '93 acquisition grant in the amount of $47,500, on behalf of the Association to acquire what is known as the Mahoning Shadow Trail.

The proposed trail would originate in Gaskill Township, Jefferson County at SR 2001 and meander easterly approximately 15 miles paralleling the Mahoning Creek to Fordham, Jefferson County. The facility has been marketed as a multipurpose facility with walking, jogging, biking, horseback riding and cross county skiing opportunities available to a diverse user group. Currently, the trail is in very good condition and usable. Nevertheless, development of the trail and trailheads will occur as grant funding becomes available.

3. Municipal-Owned Recreational Resources

Many of the small communities throughout Jefferson, Clearfield and Indiana Counties operate and support local recreational facilities. Some facilities are small and passive while others are able to offer areas for organized sports, are quite large and diverse.

Each facility is an important resource to their community as well as the overall region. Also, worthy of mention are the public schools within the Upper Mahoning Creek Watershed that are available to provide recreational resources and opportunities to those who wish to use them.

A complete listing of local publicly owned recreational facilities and the recreational opportunities that are available at each throughout the municipalities of the Upper Mahoning Creek Watershed can be found on Table VI-1.

TABLE VI-1

Public Recreational Resources Within the Upper Mahoning Creek Watershed

Facility Name and Opportunities	Location
State Game Lands No. 195 Fishing Hiking/Walking Hunting Biking	Gaskill Township, Jefferson County
Cloe Lake Recreation Area Fishing Hiking/Walking Hunting Picnic Tables Boating Restrooms	Bell Township, Jefferson County
Mahoning Shadow Trail Hiking/Walking Biking	Gaskill Township, Bell Township, Punxsutawney Borough, Young Township, Perry Township, Jefferson County
Anita Park Swimming Ball Fields Camping Volleyball Playground Passive Pavilions Picnic Tables	Village of Anita, Jefferson County
Barkley Square Ice Skating Passive	Punxsutawney Borough, Jefferson County
Big Run Community Park Playground Ball Fields Tennis Basketball	Big Run Borough, Jefferson County
Brady Township Community Park Ball Fields Picnic Table Playground Pavilions Basketball	Village of Luthersburg, Clearfield County
George Brown Swimming Pool Swimming Restrooms	Punxsutawney Borough, Jefferson County

Facility Name and Opportunities	Location
Harmon Field Playground Basketball Tennis Passive Volleyball Picnic Tables Ball Fields Pavilions	Punxsutawney Borough, Jefferson County
Henderson Township Community Park Pavilions Ball Fields Picnic Tables Tennis Playground	Village of Stump Creek, Jefferson County
National Guard Area Ball Fields	Punxsutawney Borough, Jefferson County
Patsy Dunmire Park Playground Passive Picnic Tables	Punxsutawney Borough, Jefferson County
Rossiter Recreation Area Ball Fields	Village of Rossiter, Indiana County
Stahl Park Playground Ball Fields Tennis Picnic Tables	Sykesville Borough, Jefferson County
Sykesville Community Park Playground Basketball Tennis Passive Ball Fields Picnic Tables Volleyball Restrooms Pavilions	Sykesville Borough, Jefferson County
Troutville Community Park Pavilions Picnic Table Basketball Playground Ball Fields	Troutville Borough, Clearfield County
Walston Community Park Playground Basketball Tennis Passive Ball Fields Picnic Tables Pavilions	Young Township, Jefferson County
Bell Township School Playground Basketball Restrooms	Bell Township, Jefferson County

Facility Name and Opportunities	Location
Big Run School Playground Basketball Restrooms	Big Run Borough, Jefferson County
Jenks Hill School Playground Basketball Restrooms	Punxsutawney Borough, Jefferson County
Longview School Playground Basketball Ballfields Restrooms	North Mahoning Township, Indiana County
Mary A. Wilson School Playground Basketball Restrooms	Punxsutawney Borough, Jefferson County
Parkview School Playground Basketball Restrooms	McCalmont Township, Jefferson County
West End School Playground Ball Fields Tennis Basketball Restrooms	Punxsutawney Borough, Jefferson County
Punxsy Jr. High School Basketball Ball Fields Restrooms	Punxsutawney Borough, Jefferson County
Punxsy Sr. High School Tennis Basketball Ball Fields Restrooms	Punxsutawney Borough, Jefferson County
Sykesville School Ball Fields Playground Basketball Restrooms	Winslow Township, Jefferson County

4. Privately Owned Recreational Resources

In addition to the publicly owned areas, some privately owned and operated recreational and resources exist within the Upper Mahoning Creek Watershed. The V.F.W. fields located in Punxsutawney Borough provide fields for the Punxsutawney Little League, Senior Little League, and Girls Softball Leagues. The Punxsutawney Area Country Club, also located in Punxsutawney provides an 18 hole golf course. The Punxsutawney Saddle Club located near Albion in Bell Township, Jefferson County holds annual horse riding events. Lastly, Fye Park in Gaskill Township consists of a small playground, pavilions, picnic tables and an indoor area where many family reunions are held throughout the summer months.

B. ARCHAEOLOGICAL/HISTORICAL

As a result of the amended National Historic Preservation Act of 1966, the recognition of either archaeological or historical resources has become an important issue for the Pennsylvania Historical and Museum Commission. In addition, 36 CFR Part 800 of the Federal Regulations, which is known as "protection of historic properties", governs the Section 106 review process for historic properties that was established through the National Historic Preservation Act.

Historic resources can be considered either prehistoric (archaeological) or historic - districts, sites, structures, buildings, or objects included on, are eligible for inclusion on the National Register of Historic Places. This includes artifacts, records, and remains that are related to and/or located within such properties. Each resource must meet minimal criterion to be included on the National Register of Historic Places.

The Pennsylvania Historical and Museum Commission was consulted regarding the presence of any known archaeological or historic sites within the watershed. Also each County Comprehensive Plan was reviewed to determine those sites that were listed on the National Register of Historic Places. In addition, a Historic Site Survey was conducted in Jefferson County for much of the study area in 1985-1987, and Indiana County in 1985. Clearfield County has not completed a Historic Site Survey for their County.

1. Archaeological

The Pennsylvania Historical and Museum Commission (PHMC) was consulted regarding the presence of any known archaeological sites and/or information. According the PHMC, this data is available but specific site information cannot be made available for public documents. Their concern is that known archaeological sites could be disturbed by Indian relic hunters. Therefore, site locations will not be referred to in this report.

Local knowledge has identified the Delaware Indians as probably the first and only real Indian settlers in Punxsutawney and the rest of the Upper Mahoning Creek Watershed. The Senecas resided only occasionally in the area and the Six Nations or Iroquois rarely entered Pennsylvania except in small numbers (Punxsutawney Centennial, 1949). According to records, the Punxsutawney floodplain and surrounding overlooking bluffs made ideal living conditions for the Delawares. Consequently, some of these unaltered areas are considered to have a fair probability of containing archaeological resources. Several known sites exist and have been inventoried with the PHMC, and the U.S. Department of Interior on the National Register of Historic Places.

The presence of Indians has made an everlasting mark on the area. For example, one of the most interesting legends of the area is how Punxsutawney received its namesake. Punxsutawney was once a swamp-like setting where "sandflies" thrived and pestered the local inhabitants - the Delawares. With the Indian word for sand-fly being "ponk:" the Indians named the area Ponksutenink or town of Ponkies. Later, Punxsutawney was derived from the Indian spelling to mean "sand-fly place".

2. Historical

The Jefferson, Indiana, and Clearfield County Planning Departments were consulted regarding the presence of any known historic or National Register Listed historic structures. As a result it was determined that Indiana and Jefferson Counties have conducted Historic Site Surveys for much of the Upper Mahoning Creek Watershed where Pennsylvania Historic Resource Survey Forms were completed on a select group of potentially eligible National Register Sites.

a). National Register Listed Sites

It was concluded that the following individual sites within the Upper Mahoning Creek Watershed are included on the National Register List of Historic Places.

Site	Location
Jefferson Theater	230 N. Findley Street, Punxsutawney
Kurtz, T.M., House	312 W. Mahoning Street, Punxsutawney
Schenkemeyer, House	233 W. Mahoning Street, Punxsutawney

In addition to the individual sites, the Punxsutawney Area Historical & Genealogy Society is currently utilizing a $5,000 grant from the Pennsylvania Historical and Museum Commission to prepare nominations for historic districts within Punxsutawney Borough (Punxsutawney Spirit, 1997 - See Appendix D). The Punxsutawney Area Historical and Genealogy Society along with the project consultant have identified three preliminary districts -a east-end district, west-end district and commercial-downtown district (see Figure 6). Within the districts are approximately 805 buildings that have been inventoried. According the PHMC, after the project information is reviewed and evaluated by the State, then PHMC will submit the application package to the U.S. Department of Interior for final approval and inclusion on the National Register of Historic Places.

b). Historic Site Surveys

As previously mentioned Historic Site Surveys were conducted for much of the Upper Mahoning Creek Watershed in Jefferson and Indiana Counties. Potential historic structures were evaluated through the completion of a Pennsylvania Historic Resource Survey Forms. Each form described and documented the conditions and integrity of the structure being surveyed. Table VI-2 summarizes the number of resources that were inventoried during the Historic Site Survey for each municipality within the Upper Mahoning Creek Watershed.

TABLE VI-2 - NUMBER OF HISTORIC SITE SURVEYS COMPLETED FOR MUNICIPALITIES OF THE UPPER MAHONING CREEK WATERSHED

Municipality	No.
Bell Township	N/A
Brady Township	N/A
Sandy Township	N/A
Penn Township	N/A
Troutville Borough	N/A
Total Clearfield County	N/A
Banks Township	1
Canoe Township	15
North Mahoning Township	3
West Mahoning Township	2
Total Indiana County	21
Bell Township	1
Big Run Borough	8
Gaskill Township	N/A
Henderson Township	2 + 2 zones
McCalmont Township	3 + 1 zone
Perry Township	4 + 4 zones
Porter Township	N/A
Punxsutawney Borough	47
Sykesville Borough	0
Winslow Township	0
Young Township	1
Total Jefferson County	66

N/A = Municipality not surveyed.

VII. MANAGEMENT OPTIONS

The "Management Options" that have been identified to address or correct the issues, concerns and constraints of the Upper Mahoning Creek Watershed are listed within this Section. These Management Options have in some part been identified during the public comment process of the development of the Upper Mahoning Creek Rivers Conservation Plan, and also through the numerous project team workshops that have been held.

Each issue and concern voiced has been considered to determine if a possible Management Option(s) exist to connect them. The Management Options follow the same six main focus groups format as the issues, concerns and constraints.

These Management Options have been given tentative prioritization. (see Summary Matrix) Nevertheless, it is difficult to fully prioritize these programs since time and financial commitments, as well as events, and circumstances change.

Management Options Summary

I. Degraded Water Quality

- Acid Mine Drainage

The discharge of acid mine drainage from the active and old mining sites across the basin is one of the watershed's most obvious "Issues", to both the residents of the watershed as well as the project team members. It was concluded that the most obvious (visible), and accessible areas of the watershed should be looked at initially. The study team feels that several discharges along Canoe Creek, Big Run, and Stump Creek could potentially be eliminated or reduced. Consequently, the water quality of these tributaries, would have a positive influence on the Mahoning downstream of their confluence. More data will be collected relative to these projects.

- Storm Water Runoff (Unimproved Roads Inventory)

An effort initiated by several of the Conservation Districts within the basin, considers the inventorying of all unimproved roads. The roads are a huge source of sediment during each storm event. Potentially road maintenance funds and implementation grant money could be utilized to improve the existing conditions, thereby reducing the sediment loads to nearby tributaries of the Upper Mahoning Creek Watershed. A public education program initiated through the Conservation Districts to distribute Best Management Practices (BMP) information to township supervisors will be considered.

- Sewage Issues

Currently only Punxsutawney Borough and the Village of Stump Creek have operational sewage treatment facilities within the watershed. However, an expansion at the Punxsutawney facility along with a new facility being constructed in the village of Rossiter are planned and should be operational within the next several years. In addition, Sykesville Borough and Big Run Borough have initiated their sewage plans by preparing Act 537 Plans over the last several years. Other municipalities (villages) that should/could consider sewage include, Sportsburg, and the Valier/Fordham area.

II. Flooding Frequency

♦ Storm Water Management

Jefferson County recognizes the importance of storm water management as a means of deterring flooding. Consequently, in December 1996 the County executed into an agreement to prepare an Act 167 Plan on the Upper Mahoning Creek Basin including the Big Run, Elk Run, Canoe Creek, Stump Creek and East Branch Mahoning Creek Watersheds. With the completion of the plan and implementation of the ordinance, large volumes of additional run-off will be regulated and correctly managed.

♦ Multi-purpose Reservoir

A study that was completed in the 1970's relative to a proposed reservoir for the East Branch of Mahoning Creek has been revisited. Although such a large project is probably infeasible due to funding restrictions it is important enough to be mentioned as a potential flood protection project. This collection reservoir could possibly reduce much of the flooding concerns of Big Run, Punxsutawney, Sportsburg, and other communities downstream which were severely flooded in 1972, 1977, and 1996. In addition, such a multipurpose reservoir could also provide an alternative water resource for three different water supplies, and additional recreational opportunities.

♦ Stream Channel Maintenance

The project study team recognizes that the current obstructions within the channels influence the flooding potential along some sections of the waterways. Because of the January and July 1996 floods, some large areas of debris (i.e. boards, metal, branches, logs, garbage, etc.) has accumulated at some less accessible areas within the watershed. Several areas have been identified and include the confluence of Mahoning and Canoe Creek; Elk Run, between T-456 and Punxsutawney; and Canoe Creek between Cloe and the Rossiter Road.

III. Land Use Management Practices

♦ County Land Use Ordinances

Currently, Indiana and Clearfield counties administer countywide land use controls. Jefferson County has failed to get countywide subdivision regulations put into place. The Jefferson County Planning Commission continues to support this effort.

♦ Illegal Dumping

Illegal dumping is a large problem throughout the Upper Mahoning Creek Watershed. Several areas are clearly visible along the Mahoning Creek Corridor. The idea of a "river sweep" has good potential. The areas that are larger and more dense may be considered for clean-up by The Jefferson County Chapter of PA Cleanways. This group is sponsored by the Jefferson County Solid Waste Authority, who provides clean-up materials (i.e. gloves, bags, containers) and landfill space. A cooperative effort between each County's Solid Waste Authority and DCNR's Rivers Implementation Grants would provide substantial effort in correcting this problem.

♦ Stream Bank Stabilization Projects

These projects have demonstrated considerable need throughout the watershed. Several obvious areas within the Mahoning Creek watershed include: the Twin Bridges area of East Branch, the Crawfordtown area of Elk Run, the confluence of Canoe Creek and Ugly Run, and the area north of Big Run along U.S. 119 and the Mahoning Creek. Also under consideration are smaller tributaries especially in agricultural and mining land use settings whose protective stream bank fencing would benefit the overall watershed. The study team is continuing to identify these areas which should receive top priority. The sponsor agency for each project would likely be the County Conservation Districts.

♦ Riparian Buffers

By preserving and/or enhancing riparian buffers along applicable areas of the Mahoning Creek Watershed, the water quality and temperature may be improved by the trapping and filtering of non-point source pollutants and presence of shaded forested areas paralleling the stream. Fish and wildlife would also benefit from the additional shelter, pathways, and travel corridors the riparian buffers create. With much of the basin falling in rural areas it is possible that some of the more critical corridors could be identified and preserved and/or enhanced. These corridors should be established with a minimum width of approximately 35 feet. More data will be collected relative to these projects.

IV. Lack of Recreational Opportunities

♦ Rails-to-Trails

Efforts by the Punxsutawney Area Rails-to-Trails Association to acquire and develop the Mahoning Shadow Trail have been successful. The Trail parallels the Mahoning Creek for approximately 12 of its 16 miles in length. Currently, the Association has a Key 93 acquisition grant to acquire the trail and trailheads. Individual projects such as improving drainage and minimizing erosional areas along the trail corridor would have a dual positive influence on the Mahoning Creek. Not only would this exceptional multi-purpose recreational facility be enhanced but some existing water quality concerns could also be addressed and corrected at the same time.

♦ Greenway Corridor Development

An area along the Mahoning Shadow Trail in or near Punxsutawney makes the most sense for a greenway corridor. The trail in this area parallels Mahoning Creek. Initial planning has indicated that picnic areas along with informative signage would greatly enhance the trail corridor. Development of the greenway could provide recreation, education and relaxation interaction for its users.

♦ Stream or Trail Access Improvements

Access areas or "trailheads" are being proposed along the Mahoning Shadow Trail. These areas include: an area adjacent to SR 2001 in Gaskill Township (Devil's Elbow), township roads 431, and 494 (Elbell Area), P&N Commerce Park (Punxsutawney) and off SR 3008 in Perry Township (Rose Run Area). The development of these accesses will provide parking for users of the Mahoning Shadow Trail, Mahoning Creek, and the Greenway Corridor.

♦ Canoe Access Areas

Canoeing on the Mahoning is becoming more and more common during the Spring months; however, designated launches and take outs are lacking. With a small amount of resources and a little effort three or more launches/take outs could be strategically located. Launches that have been identified include: Water Street (Punxsutawney), Guzzo Road (Sportsburg) and the SR 3015 Bridge (Valier).

♦ Multipurpose Reservoir

Revisiting a study form the 1970's indicated that a reservoir was proposed for the East Branch of Mahoning Creek. Although funding for such a project is probably nonexistent, the project team felt the project was worthy of being mentioned. Not only would the reservoir be a recreational asset to the area but it would also provide, to some degree, flood protection to Big Run, Punxsutawney and communities downstream. Also, water quality improvements may result from less sediment and colder water being discharged this providing more ideal fishing habitat throughout the year.

V. Protection and/or Enhancement of Critical Wildlife Habitats

♦ None Identified

VI. Lack of Public Education/Involvement

♦ Education Programs (Conservation)

The project study team feels the best way to continue to educate the public about conservation is through each County's Conservation District. Issues such as floodplain management, logging, stripping and farming practices are critical to the watershed and are addressed through their ongoing education missions. The project team will continue to support these efforts of the Conservation District Offices.

♦ Education Programs (Children/Youth)

It appears that school districts' curriculums are lacking conservation type activities/studies. If implemented into the school districts, the students would gain more appreciation of the natural environment and its sensitivity to environmental influences. The project team will continue to explore the most practical and effective options available.

♦ College/University Involvement

With the presence of two universities and several branch campuses within 45 minutes of the watershed, the potential exists to work together with the institutions on incorporating some studies on the Mahoning Creek Watershed into their curriculums. The studies could include a wide range of observations, from routine water quality gatherings to more detailed micro or macro-invertebrate surveys just to name a few. This involvement could produce a long range data base for the watershed. The project team will continue to explore the most practical and effective options available.

SUMMARY MATRIX

MANAGEMENT OPTION GROUPED BY ISSUE/CONCERN	MANAGEMENT OPTION SITES	TIME TABLE	POTENTIAL FUNDING SOURCES *
I. Degraded Water Quality			
Acid Mine Drainage	Canoe Creek Basin	1998 - 2000	DEP, NRCS, Trout Unlimited
	Big Run Basin	2000 - 2002	
	Stump Creek Basin	2000 - 2002	
Stormwater Runoff Sediment Loading	Basin wide	1997 - ongoing	DEP (Act 167) Funding, NEXTEA (Enhancements), Liquid Fuels, Developers
Sewage Issues	Village of Rossiter	1997 - ongoing	DEP (Act 537) Funding, PennVEST, CDBG, Farmers Home
	Punxsutawney Borough	1997 - ongoing	
	Big Run Borough	1997 - ongoing	
	Sykesville Borough	1997 - ongoing	
II. Flooding Frequency			
Stormwater Management Planning & Implementation	Basin wide	1997 - ongoing	DEP (Act 167) Funding, PennVEST Municipalities, Developers
Multi-Purpose Reservoir	E. Branch Mahoning Watershed	2002 - 2010	U.S. Army Corps of Engineers
Stream Channel Maintenance	Confluence of Mahoning/Canoe Creek	1999 - 2001	U.S. Army Corps of Engineers PADOT, DEP, Municipalities
	Elk Run from T-456 to Punxsutawney	1997 - ongoing	
	Canoe Creek from Cloe to SR 2011	1999 - 2001	
III. Land Use Management Practices			
County Land Use Ordinances	Jefferson County	2000 - 2004	County
Illegal Dumping	Basin wide	1997 - ongoing	DEP, JCSWA, PADOT, PA Cleanways, Punxsutawney Area Rails-to-Trails

MANAGEMENT OPTION GROUPED BY ISSUE/CONCERN	MANAGEMENT OPTION SITES	TIME TABLE	POTENTIAL FUNDING SOURCES *
Stream Bank Stabilization	Twin Bridges area E. Branch	1998 - 2002	Conservation Districts
	Crawfordtown area of Elk Run	1998 - 2002	
	Confluence of Canoe Creek and Ugly Run	1998 - 2002	
Riparian Buffers	Basin wide * (Determine need & potential locations)	1998 - 2000	Key 93 Grants, Conservation Districts County, NRCS
1). Forested	Basin wide * (Construction)	1999 - 2010	
2). Vegetative	Basin wide * (Determine need & potential locations)	1998 - 2000	Key 93 Grants, Conservation Districts, County, Trout Unlimited, NRCS, PA Fish & Boat Commission, PA Game Commission
	Basin wide * (Construction)	1999 - 2010	
IV. Lack of Recreational Opportunities			
Rails-To-Trails	Mahoning Shadow Corridor	1997 - ongoing	KEY 93 Grants, Symms Grants, NEXTEA, Trail Association
Greenway Corridor Development	Punxsutawney Area	1999 - 2003	KEY 93 Grants County, Trail Association
Stream/Trail Access Improvements	Gaskill Township along SR 2001	1998 - 2000	KEY 93 Grants County, Trail Association
	Elbell Area - Township Roads 431, 494	1998 - 2000	
	Punxsutawney - P&N Commerce Park	1998 - 2000	
	Perry Township - along SR 3008	1998 - 2000	
Canoe Access Areas	Water Street - Punxsutawney	1998 - 2000	KEY 93 Grants
	Guzzo Road - Sportsburg	1998 - 2000	
	SR 3015 Bridge - Valier	1998 - 2000	

MANAGEMENT OPTION GROUPED BY ISSUE/CONCERN	MANAGEMENT OPTION SITES	TIME TABLE	POTENTIAL FUNDING SOURCES *
Multipurpose Reservoir	E. Branch Mahoning Watershed	2002 - 2010	U.S. Army Corps of Engineers
V. Protection and/or Enhancement of Critical Wildlife Habitats	None	N/A	N/A
VI. Lack of Public Education/Involvement			
Education Programs (Conservation)	Across Basin	1997 - ongoing	DEP Environmental Education Grants, League of Women's Voters
Education Programs (Children/Youth)	Punxsutawney Area School District	1999 - 2001	DEP, School Districts
	DuBois Area School District	1999 - 2001	
College/University Involvement	Indiana University of Pennsylvania	1999 - 2005	Universities
	Penn State University	1999 - 2005	
	Clarion University	1999 - 2005	

* Rivers Implementation Grants are a possible funding source for each management option!

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Mr. Charles Alexander
P.O. Box 111
Brookville, PA 15825

Mr. Porter DuVall
R.D.#1
Corsica, PA 15829

ATTN: Mr. Ronald Jantz/Rick McKee
U.S. Corps of Engineers, Mahoning Dam
R.D.#1, Box 229
New Bethlehem, PA 16242

IX. PUBLIC INVOLVEMENT SUMMARY/PRESS COVERAGE

Meeting	Purpose	Date
Jefferson County Planning Commission	Monthly project update	Each month since project kickoff
Groundwater Protection Workshop	Educate public, Introduce project review	January 30, 1996
Project Team Meeting #1	Kickoff, planning requirements review	September 25, 1996
Public Meeting #1 (informational)	Seek kickoff, identification of issues/concerns	October 30, 1996
Project Team Meeting #2	Review/categorize/expand upon public input	November 26, 1996
Trout Unlimited Meeting	Present preliminary findings/seek input	January 15, 1997
Project Team Meeting #3	Review preliminary findings develop/identify management options	January 20, 1997
Project Team Meeting #4	Review Draft Rivers Plan, develop strategy for Public Meeting	May 28, 1997
Public Meeting #2	Present Draft Rivers Plan/ seek input	June 4, 1997
Public Hearing	Present Final Plan	September 3, 1997

Punxsutawney Spirit
10-29-96

County Receives Mahoning Watershed Grant

By Wick Divelbiss
Of The Spirit

Jefferson County has received a Rivers Conservation Planning Grant to develop a conservation plan for the Mahoning Creek Watershed.

A meeting to discuss issues and concerns on the 240-square-mile watershed will be held at 7 p.m. Wednesday, Oct. 30, at the Older Americans Social Center on Pine Street.

"The state's stressing we include the public as much as we can since it's their watershed," said Mike Heitzenrater, assistant planner for the Jefferson County Department of Development. "We're just basically getting this thing kicked off."

An outgrowth of the U.S. Geologic Survey sampling of groundwater in the watershed, the grant will allow the identification of issues and concerns on the watershed in Jefferson, Clearfield and Indiana counties, such as water quality, recreation possibilities and environmental and cultural resources.

By developing a comprehensive report on the watershed, the county, or a watershed authority if one is formed, would be in position to seek future grants for specific areas, such as mitigation of mine drainage or streambank erosion, canoe launches or the planned Mahoning Shadow Trail along Mahoning Creek.

Heitzenrater said the plan will be broad-ranged, with implementation plans focused more narrowly.

"We're not only talking about the Mahoning, but tributaries, too," he said. "The whole idea is to identify these issues and concerns throughout the basin and come up with a list."

A group comprised of planners and conservation district officials from the area, along with those familiar with the watershed, such as Ducks Unlimited and a former waterways conservation officer, met at the end of September to begin identifying issues and concerns. The Corps of Engineers is also involved.

Heitzenrater said the purpose of the Oct. 30 meeting in Punxsutawney is to hear from people who are knowledgeable and interested in the Mahoning Creek wa-

(See Mahoning On Page 6)

Mahoning

(Continued From Page One)

tershed.

More information is available from Heitzenrater at the county Department of Development in Brookville.

Group Disc
Needs, Opp

By Tom White
Of The Spirit

Many ideas for the improveme
and use of the Mahoning Cre
watershed were shared last night
a public meeting at the Old
American Social Center concer
ing the Mahoning Creek Rive

Mahoning

(Continued From Page One)

illegal dumping, logging, flood control and and stormwater erosion.

H. Porter Duvall, retired Jefferson County waterways conservation officer, noted acid mine drainage is worst along Elk Run and Stump Creek and these areas should be identified as such in the final report of the study.

Also discussed was the need to construct small dams along the watershed for flood control and recreation.

"Many communities along these streams would benefit. Flood control is a big issue, especially since what this area went through this year," said Roby Grose, representing the Gaskill Township Planning Commission. "The building of small dams would also promote boating, canoeing and fishing. There are many potentials."

It was agreed among those attending that water quality is the number one concern.

"If you don't have quality water, then everything else goes by the wayside," said Frampton.

Also considered important for recreational concerns were the aesthetics of the watershed, access to streams and canoe access.

Matt Taladay, representing the Punxsutawney Rails To Trails organization, explained that stream access along the organization's proposed trail would be a major benefit.

"That would help with the trail. Access to the water is important," he said.

Other recreational co
were the building of pic
along the streams and trou
ing wherever possible.

A problem along the watersh
is the erosion of stream banks.

Heitzenrater explained the purpose of preparing a a conservation plan is to identify the watershed's resources and its related issues and concerns.

"You have done some of that tonight," he said. "We want to provide the catalyst for a rivers support group. If we can gain

Park and Conservation fund will more than double the size of the proposed park to 43 acres, and will cover half of the acquisition costs.

A township recreation board has been formed and hopes to put the project out to bid next month, with at least partial completion of the park set for next summer, township Secretary George Anderson said.

Basketball and volleyball courts, soccer and baseball fields, a walking trail, picnic shelters, restrooms and other amenities are planned.

Anderson said the extra acreage is needed to provide room for future expansion and a second access road to the area.

Construction costs will be covered by a $114,000 state grant and $115,000 in township money.

The supervisors delayed action on a proposed ordinance that would adopt a fee schedule and require the mandatory review of all subdivision applications by borough engineers.

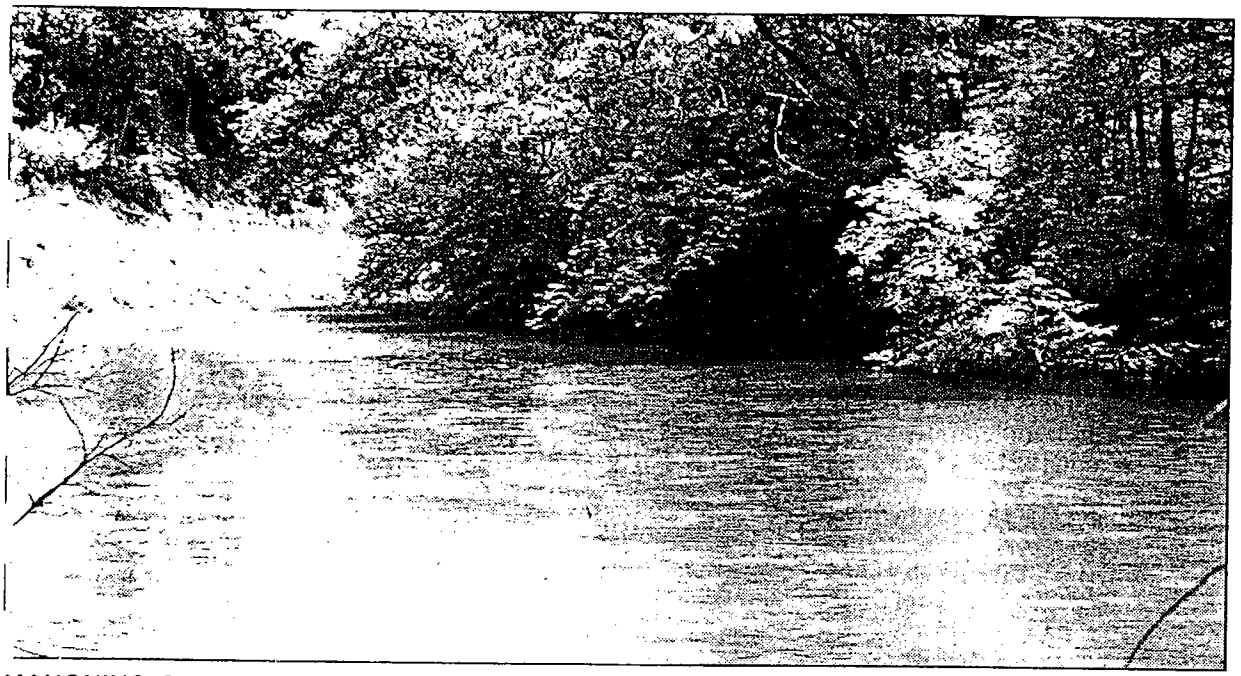
Anderson said the township has received a quote from Stiffler, McGraw and Associates of Hollidaysburg to conduct the reviews. He declined to reveal the proposed amount, noting the supervisors have yet to act on the proposal.

Belin said the supervisors should advertise the fees and adopt them as an ordinance.

All applications would be reviewed by the engineers for compliance with ordinance consideration by the planning commissio said, leaving the plann mission to deal with "p terest" considerations.

"We're putting... t technical responsibilit planning commissio said.

The supervisors also advertise for bids for t ship's 1997 paving proj said $90,000 has been b



MAHONING CREEK — Mahoning Creek meanders through Jefferson County near Bell's Landing between Big Run and Punxsutawney. (Photo by Tom Bukousky)

Mahoning River plan reviewed

By LAURA LYNN YOHE
Jeffersonian Democrat

PUNXSUTAWNEY — The Draft Rivers Conservation Plan for the Upper Mahoning Creek basin was reviewed at a special meeting of the Jefferson County Planning Commission held in Punxsutawney.

Focusing on the 207 square miles of the watershed upstream of the confluence with Little Mahoning Creek in Indiana County, the ultimate goal is inclusion in the Pennsylvania Rivers Conservation Registry.

With its headwaters just north of Big Run, the Mahoning Creek is formed by East Branch and Stump Creek and fed by fourteen other named major tributaries.

Areas of concern addressed were water quality, flooding frequency, land use management, recreational opportunities, wildlife habitat, and public education.

Within the major categories were sub-topics of acid mine drainage, storm water runoff, sewage, site pollution, sedimentation, debris, land management practices and transportation, among others.

Development of recreational opportunities such as Rail-to-Trails, canoe access areas, and greenways with trails and picnic tables are other areas needing attention according to the Plan.

Protecting the northern pike spawning beds on Stump Creek and the expansion of the state's elk range into the watershed are addressed in the Plan.

A 30-day public comment period commenced at the meeting. Copies of the plan will be available in each of the three affected counties of Jefferson, Clearfield and Indiana. Interested persons may contact the Jefferson County Department of Development at Jefferson Place in Brookville or by calling 849-3047, FAX 849-5049.

Love trian verdict: Gui

By CAROL WALKER
C-E Correspondent

CLEARFIELD — A j victed a 47-year-old W man on four of the five he was tried on in Cl County Court on Thursd

Darl E. Teats, P.O. B Winburne, was found g aggravated assault, ter threats, simple assa recklessly endangering He was found innocen tempting to commit c homicide. Assistant Dis torney Fred Neiswen scribed the case as a lo gle, jilted lover scenario

Teats was charged wi a shotgun at Rick Wils Box 253, Winburne, on 1996, outside the Winbur dence of his ex-fiancee, Dixon. Dixon testified t and Teats had a romant tionship for 9½ years; th broke up in October 19 that Teats was depress they broke up.

Teats looked pale an gard. He sat crying whe testified that Wilsoncr the reason she broke off lationship with him.

Dixon that she and W croft saw Teats in a Wi bar around midnight of N 1996. She said that wh and Wilsoncroft left t Teats was waiting in th ing lot, pulled up behin vehicle in his Bronco a two men argued.

Dixon said that whe

See VERDICT, Page 11

6-5-97
Punxsutawney Spirit

conspiracy and crim-
was sentenced to 30
rson County Jail, will
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ease from jail, will be
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two years, must pay
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O'Brien, 33, of
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a few of the spigots
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ir On Page 3)

orist — Downtown

ported with Huey to the Rossiter baseball field. Huey was transferred to a [illegible] ambulance and taken to Punxsutawney Area Hospital, where she was treated and released, state police in Punxsutawney reported. The helicopter landed outside the first-base foul line of the ball field with firefighters from Rossiter and Punxsutawney standing by. Punxsutawney firefighters also assisted at the accident scene. React members assisted at the accident scene and landing zone. Damage to the car was severe. A Conemaugh spokeswoman said Haines was in stable condition last night. (Photo by Wick Divelbiss)

Developers OK Punx'y Firm's Loan Applications

By Tom White
Of The Spirit

BROOKVILLE — The Jefferson County Development Council yesterday approved loan applications by BFG Electroplating of Punxsutawney to the Pennsylvania Economic Development Financing Authority for $1.6 million and to the Pennsylvania Independent Development Authority for $493,000 to help finance a $2.4 million building project at the Punxsutawney Industrial Park.

Jeffrey Grube of BFG Electroplating said BFG will also put up $275,000 for a new plant at the site and that construction should begin this year. Grube said the move will create 30 new jobs over the next three years.

Grube said it is hoped the 48,000 square foot building will be completed by September or October and that work would start as soon as possible.

In other business, council President Joseph Scarnati announced that the council is buying 31 acres of land from Preston Trucking Co. at the Falls Creek Industrial Park. The council has submitted an offer of $150,000 to Preston. The Falls Creek Industrial park is close to Exit 16 on Interstate 80.

Scarnati noted that Jefferson County Department of Development Director John Coleman and Economic Development Specialist Laura Mesoraco both have good track records when identifying and recommending sites that are good for industrial and economic development.

The land may be made into parcels and be sold to small businesses, according to Scarnati.

"It's good for us to have hands-on control of the property and go from there," he said. "We have already received some inquiries."

Scarnati said the land is the best property in the county for industrial development because of its location. He called it " a marketable property."

Deposit Bank will finance the purchase.

Draft Management Plan Addresses Options For Mahoning Creek Basin

By Tom Chandler
Of The Spirit

A draft manangement plan for the future of the large Upper Mahoning Creek watershed was presented last night, identifying management options to conserve and restore resources and recreational opportunities in the 207-square mile area, and listing potential funding sources for projects or further studies.

Issues and concerns raised during a public meeting in October were considered when project members prepared the draft plan, assistant Jefferson County planner Mike Heitzenrater explained last night at a public meeting at the Older American Social Center on Pine Street.

"All those concerns that were raised have been addressed with what we're calling management options that are included in the draft management plan," said Heitzenrater.

The Jefferson County Department of Development, with the assistance of the county Conservation District, received a $20,300 Pennsylvania Rivers Conservation Program grant to prepare a management plan for the watershed.

Heitzenrater said the approximately 30-month project should be completed by December. The draft presented last night will be placed on public review for a 30-day period before being submitted to the state Department of Conservation and Natural Resources for approval and to have the watershed included on the Pennsylvania Rivers Conservation Registry.

"What that will do is hopefully allow us to proceed forward for some further implementation funding for some projects," said Heitzenrater.

The entire watershed of Mahoning Creek being studied extends from its confluence with Little Mahoning Creek in northern Indiana County through Jefferson

(See Mahoning On Page 5)

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Care is available to all children up to age 18 at the Shriners' 19 orthopedic hospitals and three burn institutes in the U.S., Canada and Mexico. Shriners' Hospitals are open to children regardless of race, religion or relationship to a Shriner. The money comes from gifts, bequests, income from the endowment fund, hospital fundraisers and the annual hospital assessment paid by every Shriner.

Since 1922, Shrine hospitals have helped more than 550,000

opened in 1922 in Shreveport, La.

— Burn institutes opened in Galveston, Texas, 1966; Cincinnati, 1968; and Boston, 1968.

— Spinal cord injury units opened in Philadelphia, 1980;

Mahoning

(Continued From Page One)

County and takes into consideration headwaters in Clearfield County. There are 16 tributaries listed for consideration in the watershed management plan.

"So, you can see that this watershed is quite large and includes the three counties of Jefferson, Indiana and Clearfield," said Heitzenrater, noting that Jefferson County officials are also working with officials from the other two counties, federal and state agencies and public input in preparing the plan.

The draft includes six primary management areas and potential funding sources for projects in those areas.

The management areas include concerns of degraded water quality, flood control, land-use practices along the watershed, recreational opportunities, wildlife habitats and public education of the watershed's resources and values.

Tracy Frampton, assistant director of the Jefferson County Department of Development, pointed out that several potential sources of funding are listed in all management options in the draft.

"We tried to cover everything," Frampton said. "We're not always saying a county or municipality should be a funding source but that there are other sources out there as well."

Heitzenrater said state river conservation funds can provide a 50 percent match for projects to restore or enhance environmental, recreational or cultural projects.

Potential funding sources for the various management areas listed a variety of state and federal agencies, programs, organizations and local funding sources for projects or further studies of the watershed.

"When they first conceived of this program, I think the state just thought of implementation grants as being for brick and mortar type of projects," Frampton said. "I think they're finding now that the implementation grants could be used for both projects or for further studies such as studies of aquatic life."

Management options to preserve the quality of the water considered acid mine drainage, stormwater runoff, existing or planned sewage treatment facilities and other pollution sources.

Heitzenrater said members of the planning team along with officials of the state Department of Environmental Protection felt acid mine drainage could be addressed along three tributaries: Canoe Creek, Big Run and Stump Creek.

"They all felt these three basins could be approached with a minimal involvement," said Heitzenrater, citing state and federal agencies as potential funding sources.

Team members also felt stormwater runoff problems could best addressed through implementation grants to improve the quality of unimprove
areas.

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dramatic in the Oklahoma City auditorium where 150 survivors and relatives watched a closed-circuit telecast. One woman started hyperventilating and collapsed and several others broke into tears.

"I feel angry and very emotional. It's hard to hear it because it is so vivid. The descriptions are just such a mental picture," Jacque Walker, who lost an adult niece in the blast, said during a break in the telecast. "There's a lot of tears, a lot of sniffling."

Recognizing the emotion in the jury box, U.S. District Judge Richard Matsch sent jurors home

"We are not here to seek revenge on Timothy McVeigh," Matsch said. "We are here to consider the lives and what happened to these people, and as you'll see later, his life."

McVeigh's lawyers delayed an opening statement until they start their case. They plan to call McVeigh's relatives, who were expected to talk of his troubled past and ask that he be spared death by injection. Other witnesses will describe the influences and events — including the FBI siege at Waco — that turned the decorated Gulf War veteran against his own government.

heads. Clench your teeth. Bite your tongues. Whatever you have to do," he said.

Referring to Monday's verdict, Hartzler said: "That was tears of joy. This is going to be a lot tougher."

Mathilda Westberry said the death of her husband, Robert Westberry of the Defense Investigative Service, traumatized their 5-year-old grandson, David, who after the bombing started having thoughts of death.

"He would ask ... to run a red light so they could crash and die so he could be with 'Paw-Paw,'" she said.

school, telling peo
the school would
eventually underwent
She said he coped with
father's loss by sending hi
sages in helium balloons rel
into the sky.

Laura Sue Kennedy, whose only child, 18-month-old Blake, died in the day-care center, said she has suffered depression and bouts of sleeplessness. She said Blake's bedroom remains exactly the same as the day of the bombing, with his little clothes still hanging in the closet.

"It's painful to be a mother and not have anybody to mother," she said.

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JAN 15 1997

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Suite 322
315 South Allen Street
State College, Pennsylvania 16801

January 10, 1997

Mr. Mike Heitzenrater
Assistant Planner
Jefferson Place
155 Main Street, 2nd Floor
Brookville, PA 15825

Dear Mr. Heitzenrater:

This responds to your letter of January 6, 1997, requesting information about federally listed and proposed endangered and threatened species within the area affected by the preparation of a Rivers Conservation Plan for the Upper Mahoning Creek Watershed located in Clearfield, Indiana, and Jefferson Counties, Pennsylvania. The following comments are provided pursuant to the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) to ensure the protection of endangered and threatened species.

Except for occasional transient species, no federally listed or proposed threatened or endangered species under our jurisdiction are known to exist in the project impact area. Therefore, no Biological Assessment or further Section 7 consultation under the Endangered Species Act are required with the Fish and Wildlife Service. Should project plans change, or if additional information on listed or proposed species becomes available, this determination may be reconsidered. A compilation of certain federal status species in Pennsylvania is enclosed for your information.

This response relates only to endangered or threatened species under our jurisdiction based on an office review of the proposed project's location. No field inspection of the project area has been conducted by this office. Consequently, this letter is not to be construed as addressing other Service concerns under the Fish and Wildlife Coordination Act or other authorities.

Requests for information regarding State-listed endangered or threatened species should be directed to the Pennsylvania Game Commission (birds and mammals), the Pennsylvania Fish and Boat Commission (fish, reptiles, amphibians and aquatic invertebrates), and the Pennsylvania Department of Conservation and Natural Resources (plants).

Please contact Michael McCarthy of my staff at 814-234-4090 if you have any questions or require further assistance.

Sincerely,

David Densmore
Supervisor

Enclosure

FEDERALLY LISTED, PROPOSED AND CANDIDATE SPECIES (in Pennsylvania)

COMMON NAME	SCIENTIFIC NAME	STATUS*	DISTRIBUTION
FISHES			
Shortnose sturgeon**	*Acipenser brevirostrum*	E	Delaware River and other Atlantic coastal waters
REPTILES & AMPHIBIANS			
Bog turtle	*Clemmys muhlenbergii*	C	Current - Adams, Berks, Bucks, Chester, Cumberland, Franklin, Lancaster, Lebanon, Lehigh, Monroe, Montgomery, Northampton and York Counties. Historic - Crawford, Delaware, Mercer and Philadelphia Counties
BIRDS			
Bald eagle	*Haliaeetus leucocephalus*	T	Entire state. Recent nesting in Butler, Crawford, Dauphin, Forest, Lancaster, Pike, Tioga, Warren and York Counties
Peregrine falcon (American)	*Falco peregrinus anatum*	E	Entire state. Recent nesting in and around Philadelphia and Pittsburgh (Allegheny, Delaware, Philadelphia and Bucks Counties)
Piping plover	*Charadrius melodus*	E	Presque Isle (Erie County). Migratory. No nesting in Pennsylvania since mid-1950s
MAMMALS			
Indiana bat	*Myotis sodalis*	E	Summer range: possibly state-wide in suitable habitat. Winter hibernacula: Blair and Luzerne Counties.
MOLLUSKS			
Clubshell mussel	*Pleurobema clava*	E	French Creek and Allegheny River watersheds; Clarion, Crawford, Erie, Forest, Mercer and Venango Counties
Northern riffleshell	*Epioblasma torulosa rangiana*	E	French Creek and Allegheny River watersheds; Crawford, Erie, Forest, Venango and Warren Counties
PLANTS			
Northeastern bulrush	*Scirpus ancistrochaetus*	E	Current - Adams, Bedford, Blair, Carbon, Centre, Clinton, Cumberland, Dauphin, Franklin, Huntingdon, Lackawanna, Lehigh, Lycoming, Mifflin, Monroe, Perry, Snyder and Union Counties. Historic - Northampton Co.
Small-whorled pogonia	*Isotria medeoloides*	T	Current - Centre and Venango Counties. Historic - Berks, Chester, Greene, Monroe, Montgomery and Philadelphia Counties

* *E = Endangered, T = Threatened, PE = Proposed Endangered, PT = Proposed Threatened, C = Candidate* *Revised 11/27/96*

** *Shortnose sturgeon is under the jurisdiction of the National Marine Fisheries Service*

U.S. FISH AND WILDLIFE SERVICE
315 SOUTH ALLEN ST., SUITE 322, STATE COLLEGE, PA 16801

FEDERALLY LISTED SPECIES THAT NO LONGER OCCUR IN PENNSYLVANIA

COMMON NAME	SCIENTIFIC NAME	STATUS**	FORMER DISTRIBUTION
MAMMALS			
Delmarva Peninsula fox squirrel	*Sciurus niger cinereus*	E	mature forests of southeastern PA (Delaware and Chester Co.)
Eastern cougar	*Felis concolor couguar*	E	state-wide
Grey wolf	*Canis lupus*	E	state-wide
MOLLUSKS			
Dwarf wedge mussel*	*Alasmidonta heterodon*	E	Delaware River drainage
Fanshell*	*Cyprogenia stegaria*	E	Ohio River drainage
Orange pimpleback*	*Plethobasus striatus*	E	Ohio River drainage
Pink mucket pearly mussel*	*Lampsilis abrupta*	E	Ohio River drainage
Ring pink mussel*	*Obovaria retusa*	E	Ohio River drainage
Rough pigtoe*	*Pleurobema plenum*	E	Ohio River drainage
INSECTS			
American burying beetle	*Nicrophorus americanus*	E	state-wide
Karner blue butterfly	*Lycaeides melissa samuelis*	E	pine barrens, oak savannas (wild lupine habitat) (Wayne Co.)
Northeastern beach tiger beetle	*Cicindela dorsalis dorsalis*	T	along large rivers in southeastern PA
PLANTS			
Eastern prairie fringed orchid	*Platanthera leucophaea*	T	wet prairies, bogs (Crawford Co.)
Sensitive joint-vetch	*Aeschynomene virginica*	T	freshwater tidal marshes of Delaware river (Delaware and Philadelphia Co.)
Virginia spiraea*	*Spiraea virginiana*	T	along Youghiogheny River (Fayette Co.)
Smooth coneflower	*Echinacea laevigata*	E	serpentine barrens (Lancaster Co.)

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* *It is possible that remnant populations of some of these species (indicated with an *) may still occur in Pennsylvania, however, there have been no confirmed sightings of these species for over 70 years.*

** *E = Endangered, T = Threatened*

The following is a partial list of additional species that no longer occur in Pennsylvania: moose, bison, lynx, wolverine, passenger pigeon, Bachman's sparrow, greater prairie-chicken, olive-sided flycatcher, Bewick's wren, eastern tiger salamander, blue pike, butterfly mussel, Diana fritillary butterfly, precious underwing moth, deertoe mussel, marbled underwing moth, cobblestone tiger beetle, mountain clubmoss, crested yellow orchid, red milkweed, American barberry, small white lady's-slipper, etc, etc.

U.S. FISH AND WILDLIFE SERVICE
315 SOUTH ALLEN ST., SUITE 322, STATE COLLEGE, PA 16801

JAN 21 1997

COMMONWEALTH OF PENNSYLVANIA

PENNSYLVANIA GAME COMMISSION

2001 ELMERTON AVENUE
HARRISBURG, PA 17110-9797

ADMINISTRATIVE BUREAUS:

ADMINISTRATION	717-787-5670
AUTOMOTIVE AND PROCUREMENT DIVISION	717-787-6594
LICENSE DIVISION	717-787-2084
PERSONNEL DIVISION	717-787-7836
WILDLIFE MANAGEMENT	717-787-5529
INFORMATION & EDUCATION	717-787-6286
LAW ENFORCEMENT	717-787-5740
LAND MANAGEMENT	717-787-6818
REAL ESTATE DIVISION	717-787-6568
MANAGEMENT INFORMATION SYSTEMS	717-787-4076

January 16, 1997

Mr. Mike Heitzenrater
Jefferson Place
155 Main Street, 2nd Floor
Brookville, PA 15825

In re: Rivers Conservation Plan
Upper Mahoning Creek Watershed
Clearfield, Indiana and Jefferson Counties, PA

Dear Mr. Heitzenrater:

This is in response to your letter dated January 7, 1997 requesting information concerning natural resources within the watershed.

Our office review shows the Osprey (*Pandion halieatus*, PA Endangered) and State Game Lands 195 may be found within your study area. Also, NWI maps show many wetlands to occur throughout the watershed. For wetland impacts, you need to contact the U.S. Army Corps of Engineers, Pittsburgh District, at 412-644-6872 and the Department of Environmental Protection, Northwest Regional Office, at 814-332-6942.

If you have any questions, please contact Tony Ross of my staff at (717) 783-5957.

Very truly yours,

Denver A. McDowell, Chief
Division of Environmental
Planning and Habitat Protection
Bureau of Land Management

COMMONWEALTH OF PENNSYLVANIA
PENNSYLVANIA FISH & BOAT COMMISSION
Division of Fisheries Management
450 Robinson Lane
Bellefonte, PA 16823-9620
(814) 359-5110

APR - 4 1997

IN REPLY REFER TO
PNDI# 2022

April 3, 1997

JEFFERSON COUNTY
Mike Heitzenrater
Jefferson Place
155 Main Street, 2nd Floor
Brookville, PA 15825

Dear Mr. Heitzenrater:

RE: Environmental Assessment
Rivers Conservation Plan for the Upper Mahoning Creek Watershed
Clearfield/Indiana/Jefferson Counties, Pennsylvania

I have examined the map accompanying your recent correspondence which shows the location for the proposed above referenced project. Based on records maintained in the Pennsylvania Natural Diversity Inventory (PNDI) database and our own files, the following rare or protected species are known from the vicinity of the project site.

Common Name	Scientific Name	PA Status	PA Biological Survey Status
Ohio lamprey	*Ichthyomyzon bdellium*	PT	PT
timber rattlesnake	*Crotalus horridus*	PC	

For further consideration please submit additional information on the proposed project.

Sincerely,

Andrew L. Shiels

Andrew L. Shiels
Nongame and Endangered Species Unit

GR/sal

cc: R. Snyder, PFBC

APPENDIX B

Water Quality Data

U.S. Department of the Interior
U.S. Geological Survey
Fact Sheet 176-96

Quality of Ground Water at Selected Sites in the Upper Mahoning Creek Basin, Pennsylvania

- Fifty wells or springs were sampled within the 207 square mile upper Mahoning Creek Basin.
- No VOC, triazine herbicide, or nitrate concentration exceeded water-quality standards.
- Concentrations of manganese, iron, lead, radon, pH, hardness, and bacteria were most commonly found in exceedance of water-quality standards.
- Eighty-six percent of the radon exceedances were in water from the Glenshaw Formation.
- Seventy-four percent of the samples contained coliform bacteria.

Why Study the Upper Mahoning Creek Basin?

The ground-water quality of the upper Mahoning Creek Basin is largely unknown. Human activities in the basin have altered much of the landscape. The presence of coal mining, oil and gas exploration, agriculture, on-lot septic systems, and commercial development within the basin can introduce contaminants altering the natural chemistry of the ground water. Data collected to document current ground-water quality also can serve as a baseline for comparison of any future water-quality changes by continuing human activities.

This report presents the results of a synoptic ground-water-quality sampling in the upper Mahoning Creek Basin. Present ground-water quality in the basin is characterized in relation to published standards, local land-use activities, and other areas with similar natural characteristics.

What is the Description of the Study Area?

The basin occupies about 207 square miles upstream of the confluence of Little Mahoning Creek and Mahoning Creek in Jefferson, Indiana, and Clearfield Counties in western Pennsylvania (fig. 1). The basin lies within the Allegheny Plateau Section of the Appalachian Plateaus Physiographic Province (Fenneman, 1938). Mahoning Creek flows to the west across the plateau to its confluence with the Allegheny River about 60 miles north of Pittsburgh.

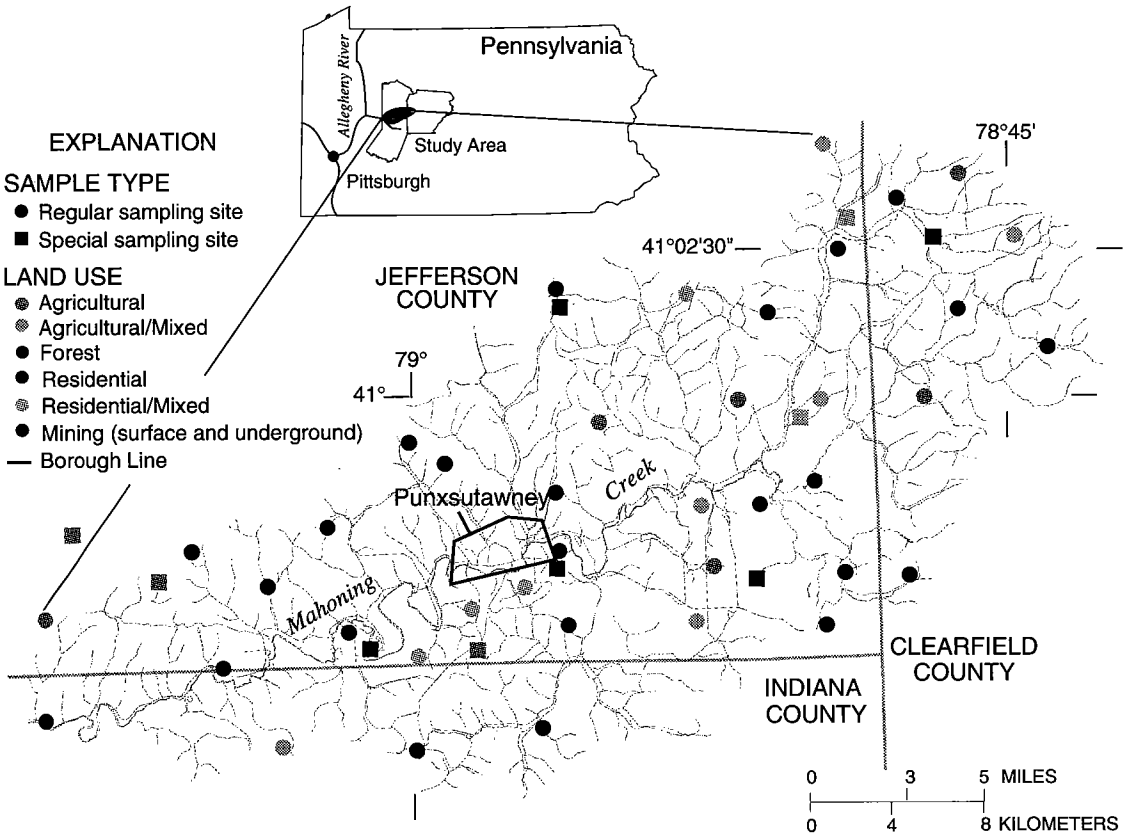
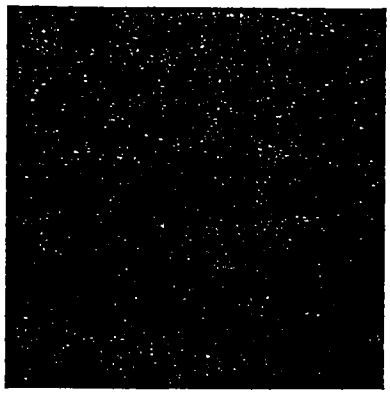


Figure 1. Location of study area, location and type of sampling sites, and land use near sampling site.



STORET
The Water Quality Information System

STORET. Powerful, versatile, easy-to-use computer database. Your central source for water quality data.

To store, retrieve or analyze water quality data, STORET is your single, up-to-date answer. STORET users have access to:

150 million water sample observations
from
800,000 sampling sites

Maintained by the U.S. Environmental Protection Agency, STORET contains data relating to the quality of surface and ground water in America's waterways. Water sample observations are available for all 50 states, the U.S. Territories, and portions of Canada.

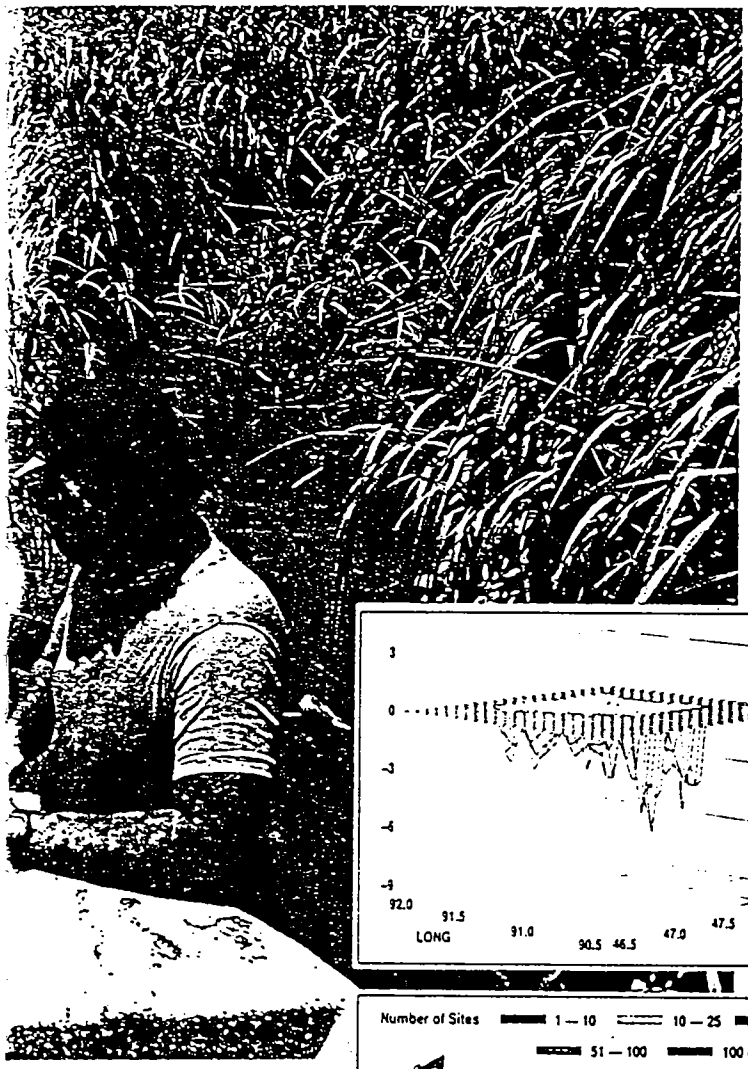
STORET — for STOrage and RETrieval — was developed as a uniform data collection and reporting system, making the task of analyzing water quality data from two or more sources possible. Accessible through most PCs with modems, the system can produce a number of geographic and statistical reports.

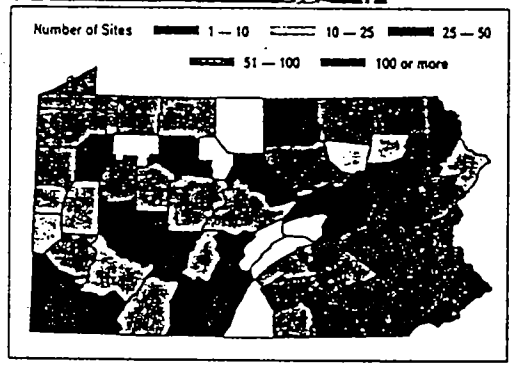
Analyzing Problems

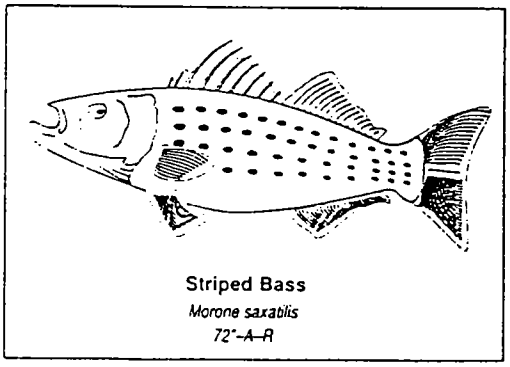
You can use STORET in solving problems such as defining the causes and effects of water pollution, measuring compliance with water quality standards, checking the status of waste treatment plant needs, and determining pollution trends.

STORET contains information on sampling sites, dates of samples, and physical, chemical and biological sample data. Historical data for some areas reach back 40 years.

STORET is used by EPA for its national water quality analysis program and is maintained as a nationally-available repository for parametric water quality data. Users have access to all the information in the system and are able to add new information as well.







STORET's User Community

Who can use STORET? You can! Anyone who needs to analyze, store or retrieve water quality data, including:

- State and local government personnel
- Federal government agencies
- Interstate commissions
- Commercial clients
- Universities

Several federal agencies have direct access to STORET and continually add data into the system. This is one more reason why STORET is up-to-date. Government users include: the U.S. Forest Service, the U.S. Army Corps of Engineers, the Bureau of Reclamation, the U.S. Geological Survey, and the Tennessee Valley Authority.

What Can STORET Do?

Shade and trend maps, plots, and statistical summaries are some of the report options available through this versatile system. Users can also generate machine-readable files that can be used as input to user-written programs or to commercially-available statistical software, such as the offerings of SAS Institute Inc., to extend the system's analytic and graphic output capabilities.

STORET users can develop reports, look at the most current data available, or present information depicting trends over time. Here's a look at a few examples of how STORET is being used today.

a) How clear are the lakes in Lake County, Minnesota? This graph of Secchi disk readings in that county gives a 3-D picture.

b) STORET can show diversity within a geographic area. The Pennsylvania map depicts the number of ground water sampling sites in the state by county.

c) Part of BIOS is the Taxonomic Database. This striped bass is just one of more than 60,000 species described in the database.

**** STORET SUMMARY SECTION ****

FOLLOWING IS A RETRIEVAL OF DATA FROM THE ENVIRONMENTAL PROTECTION AGENCY'S STORET SYSTEM, A DATABASE OF SAMPLING SITES AND THEIR ASSOCIATED QUALITY DATA. THE INFORMATION WAS RETRIEVED USING SPECIFIC STORET INSTRUCTION SETS IN COMBINATION TO SELECT ONLY THE DATA REQUESTED FOR THIS RETRIEVAL. BRIEF EXPLANATIONS OF THE INSTRUCTION SETS ARE INCLUDED BELOW. QUESTIONS MAY BE DIRECTED TO THE STORET USER ASSISTANCE SECTION AT (800) 424-9067.

****

FOLLOWING IS THE FORMAT FOR THE STATION HEADER INFORMATION WHICH APPEARS ON EACH PAGE OF THE RETRIEVAL UNLESS STATION AGGREGATION WAS PERFORMED

STATION NUMBER(S)
LATITUDE/LONGITUDE PRECISION CODE
STATION LOCATION
STATE/COUNTY CODE STATE NAME COUNTY NAME
MAJOR BASIN NAME MAJ/MIN/SUB BASIN CODE
MINOR BASIN NAME
*STATION TYPE AGENCY CODE STORED DATE HYDROLOGIC UNIT
STATION DEPTH ELEVATION
ECOREGION
WATER BODY
AQUIFERS
LOCKED DATE
*RIVER MILE INDEX

CONTINUED ON NEXT PAGE(S)

RETRIEVAL PROGRAM

PGM=INVENT
THIS IS AN INVENTORY RETRIEVAL SHOWING SUMMARY STATISTICS FOR ALL PARAMETERS

NO BEGINNING DATE WAS REQUESTED -- STORET ASSUMED THE BEGINNING DATE WAS THAT OF THE OLDEST DATA VALUE FOUND
NO ENDING DATE WAS REQUESTED -- STORET ASSUMED THE ENDING DATE WAS THAT OF THE MOST RECENT DATA VALUE FOUND

STATION SELECTION WAS BY:

AGENCY CODE(S) AND STATION NUMBER(S) FOR THE FOLLOWING AGENCY(S):
21PA

STATIONS SELECTED WERE RESTRICTED TO:

AGENCIES WHOSE DATA HAS NOT BEEN 'RETIRED'

CONTACTS FOR AGENCY CODES RETRIEVED:

AGENCY	PRIMARY CONTACT NAME	ORGANIZATION	PHONE NUMBER(S)
21PA	SCHREFFLER, TAMMY	PENNSYLVANIA DPT ENV PROT	(717)783-3638

FIELD SURVEY REFERENCES:

AGENCY	ENTRY	DESCRIPTION
21PA	V-00001	87/04/01 - PERIODIC FIXED-NETWORK TREND MONITORING MONITORING

DATA RESTRICTIONS:

NOTE
NO DEPTH INDICATOR RESTRICTIONS WERE SPECIFIED - COMPUTATIONS WILL
BE PERFORMED WITHOUT REGARD TO DEPTH INDICATORS

NOTE
NO GRAB/COMPOSITE RESTRICTIONS WERE UTILIZED, SO BOTH GRAB AND COMPOSITE SAMPLE TYPES MAY HAVE
BEEN INCLUDED - COMPUTATIONS WILL BE PERFORMED WITHOUT REGARD TO SAMPLE TYPE

NOTE
NO COMPOSITE SAMPLE RESTRICTIONS WERE SPECIFIED - COMPUTATIONS WILL INCLUDE STATISTICAL FEATURES OF
THE COMPOSITING PROCESS, PRODUCING VALID RESULTS ONLY WHEN SOPHISTICATED COMPOSITES ARE NOT ENCOUNTERED.
SPECIFY COMPOSITE HANDLING KEYWORDS "ANC" AND/OR "DSROC" IF NEEDED

***** END OF SUMMARY SECTION *****

WQN0861
40 55 19.0 079 00 23.0 4
MAHONING CRK-T374 BR AT SPORTSBURG-YOUNG TWP
42065 PENNSYLVANIA JEFFERSON
OHIO RIVER BASIN
MAHONING CREEK
21PA 880305 05010006
0000 FEET DEPTH

/TYPA/AMBNT/STREAM/BIO

PARAMETER				MEDIUM	RMK	NUMBER	MEAN	VARIANCE	STAN DEV	MAXIMUM	MINIMUM	BEG DATE	END DATE
00945	SULFATE	SO4-TOT	MG/L	WATER		107	111.4300	1388.000	37.25600	210	25	88/01/21	96/11/07
01042	COPPER	CU,TOT	UG/L	WATER		33	31.12100	2689.100	51.85600	259	10	88/04/11	96/11/07
					K	74	10.00000	.0000000	.0000000	10	10	88/01/21	96/10/03
					TOT	107	16.51400	907.8400	30.13000	259	10	88/01/21	96/11/07
01045	IRON	FE,TOT	UG/L	WATER		107	1397.200	7921900	2814.600	26700	419	88/01/21	96/11/07
01051	LEAD	PB,TOT	UG/L	WATER		20	5.444000	36.54900	6.045600	28	1	88/02/11	96/11/07
					K	87	3.379300	1.494000	1.222300	4	1	88/01/21	96/10/03
					TOT	107	3.765200	8.417300	2.901300	28	1	88/01/21	96/11/07
01055	MANGNESE	MN	UG/L	WATER		107	271.8300	19502.00	139.6500	1350.0	104.0	88/01/21	96/11/07
01067	NICKEL	NI,TOTAL	UG/L	WATER		14	49.35700	1036.700	32.19800	130	28	88/04/11	94/02/02
					K	93	25.26900	6.720700	2.592400	50	25	88/01/21	96/11/07
					TOT	107	28.42100	199.5900	14.12800	130	25	88/01/21	96/11/07
01092	ZINC	ZN,TOT	UG/L	WATER		87	29.77000	1367.500	36.98000	236	10	88/01/21	96/11/07
					K	20	10.00000	.0000000	.0000000	10	10	88/06/08	96/10/03
					TOT	107	26.07500	1169.500	34.19800	236	10	88/01/21	96/11/07
01105	ALUMINUM	AL,TOT	UG/L	WATER		81	731.8400	2749500	1658.200	12700	136	88/02/11	96/11/07
					K	26	181.7300	56778.00	238.2800	1350	135	88/01/21	96/09/05
					TOT	107	598.1700	2144700	1464.500	12700	135	88/01/21	96/11/07
34680	ALDRIN	TISMG/KG	WET WGT	WATER	K	2	.0075000	.0000125	.0035355	.010	.005	90/09/06	94/09/08
34685	ENDRIN	TISMG/KG	WET WGT	WATER	K	2	.0150000	.0000500	.0070711	.020	.010	90/09/06	94/09/08
34686	HPCHLREP	TISMG/KG	WET WGT	WATER	K	2	.0075000	.0000125	.0035355	.010	.005	90/09/06	94/09/08
34687	HEPTCHLR	TISMG/KG	WET WGT	WATER	K	2	.0075000	.0000125	.0035355	.010	.005	90/09/06	94/09/08
39063	CHLORDAN	C ISOMER	TIS-UG/G	WATER	K	2	.0125000	.0001125	.0106070	.020	.005	90/09/06	94/09/08
39066	CHLORDAN	T ISOMER	TIS-UG/G	WATER	K	2	.0125000	.0001125	.0106070	.020	.005	90/09/06	94/09/08
39069	NONACHLR	C ISOMER	TIS UG/G	WATER	K	2	.0150000	.0000500	.0070711	.020	.010	90/09/06	94/09/08
39072	NONCHLOR	T ISOMER	TIS-UG/G	WATER	K	2	.0150000	.0000500	.0070711	.020	.010	90/09/06	94/09/08
39074	ALPHABHC	TISMG/KG	WET WGT	WATER	K	2	.0075000	.0000125	.0035355	.010	.005	90/09/06	94/09/08
39105	PERCENT	FAT	HEX EXTR	WATER		2	1.315000	.0144490	.1202100	1.4	1.2	90/09/06	94/09/08
39302	P,P'DDT	TISMG/KG	WET WGT	WATER	K	2	.0250000	.0004500	.0212130	.04	.01	90/09/06	94/09/08
39307	O P DDT	TISSUE	UG/G	WATER	K	2	.0250000	.0004500	.0212130	.04	.01	90/09/06	94/09/08
39312	P,P'DDD	TISMG/KG	WET WGT	WATER	K	2	.0150000	.0000500	.0070711	.02	.01	90/09/06	94/09/08
39322	P,P'DDE	TISMG/KG	WET WGT	WATER	K	2	.0150000	.0000500	.0070711	.02	.01	90/09/06	94/09/08
39325	O,P DDD	TISSUE	UG/G	WATER	K	2	.0150000	.0000500	.0070711	.020	.010	90/09/06	94/09/08
39329	O,P'DDE	TISSUE	UG/G	WATER	K	2	.0150000	.0000500	.0070711	.020	.010	90/09/06	94/09/08
39404	DIELDRIN	TISMG/KG	WET WGT	WATER	K	2	.0150000	.0000500	.0070711	.02	.01	90/09/06	94/09/08
39515	PCBS	FISH	MG/KG	WATER	K	2	.2250000	.0012500	.0353560	.250	.200	90/09/06	94/09/08
39785	GBHC-TIS	LINDANE	WETMG/KG	WATER	K	2	.0075000	.0000125	.0035355	.01	.005	90/09/06	94/09/08
46471	CHLORDNE	TISS WET	WT MG/KG	WATER	K	2	.0150000	.0000500	.0070711	.020	.010	90/09/06	94/09/08
70320	MOISTURE	CONTENT	PERCENT	WATER		2	74.20000	36.98100	6.081200	79	70	90/09/06	94/09/08

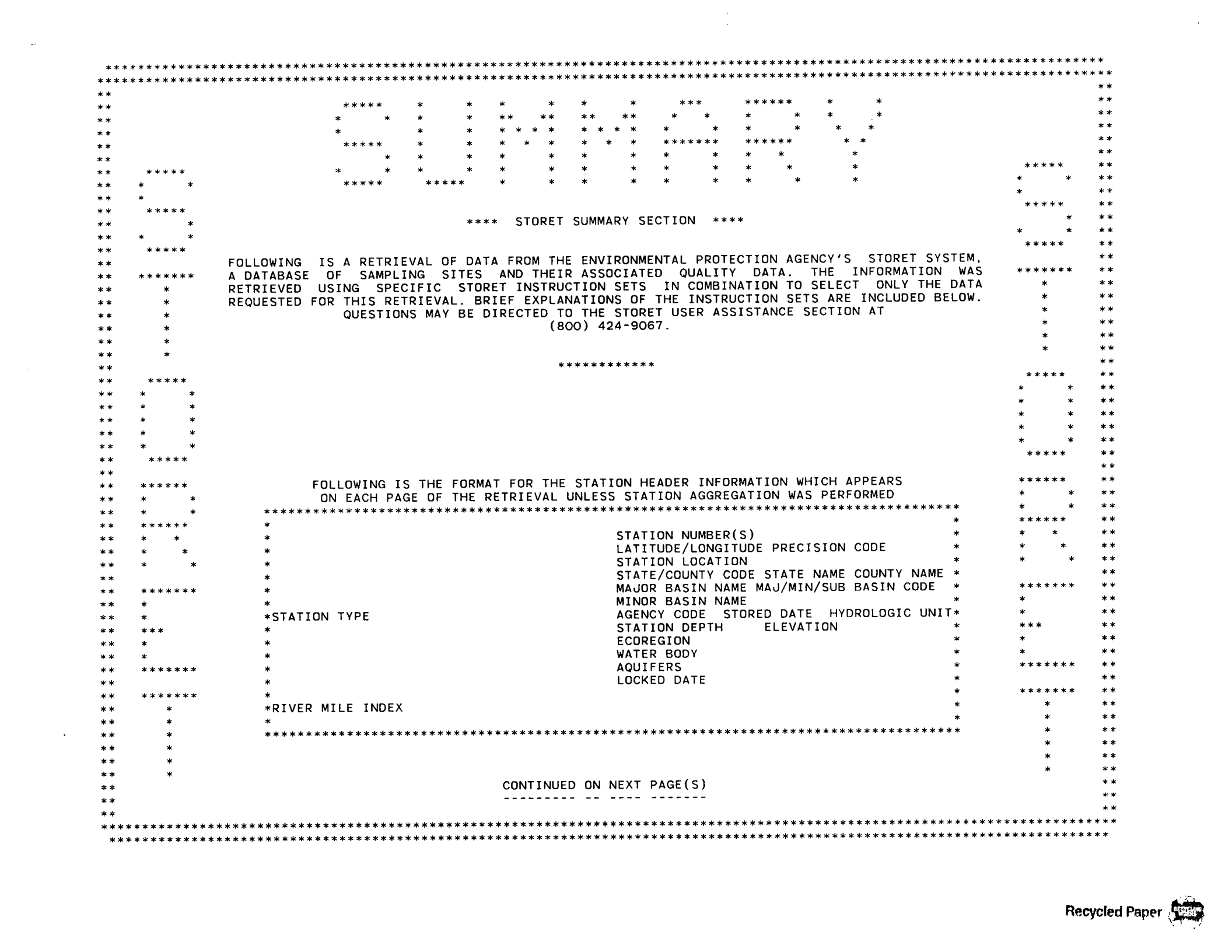
1 TOTAL STATIONS PROCESSED

	STA BEG	STA END	# OF OBS	# OF SAMPLE	STA END-PERIOD OF RECD IN YRS =0	<.5	<3	>=3
<1978	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0
1988	1	0	387	13	0	0	0	0
1989	0	0	398	15	0	0	0	0
1990	0	0	437	14	0	0	0	0
1991	0	0	387	13	0	0	0	0
1992	0	0	394	13	0	0	0	0
1993	0	0	398	13	0	0	0	0
1994	0	0	421	13	0	0	0	0
1995	0	0	336	12	0	0	0	0
1996	0	1	308	11	0	0	0	1
1997	0	0	0	0	0	0	0	0
TOTAL	1	1	3466	117	0	0	0	1

DATA with REMARK CODES

Observations in STORET are stored as numerical values usually representing the result of a laboratory or field analysis to quantify the concentration of a chemical in a water sample. In some cases, the numerical value stored represents something other than a normal outcome, and a "Remark Code" is associated with the value as it is entered. Remark codes which are permitted are listed below with their definitions.

REMARK	DEFINITION
(blank)	Data not remarked. Number should be interpreted exactly as reported.
B	Results based upon colony counts outside the acceptable range.
C	Calculated. Value stored was not measured directly, but was calculated from other data available.
D	Field measurement. Some parameter codes (e.g., 400, "Field pH") imply this condition without this remark.
E	Extra sample taken in compositing process.
F	In the case of species, F indicates Female sex.
J	Estimated. Value shown is not a result of analytical measurement.
K	Off-scale low. Actual value not known, but known to be less than value shown. Usually used to indicate a failure to detect the substance.
L	Off-scale high. Actual value not known, but known to be greater than value shown.
M	Presence of material verified, but not quantified. Indicates a positive detection, at a level too low to permit accurate quantification. In the case of temperature or oxygen reduction potential, M indicates a negative value. In the case of species, M indicates Male sex.
N	Presumptive evidence of presence of material.
O	Sampled for, but analysis lost. Accompanying value is not meaningful for analysis.
S	Laboratory test.
T	Value reported is less than the criteria of detection.
U	Material was analyzed for, but not detected. Value stored is the limit of detection for the process in use. In the case of species, U indicates Undetermined sex.
W	Value observed is less than the lowest value reportable under remark "T".
$	Calculated by retrieval software. Numerical value was neither measured nor reported to the database, but was calculated from other data available during generation of the retrieval report.□



RETRIEVAL PROGRAM

PGM=ALLPARM
THIS PROGRAM PRINTS ACTUAL SAMPLE VALUES FOR ALL PARAMETERS

NO BEGINNING DATE WAS REQUESTED -- STORET ASSUMED THE BEGINNING DATE WAS THAT OF THE OLDEST DATA VALUE FOUND
NO ENDING DATE WAS REQUESTED -- STORET ASSUMED THE ENDING DATE WAS THAT OF THE MOST RECENT DATA VALUE FOUND

STATION SELECTION WAS BY:

AGENCY CODE(S) AND STATION NUMBER(S) FOR THE FOLLOWING AGENCY(S):
21PA

STATIONS SELECTED WERE RESTRICTED TO:

AGENCIES WHOSE DATA HAS NOT BEEN 'RETIRED'

CONTACTS FOR AGENCY CODES RETRIEVED:

AGENCY	PRIMARY CONTACT NAME	ORGANIZATION	PHONE NUMBER(S)
21PA	SCHREFFLER, TAMMY	PENNSYLVANIA DPT ENV PROT	(717)783-3638

FIELD SURVEY REFERENCES:

AGENCY	ENTRY	DESCRIPTION
21PA	V-00001	87/04/01 - PERIODIC FIXED-NETWORK TREND MONITORING MONITORING

DATA SPECIFICATIONS:

NOTE
NO REMARK CODE RESTRICTIONS WERE SPECIFIED - COMPUTATIONS WILL
BE PERFORMED WITHOUT REGARD TO DATA REMARKS

DATA RESTRICTIONS:

NOTE
NO DEPTH INDICATOR RESTRICTIONS WERE SPECIFIED - COMPUTATIONS WILL
BE PERFORMED WITHOUT REGARD TO DEPTH INDICATORS

NOTE
NO GRAB/COMPOSITE RESTRICTIONS WERE UTILIZED, SO BOTH GRAB AND COMPOSITE SAMPLE TYPES MAY HAVE
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NOTE
NO COMPOSITE SAMPLE RESTRICTIONS WERE SPECIFIED - COMPUTATIONS WILL INCLUDE STATISTICAL FEATURES OF
THE COMPOSITING PROCESS, PRODUCING VALID RESULTS ONLY WHEN SOPHISTICATED COMPOSITES ARE NOT ENCOUNTERED.
SPECIFY COMPOSITE HANDLING KEYWORDS "ANC" AND/OR "DSROC" IF NEEDED

WQN0861
40 55 19.0 079 00 23.0 4
MAHONING CRK-T374 BR AT SPORTSBURG-YOUNG TWP
42065 PENNSYLVANIA JEFFERSON
OHIO RIVER BASIN
MAHONING CREEK
21PA 880305 05010006
0000 FEET DEPTH

/TYPA/AMBNT/STREAM/BIO

	INITIAL DATE			88/01/21	88/02/11	88/03/14	88/04/11	88/05/10	88/06/08	88/07/05	88/08/09	88/09/06
	INITIAL TIME			1400	1330	1115	0800	0845	0815	0830	0900	0830
	MEDIUM			WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00010	WATER	TEMP	CENT	2.0	3.0	3.2	6.8	13.0	17.5	20.8	22.0	14.0
00011	WATER	TEMP	FAHN	35.6$	37.4$	37.8$	44.2$	55.4$	63.5$	69.4$	71.6$	57.2$
00057	IND OF	FLOW	CHECKED	0	0	0	0	0	0	0	0	0
00060	STREAM	FLOW	CFS	447	299	451	274	294	85	22	29	45
00061	STREAM	FLOW,	INST-CFS	417	289	444		333	86	34	31	46
00065	STREAM	STAGE	FEET	2.50	2.18	2.57		2.29	1.42	.98	.94	1.11
00094	CNDUCTVY	FIELD	MICROMHO	140	200	170	175	260	400	550	500	395
00095	CNDUCTVY	AT 25C	MICROMHO			210	230	265	391	494	411	414
00300	DO		MG/L	11.6	12.6	12.0	10.4	9.0	7.4	4.6	5.4	7.4
00301	DO	SATUR	PERCENT	84.1$	93.3$	88.9$	85.2$	84.9$	76.3$	51.1$	61.4$	71.2$
00400	PH		SU	7.20	6.65	6.80	6.80	6.70	6.80	6.85	6.70	6.90
00403	PH	LAB	SU	6.6	6.7	6.4	6.5	6.6	6.7	6.7	6.9	6.6
00410	T ALK	CACO3	MG/L	22	32	26	34	36	60	82	66	58
00530	RESIDUE	TOT NFLT	MG/L	12	22	6	2K	76	6	2K	4	4
00610	NH3+NH4-	N TOTAL	MG/L	.140	.120	.080	.070	.100	.150	.370	.320	.180
00612	UN-IONZD	NH3-N	MG/L	.0002$	.00006$	.00005$	.00006$	.0001$	.0003$	.001$	.0007$	.0004$
00615	NO2-N	TOTAL	MG/L	.012	.004	.004	.004	.012	.012	.086	.098	.038
00619	UN-IONZD	NH3-NH3	MG/L	.0003$	.00007$	.00007$	.00008$	.0001$	.0004$	.001$	.0009$	.0004$
00620	NO3-N	TOTAL	MG/L	.890	.900	.840	.700	.450	.450	.370	.720	.540
00665	PHOS-TOT		MG/L P	.160	.060	.040	.040	.150	.090	.130	.210	.130
00680	T ORG C	C	MG/L	2.9	1.1	1.2	1.1	2.5	1.7	2.1	3.0	2.4
00900	TOT HARD	CACO3	MG/L	78	115	90	107	110	160	202	181	187
00945	SULFATE	SO4-TOT	MG/L	63	99	71	85	85	119	173	162	158
01042	COPPER	CU,TOT	UG/L	10K	10K	10K	21	10K	22	18	14	28
01045	IRON	FE,TOT	UG/L	1730	998	779	750	5030	649	524	974	1340
01051	LEAD	PB,TOT	UG/L	4K	5	4K	4K	9	4K	4K	4K	4K
01055	MANGNESE	MN	UG/L	243.0	367.0	226.0	258.0	335.0	183.0	193.0	398.0	277.0
01067	NICKEL	NI,TOTAL	UG/L	25K	25K	25K	30	25K	25K	49	25K	32
01092	ZINC	ZN,TOT	UG/L	214	37	21	31	32	10K	22	14	10K
01105	ALUMINUM	AL,TOT	UG/L	1350K	145	441	192	2760	316	222	489	460
74041	WQF	SAMPLE	UPDATED	890324	890324	890324	880624	890324	890324	890324	890324	890324

WQN0861 PFBC2-027
40 55 19.0 079 00 23.0 4
MAHONING CRK-T374 BR AT SPORTSBURG-YOUNG TWP
42065 PENNSYLVANIA JEFFERSON
OHIO RIVER BASIN
MAHONING CREEK
21PA 880305 05010006
0000 FEET DEPTH

/TYPA/AMBNT/STREAM/BIO

(SAMPLE CONTINUED FROM PREVIOUS PAGE)

				(1)								
SURVEY				1								
SAMPLE ID-REPLICATE				-0								
INITIAL DATE				88/09/07	88/10/04	88/11/09	88/12/08	89/01/04	89/02/01	89/03/07	89/03/08	89/04/05
INITIAL TIME					0800	0830	0830	0815	0900	0945	0945	0830
MEDIUM				FS	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
83509	STREAM	WIDTH	METER	37.0								
83515	CANOPY	AMOUNT	PERCENT	15.00								
83541	SUBSTRAT	BOULDER	%	5.00								
83542	SUBSTRAT	COBBLE	%	40.00								
83543	SUBSTRAT	CRS GRVL	PEBBLE %	20.00								
83544	SUBSTRAT	GRAVEL	%	30.00								
83546	SUBSTRAT	SILT	%	5.00								
84131	SMPL MTH	CONFDNCE	CODE	A								
84132	STRMBANK	VEG STAB	RATING	G								
84133	STRMBANK	STABLITY	RATING	MDST								
84134	EMBEDDED	NESS DGR	CODE	3								
84135	STRMSIDE	COVER	CODE	3								

										(7)		
SURVEY										1		
SAMPLE ID-REPLICATE										-0		
INITIAL DATE				89/05/09	89/06/04	89/06/06	89/07/10	89/08/10	89/09/05	89/09/12	89/10/05	89/11/01
INITIAL TIME				1000	0820	0820	0830	1345	0700		0710	1300
MEDIUM				WATER	WATER	WATER	WATER	WATER	WATER	FS	WATER	WATER
00010	WATER	TEMP	CENT	7.5		13.0	17.0	19.0	15.5	18.3	9.0	10.5
00011	WATER	TEMP	FAHN	45.5$		55.4$	62.6$	66.2$	59.9$	64.9$	48.2$	50.9$
00057	IND OF	FLOW	CHECKED	0	0	0	0	0	0		0	0
00060	STREAM	FLOW	CFS	755	319	373	276	48	28		34	76
00061	STREAM	FLOW,	INST-CFS	763	304		278	48	27		34	86
00065	STREAM	STAGE	FEET	3.26	2.22		2.15	1.13	.93		1.00	1.39
00094	CNDUCTVY	FIELD	MICROMHO	150		265	290	475	525	600	455	350
00095	CNDUCTVY	AT 25C	MICROMHO	164		275	300	500	668		530	378
00300	DO		MG/L	10.8		9.6	8.7	8.4	8.9	6.0	9.9	10.4
00301	DO	SATUR	PERCENT	88.5$		90.6$	89.7$	89.4$	87.3$	63.2$	85.3$	92.0$
00400	PH		SU	6.70		6.93	6.80	7.30	7.25	7.50	6.90	7.10
00403	PH	LAB	SU	6.4		6.4	6.7	6.7	7.7		7.7	7.5
00410	T ALK	CACO3	MG/L	20		32	32	66	72		64	56
00530	RESIDUE	TOT NFLT	MG/L	12		26	4	10	12		14	4
00610	NH3+NH4-	N TOTAL	MG/L	.050		.080	.060	.140	.400		.400	.060
00612	UN-IONZD	NH3-N	MG/L	.00004$		.0002$	.0001$	.001$	.002$		.0005$	.0001$

(SAMPLE CONTINUED ON NEXT PAGE)

WQN0861 PFBC2-027
40 55 19.0 079 00 23.0 4
MAHONING CRK-T374 BR AT SPORTSBURG-YOUNG TWP
42065 PENNSYLVANIA JEFFERSON
OHIO RIVER BASIN
MAHONING CREEK
21PA 880305 05010006
0000 FEET DEPTH

/TYPA/AMBNT/STREAM/BIO

INITIAL DATE				89/12/05	90/01/04	90/02/07	90/03/08	90/04/04	90/05/03	90/06/04	90/07/11	90/08/01
INITIAL TIME				0700	0645	0730	0715	0715	0730	0800	0705	0700
MEDIUM				WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00010	WATER	TEMP	CENT	.5	.3	5.5	1.5	5.0	9.8	15.6	21.3	16.0
00011	WATER	TEMP	FAHN	32.9$	32.5$	41.9$	34.7$	41.0$	49.6$	60.1$	70.3$	60.8$
00057	IND OF	FLOW	CHECKED	0	0	0	0	0	0	0	0	0
00060	STREAM	FLOW	CFS	104	274	755	163	397	161	184	629	157
00061	STREAM	FLOW,	INST-CFS	102	236	790	148	387	161	185	580	161
00065	STREAM	STAGE	FEET	1.48	2.02	3.31	1.69	2.42	1.74	1.83	2.89	1.74
00094	CNDUCTVY	FIELD	MICROMHO	265	180	145	295	185	330	260	150	
00095	CNDUCTVY	AT 25C	MICROMHO	379	250	210	383	237	345	327	144	377
00300	DO		MG/L	12.0	12.6	10.6	13.2	12.0	9.8	7.8	8.6	8.5
00301	DO	SATUR	PERCENT	82.2$	86.3$	82.8$	93.0$	93.8$	86.7$	78.0$	95.0$	85.0$
00400	PH		SU	7.60	7.30	7.10	7.15	7.05	7.05	7.05	6.65	6.80
00403	PH	LAB	SU	7.2	7.1	6.8	7.1	7.0	6.6	7.4	6.8	7.1
00410	T ALK	CACO3	MG/L	48	26	20	40	26	46	44	20	48
00530	RESIDUE	TOT NFLT	MG/L	2K	14	26	2K	2K	4	4	64	12
00610	NH3+NH4-	N TOTAL	MG/L	.250	.140	.060	.170	.090	.100	.140	.050	.080
00612	UN-IONZD	NH3-N	MG/L	.0009$	.0002$	.00010$	.0002$	.0001$	.0002$	.0004$	.00010$	.0001$
00615	NO2-N	TOTAL	MG/L	.006	.010	.004	.004	.006	.006	.010	.012	.004
00619	UN-IONZD	NH3-NH3	MG/L	.001$	.0003$	.0001$	.0003$	.0002$	.0002$	.0005$	.0001$	.0002$
00620	NO3-N	TOTAL	MG/L	.830	1.330	1.410	.880	.950	.570	.650	.800	.590
00665	PHOS-TOT		MG/L P	.050	.040	.040	.020	.030	.020	.040	.100	.040
00680	T ORG C	C	MG/L	1.9	1.7	1.2	1.3	1.5	1.6	1.8	3.9	1.5
00900	TOT HARD	CACO3	MG/L	157	102	90	161	95	159	143	55	163
00945	SULFATE	SO4-TOT	MG/L	118	76	71	136	78	128	124	52	135
01042	COPPER	CU,TOT	UG/L	10K	10K	10K	10K	10K	17	14	10K	13
01045	IRON	FE,TOT	UG/L	426	1030	884	1210	1210	606	886	3910	593
01051	LEAD	PB,TOT	UG/L	4K	4K	4K	4K	4K	4K	4K	5	5
01055	MANGNESE	MN	UG/L	414.0	331.0	258.0	452.0	257.0	274.0	212.0	350.0	241.0
01067	NICKEL	NI,TOTAL	UG/L	25K	33	25K	25K	25K	25K	25K	25K	25K
01092	ZINC	ZN,TOT	UG/L	20	40	17	10K	16	28	11	28	11
01105	ALUMINUM	AL,TOT	UG/L	135K	294	182	199	220	135K	266	2400	187
71999	SAMPLE	PURPOSE	CODE		10	10	10	10	10	10	10	10
74041	WQF	SAMPLE	UPDATED	920723	920723	920723	920723	920723	920723	920723	920723	920723

WQN0861
40 55 19.0 079 00 23.0 4
MAHONING CRK-T374 BR AT SPORTSBURG-YOUNG TWP
42065 PENNSYLVANIA JEFFERSON
OHIO RIVER BASIN
MAHONING CREEK
/TYPA/AMBNT/STREAM/BIO
21PA 880305 05010006
0000 FEET DEPTH

(SAMPLE CONTINUED FROM PREVIOUS PAGE)

	SURVEY				(3)							
	SAMPLE ID-REPLICATE				1							
	INITIAL DATE			90/09/04	90/09/06	90/09/09	-0 90/10/02	90/11/05	90/12/03	91/01/08	91/01/08	91/02/07
	INITIAL TIME			0700	0157		0715	0715	0730	0700	0715	0715
	MEDIUM			WATER	WATER	FS	WATER	WATER	WATER	WATER	WATER	WATER
	DEPTH-FT(SMK)				431							
34680	ALDRIN	TISMG/KG	WET WGT		.010K							
34685	ENDRIN	TISMG/KG	WET WGT		.020K							
34686	HPCHLREP	TISMG/KG	WET WGT		.010K							
34687	HEPTCHLR	TISMG/KG	WET WGT		.010K							
39063	CHLORDAN	C ISOMER	TIS-UG/G		.020K							
39066	CHLORDAN	T ISOMER	TIS-UG/G		.020K							
39069	NONACHLR	C ISOMER	TIS UG/G		.020K							
39072	NONCHLOR	T ISOMER	TIS-UG/G		.020K							
39074	ALPHABHC	TISMG/KG	WET WGT		.010K							
39105	PERCENT	FAT	HEX EXTR		1.2							
39302	P,P'DDT	TISMG/KG	WET WGT		.04K							
39307	O P DDT	TISSUE	UG/G		.04K							
39312	P,P'DDD	TISMG/KG	WET WGT		.02K							
39322	P,P'DDE	TISMG/KG	WET WGT		.02K							
39325	O,P DDD	TISSUE	UG/G		.020K							
39329	O,P'DDE	TISSUE	UG/G		.020K							
39404	DIELDRIN	TISMG/KG	WET WGT		.02K							
39515	PCBS	FISH	MG/KG		.200K							
39785	GBHC-TIS	LINDANE	WETMG/KG		.01K							
46471	CHLORDNE	TISS WET	WT MG/KG		.020K							
70320	MOISTURE	CONTENT	PERCENT		70							
71918	AS TOTAL	FISH DWT	UG/GM		.400K							
71934	PB TOTAL	FISH DWT	UG/GM		.234							
71941	CD TOTAL	FISH DWT	UG/GM		.037							
71942	CU TOTAL	FISH DWT	UG/GM		2.460							
71943	CR TOTAL	FISH DWT	UG/GM		.396							
71999	SAMPLE	PURPOSE	CODE	10			10	10	10		10	10
74041	WQF	SAMPLE	UPDATED	920723	911004		920826	920826	920826	920826	910925	920826
74990	FISH	SPECIES	NUMERIC		43							
74995	ANATOMY		CODE		117							
78457	A-CLRDEN	TISS,WET	WT.MK/KG		.020K							
78459	G-CLRDEN	TISS,WET	WT.MK/KG		.020K							
81614	NO.INDV.	IN THE	SAMPLE		5							
81644	MTXCHLOR	FISH WET	WGT UG/G		.100K							

(SAMPLE CONTINUED ON NEXT PAGE)

WQN0861
40 55 19.0 079 00 23.0 4
MAHONING CRK-T374 BR AT SPORTSBURG-YOUNG TWP
42065 PENNSYLVANIA JEFFERSON
OHIO RIVER BASIN
MAHONING CREEK
21PA 880305 05010006
0000 FEET DEPTH

/TYPA/AMBNT/STREAM/BIO

(SAMPLE CONTINUED FROM PREVIOUS PAGE)

INITIAL DATE				91/03/12	91/04/03	91/05/08	91/06/06	91/07/10	91/08/01	91/09/04	91/10/02	91/11/04
INITIAL TIME				0715	0715	1230	0700	0715	1300	1215	0700	0715
MEDIUM				WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00403	PH	LAB	SU	7.0	7.3	7.5	7.6	7.5	7.4	7.4	7.3	7.9
00410	T ALK	CACO3	MG/L	30	34	36	70	40	52	92	84	88
00515	RESIDUE	DISS-105 C	MG/L	216	3486	240	370	264	318	452	388	530
00610	NH3+NH4-	N TOTAL	MG/L	.100	.090	.090	.280	.080	.150	.600	.700	.820
00612	UN-IONZD	NH3-N	MG/L	.00006$	.00005$	.0003$	.0006$	.0006$	.0006$	.003$	.001$	.0006$
00615	NO2-N	TOTAL	MG/L	.004K	.004	.006	.042	.018	.024	.162	.114	.020
00619	UN-IONZD	NH3-NH3	MG/L	.00007$	.00005$	.0003$	.0007$	.0007$	.0008$	.004$	.002$	.0007$
00620	NO3-N	TOTAL	MG/L	1.030	.840	.560	.530	.930	.570	.630	.920	.440
00665	PHOS-TOT		MG/L P	.030	.030	.030	.070	.050	.100	.180	.130	.080
00680	T ORG C	C	MG/L	1.2	1.0	1.7	2.1	2.9	3.2	2.6	2.3	1.9
00900	TOT HARD	CACO3	MG/L	114	125	108	217	125	169	204	199	260
00945	SULFATE	SO4-TOT	MG/L	94	96	86	162	97	137	180	174	174
01042	COPPER	CU,TOT	UG/L	10K	10K	10K	11	10K	17	10K	10K	10K
01045	IRON	FE,TOT	UG/L	1000	691	844	767	1540	1170	1060	1000	514
01051	LEAD	PB,TOT	UG/L	4K	4K	4K	4K	4K	4K	4K	4K	4K
01055	MANGNESE	MN	UG/L	362.0	310.0	216.0	174.0	202.0	254.0	456.0	181.0	121.0
01067	NICKEL	NI,TOTAL	UG/L	25K	25K	25K	25K	25K	25K	25K	25K	25K
01092	ZINC	ZN,TOT	UG/L	20	20	17	10K	10K	27	42	42	11
01105	ALUMINUM	AL,TOT	UG/L	320	135K	224	183	761	778	258	246	135K
71999	SAMPLE	PURPOSE	CODE	10	10	10	10	10	10	10	10	10
74041	WQF	SAMPLE	UPDATED	920826	920826	920826	920826	920826	920826	920826	940915	940915

INITIAL DATE				91/12/10	92/01/07	92/02/11	92/03/03	92/04/06	92/04/06	92/05/06	92/06/03	92/07/13
INITIAL TIME				0715	0715	1400	0715	1345	1400	1430	0700	0730
MEDIUM				WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00010	WATER	TEMP	CENT	5.0	2.5	.5	4.0		6.0	9.5	14.5	20.3
00011	WATER	TEMP	FAHN	41.0$	36.5$	32.9$	39.2$		42.8$	49.1$	58.1$	68.5$
00057	IND OF	FLOW	CHECKED	0	0	0	0	0	0	0	0	0
00060	STREAM	FLOW	CFS	82	100	76	405	492	523	173	63	350
00061	STREAM	FLOW,	INST-CFS	84	100	40J	386	482		161	64	434
00065	STREAM	STAGE	FEET	1.37	1.47	1.37	2.49	2.74		1.78	1.27	2.66
00094	CNDUCTVY	FIELD	MICROMHO	285	225	275	120		180	320	440	275
00095	CNDUCTVY	AT 25C	MICROMHO	450	390	473	254		281	401	543	293
00300	DO		MG/L	11.0	11.4	13.2	11.6		12.2	11.2	8.0	6.8
00301	DO	SATUR	PERCENT	85.9$	82.6$	90.4$	88.5$		97.6$	96.6$	76.9$	73.9$
00400	PH		SU	7.00	7.00	7.15	6.80		6.95	7.20	7.40	7.10
00403	PH	LAB	SU	7.5	7.3	7.5	6.9		6.7	7.4	7.3	7.3
00410	T ALK	CACO3	MG/L	42	42	56	26		26	44	58	44

(SAMPLE CONTINUED ON NEXT PAGE)

WQN0861
40 55 19.0 079 00 23.0 4
MAHONING CRK-T374 BR AT SPORTSBURG-YOUNG TWP
42065 PENNSYLVANIA JEFFERSON
OHIO RIVER BASIN
MAHONING CREEK
21PA 880305 05010006
0000 FEET DEPTH

/TYPA/AMBNT/STREAM/BIO

(SAMPLE CONTINUED FROM PREVIOUS PAGE)

INITIAL DATE				92/08/11	92/09/09	92/10/06	92/11/04	92/12/07	93/01/05	93/02/03	93/03/08	93/04/06
INITIAL TIME				0715	0700	0730	0700	0715	0730	0715	0715	0715
MEDIUM				WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00530	RESIDUE	TOT NFLT	MG/L	120	15	2K	11	5	19	2K	15	7
00610	NH3+NH4-	N TOTAL	MG/L	.060	.050	.110	.050	.140	.060	.150	.090	.080
00612	UN-IONZD	NH3-N	MG/L	.0002$	.0002$	.0004$	.0002$	.0002$	.00010$	.00010$	.00004$	.00004$
00615	NO2-N	TOTAL	MG/L	.018	.010	.008	.006	.006	.006	.004	.008	.004
00619	UN-IONZD	NH3-NH3	MG/L	.0002$	.0003$	.0004$	.0002$	.0002$	.0001$	.0001$	.00005$	.00004$
00620	NO3-N	TOTAL	MG/L	.770	.520	.630	.790	.690	.790	.740	.890	.770
00665	PHOS-TOT		MG/L P	.130	.060	.020K	.040	.020	.040	.020	.030	.030
00680	T ORG C	C	MG/L	3.8	2.0	1.4	3.2	1.1	1.7	1.1	1.5	1.3
00900	TOT HARD	CACO3	MG/L	75	153	158	74	135	90	147	88	116
00945	SULFATE	SO4-TOT	MG/L	59	121	127	57	109	75	124	62	98
01042	COPPER	CU,TOT	UG/L	10K	10K	10K	10K	10K	11	10K	10K	10K
01045	IRON	FE,TOT	UG/L	7300	1160	483	2380	669	1810	957	1300	1090
01051	LEAD	PB,TOT	UG/L	6	4K	4K	4K	4K	4K	4K	5	4K
01055	MANGNESE	MN	UG/L	341.0	154.0	185.0	253.0	356.0	280.0	397.0	252.0	408.0
01067	NICKEL	NI,TOTAL	UG/L	25K	25K	25K	25K	34	28	25K	25K	31
01092	ZINC	ZN,TOT	UG/L	187	12	10K	20	18	28	17	19	25
01105	ALUMINUM	AL,TOT	UG/L	5360	439	135K	1040	163	1130	391	592	511
71999	SAMPLE	PURPOSE	CODE	10	10	10	10	10	10	10	10	10
74041	WQF	SAMPLE	UPDATED	940915	940915	940915	940915	940915	940915	940915	940915	940915

INITIAL DATE				93/05/03	93/06/03	93/07/01	93/07/06	93/08/03	93/09/02	93/10/14	93/11/09	93/12/09
INITIAL TIME				0715	0700		0715	0700	0715	0715	1330	0730
MEDIUM				WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00010	WATER	TEMP	CENT	13.5	12.5		22.7	17.9	21.0	7.6	4.3	3.9
00011	WATER	TEMP	FAHN	56.3$	54.5$		72.9$	64.2$	69.8$	45.7$	39.7$	39.0$
00057	IND OF	FLOW	CHECKED	0	0	0	0	0	0	0	0	0
00060	STREAM	FLOW	CFS	310	86	61	66	126	38	48	175	439
00061	STREAM	FLOW,	INST-CFS	316	86		66	140	37	45	172	452
00065	STREAM	STAGE	FEET	2.34	1.41		1.29	1.67	1.05	1.16	1.81	2.71
00094	CNDUCTVY	FIELD	MICROMHO	275	200		450	330	500	420	180	155
00095	CNDUCTVY	AT 25C	MICROMHO	351	452		447	450	535	632	309	275
00300	DO		MG/L	9.4	8.7		5.8	7.9	5.7	9.7	12.1	11.2
00301	DO	SATUR	PERCENT	88.7$	80.6$		66.7$	83.2$	63.3$	81.5$	92.4$	85.5$
00400	PH		SU		7.20		6.80	6.73		7.16	7.25	6.85
00403	PH	LAB	SU	7.0	6.7		6.9	7.3	6.8	7.1	6.7	6.4
00410	T ALK	CACO3	MG/L	34	58		58	54	72	64	38	28
00515	RESIDUE	DISS-105	C MG/L	261	285		328	271	384	436	214	168
00530	RESIDUE	TOT NFLT	MG/L	5	13		2K	19	12	2K	14	2K

(SAMPLE CONTINUED ON NEXT PAGE)

WQN0861
40 55 19.0 079 00 23.0 4
MAHONING CRK-T374 BR AT SPORTSBURG-YOUNG TWP
42065 PENNSYLVANIA JEFFERSON
OHIO RIVER BASIN
MAHONING CREEK
21PA 880305 05010006
0000 FEET DEPTH

/TYPA/AMBNT/STREAM/BIO

(SAMPLE CONTINUED FROM PREVIOUS PAGE)

	INITIAL DATE			94/01/11	94/02/02	94/03/07	94/04/05	94/05/02	94/06/09	94/07/05	94/08/02	94/09/01
	INITIAL TIME			1230	0830	0700	0715	1000	0800	0715	0715	0730
	MEDIUM			WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00610	NH3+NH4-	N TOTAL	MG/L	.300	.110	.120	.040	.060	.070	.100	.250	.030
00612	UN-IONZD	NH3-N	MG/L	.0002$	.0001$	.0002$	.00002$	.00009$	.0002$	.0003$	.0007$	.00006$
00615	NO2-N	TOTAL	MG/L	.006	.006	.014	.004K	.004	.006	.016	.050	.004
00619	UN-IONZD	NH3-NH3	MG/L	.0003$	.0001$	.0002$	.00002$	.0001$	.0003$	.0003$	.0008$	.00008$
00620	NO3-N	TOTAL	MG/L	.570	1.140	.760	.640	.440	.480	.490	.460	.740
00665	PHOS-TOT		MG/L P	.070	.030	.030	.030	.030	.040	.040	.180	.030
00680	T ORG C	C	MG/L	1.1	1.5	1.2	1.7	2.2	1.6	1.5	1.8	1.5
00900	TOT HARD	CACO3	MG/L	169	94	127	101	108	116	162	194	114
00945	SULFATE	SO4-TOT	MG/L	159	71	100	85	104	94	146	173	73
01042	COPPER	CU,TOT	UG/L	10K	259	10K	33	10K	28	12	10K	10K
01045	IRON	FE,TOT	UG/L	490	866	1150	1080	1460	699	635	888	744
01051	LEAD	PB,TOT	UG/L	4K	4K	4K	4K	4K	4K	1	3	3
01055	MANGNESE	MN	UG/L	453.0	256.0	361.0	318.0	275.0	207.0	152.0	240.0	162.0
01067	NICKEL	NI,TOTAL	UG/L	25K	40	25K	25K	25K	25K	25K	25K	25K
01092	ZINC	ZN,TOT	UG/L	64	32	23	39	16	24	10K	56	10K
01105	ALUMINUM	AL,TOT	UG/L	135K	242	288	1030	476	359	315	219	469
71999	SAMPLE	PURPOSE	CODE	10	10	10	10	10	10	10	10	10
74041	WQF	SAMPLE	UPDATED	960202	960202	960202	960202	960202	960202	960202	960202	960202

	INITIAL DATE			94/09/08	94/10/04	94/11/01	94/12/05	95/01/05	95/02/01	95/03/07	95/04/03	95/05/09
	INITIAL TIME			0157	0745	0830	0730	0730	0715	0700	0715	0730
	MEDIUM			WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
	DEPTH-FT(SMK)			431								
00010	WATER	TEMP	CENT		8.1	9.9	9.1	.3	1.7	5.3	4.7	12.3
00011	WATER	TEMP	FAHN		46.6$	49.8$	48.4$	32.5$	35.1$	41.5$	40.5$	54.1$
00057	IND OF	FLOW	CHECKED	0								
00060	STREAM	FLOW	CFS	108								
00094	CNDUCTVY	FIELD	MICROMHO		210	505	275	485	422	285	420	435
00095	CNDUCTVY	AT 25C	MICROMHO		322	545	267	427	374	261	396	432
00300	DO		MG/L		10.2	8.8	10.2	13.0	13.0	10.2	10.9	8.3
00301	DO	SATUR	PERCENT		85.7$	77.9$	87.9$	89.0$	94.2$	79.7$	85.2$	76.9$
00400	PH		SU		7.03	7.10	6.70	6.75	6.86	6.60	6.80	6.70
00403	PH	LAB	SU		6.6	7.4	7.0	6.8	7.0	6.5	6.8	7.2
00410	T ALK	CACO3	MG/L		42	62	32	48	40	26	44	52
00515	RESIDUE	DISS-105	C MG/L		264	342	204	272	222	148	244	336
00530	RESIDUE	TOT NFLT	MG/L		2K	4	20	8	2K	22	6	10
00610	NH3+NH4-	N TOTAL	MG/L		.080	.210	.080	.250	.130	.070	.140	.080
00612	UN-IONZD	NH3-N	MG/L		.0001$	.0005$	.00007$	.0001$	.00009$	.00004$	.0001$	.00009$

(SAMPLE CONTINUED ON NEXT PAGE)

WQN0861
40 55 19.0 079 00 23.0 4
MAHONING CRK-T374 BR AT SPORTSBURG-YOUNG TWP
42065 PENNSYLVANIA JEFFERSON
OHIO RIVER BASIN
MAHONING CREEK
21PA 880305 05010006
0000 FEET DEPTH

/TYPA/AMBNT/STREAM/BIO

(SAMPLE CONTINUED FROM PREVIOUS PAGE)

	INITIAL DATE			94/09/08	94/10/04	94/11/01	94/12/05	95/01/05	95/02/01	95/03/07	95/04/03	95/05/09
	INITIAL TIME			0157	0745	0830	0730	0730	0715	0700	0715	0730
	MEDIUM			WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
	DEPTH-FT(SMK)			431								
71937	COPPER	TISMG/KG	WET WGT	.45								
71939	CR-FISH	UG/G OR	MG/KG WT	.16								
71940	CADMIUM	TISMG/KG	WET WGT	.005K								
74041	WQF	SAMPLE	UPDATED	950718	941230	950329	950329	950329	950616	950620	950621	950908
74990	FISH	SPECIES	NUMERIC	43								
74995	ANATOMY		CODE	117								
78457	A-CLRDEN	TISS,WET	WT.MK/KG	.010K								
78459	G-CLRDEN	TISS,WET	WT.MK/KG	.010K								
81614	NO.INDV.	IN THE	SAMPLE	5								
81644	MTXCHLOR	FISH WET	WGT UG/G	.050K								
81645	MIREX F	ISH WETW	GT UG/G	.010K								
81822	KEPONE	FISH WET	WGTMG/KG	.100K								
82029	OXYCHLRD	TISS	WETMG/KG	.010K								
84005	FISH	SPECIES	F &WL	RKB								
84007	ANATOMY	ALPHA	CODE	FILSK								

	INITIAL DATE			95/06/08	95/07/05	95/08/03	95/09/05	95/10/10	95/11/01	95/12/06	96/01/22	96/02/15
	INITIAL TIME			0700	0700	0700	0715	0730	0730	0715	0715	0830
	MEDIUM			WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00010	WATER	TEMP	CENT	17.6	18.6	23.3	17.3	11.9	8.7	2.5	1.6	.6
00011	WATER	TEMP	FAHN	63.7$	65.5$	73.9$	63.1$	53.4$	47.7$	36.5$	34.9$	33.1$
00094	CNDUCTVY	FIELD	MICROMHO	310	470	615	731	425	500	227	275	410
00095	CNDUCTVY	AT 25C	MICROMHO	292	472	625	735	624	490	280	250	385
00300	DO		MG/L	8.5	7.6	5.8	8.3	8.6	9.5	13.3	13.3	13.2
00301	DO	SATUR	PERCENT	89.5$	80.9$	66.7$	85.6$	79.6$	81.9$	96.4$	96.4$	93.0$
00400	PH		SU	6.83	6.95	6.85	7.25	7.00	6.62	6.14	6.45	6.20
00403	PH	LAB	SU	6.8	7.0	7.2	7.5	7.0	7.1	7.0	6.4	6.4
00410	T ALK	CACO3	MG/L	36	56	72	82	74	62	30	18	34
00515	RESIDUE	DISS-105	C MG/L	222	342	410	576	458	350	164	228	257
00530	RESIDUE	TOT NFLT	MG/L	158	16	8	2K	2K	2K	4	2	19
00610	NH3+NH4-	N TOTAL	MG/L	.120	.130	.150	.050	.130	.400	.070	.050	.120
00612	UN-IONZD	NH3-N	MG/L	.0003$	.0004$	.0005$	.0003$	.0003$	.0003$	.000010$	.00001$	.00002$
00615	NO2-N	TOTAL	MG/L	.010	.018	.052	.018	.028	.024	.006	.006	.004K
00619	UN-IONZD	NH3-NH3	MG/L	.0003$	.0005$	.0006$	.0003$	.0003$	.0003$	.00001$	.00002$	.00002$
00620	NO3-N	TOTAL	MG/L	.580	.530	.460	.800	.460	.400	.960	1.360	.810
00665	PHOS-TOT		MG/L P	.200	.050	.090	.150	.050	.140	.030	.030	.060
00680	T ORG C	C	MG/L	2.8	1.8	2.1	2.5	2.7	2.2	1.3	1.8	1.3

(SAMPLE CONTINUED ON NEXT PAGE)

WQN0861
40 55 19.0 079 00 23.0 4
MAHONING CRK-T374 BR AT SPORTSBURG-YOUNG TWP
42065 PENNSYLVANIA JEFFERSON
OHIO RIVER BASIN
MAHONING CREEK
21PA 880305 05010006
0000 FEET DEPTH

/TYPA/AMBNT/STREAM/BIO

(SAMPLE CONTINUED FROM PREVIOUS PAGE)

INITIAL DATE				96/03/07	96/04/09	96/05/07	96/06/03	96/07/10	96/08/14	96/09/05	96/10/03	96/11/07
INITIAL TIME				0800	0730	0830	0715	0730	0715	0730	0700	0645
MEDIUM				WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
01067	NICKEL	NI,TOTAL	UG/L	25K	25K	25K	25K	25K	25K	25K	25K	25K
01092	ZINC	ZN,TOT	UG/L	24	11	15	24	13	26	16	10K	14
01105	ALUMINUM	AL,TOT	UG/L	345	239	221	460	135K	136	135K	201	367
74041	WQF	SAMPLE	UPDATED	960613	960820	960816	960911	970106	970107	970107	970107	970228

THAT'S ALL FOLKS

LOCATED ON MAHONING CREEK AT THE BRIDGE IN FOXBURG, PA. - PUNXSUTAWNEY, STATION: 4MAH11120

PA. QUAD - SAMPLED BY THE U.S. ARMY CORPS OF ENGINEERS, PITTSBURGH, PA

LAT/LON: 40 57 52.0 78 52 47.3 1 TOTAL DEPTH: F010
LOCATION: MAHONING CREEK - MILE 62.8
STATE: 42 PENNSYLVANIA BASIN: 050100
MAJOR BASIN: OHIO RIVER
MINOR BASIN: ALLEGHENY RIVER
REACH: 02050201

INDEX 1021500 7720 21670 1320
MILES 953.80 981.00 55.80 62.84

DATE YYMMDD	TIME FROM THRU HHMM HHMM	DEPTH FT	00076 Turb. NTU	00080 Color PT-CO UNITS	00094 Sp.Cond Field UM/CM	00400 pH Field UNITS	00403 pH Lab UNITS	00410 T.Alk CaCO3 MG/L	00435 T.Acid CaCO3 MG/L	00436 M.Acid CaCO3 MG/L	00437 Acid CO2 MG/L	00900 T.Hard CaCO3 MG/L
790215	1300	000	17	40	352	6.8	6.6	4	13	0	13	170

401REP AURAS RAW DATA REPORT FOR WATER QUALITY FROM BEG. TO END USING 1 MIN. TIME RANGE DATE 02/25/97 PAGE 30
LOCATED ON MAHONING CREEK AT THE BRIDGE IN FOXBURG, PA. - PUNXSUTAWNEY, STATION: 4MAH11120

PA. QUAD - SAMPLED BY THE U.S. ARMY CORPS OF ENGINEERS, PITTSBURGH, PA

LAT/LON: 40 57 52.0 78 52 47.3 1 TOTAL DEPTH: F010
LOCATION: MAHONING CREEK - MILE 62.8
STATE: 42 PENNSYLVANIA BASIN: 050100
MAJOR BASIN: OHIO RIVER
MINOR BASIN: ALLEGHENY RIVER
REACH: 02050201

INDEX	1021500	7720	21670	1320
MILES	953.80	981.00	55.80	62.84

DATE	TIME		DEPTH	7050H
YYMMDD	FROM	THRU	FT	H.M.ACID CACO3 MG/L
	HHMM	HHMM		
790215	1300		000	0

401REP AURAS RAW DATA REPORT FOR WATER QUALITY FROM BEG. TO END USING 1 MIN. TIME RANGE DATE 02/25/97 PAGE 27
LOCATED ON MAHONING CREEK AT THE BRIDGE .95 MILES UPSTREAM OF THE BELLS STATION: 4MAH11118

MILLS BRIDGE BETWEEN BELLS MILLS, PA. AND BIG RUN, PA. - PUNXSUTAWNEY, PA. QUAD - SAMPLED BY THE U.S. ARMY CORPS OF ENGINEERS, PITTSBURGH, PA.

LAT/LON: 40 57 24.0 78 55 04.6 1 TOTAL DEPTH: F010
LOCATION: MAHONING CREEK - MILE 60.1
STATE: 42 PENNSYLVANIA BASIN: 050100
MAJOR BASIN: OHIO RIVER
MINOR BASIN: ALLEGHENY RIVER
REACH: 05010006

INDEX 1021500 7720 21670 1320
MILES 953.80 981.00 55.80 60.06

DATE YYMMDD	TIME FROM THRU HHMM HHMM	DEPTH FT	00076 Turb. NTU	00080 Color PT-CO UNITS	00094 Sp.Cond Field UM/CM	00400 pH Field UNITS	00403 pH Lab UNITS	00410 T.Alk CaCO3 MG/L	00435 T.Acid CaCO3 MG/L	00436 M.Acid CaCO3 MG/L	00437 Acid CO2 MG/L	00900 T.Hard CaCO3 MG/L
790215	1330	000	9	20	370	6.65	6.8	35	17	0	17	156

401REP AURAS RAW DATA REPORT FOR WATER QUALITY FROM BEG. TO END USING 1 MIN. TIME RANGE DATE 02/25/97 PAGE 28
LOCATED ON MAHONING CREEK AT THE BRIDGE .95 MILES UPSTREAM OF THE BELLS STATION: 4MAH11118

MILLS BRIDGE BETWEEN BELLS MILLS, PA. AND BIG RUN, PA. - PUNXSUTAWNEY, PA. QUAD - SAMPLED BY THE U.S. ARMY CORPS OF ENGINEERS, PITTSBURGH, PA.

LAT/LON: 40 57 24.0 78 55 04.6 1 TOTAL DEPTH: F010
LOCATION: MAHONING CREEK - MILE 60.1
STATE: 42 PENNSYLVANIA BASIN: 050100
MAJOR BASIN: OHIO RIVER
MINOR BASIN: ALLEGHENY RIVER
REACH: 05010006

INDEX	1021500	7720	21670	1320
MILES	953.80	981.00	55.80	60.06

DATE YYMMDD	TIME FROM HHMM	THRU HHMM	DEPTH FT	7050H H.M.ACID CACO3 MG/L
790215	1330		000	0

401REP AURAS RAW DATA REPORT FOR WATER QUALITY FROM BEG. TO END USING 1 MIN. TIME RANGE DATE 02/25/97 PAGE 25
LOCATED ON MAHONING CREEK AT THE ROUTE 119 BRIDGE IN PUNXSUTAWNEY, PA. - STATION: 4MAH11116

PUNXSUTAWNEY, PA. QUAD - SAMPLED BY THE U.S. ARMY CORPS OF ENGINEERS,
PITTSBURGH, PA.

LAT/LON: 40 56 25.0 78 58 25.0 1 TOTAL DEPTH: F010
LOCATION: MAHONING CREEK - MILE 54.1
STATE: 42 PENNSYLVANIA BASIN: 050100
MAJOR BASIN: OHIO RIVER
MINOR BASIN: ALLEGHENY RIVER
REACH: 05010006

INDEX 1021500 7720 21670 1320
MILES 953.80 981.00 55.80 54.08

DATE YYMMDD	TIME FROM THRU HHMM HHMM	DEPTH FT	00076 Turb. NTU	00080 Color PT-CO UNITS	00094 Sp.Cond Field UM/CM	00400 pH Field UNITS	00403 pH Lab UNITS	00410 T.Alk CaCO3 MG/L	00435 T.Acid CaCO3 MG/L	00436 M.Acid CaCO3 MG/L	00437 Acid CO2 MG/L	00900 T.Hard CaCO3 MG/L
790215	1400	000	4.6	5	370	6.7	6.85	44	13	0	13	148

401REP AURAS RAW DATA REPORT FOR WATER QUALITY FROM BEG. TO END USING 1 MIN. TIME RANGE DATE 02/25/97 PAGE 26
LOCATED ON MAHONING CREEK AT THE ROUTE 119 BRIDGE IN PUNXSUTAWNEY, PA. - STATION: 4MAH11116

PUNXSUTAWNEY, PA. QUAD - SAMPLED BY THE U.S. ARMY CORPS OF ENGINEERS, PITTSBURGH, PA.

LAT/LON: 40 56 25.0 78 58 25.0 1 TOTAL DEPTH: F010
LOCATION: MAHONING CREEK - MILE 54.1
STATE: 42 PENNSYLVANIA BASIN: 050100
MAJOR BASIN: OHIO RIVER
MINOR BASIN: ALLEGHENY RIVER
REACH: 05010006

INDEX	1021500	7720	21670	1320
MILES	953.80	981.00	55.80	54.08

DATE YYMMDD	TIME FROM HHMM	TIME THRU HHMM	DEPTH FT	7050H H.M.ACID CACO3 MG/L
790215	1400		000	0

401REP AURAS RAW DATA REPORT FOR WATER QUALITY FROM BEG. TO END USING 1 MIN. TIME RANGE DATE 02/25/97 PAGE 23
LOCATED ON MAHONING CREEK AT THE BRIDGE JUST NORT OF SPORTSBURG, PA. - STATION: 4MAH11114

VALIER, PA. QUAD - SAMPLED BY THE U.S. ARMY CORPS OF ENGINEERS,
PITTSBURGH, PA.

LAT/LON: 40 55 19.0 79 00 23.0 1 TOTAL DEPTH: F010
LOCATION: MAHONING CREEK - MILE 50.1
STATE: 42 PENNSYLVANIA BASIN: 050100
MAJOR BASIN: OHIO RIVER
MINOR BASIN: ALLEGHENY RIVER
REACH: 05010006

INDEX 1021500 7720 21670 1320
MILES 953.80 981.00 55.80 50.05

DATE YYMMDD	TIME FROM HHMM	THRU HHMM	DEPTH FT	00076 Turb. NTU	00080 Color PT-CO UNITS	00094 Sp.Cond Field UM/CM	pH Field UNITS	00403 pH Lab UNITS	00410 T.Alk CaCO3 MG/L	00435 T.Acid CaCO3 MG/L	00436 M.Acid CaCO3 MG/L	00437 Acid CO2 MG/L	00900 T.Hard CaCO3 MG/L
790215	1430		000	4.2	7.5	368	6.75	7.05	32	9	0	9	150

401REP AURAS RAW DATA REPORT FOR WATER QUALITY FROM BEG. TO END USING 1 MIN. TIME RANGE DATE 02/25/97 PAGE 24
LOCATED ON MAHONING CREEK AT THE BRIDGE JUST NORT OF SPORTSBURG, PA. - STATION: 4MAH11114

VALIER, PA. QUAD - SAMPLED BY THE U.S. ARMY CORPS OF ENGINEERS, PITTSBURGH, PA.

LAT/LON: 40 55 19.0 79 00 23.0 1 TOTAL DEPTH: F010
LOCATION: MAHONING CREEK - MILE 50.1
STATE: 42 PENNSYLVANIA BASIN: 050100
MAJOR BASIN: OHIO RIVER
MINOR BASIN: ALLEGHENY RIVER
REACH: 05010006

INDEX	1021500	7720	21670	1320
MILES	953.80	981.00	55.80	50.05

DATE YYMMDD	TIME FROM HHMM	TIME THRU HHMM	DEPTH FT	7050H H.M.ACID CACO3 MG/L
790215	1430		000	0

401REP AURAS RAW DATA REPORT FOR WATER QUALITY FROM BEG. TO END USING 1 MIN. TIME RANGE DATE 02/25/97 PAGE 18
LOCATED ON MAHONING CREEK UPSTREAM FROM MAHONING CREEK LAKE AT THE STATION: 4MAH11111

BRIDGE NEAR HAMILTON, PA. - VALIER, PA. QUAD. - SAMPLED BY THE U S ARMY CORPS OF ENGINEERS, PITTSBURGH, PA.

LAT/LON: 40 55 17.5 79 04 46.0 1 TOTAL DEPTH: F010
LOCATION: MAHONING CREEK - MILE 41.0
STATE: 42 PENNSYLVANIA BASIN: 050100
MAJOR BASIN: OHIO RIVER
MINOR BASIN: ALLEGHENY RIVER
REACH: 05010006

INDEX 1021500 7720 21670 1320
MILES 953.80 981.00 55.80 41.03

DATE YYMMDD	TIME FROM HHMM	THRU HHMM	DEPTH FT	00010 Temp DEG.C	00032 Cloud Cover %	00061 Stream Ins.Flow CFS	00076 Turb. NTU	00080 Color PT-CO UNITS	00094 Sp.Cond Field UM/CM	00299 Oxygen D. MG/L	00400 pH Field UNITS	00403 pH Lab UNITS	00410 T.Alk CaCO3 MG/L
730718	1530		000	24.4		700	7.2	25	405	10.9	7.7	7.8	44
731009	1500		000	15.1	60	470	7.5	5	279	9.5	7.5	6.75	24
740611	1500		000	22.1		200	2.0	23	395	8.5	7.65	7.0	45
790215	1345		000				1.8	1	232			6.75	44
790515	1130		000	14.5			2.3	20	253	9.6	7.45	6.8	33
790530	0845		000	9.8	60		4.0	15	161	10.1	7.15	6.4	20
790611	1415		000	18.8			4.1	20	293	9.3	7.45	7.1	38
790628	1230		000	20.0	10		2.6	12	440	8.4		7.1	57
790711	1145		000	17.2	100		7.5	15	298	9.4	6.6	7.22	36
790726	1030		000	22.2			2.8	18	379	7.10	7.60	6.9	46
790808	1030		000	23.5	60		4.7	12	410	6.40	7.00	7.70	51
790822	1350		000	22.7	20		0.8	11	408	9.50		7.40	51
790905	1515		000	23.4			3.7	10	398	8.70	8.00	7.6	55
790921	0950		000	14.5			2.1	10	600	9.0	7.8	7.1	53
791004	1100		000	13.2			5.2	20	212	9.6	8.05	6.5	27
830422	1200		000	6.1			1.6	3.5	319	14.5	6.4	6.85	25
830907	1630		000	25.3			3.2	6.5	645	9.2	7.2	7.49	59
850501	1630		000	17.3			3.4	15	487	12.1	9.2	8.8	44
850607	1345		000	18.5			8.7	20	370	10.7	8.28	8.0	34
850702	1315		000	19.7			5.1	10	662	9.9	7.7	7.00	58
850801	1300		000	22.7			4.8	30	564	8.5	7.6	7.39	58
850906	0930		000	22.3			4.8	18	504	7.1	7.0	7.42	50
851003	1200		000	12.9			4.8	25	551	11.0	6.9	7.38	61
860402	1145		000	13.0			3.4	15	469	9.4	6.8	6.99	35

401REP AURAS RAW DATA REPORT FOR WATER QUALITY FROM BEG. TO END USING 1 MIN. TIME RANGE DATE 02/25/97 PAGE 19
LOCATED ON MAHONING CREEK UPSTREAM FROM MAHONING CREEK LAKE AT THE STATION: 4MAH11111

BRIDGE NEAR HAMILTON, PA. - VALIER, PA. QUAD. - SAMPLED BY THE U S ARMY CORPS OF ENGINEERS, PITTSBURGH, PA.

LAT/LON: 40 55 17.5 79 04 46.0 1 TOTAL DEPTH: F010
LOCATION: MAHONING CREEK - MILE 41.0
STATE: 42 PENNSYLVANIA BASIN: 050100
MAJOR BASIN: OHIO RIVER
MINOR BASIN: ALLEGHENY RIVER
REACH: 05010006

INDEX 1021500 7720 21670 1320
MILES 953.80 981.00 55.80 41.03

DATE YYMMDD	TIME FROM HHMM	TIME THRU HHMM	DEPTH FT	00415 P.Alk CaCO3 MG/L	00425 BI-C.Alk CaCO3 MG/L	00430 CARB.Alk CaCO3 MG/L	00435 T.Acid CaCO3 MG/L	00436 M.Acid CaCO3 MG/L	00437 Acid CO2 MG/L	00530 Solids 105 C S.	00530 Solids 105 C MG/L	00610 NH3-N As N T.	00610 NH3-N As N MG/L	00620 NO3-N MG/L	00625 Kjeldahl As N T.	00625 Kjeldahl As N MG/L
730718	1530		000				2	0	2		24.3			0.5		0.4
731009	1500		000				9	0	9		9.7					0.4
740611	1500		000				9	0	9		13.4					0.5
790215	1345		000				17	0	17							
790515	1130		000				6	0	6		3.4		0.2			0.2
790530	0845		000				3	0	3		0.2		0.1			0.3
790611	1415		000				3	0	3		8.5	L	0.1		L	0.1
790628	1230		000				8	0	8		10.8		0.1		L	0.1
790711	1145		000				6	0	6		61.3		0.2			0.9
790726	1030		000				5	0	5		8.0		0.1			0.2
790808	1030		000				7	0	7		14.0		0.2			0.2
790822	1350		000				6	0	6		4.7	L	0.1			0.3
790905	1515		000				4	0	4		10.0	L	0.1			0.2
790921	0950		000				6	0	6		3.1	L	0.1			0.2
791004	1100		000				2	0	2		16.8	L	0.1			0.2
830422	1200		000				3	0	3		8.4	L	0.1			0.2
830907	1630		000				6	0	6		12.1		0.1			0.3
850501	1630		000	4	35	9	0	0	0		4.4	L	0.1		L	0.1
850607	1345		000				2	0	2		15.3		0.2			0.3
850702	1315		000				6	0	6		8.5	L	0.1		L	0.1
850801	1300		000				4	0	4		10.5	L	0.1			0.2
850906	0930		000				4	0	4		9.6				L	0.1
851003	1200		000				3	0	3		10.0				L	0.1
860402	1145		000				5	0	5		2.2	L	0.1			0.2

401REP AURAS RAW DATA REPORT FOR WATER QUALITY FROM BEG. TO END USING 1 MIN. TIME RANGE DATE 02/25/97 PAGE 20
LOCATED ON MAHONING CREEK UPSTREAM FROM MAHONING CREEK LAKE AT THE STATION: 4MAH11111

BRIDGE NEAR HAMILTON, PA. - VALIER, PA. QUAD. - SAMPLED BY THE U S ARMY CORPS OF ENGINEERS, PITTSBURGH, PA.

LAT/LON: 40 55 17.5 79 04 46.0 1 TOTAL DEPTH: F010
LOCATION: MAHONING CREEK - MILE 41.0
STATE: 42 PENNSYLVANIA BASIN: 050100
MAJOR BASIN: OHIO RIVER
MINOR BASIN: ALLEGHENY RIVER
REACH: 05010006

INDEX 1021500 7720 21670 1320
MILES 953.80 981.00 55.80 41.03

DATE YYMMDD	TIME FROM HHMM	TIME THRU HHMM	DEPTH FT	00630 NO3+Nitrite As N T.	00630 MG/L	00900 T.Hard CaCO3 MG/L	00916 Calcium T.	00916 MG/L	00927 Magnesium T.	00927 MG/L	00929 Sodium T.	00929 MG/L	00937 Potassium T.	00937 MG/L	00945 Sulfate MG/L	01007 Barium T.	01007 UG/L	01012 Berylium T.	01012 UG/L	01027 Cadmium T.	01027 UG/L
730718	1530		000		0.5	155															
731009	1500		000		0.8	108															
740611	1500		000		1.1	165															
790215	1345		000			152															
790515	1130		000		0.4	115									97						
790530	0845		000		1.5	81									50						
790611	1415		000		0.4	122									88						
790628	1230		000		0.3	204									140						
790711	1145		000		0.5	161									95						
790726	1030		000		0.4	155									137						
790808	1030		000		0.6	155									103						
790822	1350		000		0.4	167									115						
790905	1515		000		0.4	167									103						
790921	0950		000	L	0.1	162									115						
791004	1100		000	L	0.1	112									59						
830422	1200		000	L	0.1	124		33		9		12		2	98		35	L	1	L	1
830907	1630		000		0.6	177		28		11		25		3	134		59	L	1	L	1
850501	1630		000	L	0.1	178		46		14		21		3	112		50	L	1	L	1
850607	1345		000		0.4	129		35		9		16		2	114		70	L	1	L	1
850702	1315		000		0.3	218		53		16		39		3	168		110	L	1	L	1
850801	1300		000	L	0.1	195		53		14		36		4	121		110	L	1	L	1
850906	0930		000			167		52		13		25		1	114		100	L	1	L	1
851003	1200		000			194		53		16		33	L	1	133		90	L	1	L	1
860402	1145		000		0.9	163		45		13		19	L	1	126		80	L	1	L	1

401REP AURAS RAW DATA REPORT FOR WATER QUALITY FROM BEG. TO END USING 1 MIN. TIME RANGE DATE 02/25/97 PAGE 21
LOCATED ON MAHONING CREEK UPSTREAM FROM MAHONING CREEK LAKE AT THE STATION: 4MAH11111

BRIDGE NEAR HAMILTON, PA. - VALIER, PA. QUAD. - SAMPLED BY THE U S ARMY CORPS OF ENGINEERS, PITTSBURGH, PA.

LAT/LON: 40 55 17.5 79 04 46.0 1 TOTAL DEPTH: F010
LOCATION: MAHONING CREEK - MILE 41.0
STATE: 42 PENNSYLVANIA BASIN: 050100
MAJOR BASIN: OHIO RIVER
MINOR BASIN: ALLEGHENY RIVER
REACH: 05010006

INDEX 1021500 7720 21670 1320
MILES 953.80 981.00 55.80 41.03

DATE YYMMDD	TIME FROM HHMM	TIME THRU HHMM	DEPTH FT	01034 Chromium T.	01034 Chromium UG/L	01042 Copper T.	01042 Copper UG/L	01045 Iron T.	01045 Iron UG/L	01051 Lead T.	01051 Lead UG/L	01055 MANGANESE T.	01055 MANGANESE UG/L	01067 NICKEL T.	01067 NICKEL UG/L	01092 ZINC T.	01092 ZINC UG/L	01097 ANTIMONY T.	01097 ANTIMONY UG/L	01105 ALUMINUM T.	01105 ALUMINUM UG/L	70222 Wave Height WMO
730718	1530		000						1190				350									
731009	1500		000						1020				370									
740611	1500		000						1600				250									
790515	1130		000	L	50	L	50		840	L	50		260			L	100			L	500	
790530	0845		000						1125				230									
790611	1415		000	L	50	L	50		1070	L	50		165			L	100			L	500	
790628	1230		000						925				210									
790711	1145		000						3240				295									
790726	1030		000						600				200									
790808	1030		000						1100				300									
790822	1350		000						925				190									0
790905	1515		000						935				150									
790921	0950		000						550				130									
791004	1100		000						1400				200									
830422	1200		000		6.	L	5		800	L	2		400		94.	L	50	L	100		350	
830907	1630		000	L	1	L	5		400	L	2		260	L	5	L	50	L	100		370	
850501	1630		000	L	1		7.		300	L	2		100	L	5	L	50	L	100		220	
850607	1345		000	L	1	L	5		1000	L	2		230	L	5	L	50	L	100		530	
850702	1315		000	L	1		8.		600	L	2		170	L	5	L	50	L	100		260	
850801	1300		000	L	1	L	5		600	L	2		270	L	5	L	50	L	100		250	
850906	0930		000	L	1	L	5		600	L	2		240	L	5	L	50	L	100		240	
851003	1200		000	L	1	L	5		500	L	2		110	L	5	L	50	L	100		270	
860402	1145		000	L	1	L	5		500	L	2		290	L	5	L	50	L	100		150	

401REP AURAS RAW DATA REPORT FOR WATER QUALITY FROM BEG. TO END USING 1 MIN. TIME RANGE DATE 02/25/97 PAGE 22
LOCATED ON MAHONING CREEK UPSTREAM FROM MAHONING CREEK LAKE AT THE STATION: 4MAH11111

BRIDGE NEAR HAMILTON, PA. - VALIER, PA. QUAD. - SAMPLED BY THE U S ARMY CORPS OF ENGINEERS, PITTSBURGH, PA.

LAT/LON: 40 55 17.5 79 04 46.0 1 TOTAL DEPTH: F010
LOCATION: MAHONING CREEK - MILE 41.0
STATE: 42 PENNSYLVANIA BASIN: 050100
MAJOR BASIN: OHIO RIVER
MINOR BASIN: ALLEGHENY RIVER
REACH: 05010006

INDEX 1021500 7720 21670 1320
MILES 953.80 981.00 55.80 41.03

DATE YYMMDD	TIME FROM HHMM	THRU HHMM	DEPTH FT	7050H H.M.ACID CACO3 MG/L	71900 Mercury T.	UG/L	L0665 Phos As P T.	UG/L	L0666 Phos As P D.	UG/L
730718	1530		000	0				50	L	10
731009	1500		000	0				35		10
740611	1500		000	0				60		10
790215	1345		000	0						
790515	1130		000	0	L	1.0		20		
790530	0845		000	0				30		
790611	1415		000	0	L	1.0		10		
790628	1230		000	0			L	10		
790711	1145		000	0				100		
790726	1030		000	0				30		
790808	1030		000	0				40		
790822	1350		000	0				40		
790905	1515		000	0				30		
790921	0950		000	0				30		
791004	1100		000	0				40		
830422	1200		000	0			L	10		
830907	1630		000	0			L	10		
850501	1630		000	0			L	10		
850607	1345		000	0			L	10		
850702	1315		000	0				28		
850801	1300		000	0			L	10		
850906	0930		000	0			L	10		
851003	1200		000	0			L	10		
860402	1145		000	0				14		

401REP AURAS RAW DATA REPORT FOR WATER QUALITY FROM BEG. TO END USING 1 MIN. TIME RANGE DATE 02/25/97 PAGE 14
LOCATED IN MAHONING CREEK LAKE AT RIVER MILE 37.9, AT THE RIGHT BANK, STATION: 4MAH11110 4MAH11110 4MAH21110

15.0 MILES UPSTREAM OF THE DAM, WEST OF HAMILTON, PA - VALIER, PA QUAD- LAT/LON: 40 54 42.2 79 06 45.0 1 TOTAL DEPTH: F045
SAMPLED BY THE U.S. ARMY CORPS OF ENGINEERS, PITTSBURGH, PA. LOCATION: MAHONING CREEK,INFLOW TO MAHONIN
STATE: 42 PENNSYLVANIA BASIN: 050100
MAJOR BASIN: OHIO RIVER
MINOR BASIN: ALLEGHENY RIVER
REACH: 05010006009ON 0.11

INDEX 1021500 7720 21670 1320
MILES 953.80 981.00 55.80 37.90

DATE YYMMDD	TIME FROM HHMM	THRU HHMM	DEPTH FT	00010 Temp DEG.C	00076 Turb. NTU	00080 Color PT-CO UNITS	00094 Sp.Cond Field UM/CM	00095 Sp.Cond 25 C UM/CM	00299 Oxygen D. MG/L	00400 pH Field UNITS	00403 pH Lab UNITS	00410 T.Alk CaCO3 MG/L	00435 T.Acid CaCO3 MG/L
850501	1645		000		17	45	442				8.12	39	1
860402	1030		000	12.7	5.8	20	449		9.6	7.0	7.03	38	5
910402	1215		000	5.9	3.6	15	271	243	11.8	7.07	6.92	24	2

401REP AURAS RAW DATA REPORT FOR WATER QUALITY FROM BEG. TO END USING 1 MIN. TIME RANGE DATE 02/25/97 PAGE 15
LOCATED IN MAHONING CREEK LAKE AT RIVER MILE 37.9, AT THE RIGHT BANK, STATION: 4MAH11110 4MAH11110 4MAH21110

15.0 MILES UPSTREAM OF THE DAM, WEST OF HAMILTON, PA - VALIER, PA QUAD- LAT/LON: 40 54 42.2 79 06 45.0 1 TOTAL DEPTH: F045
SAMPLED BY THE U.S. ARMY CORPS OF ENGINEERS, PITTSBURGH, PA. LOCATION: MAHONING CREEK,INFLOW TO MAHONIN
STATE: 42 PENNSYLVANIA BASIN: 050100
MAJOR BASIN: OHIO RIVER
MINOR BASIN: ALLEGHENY RIVER
REACH: 050100060090N 0.11

INDEX 1021500 7720 21670 1320
MILES 953.80 981.00 55.80 37.90

DATE YYMMDD	TIME FROM HHMM	THRU HHMM	DEPTH FT	00436 M.Acid CaCO3 MG/L	00437 Acid CO2 MG/L	00530 Solids 105 C S. MG/L	00610 NH3-N As N T. MG/L	00625 Kjeldahl As N T. MG/L	00630 NO3+Nitrite As N T. MG/L	00900 T.Hard CaCO3 MG/L	00916 Calcium T. MG/L	00927 Magnesium T. MG/L	00929 Sodium T. MG/L
850501	1645		000	0	1	37.7				156			
860402	1030		000	0	5	2.8	L 0.1	L 0.1	0.9	160	44	13	17
910402	1215		000	0	2	0.5	0.1		0.8	89			

401REP AURAS RAW DATA REPORT FOR WATER QUALITY FROM BEG. TO END USING 1 MIN. TIME RANGE DATE 02/25/97 PAGE 16
LOCATED IN MAHONING CREEK LAKE AT RIVER MILE 37.9, AT THE RIGHT BANK, STATION: 4MAH11110 4MAH11110 4MAH21110

15.0 MILES UPSTREAM OF THE DAM, WEST OF HAMILTON, PA - VALIER, PA QUAD- LAT/LON: 40 54 42.2 79 06 45.0 1 TOTAL DEPTH: F045
SAMPLED BY THE U.S. ARMY CORPS OF ENGINEERS, PITTSBURGH, PA. LOCATION: MAHONING CREEK,INFLOW TO MAHONIN
STATE: 42 PENNSYLVANIA BASIN: 050100
MAJOR BASIN: OHIO RIVER
MINOR BASIN: ALLEGHENY RIVER
REACH: 050100060090N 0.11

INDEX 1021500 7720 21670 1320
MILES 953.80 981.00 55.80 37.90

DATE	TIME	DEPTH	00937		00945	01007		01012		01027		01034		01042		01045		01051		01055	
YYMMDD	FROM THRU HHMM HHMM	FT	Potassium T.	MG/L	Sulfate MG/L	Barium T.	UG/L	Berylium T.	UG/L	Cadmium T.	UG/L	Chromium T.	UG/L	Copper T.	UG/L	Iron T.	UG/L	Lead T.	UG/L	MANGANESE T.	UG/L
860402	1030	000	L	1	120		80	L	1	L	1	L	1	L	5		600	L	2		280
910402	1215	000			91																

401REP AURAS RAW DATA REPORT FOR WATER QUALITY FROM BEG. TO END USING 1 MIN. TIME RANGE DATE 02/25/97 PAGE 17
LOCATED IN MAHONING CREEK LAKE AT RIVER MILE 37.9, AT THE RIGHT BANK, STATION: 4MAH11110 4MAH11110 4MAH21110

15.0 MILES UPSTREAM OF THE DAM, WEST OF HAMILTON, PA - VALIER, PA QUAD- LAT/LON: 40 54 42.2 79 06 45.0 1 TOTAL DEPTH: F045
SAMPLED BY THE U.S. ARMY CORPS OF ENGINEERS, PITTSBURGH, PA. LOCATION: MAHONING CREEK,INFLOW TO MAHONIN
STATE: 42 PENNSYLVANIA BASIN: 050100
MAJOR BASIN: OHIO RIVER
MINOR BASIN: ALLEGHENY RIVER
REACH: 050100060090N 0.11

INDEX 1021500 7720 21670 1320
MILES 953.80 981.00 55.80 37.90

DATE	TIME	DEPTH	01067		01092		01097		01105		7050H	L0665	
YYMMDD	FROM THRU	FT	NICKEL		ZINC		ANTIMONY		ALUMINUM		H.M.ACID	Phos	
	HHMM HHMM										CACO3	As P	
			T.	UG/L	T.	UG/L	T.	UG/L	T.	UG/L	MG/L	T.	UG/L
850501	1645	000									0		
860402	1030	000	L	5	L	50	L	100		300	0	L	10
910402	1215	000									0		

401REP AURAS RAW DATA REPORT FOR WATER QUALITY FROM BEG. TO END USING 1 MIN. TIME RANGE DATE 02/25/97 PAGE 10
LOCATED ON MAHONING CREEK LAKE AT THE BRIDGE OVER MAHONING CREEK - 0.3 STATION: 4MAH11009

MILES UPSTREAM OF NORTH POINT , PA. - DAYTON , PA. QUAD - SAMPLED BY THE U.S. ARMY CORPS OF ENGINEERS , PITTSBURGH, PA.

LAT/LON: 40 54 06.0 79 07 31.0 1 TOTAL DEPTH: F150
LOCATION: MAHONING CREEK LAKE - MILE 36.9
STATE: 42 PENNSYLVANIA BASIN: 050100
MAJOR BASIN: OHIO RIVER
MINOR BASIN: ALLEGHENY RIVER
REACH: 05010006

INDEX 1021500 7720 21670 1320
MILES 953.80 981.00 55.80 36.90

DATE YYMMDD	TIME FROM HHMM	THRU HHMM	DEPTH FT	00010 Temp DEG.C	00076 Turb. NTU	00080 Color PT-CO UNITS	00094 Sp.Cond Field UM/CM	00299 Oxygen D. MG/L	00400 pH Field UNITS	00403 pH Lab UNITS	00410 T.Alk CaCO3 MG/L	00435 T.Acid CaCO3 MG/L	00436 M.Acid CaCO3 MG/L
790215	1320		000		3.8	1	232			6.05	14	33	0
830907	1555		000	26.5	2.6	5.0	637	8.9	7.3	7.09	59	4	0
890630	1230		000	16.6	3.5	10	302	9.0	7.35	7.20	27	3	0

401REP AURAS RAW DATA REPORT FOR WATER QUALITY FROM BEG. TO END USING 1 MIN. TIME RANGE DATE 02/25/97 PAGE 11
LOCATED ON MAHONING CREEK LAKE AT THE BRIDGE OVER MAHONING CREEK - 0.3 STATION: 4MAH11009

MILES UPSTREAM OF NORTH POINT , PA. - DAYTON , PA. QUAD - SAMPLED BY THE U.S. ARMY CORPS OF ENGINEERS , PITTSBURGH, PA.

LAT/LON: 40 54 06.0 79 07 31.0 1 TOTAL DEPTH: F150
LOCATION: MAHONING CREEK LAKE - MILE 36.9
STATE: 42 PENNSYLVANIA BASIN: 050100
MAJOR BASIN: OHIO RIVER
MINOR BASIN: ALLEGHENY RIVER
REACH: 05010006

INDEX 1021500 7720 21670 1320
MILES 953.80 981.00 55.80 36.90

DATE YYMMDD	TIME FROM HHMM	THRU HHMM	DEPTH FT	00437 Acid CO2 MG/L	00500 Solids T. MG/L	00515 Solids 105 C D. MG/L	00530 Solids 105 C S. MG/L	00610 NH3-N As N T. MG/L	00625 Kjeldahl As N T. MG/L	00630 NO3+Nitr ite As N T. MG/L	00900 T.Hard CaCO3 MG/L	00916 Calcium T. MG/L	00927 Magnesium T. MG/L
790215	1320		000	33							168		
830907	1555		000	4			5.8				204		
890630	1230		000	3	217.8	206.0	11.8	L 0.1	0.2	67.0	116	35.7	10.4

401REP AURAS RAW DATA REPORT FOR WATER QUALITY FROM BEG. TO END USING 1 MIN. TIME RANGE DATE 02/25/97 PAGE 12
LOCATED ON MAHONING CREEK LAKE AT THE BRIDGE OVER MAHONING CREEK - 0.3 STATION: 4MAH11009

MILES UPSTREAM OF NORTH POINT , PA. - DAYTON , PA. QUAD - SAMPLED BY THE U.S. ARMY CORPS OF ENGINEERS , PITTSBURGH, PA.

LAT/LON: 40 54 06.0 79 07 31.0 1 TOTAL DEPTH: F150
LOCATION: MAHONING CREEK LAKE - MILE 36.9
STATE: 42 PENNSYLVANIA BASIN: 050100
MAJOR BASIN: OHIO RIVER
MINOR BASIN: ALLEGHENY RIVER
REACH: 05010006

INDEX 1021500 7720 21670 1320
MILES 953.80 981.00 55.80 36.90

DATE	TIME	DEPTH	00929		00937		00940	00945	01002		01007		01012		01027		01034		01042	
YYMMDD	FROM THRU HHMM HHMM	FT	Sodium		Potassium		Chloride	Sulfate	Arsenic		Barium		Berylium		Cadmium		Chromium		Copper	
			T.	MG/L	T.	MG/L	T. MG/L	MG/L	T.	UG/L	T.	UG/L	T.	UG/L	T.	UG/L	T.	UG/L	T.	UG/L
890630	1230	000		14.5	L	10.0	15.0	84	L	1.0		70	L	10	L	1.0		1.0	L	5.0

401REP AURAS RAW DATA REPORT FOR WATER QUALITY FROM BEG. TO END USING 1 MIN. TIME RANGE DATE 02/25/97 PAGE 13
LOCATED ON MAHONING CREEK LAKE AT THE BRIDGE OVER MAHONING CREEK - 0.3 STATION: 4MAH11009

MILES UPSTREAM OF NORTH POINT , PA. - DAYTON , PA. QUAD - SAMPLED BY THE U.S. ARMY CORPS OF ENGINEERS , PITTSBURGH, PA.

LAT/LON: 40 54 06.0 79 07 31.0 1 TOTAL DEPTH: F150
LOCATION: MAHONING CREEK LAKE - MILE 36.9
STATE: 42 PENNSYLVANIA BASIN: 050100
MAJOR BASIN: OHIO RIVER
MINOR BASIN: ALLEGHENY RIVER
REACH: 05010006

INDEX 1021500 7720 21670 1320
MILES 953.80 981.00 55.80 36.90

DATE	TIME	DEPTH	01045		01051		01055		01067		01092		01097		01105		01147		7050H	L0665	
YYMMDD	FROM THRU HHMM HHMM	FT	Iron		Lead		MANGANESE		NICKEL		ZINC		ANTIMONY		ALUMINUM		SELENIUM		H.M.ACID CACO3	Phos As P	
			T.	UG/L	T.	UG/L	T.	UG/L	T.	UG/L	T.	UG/L	T.	UG/L	T.	UG/L	T.	UG/L	MG/L	T.	UG/L
790215	1320	000																	0		
830907	1555	000																	0		
890630	1230	000		916	L	2.0		298		10.0	L	50	L	100		396		1.1	0	L	10

401REP AURAS RAW DATA REPORT FOR WATER QUALITY FROM BEG. TO END USING 1 MIN. TIME RANGE DATE 02/25/97 PAGE 43
LOCATED ON SUGARCAMP RUN DOWNSTREAM FROM THE ACID MINE DRAINAGE PONDS STATION: 4MAH12112

DAYTON, PA. QUAD. - SAMPLED BY THE U S ARMY CORPS OF ENGINEERS,
PITTSBURGH, PA.

LAT/LON: 40 54 21.5 79 11 30.0 1 TOTAL DEPTH: F003
LOCATION: SUGARCAMP RUN - MILE 1.3
STATE: 42 PENNSYLVANIA BASIN: 050100
MAJOR BASIN: OHIO RIVER
MINOR BASIN: ALLEGHENY RIVER MAHONING CR.
REACH: 05010006

INDEX 1021500 7720 21670 1320 580
MILES 953.80 981.00 55.80 29.00 1.28

DATE YYMMDD	TIME FROM HHMM	THRU HHMM	DEPTH FT	00010 Temp DEG.C	00032 Cloud Cover %	00076 Turb. NTU	00080 Color PT-CO UNITS	00094 Sp.Cond Field UM/CM	00400 pH Field UNITS	00403 pH Lab UNITS	00410 T.Alk CaCO3 MG/L	00435 T.Acid CaCO3 MG/L	00436 M.Acid CaCO3 MG/L
731011	1830		000	14.5	0	5.8	10	270	5.4	4.9	2	13	0

401REP AURAS RAW DATA REPORT FOR WATER QUALITY FROM BEG. TO END USING 1 MIN. TIME RANGE DATE 02/25/97 PAGE 44
LOCATED ON SUGARCAMP RUN DOWNSTREAM FROM THE ACID MINE DRAINAGE PONDS STATION: 4MAH12112

DAYTON, PA. QUAD. - SAMPLED BY THE U S ARMY CORPS OF ENGINEERS,
PITTSBURGH, PA.

LAT/LON: 40 54 21.5 79 11 30.0 1 TOTAL DEPTH: F003
LOCATION: SUGARCAMP RUN - MILE 1.3
STATE: 42 PENNSYLVANIA BASIN: 050100
MAJOR BASIN: OHIO RIVER
MINOR BASIN: ALLEGHENY RIVER MAHONING CR.
REACH: 05010006

INDEX 1021500 7720 21670 1320 580
MILES 953.80 981.00 55.80 29.00 1.28

DATE YYMMDD	TIME FROM HHMM	THRU HHMM	DEPTH FT	00900 T.Hard CaCO3 MG/L	00945 Sulfate MG/L	01045 Iron T. UG/L	01055 MANGANESE T. UG/L	01105 ALUMINUM T. UG/L
731011	1830		000	106	90	280	940	1650

401REP AURAS RAW DATA REPORT FOR WATER QUALITY FROM BEG. TO END USING 1 MIN. TIME RANGE DATE 02/25/97 PAGE 45
LOCATED ON SUGARCAMP RUN MILE 1.0 - UPSTREAM FROM THE ACID MINE DRAINAGE STATION: 4MAH12113

PONDS - DAYTON , PA. QUAD. - SAMPLED BY U S ARMY CORPS OF ENGINEERS, PITTSBURGH, PA.

LAT/LON: 40 54 34.0 79 11 18.0 2 TOTAL DEPTH: F003
LOCATION: SUGARCAMP RUN - MILE 1.0
STATE: 42 PENNSYLVANIA BASIN: 050100
MAJOR BASIN: OHIO RIVER
MINOR BASIN: ALLEGHENY RIVER MAHONING CR.
REACH: 05010006

INDEX	1021500	7720	21670	1320	580
MILES	953.80	981.00	55.80	29.00	.96

DATE YYMMDD	TIME FROM HHMM	THRU HHMM	DEPTH FT	00010 Temp DEG.C	00032 Cloud Cover %	00076 Turb. NTU	00080 Color PT-CO UNITS	00094 Sp.Cond Field UM/CM	00400 pH Field UNITS	00403 pH Lab UNITS	00410 T.Alk CaCO3 MG/L	00435 T.Acid CaCO3 MG/L	00436 M.Acid CaCO3 MG/L
731011	1800		000	15.0	0	1.5	5	215	5.1	4.75	2	19	0

401REP AURAS RAW DATA REPORT FOR WATER QUALITY FROM BEG. TO END USING 1 MIN. TIME RANGE DATE 02/25/97 PAGE 46
LOCATED ON SUGARCAMP RUN MILE 1.0 - UPSTREAM FROM THE ACID MINE DRAINAGE STATION: 4MAH12113

PONDS - DAYTON , PA. QUAD. - SAMPLED BY U S ARMY CORPS OF ENGINEERS, PITTSBURGH, PA.

LAT/LON: 40 54 34.0 79 11 18.0 2 TOTAL DEPTH: F003
LOCATION: SUGARCAMP RUN - MILE 1.0
STATE: 42 PENNSYLVANIA BASIN: 050100
MAJOR BASIN: OHIO RIVER
MINOR BASIN: ALLEGHENY RIVER MAHONING CR.
REACH: 05010006

INDEX	1021500	7720	21670	1320	580
MILES	953.80	981.00	55.80	29.00	.96

DATE YYMMDD	TIME FROM HHMM	THRU HHMM	DEPTH FT	00900 T.Hard CaCO3 MG/L	00945 Sulfate MG/L	01045 Iron T. UG/L	01055 MANGANESE T. UG/L	01105 ALUMINUM T. UG/L
731011	1800		000	82	72	120	900	2000

401REP AURAS RAW DATA REPORT FOR WATER QUALITY FROM BEG. TO END USING 1 MIN. TIME RANGE DATE 02/25/97 PAGE 8
LOCATED ON THE MAHONING CREEK LAKE - 8.0 MILES UPSTREAM FROM THE DAM - STATION: 4MAH11008 4MAH11008 4MAH21008

AT THE BRIDGE 0.2 MILES UPSTREAM FROM THE CONFLUENCE WITH LITTLE MAHONING CREEK - DAYTON , PA. QUAD. - SAMPLED BY THE U S ARMY CORPS OF ENGINEERS , PITTSBURGH, PA.

LAT/LON: 40 53 45.0 79 11 46.5 1 TOTAL DEPTH: F050
LOCATION: MAHONING CREEK LAKE - MILE 30.9
STATE: 42 PENNSYLVANIA BASIN: 050100
MAJOR BASIN: OHIO RIVER
MINOR BASIN: ALLEGHENY RIVER MAHONING CR.
REACH: 050100060080N 1.14

INDEX 1021500 7720 21670 1320
MILES 953.80 981.00 55.80 30.92

DATE YYMMDD	TIME FROM HHMM	THRU HHMM	DEPTH FT	00010 Temp DEG.C	00076 Turb. NTU	00080 Color PT-CO UNITS	00094 Sp.Cond Field UM/CM	00299 Oxygen D. MG/L	00400 pH Field UNITS	00403 pH Lab UNITS	00410 T.Alk CaCO3 MG/L	00435 T.Acid CaCO3 MG/L	00436 M.Acid CaCO3 MG/L
731009	1800		000	15.7	6.2	2.5	261	9.9	7.6	6.65	21	6	0
790215	1230		000		1.2	5	218		7.05	6.8	39	2	0
830907	1525		000	26.6	1.6	3.5	622	9.8	7.7	7.82	57	6	0

IO1REP AURAS RAW DATA REPORT FOR WATER QUALITY FROM BEG. TO END USING 1 MIN. TIME RANGE DATE 02/25/97 PAGE 9
.OCATED ON THE MAHONING CREEK LAKE - 8.0 MILES UPSTREAM FROM THE DAM - STATION: 4MAH11008 4MAH11008 4MAH21008

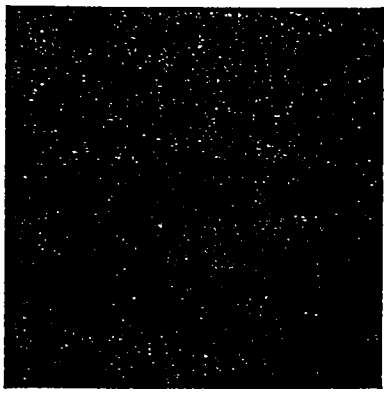
\T THE BRIDGE 0.2 MILES UPSTREAM FROM THE CONFLUENCE WITH LITTLE LAT/LON: 40 53 45.0 79 11 46.5 1 TOTAL DEPTH: F050
MAHONING CREEK - DAYTON , PA. QUAD. - SAMPLED BY THE U S ARMY CORPS OF LOCATION: MAHONING CREEK LAKE - MILE 30.9
ENGINEERS , PITTSBURGH, PA. STATE: 42 PENNSYLVANIA BASIN: 050100
MAJOR BASIN: OHIO RIVER
MINOR BASIN: ALLEGHENY RIVER MAHONING CR.
REACH: 050100060080N 1.14

INDEX 1021500 7720 21670 1320
MILES 953.80 981.00 55.80 30.92

DATE	TIME	DEPTH	00437	00530	00900	7050H
YYMMDD	FROM THRU	FT	Acid CO2	Solids	T.Hard	H.M.ACID
	HHMM HHMM			105 C	CaCO3	CACO3
			MG/L	S. MG/L	MG/L	MG/L
731009	1800	000	6		98	0
790215	1230	000	2		144	0
830907	1525	000	6	2.0	189	0

APPENDIX C

Biological Data



STORET
The Water Quality Information System

STORET. Powerful, versatile, easy-to-use computer database. Your central source for water quality data.

To store, retrieve or analyze water quality data, STORET is your single, up-to-date answer. STORET users have access to:

150 million water sample observations
from
800,000 sampling sites

Maintained by the U.S. Environmental Protection Agency, STORET contains data relating to the quality of surface and ground water in America's waterways. Water sample observations are available for all 50 states, the U.S. Territories, and portions of Canada.

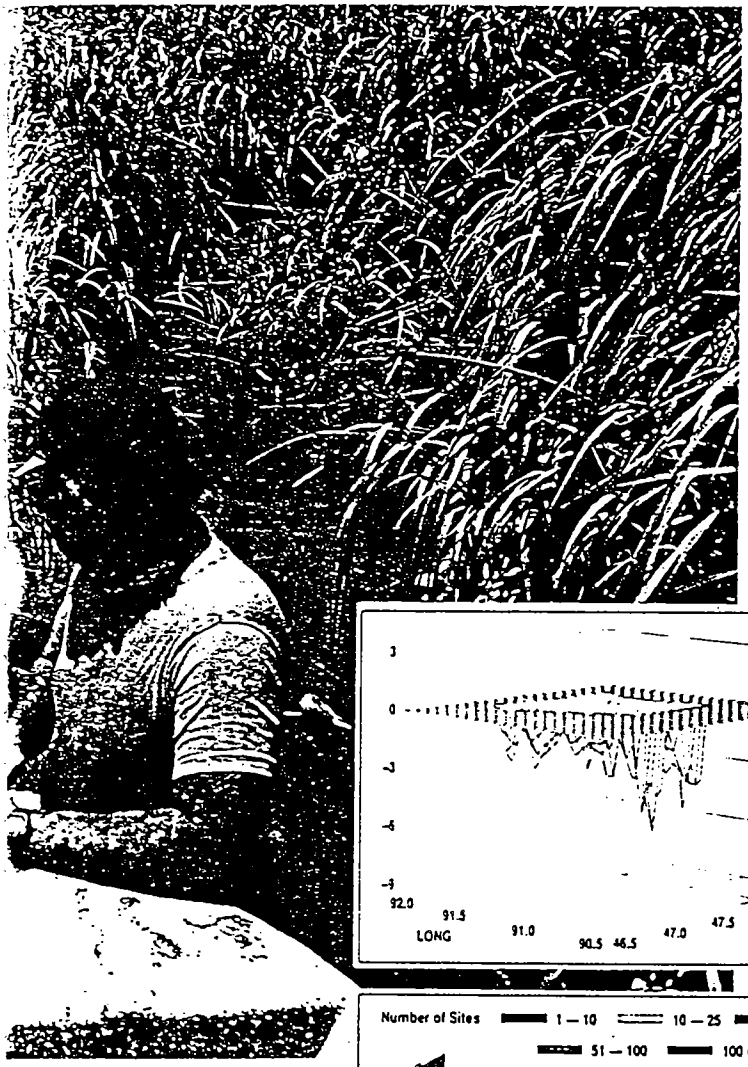
STORET — for STOrage and RETrieval — was developed as a uniform data collection and reporting system, making the task of analyzing water quality data from two or more sources possible. Accessible through most PCs with modems, the system can produce a number of geographic and statistical reports.

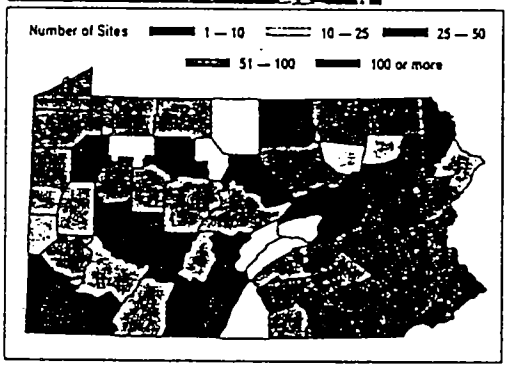
Analyzing Problems

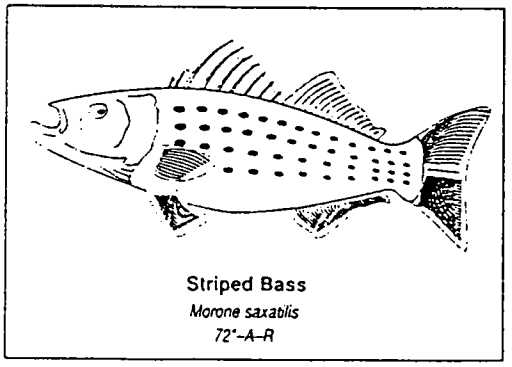
You can use STORET in solving problems such as defining the causes and effects of water pollution, measuring compliance with water quality standards, checking the status of waste treatment plant needs, and determining pollution trends.

STORET contains information on sampling sites, dates of samples, and physical, chemical and biological sample data. Historical data for some areas reach back 40 years.

STORET is used by EPA for its national water quality analysis program and is maintained as a nationally-available repository for parametric water quality data. Users have access to all the information in the system and are able to add new information as well.







Striped Bass

Morone saxatilis

72°-A-R

STORET's User Community

Who can use STORET? You can! Anyone who needs to analyze, store or retrieve water quality data, including:

- State and local government personnel
- Federal government agencies
- Interstate commissions
- Commercial clients
- Universities

Several federal agencies have direct access to STORET and continually add data into the system. This is one more reason why STORET is up-to-date. Government users include: the U.S. Forest Service, the U.S. Army Corps of Engineers, the Bureau of Reclamation, the U.S. Geological Survey, and the Tennessee Valley Authority.

What Can STORET Do?

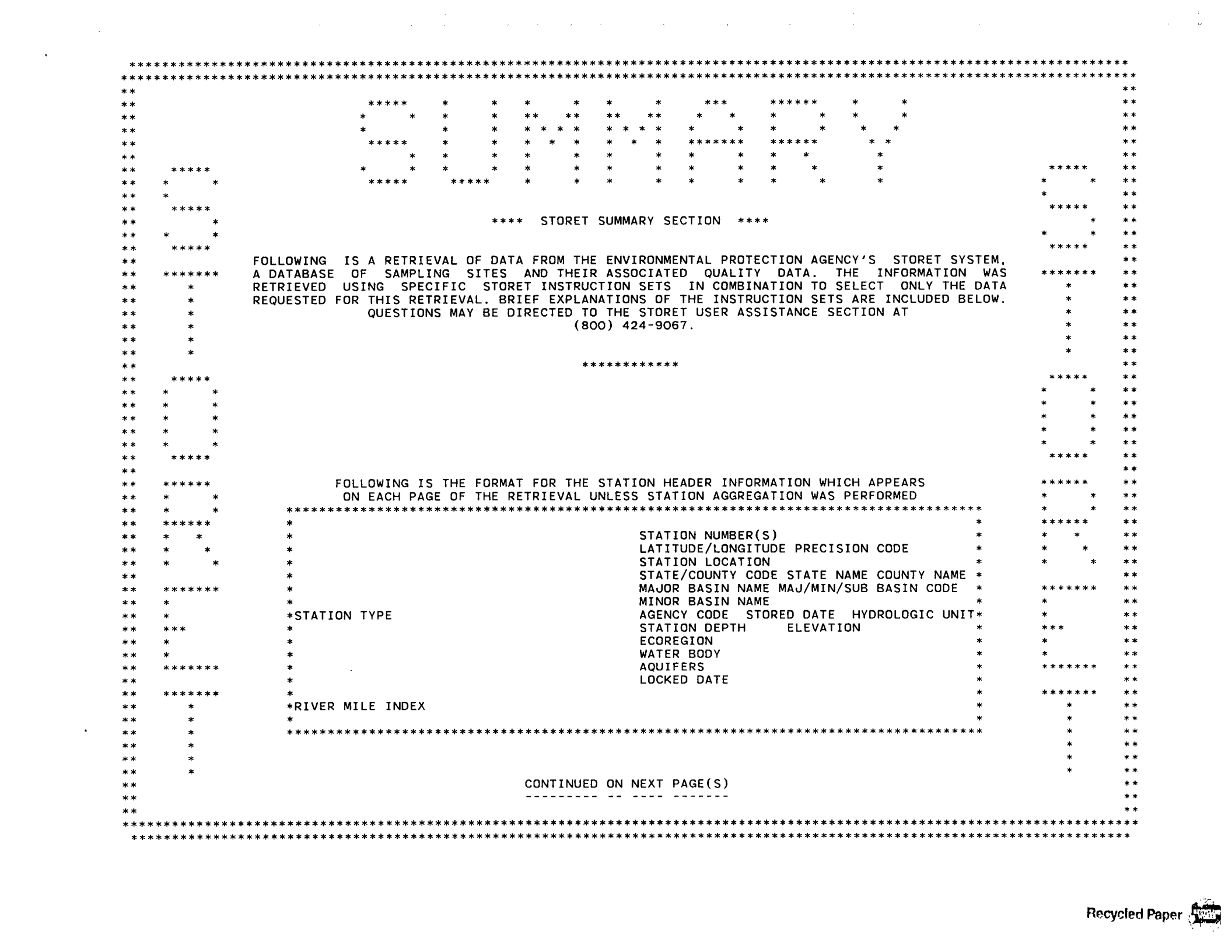
Shade and trend maps, plots, and statistical summaries are some of the report options available through this versatile system. Users can also generate machine-readable files that can be used as input to user-written programs or to commercially-available statistical software, such as the offerings of SAS Institute Inc., to extend the system's analytic and graphic output capabilities.

STORET users can develop reports, look at the most current data available, or present information depicting trends over time. Here's a look at a few examples of how STORET is being used today.

a) How clear are the lakes in Lake County, Minnesota? This graph of Secchi disk readings in that county gives a 3-D picture.

b) STORET can show diversity within a geographic area. The Pennsylvania map depicts the number of ground water sampling sites in the state by county.

c) Part of BIOS is the Taxonomic Database. This striped bass is just one of more than 60,000 species described in the database.



RETRIEVAL PROGRAM

PGM=ALLFS
THIS PROGRAM PRINTS THE ACTUAL SAMPLE VALUES FOR ALL RETRIEVED SAMPLES

NO BEGINNING DATE WAS REQUESTED -- STORET ASSUMED THE BEGINNING DATE WAS THAT OF THE OLDEST DATA VALUE FOUND
NO ENDING DATE WAS REQUESTED -- STORET ASSUMED THE ENDING DATE WAS THAT OF THE MOST RECENT DATA VALUE FOUND

STATION SELECTION WAS BY:

AGENCY CODE(S) AND STATION NUMBER(S) FOR THE FOLLOWING AGENCY(S):
21PA

STATIONS SELECTED WERE RESTRICTED TO:

AGENCIES WHOSE DATA HAS NOT BEEN 'RETIRED'

CONTACTS FOR AGENCY CODES RETRIEVED:

AGENCY	PRIMARY CONTACT NAME	ORGANIZATION	PHONE NUMBER(S)
21PA	SCHREFFLER, TAMMY	PENNSYLVANIA DPT ENV PROT	(717)783-3638

FIELD SURVEY REFERENCES:

AGENCY	ENTRY	DESCRIPTION
21PA	C-00007	HASSE, RAY PA DER-BUR WATER QUALITY 1012 WATER STREET 814-724-8550 MEADVILLE PA 16335
21PA	I-00007	HASSE, RAY PA DER-BUR WATER QUALITY 1012 WATER STREET 814-724-8550 MEADVILLE PA 16335
21PA	I-00020	JONES, GARY EVAN PRESS BLDG, 3RD & REILY ST. PA DER-BUR LAB, BIO-SEC PO BOX 1467 717-787-9633 HARRISBURG PA 17105
21PA	V-00001	87/04/01 - PERIODIC FIXED-NETWORK TREND MONITORING MONITORING

DATA SPECIFICATIONS:

NOTE
NO REMARK CODE RESTRICTIONS WERE SPECIFIED - COMPUTATIONS WILL
BE PERFORMED WITHOUT REGARD TO DATA REMARKS

DATA RESTRICTIONS:

NOTE
NO DEPTH INDICATOR RESTRICTIONS WERE SPECIFIED - COMPUTATIONS WILL
BE PERFORMED WITHOUT REGARD TO DEPTH INDICATORS

NOTE
NO GRAB/COMPOSITE RESTRICTIONS WERE UTILIZED, SO BOTH GRAB AND COMPOSITE SAMPLE TYPES MAY HAVE
BEEN INCLUDED - COMPUTATIONS WILL BE PERFORMED WITHOUT REGARD TO SAMPLE TYPE

WQN0861 PFBC2-027
40 55 19.0 079 00 23.0 4
MAHONING CRK-T374 BR AT SPORTSBURG-YOUNG TWP
42065 PENNSYLVANIA JEFFERSON
OHIO RIVER BASIN
MAHONING CREEK
21PA 880305 05010006
0000 FEET DEPTH

/TYPA/AMBNT/STREAM/BIO

SURVEY NUMBER => 1
SAMPLE DATE => 88/09/07

COMMUNITY => MACROINVERTEBRATES

SAMPLING ENVIRONMENT CHARACTERISTICS:

P00010 - TEMPERATURE, WATER (DEGREES CENTIGRADE)		=>	15.8	
P00011 - TEMPERATURE, WATER (DEGREES FAHRENHEIT)		=>	60.4	$
P00094 - SPECIFIC CONDUCTANCE,FIELD (UMHOS/CM @ 25C)		=>	405	
P00300 - OXYGEN, DISSOLVED	MG/L	=>	9.5	
P00301 - OXYGEN, DISSOLVED, PERCENT OF SATURATION	%	=>	95.0	$
P00400 - PH (STANDARD UNITS)		=>	7.98	
P83509 - STREAM, WIDTH	METER	=>	37.0	
P83515 - STREAM, PERCENT SHADED BY CANOPY	%	=>	15.00	
P83541 - SUBSTRATE, BOULDER 4096-256 MM	%	=>	5.00	
P83542 - SUBSTRATE, COBBLE 256-64 MM	%	=>	40.00	
P83543 - SUBSTRATE, COARSE GRAVEL/PEBBLE 64-16 MM	%	=>	20.00	
P83544 - SUBSTRATE, GRAVEL 16-2 MM	%	=>	30.00	
P83546 - SUBSTRATE, SILT 0.062-0.004 MM	%	=>	5.00	
P84131 - SAMPLING METHOD, CONFIDENCE CODE (A,B,C,D)	CODE	=>	A	
P84132 - STREAMBANK, VEGETATIVE STABILITY RATING	CODE	=>	G	
P84133 - STREAMBANK, STABILITY (BANK EROSION) RATING	CODE	=>	MDST	
P84134 - PARTICLES, DEGREE SURROUNDED BY FINE SEDIMENT,	CODE	=>	3	
P84135 - STREAMSIDE, (SHORELINE) COVER RATING	CODE	=>	3	

SAMPLING EFFORT INFORMATION:
P83500 - SAMPLE, AREA SQUARE CENTIMETERS => 41806.0
GEAR => KICKNET
MESH SIZE => 0.0800 CM
LENGTH => 91.44 CM
WIDTH => 91.44 CM

REFERENCES:
COLLECTOR => 7
IDENTIFIER => 7

TAXON NAME => PHYSA
CONFIDENCE IN IDENTIFICATION => A
COUNT => 1
TAXON NAME => PISIDIUM
CONFIDENCE IN IDENTIFICATION => A
COUNT => 1
TAXON NAME => CAMBARIDAE (CRAYFISHES)
CONFIDENCE IN IDENTIFICATION => A
COUNT => 1
TAXON NOTE => DOMINANT

(SAMPLE CONTINUED ON FOLLOWING PAGE)

WQN0861 PFBC2-027
40 55 19.0 079 00 23.0 4
MAHONING CRK-T374 BR AT SPORTSBURG-YOUNG TWP
42065 PENNSYLVANIA JEFFERSON
OHIO RIVER BASIN
MAHONING CREEK
21PA 880305 05010006
0000 FEET DEPTH

/TYPA/AMBNT/STREAM/BIO

SURVEY NUMBER => 1
SAMPLE DATE => 89/09/12

COMMUNITY => MACROINVERTEBRATES

SAMPLE NOTE => PRESENCE/ABSENCE DATA. COUNT=1 IS PRESENT.

SAMPLING ENVIRONMENT CHARACTERISTICS:

P00010 - TEMPERATURE, WATER (DEGREES CENTIGRADE)		=>	18.3	
P00011 - TEMPERATURE, WATER (DEGREES FAHRENHEIT)		=>	64.9	$
P00094 - SPECIFIC CONDUCTANCE,FIELD (UMHOS/CM @ 25C)		=>	600	
P00300 - OXYGEN, DISSOLVED	MG/L	=>	6.0	
P00301 - OXYGEN, DISSOLVED, PERCENT OF SATURATION	%	=>	63.2	$
P00400 - PH (STANDARD UNITS)		=>	7.50	
P83509 - STREAM, WIDTH	METER	=>	15.2	
P83515 - STREAM, PERCENT SHADED BY CANOPY	%	=>	25.00	
P83541 - SUBSTRATE, BOULDER 4096-256 MM	%	=>	5.00	
P83542 - SUBSTRATE, COBBLE 256-64 MM	%	=>	30.00	
P83543 - SUBSTRATE, COARSE GRAVEL/PEBBLE 64-16 MM	%	=>	30.00	
P83544 - SUBSTRATE, GRAVEL 16-2 MM	%	=>	20.00	
P83545 - SUBSTRATE, SAND 2.000-0.062 MM	%	=>	5.00	
P83546 - SUBSTRATE, SILT 0.062-0.004 MM	%	=>	5.00	
P83548 - SUBSTRATE,DETRITUS/COARSE PARTICULATE ORG MATTER	%	=>	5.00	
P84131 - SAMPLING METHOD, CONFIDENCE CODE (A,B,C,D)	CODE	=>	A	
P84132 - STREAMBANK, VEGETATIVE STABILITY RATING	CODE	=>	F	
P84133 - STREAMBANK, STABILITY (BANK EROSION) RATING	CODE	=>	MDST	
P84134 - PARTICLES, DEGREE SURROUNDED BY FINE SEDIMENT	CODE	=>	2	
P84135 - STREAMSIDE, (SHORELINE) COVER RATING	CODE	=>	2	

SAMPLING EFFORT INFORMATION:
P83500 - SAMPLE, AREA SQUARE CENTIMETERS => 41806.0
GEAR => KICKNET
MESH SIZE => 0.0800 CM
LENGTH => 91.44 CM
WIDTH => 91.44 CM

REFERENCES:
COLLECTOR => 7
IDENTIFIER => 7

TAXON NAME => LUMBRICIDAE
CONFIDENCE IN IDENTIFICATION => A
COUNT => 1
TAXON NOTE => DOMINANT

(SAMPLE CONTINUED ON FOLLOWING PAGE)

WQN0861 PFBC2-027
40 55 19.0 079 00 23.0 4
MAHONING CRK-T374 BR AT SPORTSBURG-YOUNG TWP
42065 PENNSYLVANIA JEFFERSON
OHIO RIVER BASIN
MAHONING CREEK
21PA 880305 05010006
0000 FEET DEPTH

/TYPA/AMBNT/STREAM/BIO

(SAMPLE CONTINUED FROM PRECEDING PAGE)

SURVEY NUMBER => 1
SAMPLE DATE => 89/09/12

TAXON NAME => HYDROPSYCHE
CONFIDENCE IN IDENTIFICATION => A
COUNT => 1
TAXON NOTE => DOMINANT
TAXON NAME => PROSIMULIUM
CONFIDENCE IN IDENTIFICATION => A
COUNT => 1
TAXON NOTE => DOMINANT
TAXON NAME => EUKIEFFERIELLA
CONFIDENCE IN IDENTIFICATION => A
COUNT => 1
TAXON NOTE => DOMINANT
TAXON NAME => RHEOCRICOTOPUS
CONFIDENCE IN IDENTIFICATION => A
COUNT => 1
TAXON NAME => TVETENIA
CONFIDENCE IN IDENTIFICATION => A
COUNT => 1
TAXON NAME => RHEOTANYTARSUS
CONFIDENCE IN IDENTIFICATION => A
COUNT => 1
TAXON NAME => ATHERIX
CONFIDENCE IN IDENTIFICATION => A
COUNT => 1
TAXON NOTE => RARE

WQN0861 PFBC2-027
40 55 19.0 079 00 23.0 4
MAHONING CRK-T374 BR AT SPORTSBURG-YOUNG TWP
42065 PENNSYLVANIA JEFFERSON
OHIO RIVER BASIN
MAHONING CREEK
21PA 880305 05010006
0000 FEET DEPTH

/TYPA/AMBNT/STREAM/BIO

(SAMPLE CONTINUED FROM PRECEDING PAGE)

SURVEY NUMBER => 1
SAMPLE DATE => 90/09/09

TAXON NAME => CAMBARIDAE (CRAYFISHES)
CONFIDENCE IN IDENTIFICATION => A
COUNT => 1
TAXON NOTE => RARE
TAXON NAME => STENONEMA
CONFIDENCE IN IDENTIFICATION => A
COUNT => 1
TAXON NOTE => DOMINANT
TAXON NAME => STENACRON
CONFIDENCE IN IDENTIFICATION => A
COUNT => 1
TAXON NAME => PSEUDOCLOEON
CONFIDENCE IN IDENTIFICATION => A
COUNT => 1
TAXON NAME => BAETIS
CONFIDENCE IN IDENTIFICATION => A
COUNT => 1
TAXON NOTE => DOMINANT
TAXON NAME => ISONYCHIA
CONFIDENCE IN IDENTIFICATION => A
COUNT => 1
TAXON NAME => CAENIS
CONFIDENCE IN IDENTIFICATION => A
COUNT => 1
TAXON NAME => OPHIOGOMPHUS
CONFIDENCE IN IDENTIFICATION => A
COUNT => 1
TAXON NAME => DINEUTUS
CONFIDENCE IN IDENTIFICATION => A
COUNT => 1
TAXON NOTE => RARE
TAXON NAME => OPTIOSERVUS
CONFIDENCE IN IDENTIFICATION => A
COUNT => 1
TAXON NOTE => RARE
TAXON NAME => SIALIS
CONFIDENCE IN IDENTIFICATION => A
COUNT => 1
TAXON NAME => NIGRONIA
CONFIDENCE IN IDENTIFICATION => A
COUNT => 1

(SAMPLE CONTINUED ON FOLLOWING PAGE)

WQN0861 PFBC2-027
40 55 19.0 079 00 23.0 4
MAHONING CRK-T374 BR AT SPORTSBURG-YOUNG TWP
42065 PENNSYLVANIA JEFFERSON
OHIO RIVER BASIN
MAHONING CREEK
21PA 880305 05010006
0000 FEET DEPTH

/TYPA/AMBNT/STREAM/BIO

SURVEY NUMBER => 1
SAMPLE DATE => 91/09/05

COMMUNITY => MACROINVERTEBRATES

SAMPLE NOTE => RAPID BIOASSESSMENT PROTOCOL (RBP) 100+ ORGANISM SUBSAMPLE

SAMPLING EFFORT INFORMATION:
GEAR => D-FRAME NET
MESH SIZE => 0.0800 CM
WIDTH => 30.00 CM

REFERENCES:
COLLECTOR => 7
IDENTIFIER => 20

TAXON NAME => OLIGOCHAETA (ANGLEWORMS)
CONFIDENCE IN IDENTIFICATION => A
COUNT => 5
TAXON NOTE => RBP SUBSAMPLE
TAXON NAME => FERRISSIA
CONFIDENCE IN IDENTIFICATION => A
COUNT => 9
TAXON NOTE => RBP SUBSAMPLE
TAXON NAME => CAMBARIDAE (CRAYFISHES)
CONFIDENCE IN IDENTIFICATION => A
COUNT => 2
TAXON NOTE => RBP SUBSAMPLE
TAXON NAME => STENONEMA
CONFIDENCE IN IDENTIFICATION => A
COUNT => 23
TAXON NOTE => RBP SUBSAMPLE
TAXON NAME => STENACRON
CONFIDENCE IN IDENTIFICATION => A
COUNT => 3
TAXON NOTE => RBP SUBSAMPLE
TAXON NAME => ISONYCHIA
CONFIDENCE IN IDENTIFICATION => A
COUNT => 16
TAXON NOTE => RBP SUBSAMPLE
TAXON NAME => CAENIS
CONFIDENCE IN IDENTIFICATION => A
COUNT => 26
TAXON NOTE => RBP SUBSAMPLE

(SAMPLE CONTINUED ON FOLLOWING PAGE)

WQN0861 PFBC2-027
40 55 19.0 079 00 23.0 4
MAHONING CRK-T374 BR AT SPORTSBURG-YOUNG TWP
42065 PENNSYLVANIA JEFFERSON
OHIO RIVER BASIN
MAHONING CREEK
21PA 880305 05010006
0000 FEET DEPTH

/TYPA/AMBNT/STREAM/BIO

SURVEY NUMBER => 1
SAMPLE DATE => 92/08/24

COMMUNITY => MACROINVERTEBRATES

SAMPLE NOTE => RBP 100+ ORGANISM SUBSAMPLE

SAMPLING EFFORT INFORMATION:
GEAR => D-FRAME NET
MESH SIZE => 0.0800 CM
WIDTH => 30.00 CM

REFERENCES:
COLLECTOR => 7
IDENTIFIER => 20

TAXON NAME => OLIGOCHAETA (ANGLEWORMS)
CONFIDENCE IN IDENTIFICATION => A
COUNT => 18
TAXON NOTE => RBP SUBSAMPLE
TAXON NAME => FERRISSIA
CONFIDENCE IN IDENTIFICATION => A
COUNT => 8
TAXON NOTE => RBP SUBSAMPLE
TAXON NAME => SPHAERIIDAE(MOLLUSCA)
CONFIDENCE IN IDENTIFICATION => A
COUNT => 1
TAXON NOTE => RBP SUBSAMPLE
TAXON NAME => CAMBARIDAE (CRAYFISHES)
CONFIDENCE IN IDENTIFICATION => A
COUNT => 1
TAXON NOTE => RBP SUBSAMPLE
TAXON NAME => ISONYCHIA
CONFIDENCE IN IDENTIFICATION => A
COUNT => 7
TAXON NOTE => RBP SUBSAMPLE
TAXON NAME => STENELMIS
CONFIDENCE IN IDENTIFICATION => A
COUNT => 1
TAXON NOTE => RBP SUBSAMPLE
TAXON NAME => OPTIOSERVUS
CONFIDENCE IN IDENTIFICATION => A
COUNT => 1
TAXON NOTE => RBP SUBSAMPLE

(SAMPLE CONTINUED ON FOLLOWING PAGE)

WQN0861 PFBC2-027
40 55 19.0 079 00 23.0 4
MAHONING CRK-T374 BR AT SPORTSBURG-YOUNG TWP
42065 PENNSYLVANIA JEFFERSON
OHIO RIVER BASIN
MAHONING CREEK
21PA 880305 05010006
0000 FEET DEPTH

/TYPA/AMBNT/STREAM/BIO

SURVEY NUMBER => 1
SAMPLE DATE => 93/08/09

COMMUNITY => MACROINVERTEBRATES

SAMPLE NOTE => RBP 100+ ORGANISM SUBSAMPLE

SAMPLING EFFORT INFORMATION:
GEAR => D-FRAME NET
MESH SIZE => 0.0800 CM
WIDTH => 30.00 CM

REFERENCES:
COLLECTOR => 7
IDENTIFIER => 20

TAXON NAME => OLIGOCHAETA (ANGLEWORMS)
CONFIDENCE IN IDENTIFICATION => A
COUNT => 43
TAXON NOTE => RBP SUBSAMPLE
TAXON NAME => STENACRON
CONFIDENCE IN IDENTIFICATION => A
COUNT => 1
TAXON NOTE => RBP SUBSAMPLE
TAXON NAME => BAETIS
CONFIDENCE IN IDENTIFICATION => A
COUNT => 1
TAXON NOTE => RBP SUBSAMPLE
TAXON NAME => ISONYCHIA
CONFIDENCE IN IDENTIFICATION => A
COUNT => 3
TAXON NOTE => RBP SUBSAMPLE
TAXON NAME => CAENIS
CONFIDENCE IN IDENTIFICATION => A
COUNT => 1
TAXON NOTE => RBP SUBSAMPLE
TAXON NAME => EPHEMERA
CONFIDENCE IN IDENTIFICATION => A
COUNT => 1
TAXON NOTE => RBP SUBSAMPLE
TAXON NAME => HETAERINA
CONFIDENCE IN IDENTIFICATION => A
COUNT => 1
TAXON NOTE => RBP SUBSAMPLE

(SAMPLE CONTINUED ON FOLLOWING PAGE)

COMMONWEALTH OF PENNSYLVANIA

October 29, 1984

SUBJECT: Aquatic Biological Investigation
East Branch Mahoning Creek Watershed
Clearfield and Jefferson Counties
Stream File 8.19.0, April 23-27, 1984

TO: Daniel L. Alters
Chief - Operations Section
Bureau of Water Quality Management
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At your request I conducted an aquatic biological investigation of the East Branch Mahoning Creek Watershed. The purpose of the investigation was to inventory the general condition of East Branch Mahoning Creek and its tributaries in the Clearfield - Jefferson County border area. The investigation was conducted during the week of April 23, 1984. Assisting with the field work in various capacities were Floyd Himes of the Bureau of Water Quality Management Meadville Region, Steve Farrell and John Sengle of the Bureau of Water Quality Management Williamsport Region.

Twelve sampling stations (Figure 1, Table 1) were established in an effort to characterize as much of the East Branch and as many of its tributaries as possible. Some stations were also located on the Stump Creek Watershed but these will be discussed in a separate report. There is some disagreement between maps as to which is the nominal branch in the headwaters of some of these streams. Although Figure 1 was reproduced from PennDot county highway maps the stream names for the headwater stations in this investigation followed the designations found on USGS topographical maps. Physical and chemical parameters (Table 2) were obtained from grab water samples that were iced and shipped to the Bureau of Laboratories for analysis. Separate samples were fixed with nitric acid for metals analyses. The dissolved metals samples were field filtered before fixing. Temperature, dissolved oxygen and pH were measured in the field with appropriate meters.

Benthic macroinvertebrates (fish food organisms) were collected qualitatively with a hand held screen and by hand picking. I attempted to collect about 100 organisms per sample and made a conscious effort to collect as diverse and representative a sample as possible. In some unproductive or pollution limited streams I was unable to collect 100 organisms. Relative abundances (Table 3) of recognizable taxa were noted in the field while collecting.

Fish populations (Table 4) were sampled by electrofishing measured 200 yard stream segments using a Coffelt backpack electrofisher. We attempted to catch and count as many fish as possible in the sampled reaches. Fish were scarce throughout the study area or we would never have attempted to count individuals of non-game species. No effort was made to estimate populations using mark and recapture methods. Therefore the numbers presented in Table 4 represent indices of relative abundance for equal length stream segments.

RESULTS

All the data are attached to the back of this memo in a series of tables. Station by station discussions of this data follow.

MAH I. East Branch Mahoning Creek, just upstream from its confluence with Clover Run.

At this point the East Branch is a third order stream with an average width of 50 feet. Depths ranged from 1 foot in riffles to as much as 5 feet in pools. Most chemical and physcial parameters indicated a good quality but weakly buffered stream. Total alkalinity was 18 mg/l, total acidity 0 and the pH was 6.8. The aluminum concentration was high but most was present in an undissolved state. The more toxic dissolved aluminum was below the lab's reported detection level of 150 ug/l. Zinc concentrations exceeded EPA's (1980) recommended chronic criteria (47 ug/l) but not the acute criteria.

Presence of a diverse, balanced benthic macroinvertebrate community confirmed healthy stream conditions in spite of the high zinc concentration. The collection contained 25 taxa and was dominated by an assortment of stoneflies, mayflies and caddisflies. A fair collection of fish was also obtained at this station. We found 13 species and 78 individuals. Blacknose dace, bluntnose minnows and white suckers were the most numerous species. Trout were present but not common. No fingerling trout were observed, therefore there was no indication of trout reproduction in the reach. The stream was fairly wide and too deep to wade in one hole. We obviously missed a lot of fish. The collection indicated a cold water community, but not a spectacular fishery.

A previous investigation at this locatation (Hasse, 1980) found a benthic macroinvertebrate community comparable in sensitivity and function to the one we found. Hasse also noted excessive silt and mud coating the substrate, whereas we did not. Our chemical results did indicate order of magnitude increases in total aluminum and sulfates when compared to Hasse's. But, since there were no complementary changes in alkalinity, acidity or pH I'm not sure these increases are significant.

CLO 0. Clover Run, just upstream from its confluence with East Branch Mahoning Creek.

Near its mouth Clover Run is a second order stream with an average width of 22 feet. Depths ranged from 6 inches to 3 feet. Excepting zinc and total aluminum, the chemical and physical parameters indicated good water quality. The stream had a moderate buffering capacity (alkalinity = 22 mg/l, acidity = 0 mg/l) and a neutral pH. Total aluminum was high (740 ug/l), but dissolved aluminum was below the lab's reported detection level (150 ug/l). Total and dissolved zinc exceeded EPA's (1980) recommended chronic criteria, but the not acute criteria. Substrate conditions appeared to be good, with no excessive siltation or iron staining.

The benthic macroinvertebrate collection was sparse and indicated either very low fertility or a chronically toxic condition. Of the 16 taxa that were collected only Leuctra, a small stonefly, was common. All others were rare. The fish collection was also sparse. We found 7 species and 23 individuals. Fish habitat appeared to be good and we expected to find more individuals if not more species. The limited fish community could have been a response to the limited number of fish food organisms or whatever parameter was limiting the macroinvertebrate community.

Hasse also visited this station in 1980. In comparing our chemical results to his, we found a higher zinc concentration, but we also found a substantially higher pH and alkalinity. Hasse again found evidence of sedimentation where we did not. Our conclusions concerning the biological community were similar. He stated that baitfish and fish food organisms were rare and I concur. We did find 16 taxa of macroinvertebrates, whereas Hasse found only 6. Perhaps this indicates a trend of improving conditions.

LOS 0. Lost Run, approximately 0.25 mile upstream from confluence with Clover Run.

Lost Run is a first order stream with an average width of 15 feet. Depths ranged from 3 to 18 inches. Chemical and physical parameters were characteristic of a good quality, but weakly buffered stream (alkalinty = 11 mg/l, acidity = 0, pH = 6.7). Larger rocks were about 25% imbedded in sand and silt indicating that excessive siltation had occurred some time in the past.

The meager benthic macroinvertebrate collection indicated a low biomass, low diversity community. Stoneflies (Acroneuria) and crayfish (Cambarus) were the only common taxa. Mayflies were represented by only one individual. The community had the appearance of an acid-limited stream, but none of the chemical parameters indicated excessive acidity. The benthic community may have been limited by low fertility, silted substrate, and/or acid slugs such as might occur during spring snow melt or heavy rains.

Although not diverse, the fish collection did not seem as sparse as the macroinvertebrate collection. We found 5 species and 73 individuals. Creek chubs were the dominant species, but we also found 10 small brook trout, confirming the presence of a naturally reproducing brook trout population.

CLO 3. Clover Run, just downstream from confluence with Lost Run.

An astute reader will have noticed that the sampling stations in this investigation are tabulated and discussed in ascending order of their occurrence in the watershed. He will also have noticed that this and the preceding station (LOS 0) are transposed from their proper order. Rather than assume responsibility for the retyping of four lengthy tables and the insanity of a typist, I chose to let them remain transposed in this report.

Clover Run is a second order stream at this point with an average width of 21 feet. Depths ranged from 6inches to 3 feet. Most chemical and physical parameters indicated good water quality. The total aluminum concentration was high (570 ug/l), but dissolved aluminum remained below the reported detection level. Zinc concentrations exceeded EPA's (1980) recommended chronic criteria, but not the acute. However, the zinc concentration was about half of that found at the mouth of Clover Run. The sand-boulder substrate was less than desirable for optimal macroinvertebrate colonization. The boulders were about 30% imbedded in the sand evidencing a history of excessive siltation.

Although the benthic collection was moderately diverse (18 taxa) a low biomass was indicated. Stoneflies (Acroneuria) and crayfish (Cambarus) were the only common taxa. Mayflies were poorly represented. As at LOS 0, low fertility, damaged substrate, and acid slugging may have combined to limit the community.

The fish collection was also sparse. We found 5 species and 38 individuals in the 200 yard segment. There were several deep, boulder strewn pools in this reach that could have held trout but didn't. As with the macroinvertebrates, I am unsure of the exact limiting parameter.

CLO 5. Clover Run at the Clearfield-Jefferson County Line.

This station is near the headwaters where Clover Run is a first order stream. The average width was 14 feet and depths ranged from 3 inches in riffles to 18 inches in pools. The chemical and physical data for this station is perplexing. Specific conductance and dissolved solids concentrations were high, as if there were some type of oil or gas well

discharge. However, chlorides are usually elevated in oil or gas related wastes and the chloride concentration was low at this station. Acid mine drainage was implicated by the high sulfate concentration, but not by any of the other parameters (pH, iron, alkalinity, acidity) that are normally affected by mine drainage. The substrate appeared to be in good condition. The stream bottom was not silted or iron stained.

The biological data is also confusing. The macroinvertebrate collection indicated a near sterile condition. We found only 11 taxa and very few individuals. It looked like the community was responding to a chronically toxic condition, but I don't know what parameter was responsible. Fish, while not abundant, did not seem quite as sparse as benthic macroinverterates. We found 5 species and 57 individuals in the 200 yard sample segment. Blacknose dace, creek chubs and white suckers dominated the collection. This is a normal community composition for a small headwater stream. The low biomass could be attributed to the scarcity of fish food organisms or to whatever toxic factor was limiting the fish food community.

The area upstream from this station is ringed with gas wells and strip mines and it is easy to suspect that these activities were responsible for the absence of macroinvertebrates. Without knowing the specific limiting factor, it is difficult to draw any conclusions.

MAH 4. East Branch Mahoning Creek, at the T-622 bridge, just downstream from confluence with Laurel Run.

At this station the East Branch is still a third order stream with an average width of 33 feet. Riffles were 1 foot deep and the deepest pools about 5 feet. We didn't have time to collect a water sample and deliver it to a Purolator drop in time, but we did measure field parameters and fix metals samples for later shipment. Concentrations of total aluminum (1150 ug/l) and total manganese (1170 ug/l) were high. Manganese exceeded drinking water based criteria (DER, 1981) but posed no threat to aquatic life. The dissolved aluminum concentration was 150 ug/l. The substrate was an even mix of rubble-gravel-sand at this station. There was no evidence of iron staining or excessive siltation.

We found a healthy community of benthic macroinvertebrates. The collection included 23 taxa and indicated a moderate to high biomass. An assortment of stoneflies, mayflies and caddisflies were common. The fish community also indicated fair to good conditions. We collected 11 species and 87 individuals. Mottled sculpins were the most numerous species. Five stocked brown trout were also found. This station, like MAH 1, was a little too deep and wide for effective electofishing. We probably missed a lot of fish.

LRL 1. Laurel Run, at the Clearfield-Jefferson County Line and about one mile upstream from confluence with East Branch Mahoning Creek.

Laurel Run is a second order stream with an average width of 16 feet. Depths ranged from 6 inches in riffles to 2 feet in pools. Chemical and physical parameters were characteristic of a healthy stream. The stream had a moderate buffering capacity (alkalinity = 36 mg/l) and neutral pH. The only parameter that may have approached a harmful concentration was dissolved aluminum (210 ug/l). The substrate was an even mix of boulders, rubble and gravel and did not appear excessively silted. There was no iron staining on the substrate.

The benthic macroinvertebrate collection contained 19 taxa and indicated a moderate diversity and biomass. Numerous stonefiles, mayflies and caddisflies characterized a healthy, balanced community. The fish collection, however, was disappointingly sparse. This was another of those stations where pools and pockets promised trout that simply weren't there. We did find 8 species and 57 individuals, mostly mottled sculpins. Two brook trout under 6 inches in length hinted at the possibility of a native brook trout fishery somewhere upstream.

MAH 6. East Branch Mahoning Creek at LR 17008 bridge and 2,000 feet upstream from confluence with Beaver Run.

At this station the East Branch is a third order stream with an average width of 27 feet. Depths ranged from 1 foot in riffles to 3 feet in pools. Chemical and physical parameters revealed a higher level of acidity than at downstream stations (pH = 6.8, alkalinity = 13 mg/l, acidity = 6 mg/l). Total manganese, total aluminum, total and dissolved zinc concentrations were also higher than at downstream stations. The dissolved zinc concentration of 120 ug/l was the parameter most likely to affect aquatic life. Substrate conditions were not good at this station. Rubble and boulders were about 40% imbedded in silt and sand indicating excessive sedimentation in the past. Interstitial space was limited. Some iron staining was also visible on the substrate.

The benthic macroinvertebrate collection was fairly diverse (19 taxa), but represented by few individuals. An exhaustive effort was required to collect those that were found. The stonefly, Acroneuria, was the only common taxa. The community was probably limited by some combination of the following: chronically toxic zinc concentrations, silted substrate and/or acid slugs.

The fish collection included 10 stocked brown trout, but otherwise was sparse. We found 9 species and 50 individuals. No species were common. Habitat conditions appeared to be good and we expected to find more fish. Whatever factors were limiting the benthic community (zinc, acid mine drainage, low productivity) were probably also limiting the fish community.

BCH 0. Beech Run, about 0.5 mile upstream from confluence with East Branch Mahoning Creek.

Beech Run is a second order stream with an average width of 23 feet. Depths ranged from 6 inches in riffles to 2 feet in pools. Although the pH was within an acceptable range, the stream was poorly buffered and vulnerable to acid slugs (pH = 6.5, alkalinity = 12 mg/l, acidity = 8 mg/l). Zinc concentations exceeded EPA's (1980) recommended chronic criteria, but not the recommended acute criteria. The substrate was a mix of rubble, gravel and sand. It was slightly imbedded indicating past sedimentation and there were iron deposits on some rocks.

The benthic macroinvertebrate community was characteristic of fair water quality. The collection was relatively diverse, including 23 taxa, and seemed to represent a moderate biomass. As frequently occurs in low-alkalinity, infertile streams, stoneflies dominated the community.

The fish collection was poor, indicating a sterile condition. We found only 5 species and 15 individuals. The stream was small enough to electrofish effectively and held good habitat. The fish simply weren't there. Zinc and/or intermittent slugs of acidity were the most likely limiting factors.

LRB 0. Laurel Branch Run, at T-336 bridge about 0.5 mile upstream from confluence with Beech Run.

Laurel Branch Run is a second order stream with an average width of 15 feet. Depths ranged from 6 to 18 inches. The stream bottom was iron stained and severely silted. Sand and silt made up about 50% of the riffle substrate. The chemical and physical data indicated a slightly acid, weakly buffered stream (pH = 6.3, alkalinity = 6 mg/l, acidity = 12 mg/l). Manganese (1500 ug/l) and dissolved iron (660 ug/l) exceeded water quality criteria (DER, 1981).

The benthic macroinvertebrate community was characteristic of a near sterile, acid-limited stream. We found 11 taxa, all uncommon. Stoneflies, a relatively acid-tolerant group, were the best represented group in the collection. All of the larger stoneflies were covered with iron deposits.

The fish collection was also sparse, but not as sparse as I had expected. We found 4 species and 22 individuals in the 200 yard reach. Included in the collection were 4 brook trout, 2 over and 2 under 6 inches. The Luthersburg, PA USGS topographical map (photo revised 1981) shows the headwaters of Laurel Branch Run to be surrounded by strip mines. They no doubt contributed to poor condition of the stream.

BCH 2. Beech Run, at T-336 bridge and 0.3 mile upstream from confluence with Laurel Branch Run.

At this station Beech Run is a first order stream averaging 9 feet wide. Riffles were 3 to 6 inches deep and the deepest pools were about 2 feet. Physical and chemical data indicated a near neutral field pH (6.9), but an extremely low buffering capacity (alkalinity = 3 mg/l; acidity = 8 mg/l). Dissolved aluminum remained low (<150 ug/l) even though total aluminum was high (1460 ug/l). Substrate conditions were good with no evidence of excessive siltation or iron deposition.

The benthic macroinvertebrate collection was sparse, including only 14 taxa and few individuals. Only stoneflies and crayfish were common. I suspect the limiting factors were an infertile watershed and/or acid slugs caused by precipitation. The stream was certainly not buffered adequately to neutralize an acid snow melt.

The fish collection was also sparse but included more wild trout than found at any other station in this investigation. In 200 yards, or about 0.1 acre of stream, we found 12 brook trout ranging from 2 to 11 inches in length. About half were over 6 inches and half under. Mottled sculpins made up the rest of the collection.

MAH 9. East Branch Mahoning Creek, at L.R. 17011 bridge and about 3.5 miles upstream from confluence with Beech Run.

At this station the East Branch is a second order stream with an average width of 18 feet. Depths ranged from 6 inches to 2 feet. Physical and chemical parameters indicated poor water quality. The pH was neutral, but the stream had a low buffering capacity (alkalinity = 8 mg/l, acidity = 10 mg/l). Total manganese, dissolved and total iron exceeded water quality criteria (DER, 1981). Zinc concentrations exceeded EPA's (1980) recommended chronic criteria. The total aluminum concentration was high (1320 ug/l), but the dissolved aluminum concentration was much lower (160 ug/l). The substrate was iron stained and severely silted. The stream had all the appearances of an acid mine drainage affected stream in spite of the neutral pH.

The benthic macroinvertebrate collection indicated near sterile stream conditions. Nine taxa were represented by very few individuals. No mayflies were present. The community was limited by some combination of the following: Silted substrate, chronically toxic metals concentrations, and/or acid slugs.

The fish collection was also sparse. We found only 2 species and 11 individuals. To our surprise, 10 of the 11 individuals were fingerling brook trout. Brook trout, like stoneflies, are among the organisms normally associated with pristine waters, but that are fairly tolerant of acidity and heavy metals. The fish community was limited by the same factors that affected the benthic macroinvertebrates as well as the virtual absence of fish food organisms.

Summary

The Clearfield County reach of East Branch Mahoning Creek (MAH 9 and MAH 6) was degraded. Problems included silted substrate and high concentrations of metals. I suspect occasional slugs of acid water were also a factor. This reach was very poorly buffered and vulnerable to acidity. The stream recovered and was in fair condition in Jefferson County (MAH 4 and MAH 1).

Of the Clearfield County tributaries sampled, Laurel Branch Run (LRB 0) was the most degraded, apparently by acid mine drainage and siltation. Laurel Branch Run affected Beech Run (BCH 0) which was in fair shape above the confluence with Laurel Branch Run at BCH 2. Beech Run, in turn, contributed to the poor condition of East Branch Mahoning Creek at MAH 6. Laurel Run (LRL 1) appeared to be in good condition even though it held few game fish.

Clover Run, the largest tributary of East Branch Mahoning Creek, was not sterile, but supported only limited aquatic communities throughout its length. A number of parameters may have combined to create this condition. The watershed appeared to be quite infertile, zinc concentrations were high in the lower reach, and the middle reach was excessively silted. The upper reach seemed to be limited by some unknown toxic factor. Lost Run, a tributary to Clover Run, was excessively silted and weakly buffered. The Lost Run watershed probably contributed to the silted condition found in Clover Run at CLO 3.

Literature Cited

Department of Environmental Resources. 1981. Title 25, Chapter 93 - Water Quality Standards. Pennsylvania Code February 1981.

Environmental Protection Agency. 1980. Ambient Water Quality Criteria for Zinc. USEPA. Washington, D.C.

Hasse, Raymond L. 1980. Aquatic Biological Investigations - Clover Run, East Branch Mahoning Creek and Mahoning Creek, Jefferson County. Pennsylvania Department of Environmental Resources, Bureau of Water Quality Management (unpublished).

Table: 1
Stream: East Branch Mahoning Creek Watershed
County/Township(s): Clearfield and Jefferson
Date: Week of April 23, 1984

Aquatic Biological Investigation
Sampling Station Locations

Stream	River Mile Index	Township	USGS Quad	Inches North	Inches West	Description
E. Branch Mahoning Creek	MAH 1	Gaskill	5-8.1	15-9	13.5	Just upstream Clover Run, Jefferson County
Clover Run	CLO 0	Gaskill	5-8.1	15.9	14.0	L.R. 33035 bridge, Jefferson County
Lost Run	LOS 0	Gaskill	5-8.1	12.1	9.4	Upstream mouth .25 mile, Jefferson County
Clover Run	CLO 3	Gaskill	5-8.1	11.9	10.5	Just downstream, Lost Run, Jefferson County
Clover Run	CLO 5	Bell	5-8.1	9.2	7.6	Jefferson - Clearfield County Line
E. Branch Mahoning Creek	MAH 4	Henderson	5-8.1	20.0	8.7	T-622 bridge, Jefferson County
Laurel Run	LRL 1	Bell	5-8.1	18.8	7.5	Jefferson-Clearfield County Line
E. Branch Mahoning Creek	MAH 6	Brady	4-8.2	0.6	5.2	L.R. 17008 bridge, Clearfield County
Beech Run	BCH 0	Brady	4-8.2	1.4	3.1	Upstream mouth 0.5 mile, Clearfield County
Laurel Branch Run	LBR 0	Brady	4-9.3	0.2	15.9	T-336 bridge, Clearfield County
Beech Run	BCH 2	Brady	5-9.4	21.7	16.0	T-336 bridge, Clearfield County
E. Branch Mahoning Creek	MAH 9	Brady	4-9.3	3.6	16.2	L.R. 17011 bridge, Clearfield County

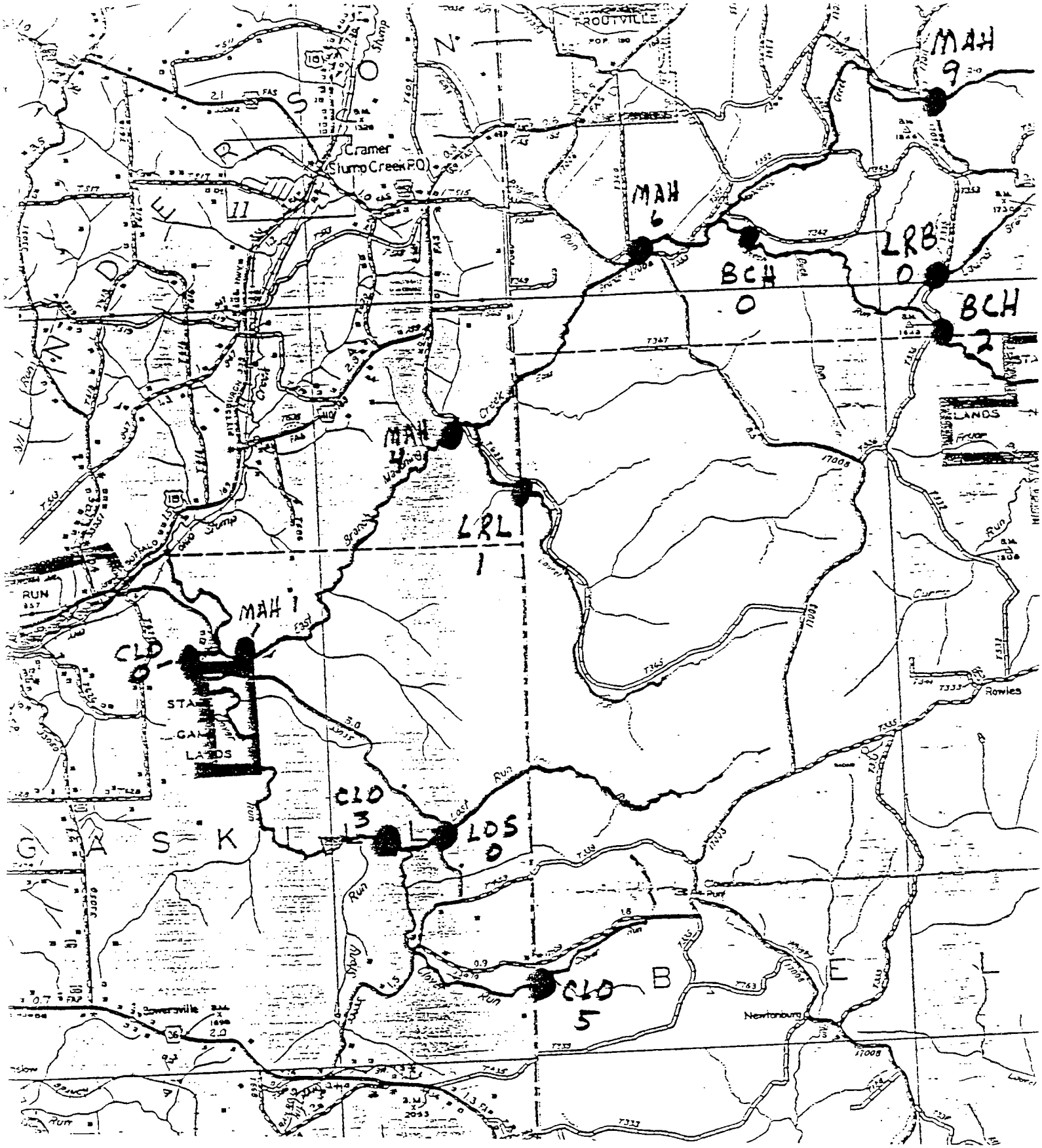

Figure 1: Sampling station locations for an aquatic biological investigation of the East Branch Mahoning Creek watershed in Clearfield and Jefferson Counties, April 23-27, 1984. Reproduced from Penndot Clearfield and Jefferson County Highway maps.
One inch = one mile.

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Table: 2
Name of Stream: East Branch Mahoning Creek Watershed
County: Clearfield and Jefferson
Date: Week April 23, 1984

AQUATIC BIOLOGICAL INVESTIGATION

Water Chemistry Data

Parameter	Stations: MAH 1	CLO 0	LOS 0	CLO 3	CLO 5	MAH 4	LRL 1	MAH 6	BCH 0	LRB 0	BCH 2	MAH 9
Temperature °C(Field)	7	6	8	9	4	11	5	4	4	7	4	4
pH (Field)	6.8	7.0	6.7	6.8	7.0	6.4	7.0	6.8	6.5	6.3	6.9	7.0
D.O. (Field)	12.0	12.6	11.2	11.8	9.6	11.0	9.2	12.4	12.2	-	11.9	11.2
Special Condition	320	305	265	440	725	-	495	385	250	330	85	445
Turbidity	0	3.8	2.2	1.6	4.3	-	3.8	6.1	2.2	6.0	2.6	19.7
pH	6.6	6.6	6.7	7.0	7.5	-	7.1	6.3	6.4	6.3	6.0	6.3
Alkalinity	18	22	11	36	84	-	36	13	12	6	3	8
Acidity	0	0	0	0	0	-	0	6	8	12	9	10
Dissolved Solids	224	202	206	350	544	-	284	296	192	286	72	336
Hardness	144	144	114	200	358	-	248	175	108	146	30	208
SO_4	138	150	98	203	314	-	198	-	-	162	25	198
Cl	15	8	10	10	12	-	16	14	10	7	10	7
Fe (Total)	470	760	230	350	430	370	260	610	310	1020	270	2570
Fe (Dissolved)	100	120	220	<100	400	190	250	190	120	660	250	1390
Ma (Total)	880	420	110	310	240	1170	170	2060	680	1500	60	2390
Cu (Total)	Less than defection level of 80 ug/l at all stations											
Cu (Dissolved)												
Zn (Total)	90	160	20	80	70	40	40	130	100	50	30	100
Zn (Dissolved)	90	150	20	80	70	40	40	120	100	10	30	100
Ni (Total)	Less than detection level of 140 ug/l at all stations.											
Ni (Dissolved)												
Al (Total)	420	740	340	570	240	1150	250	500	150	280	1460	1320
Al (Dissolved)	<150	<150	<150	<150	150	150	210	150	<150	<150	<150	160
Ba (Total)	60	60	90	<60	90	70	60	60	80	60	<60	70

Metals expressed as ug/l, others as mg/l where appropriate.

Table 3: Benthic macroinvertebrates collected from the East Branch Mahoning Creek watershed in Clearfield and Jefferson Counties, during the week of April 23, 1984.

TAXA	STATION/REPLICATE NUMBER											
	MAH 1	CLO 0	LOS 0	CLO 3	CLO 5	MAH 4	LRL 1	MAH 6	BCH 0	LRB 0	BCH 2	MAH 9
Decapoda (Crayfish)												
Cambarus	U	C	C	C	U	U	U	U	U	U	C	U
Plecoptera (Stoneflies)												
Acroneuria carolinensis	U	U	C	A	U	A	C	C	C	U	C	U
Allocapnia						U		U				
Amphinemura					U							
Chloroperlidae	U	U	U	U	U	U	U	U	U	U	U	
Isoperla	C	U		U	U	C	U	U	C	U	U	U
Leuctra	U	A	U	U	U	U		U	A	U	C	U
Paracapnia		U		U			U					
Peltoperla	U						U	U	U			
Phasganophora capitata	C					U						
Pteronarcys						U	U	U	U		U	
Taenionema	U			U		U	U		U		U	
Ephemeroptera (Mayflies)												
Ameletus		U										
Baetis	U					U	U		U			
Ephemera	U					U	U					
Ephemerella	C	U	U			C	C	U	C			
Eurylophella	U											

U (Uncommon) = <10/sample
C (Common) = 10 to 25/sample
A (Abundant) = >25/sample

TAXA	STATION/REPLICATE NUMBER											
	MAH 1	CLO 0	LOS 0	CLO 3	CLO 5	MAH 4	LRL 1	MAH 6	BCH 0	LRB 0	BCH 2	MAH 9
Ephemeroptera continued												
Epeorus				U		U	U	U	U			
Stenonema fuscum	U											
S. pulochellum gr.											U	
S. vicarium	U											
Odonata (Dragonflies)												
Cordulegaster			U					U				U
Lanthus			U	U				U			U	
Megaloptera (Alderflies, Fishflies)												
Nigronia	U				U	U	U		U	U		
Sialis	U	U		U	U				U	U		
Coleoptera (Beetles)												
Elmidae				U								
Trichoptera (Caddisflies)												
Apatania					U							
Cheumatopsyche	C	U		U	U	C	U	U	U			
Chimara					U				U			
Diplectrona	U	U	U	U		U		U	U	U		U
Dolophilodes			U						U			

TAXA	STATION/REPLICATE NUMBER											
	MAH 1	CLO 0	LOS 0	CLO 3	CLO 5	MAH 4	LRL 1	MAH 6	BCH 0	LRB 0	BCH 2	MAH 9
Hydatophylax												U
Hydropsyche betteni						U	U					
Rhyacophila	U	U	U	U		U	U	U	U		U	U
Symphitopsyche alhedro	U	U	U	U		U		U	U		U	
S. bifida	U	U				U						
S. slossonae			U	U		A	A	U	U			
S. sparna	U											
Diptera (Midges, Flies)												
Chrysops										U		
Hexatoma	U	U				U	U		U	U	U	
Parametriocnemus				U								
Simuliidae								U	U		U	
Tanypodinae	U						U					
Tipula	U	U	U	U		U		U	U	U	U	U
Total Taxa	25	16	13	18	11	23	19	19	23	11	14	9

Table: 4
Name of Stream: East Branch Mahoning Creek Watershed
County: Clearfield and Jefferson
Date: Week of April 23, 1984

AQUATIC BIOLOGICAL INVESTIGATION

Stations

Common Name	MAH	CLO	LOS	CLO	CLO	MAH	LRL	MAH	BCH	LRB	BCH	MAH
	1	0	0	3	5	4	1	6	0	0	2	9
Rainbow Trout											1	
Brown Trout	4					5	1	10	1			
Brook Trout	1	1	10				2			4	12	10
Stoneroller	4	1				3						
Redside Dace	2					5	1	4	2			
Common Shiner	5							3				
Rosyface Shiner	3											
Bluntnose Minnow	18					7		2				
Blacknose Dace	20	8	1	6	18	17	9	6	4	8		1
Creek Chub	4	3	60	15	16	5	1	2		2		
White Sucker	10	3	2	3	18	5	6	11	3			
Hog Sucker	3	5				5	3					
Johnny Darter	3			1	1	10		3				
Banded Darter						1						
Blackside Darter	1											
Mottled Sculpin		2	7	13	4	24	34	9	5	8	11	
#Species	13	7	5	5	5	11	8	9	5	4	3	2
#Individuals	78	23	73	38	57	87	57	50	15	22	24	11
Ave. Width, feet	50	22	15	21	14	33	16	27	22	15	9	18

U. Rood

COMMENTS AND RECOMMENDATIONS

WATER: [redacted] Armstrong County

EXAMINED: Spring/Summer 1987

BY: R. Lee

Bureau Director Action: Approved Delano R. Graff Date: 5-11-89

Division Chief Action: Richard G Snyder Date: 5-10-89

WW Unit Leader Action: F L Hoppe Date: 5/1/89

CW Unit Leader Action: _____ Date: _____

AREA COMMENTS

Mahoning Lake has consistently maintained a very low density fish population with quality size individuals. Productivity which is directly related to retention time, is a major limiting factor. Bluegill, rock bass and pumpkinseed have not reproduced successfully since the change in operations, which raised pool level in 1981. Black crappie and white crappie have had fairly consistent reproduction since that change.

Largemouth and smallmouth bass were not sampled effectively. These two populations should be reevaluated by electrofishing in 1990 to determine population levels.

Northern pike are self-sustaining. Tiger muskellunge, walleye and channel catfish should continue to be maintained through stocking efforts.

AREA RECOMMENDATIONS

1989	Walleye	300,000 Fry
	Muskellunge (T)	900 Fingerling
1990	Walleye	300,000 Fry
	Channel catfish	2,000 Fingerling
	Evaluate age, growth and recruitment of large and smallmouth bass	
1991	Walleye	300,000 Fry
	Muskellunge (T)	900 Fingerling
1992	Walleye	300,000 Fry
	Channel catfish	2,000 Fingerling
1993	Walleye	300,000 Fry
	Muskellunge (T)	2,000 Fingerling

Cont'd.

PENNSYLVANIA FISH COMMISSION
BUREAU OF FISHERIES
FISHERIES MANAGEMENT DIVISION

MAHONING LAKE
217D
ROUTINE LAKE ASSESSMENT

BY
R. LEE

DATE SAMPLED: SPRING & SUMMER 1987 DATE PREPARED: MARCH 1989

hardness, pH, and specific conductivity were determined for surface, one meter deep, and one meter off bottom. The samples were collected at 11:15 hours, and analyses were made in the field using electronic equipment for dissolved oxygen, temperature, and specific conductance. Total alkalinity, hardness, and pH were determined using accepted titration and colormetric procedures.

Lake vegetation was also sampled on August 4, 1987. All sampling was done utilizing methods described by Hoopes (1989) in The Pennsylvania Fish Commission Lake Examination Manual.

RESULTS

Water quality analyses show that a thermocline did not develop in 1987. Temperature ranged from 26.1 C at the surface to 21.2 C at the bottom. Dissolved oxygen was consistently higher than 5 mg/l to 16 meters depth, with the exception of 4.8 mg/l at 7.5m, 4.9 mg/l at 9.0m, and 3.9 mg/l at 11.5m. Total hardness ranged from 96 to 108 mg/l, total alkalinity from 30 to 34 mg/l, pH from 7.2 to 7.8 S.U., and specific conductivity was 273 Umhos at the surface. The secchi disk reading was 5.5 m. Physical size of the impoundment and watershed size are such that the lake has a nine day retention time for impounded water.

Lake vegetation was very limited. Only Myriophyllum and a member of the Iris family were observed. This is very typical of Corps impoundments which have traditionally high fluctuation of water level, and in the case of Mahoning Lake lack of shallow water due to the steepness of hillsides impounding water. There was neither shoreline nor surface congestion.

Fish sampling yielded a very small number of fish for the effort (net hours). Trapnet effort of 68.5 hours yielded a total of 86 fish or 1.25 fish per hour. Black crappie (37) and white crappie (27) were the two prominent species caught in trapnets, contributing 43.0 and 31.4 percent respectively to the total catch. Nine brown bullhead contributed 10.4% to the catch and bluegill, pumpkinseed, channel catfish, and yellow perch (Table 1) were also sampled.

Gill netting effort (206.5 hours) yielded higher diversity (Table 2) but fewer total number of fish than trapnetting. Surprisingly, brown bullhead were the most prominent catch, although they only contributed 24.3% to the total catch. Walleye (13) were second most abundant at 18.6%. Other catches included channel catfish (10), rock bass (10), white crappie (7), black crappie (3), tiger muskellunge (4), northern pike (2), yellow perch (2), largemouth bass (1), and yellow bullhead.

Panfish growth rates very closely parallel state average growth rates. White crappie were growing slightly better than state average and had a PSD of 73 and an RSD250 of 52 (Table 7). Black crappie had a PSD of 10 and an RSD250 of 0. All non-stocked species except black crappie and yellow perch had high PSD's. All non-stocked species except white crappie have shown sporadic reproduction. Age and growth of rock bass, bluegill, and pumpkinseed failed to verify reproduction since 1981 and 1982 respectively. The only largemouth sampled was from the 1981 year class and no smallmouth bass were sampled.

Those species considered to be self sustaining have not demonstrated good recruitment since the 1981 change in recreation pool level. White crappie and black crappie are the two exceptions, yet they cannot be considered abundant.

Mahoning lake surveys historically define the fishery as having low density, quality size fish (Table 9). The 1987 survey again indicates this same characteristic. The bass communities cause some concern, since they are managed as self sustaining populations. Data provided by netting indicates bass populations are poor, however that is typical of net results for bass. Electrofishing should be done in 1990 to evaluate the bass populations and maintenance stocking should continue for walleye, tiger muskellunge, and channel catfish.

Alex Barna (1989), Corps hydrologist was contacted to determine if any water release manipulations could be made to retain more surface water in an attempt to increase productivity. Mahoning Lake is at bottom draw off year around. Therefore there is no potential to increase productivity by changing release patterns.

CONCLUSIONS

Mahoning Lake has consistently maintained a very low density fish population with quality size individuals. Productivity which is directly related to retention time, is a major limiting factor. Bluegill, rock bass, and pumpkinseed have not reproduced successfully since the change in operations, which raised pool level in 1981. Black crappie and white crappie have had fairly consistent reproduction since that change.

Largemouth and smallmouth bass were not sampled effectively. These two populations should be re-evaluated by electrofishing in 1990 to determine population levels.

Northern pike are self sustaining. Tiger muskellunge, walleye, and channel catfish should continue to be maintained through stocking efforts.

LITERATURE CITATION

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Miller, J. 1960. Survey of Mahoning Flood Control Dam, Armstrong County. PFC Files, Pleasant Gap, Pa.

Smith, E. 1988. Telephone Communicae. U. S. Army Corps of Engineers. Pittsburgh, Pa.

Table 1. Mahoning Lake (217D), Armstrong County, Pennsylvania. Total Trapnet Catch of Game and Panfish Species Sampled May, 1987.

SPECIES	NUMBER SAMPLED	% OF CATCH	SIZE RANGE(mm)	CATCH PER HOUR	CATCH PER NET DAY
Brown bulhead	9	10.4	356-397	.13	3.0
Bluegill	5	5.8	187-216	.07	1.7
Pumpkinseed	3	3.5	152-185	.04	1.0
Black crappie	37	43.0	142-218	.54	12.3
White crappie	27	31.4	152-310	.39	9.0
Channel catfish	1	1.2	505	.01	.3
Yellow perch	4	4.7	145-238	.06	1.3
	86	100.0			

* 68.5 hours or 3 net days effort

Table 2. Mahoning Lake (217D), Armstrong County, Pennsylvania. Total Gill Net Catch of Game and Panfish Species Sampled May, 1987.

SPECIES	NUMBER SAMPLED	% OF CATCH	SIZE RANGE(mm)	CATCH PER HOUR	CATCH PER NET DAY
Brown bullhead	17	24.3	180-407	.08	1.89
Yellow bullhead	1	1.4	335	~	0.11
Black crappie	3	4.3	140-158	.01	0.33
White crappie	7	10.0	95-308	.03	0.78
Channel catfish	10	14.3	180-552	.05	1.11
Yellow perch	2	2.9	149-182	.01	0.22
Rock bass	10	14.3	192-230	.05	1.11
Largemouth bass	1	1.4	390	~	0.11
Walleye	13	18.6	361-695	.06	1.44
Muskellunge	4	5.7	535-948	.02	0.44
Northern pike	2	2.9	563-730	.01	0.22

206.5 hours or 9 net days

Table 4. Mahoning Lake (217D), Armstrong County, Pennsylvania. Mean Weight (grams) by Twenty-Five Millimeter Increments of Game and Panfish Captured During 1987 Sampling.

MM	BBH	WC	BG	BC	CC	YP	PSS	WE	RB	LMB	YBH	NP	M
50													
75		9											
100													
125		34		39		32							
150		46		46			82						
175		72	124	85	62	62	152		153				
200		95	208	104					172				
225		165				142			260				
250		209											
275		306											
300		412			302								
325	653										795		
350	794				1290			596					
375	976				1021			543		908			
400	1107				823			653					
425					1589			937					
450													
475													
500					1674								
525								1874					965
550					2214							1192	
575													
600								2570					
625								2897					
650								3095					
675								3707					2298
700													
725												3008	
750													
775													3576
800													
825													
850													
875													
900													
925													6838

Table 6. Mahoning Lake (217D), Armstrong County, Pennsylvania. Mean Length (mm) at Age for Warm Water Game and Panfish Sampled in 1987.

	AGE:	I	II	III	IV	V	VI	VII	VIII	IX
SPECIES	NO.									
Largemouth bass	(1)						384			
Bluegill	(5)						181	201		
Rockbass	(10)						196	181		
Pumpkinseed	(2)					146	180			
Yellow perch	(6)		135	176		231				
Black crappie	(24)		143	180	209					
White crappie	(33)	95	148	194	240	270	295			
Walleye	(13)			373	419		535	606	623	687
Northern pike	(2)				551	715				
Muskellunge (T)	(4)			573	740		925			

Table 7. Mahoning Lake (217D), Armstrong County, Pennsylvania. PSD and RSD Estimates for Warm Water Game and Panfish Species Sampled in 1987.

	NO.	STOCK SIZE(mm)	PSD SIZE(mm)	PSD	RSD SIZE(mm)	RSD
SPECIES						
Muskellunge	(4)*	500	750	50	975	0
Northern pike	(2)*	350	600	50		
Brown bullhead	(26)	150	225	100	300	100
Channel catfish	(11)*	275	400	64	600	0
Rock bass	(10)*	125	200	100	225	10
Pumpkinseed	(3)*	100	175	100	225	0
Bluegill	(5)*	75	150	100	200	40
Largemouth bass	(1)*	200	300	100	375	100
Black crappie	(40)	125	200	10	250	0
White crappie	(34)	125	200	73	250	52
Yellow perch	(6)*	125	200	17	250	0
Walleye	(13)*	250	375	92	500	69

*Insufficient sample size to provide significant data.

(Table 8 cont.)

Largemouth bass	1974		80	201	258						
	1978	(19)		152		298	344	386	418		
	1987	(1)						384			
	St. Ave		108	186	246	299	345	388	430	465	
Walleye	1974										
	1978	(8)		248	391	376					
	1987	(13)			373	419		535	606	623	687
	St. Ave		231	324	395	461	549	579	624		
Northern pike	1974		243	477	597						
	1978	(2)			732			930			
	1987	(2)				551	715				
	St. Ave		290	421	524	592	673	747	793		
Tiger Muskellunge	1978	(6)	310								
	1987	(4)			573	740		925			
	St. Ave		293	470	601	719	808	923			

* 1974 & St. Ave fish lengths based on back calculated lengths; 1978 & 1987 fish lengths based on mean length at age for each aged fish.

Table 10. Mahoning Lake (217D), Armstrong County, Pennsylvania. Historical and 1987 Species Diversity Check List.

	Miller 1960	Hollender 1974	Lee 1978	Lee 1987
Muskellunge (T)			x	x
Northern pike		x	x	x
Largemouth bass		x	x	x
Smallmouth bass	x	x	x	
Walleye		x	x	x
Channel catfish		x	x	x
Yellow bullhead				x
Brown bullhead	x	x	x	x
Black crappie	x	x	x	x
White crappie		x	x	x
Bluegill	x	x	x	x
Pumpkinseed	x	x		x
Rockbass		x	x	x
Yellow perch		x	x	x
White sucker	x		x	x
Redhorse sucker	x			x
Golden shiner	x		x	x
Common carp			x	x

(Table 11 cont.)

1979		Muskellunge (T)	600
		Walleye	6,000
1980		Muskellunge (T)	600
		Walleye	6,000
1981	(10)	Muskellunge (T)	3,385
1983	(08)	Muskellunge (T)	900
	(06)	Walleye	4,000
1985	(09)	Muskellunge (T)	900
	(06)	Walleye	4,000
1986	(06)	Walleye	4,000
	(10)	Channel catfish	2,000
1987	(09)	Muskellunge (T)	900

Water: East Branch of Mahoning Creek
Examiners: Lee, Obert, Dinger, McMillen
Date: June 27, 1979

Fisheries Management
Area 2
Division of Fisheries
Pennsylvania Fish Commission

Introduction

The East Branch of Mahoning Creek originates in the western slope of the Allegheny Mountains east of Troutville in Clearfield County. It flows 14 kilometers (km) in a southwesterly direction into Jefferson County where it joins Stump Creek at a site approximately ½ km east of the fork of Big Run to form Mahoning Creek.

Geologically the area consists of coal shales and sandstones and is derived from the Allegheny Plateau, Allegheny Group. Because of these underlying strata the area has been strip mined in the past and presently this mining is increasing. Historically, (Buller 1932, Davis 1942, and Bradford 1950) the East Branch of Mahoning Creek has received inputs of highly acidic water from its tributaries (Bradford reported three tributaries with a pH of 4.5 or less). In addition to the acidity problem, Brown (1975) reports a chronic pollution problem of coal and clay silt near Troutville.

The East Branch of Mahoning Creek is surrounded by privately owned forested land (except in stripped areas). The Punxsutawney Water Filtration plant lies at the downstream end near the mouth of Clover Creek. This site (Davis 1949) and others (Donahue 1968, Duvall 1971) have been sites of pollution inputs into the stream.

Preseason trout stocking in the East Branch consist of 1000 brook trout (Salvelinus fontinalis). Brown trout (Salmo trutta) (1000) are also stocked during the fishing season. The area recommended for stocking extends from the first bridge downstream of Beech Run downstream for 6.4 km to approximately three kilometers below the confluence of Laurel Run.

Two sections were established on the East Branch of Mahoning Creek as part of the Pennsylvania Fish Commission's Stream Inventory and Classi-

fication Program. Section 02 runs from the mouth upstream for 10.6 km to the confluence of Buck Run and will be dealt with in this report. Three sampling stations were established within this section.

Station 01: From a point 25m upstream of the bridge on LR 17008, upstream for 55m.

Station 02: From a point 500m downstream of the bridge on T622, upstream for 46m.

Station 03: From a point 700m upstream of the Punxsatawney Water Filtration plant, upstream for 83m.

Methods

All stations were sampled on June 27, 1979. Social (riparian ownership, population density, accessibility, parking, and physical (flow, bank erosion, shade, bank vegetation, substrate composition) factors were determined following methodologies described in the Pennsylvania Fish Commissions Stream Survey Manual. Water chemistry data (temperature, pH, specific conductance, total alkalinity, total hardness, and dissolved oxygen (D.O.) were determined by methodologies outlined in Standard Methods.

Invertebrates were qualitatively sampled with a kick net, preserved in alcohol, and returned to the lab for identification. Fish were sampled with a Coffelt back-pack electroshocker at 100VAC. Gamefish were collected, measured, and returned to the stream. All other fish were identified and returned to the stream. If a fish species was unknown to the person electroshocking it was collected, preserved in formalin, and returned to the lab for identification.

Results

Although there are few riparian owners (1 per km) and all of the East Branch of Mahoning Creek is open to fishing, accessibility is limited. There are only 3 road crossings (two of these are 1 km apart) and only 49% of the creek is within 500m of a road. Parking is also limited as no public parking spaces exist and only 8 private spaces per kilometer are available.

Physical factors did not vary from station to station. All had low flows, moderate bank erosion and a stream bottom made of rubble and gravel with some silt present. Partial shading of the stream was provided by the tree lined banks. The gradients at the stations were 7.5, 2.8, 4.5 m/km at Stations 01,02, and 03 respectively.

Water chemistry data (Table 1) indicate a high total hardness and low alkalinities at all stations. Specific conductance was also high and pH was near neutral at all stations.

Invertebrate diversity was low at all stations (Table II). Species of Ephemeroptera and Trichoptera were found at all stations and five other orders were found at one or two of the stations.

Nine species of fish were found in Section 02 (Table III), although none were abundant. Only two gamefish (brown trout) were found, one 250mm long at Station 01 and one 150mm long at Station 02.

Discussion

Although it is true that all of the creek is open to fishing, over 50% (that portion of the creek greater than 500m from the road) will probably receive little if any fishing pressure. This, combined with the fact that two bridges are within one kilometer of each other, concentrates the fishing

pressure in a relatively small area. Considering the low human population density ($16/km^2$) and the limited accessibility of the entire section, one must question the rationale for stocking 3000 trout in the East Branch of Mahoning Creek.

The low alkalinity and high total hardness and siltation found are indicative of the strip mining which is occurring. In the past (Davis 1942) the buffering capacity of the system has diluted the acidic inputs, but with more strip mining on the horizon, one must wonder if the capacity of the system will be exceeded, both chemically (pH) and physically (siltation). The low diversity of invertebrates and fish species may indicate that the system may already be in trouble. Stocking trout in a system such as this may stress the system even more. On the other hand the system is within the parameters established for stocking trout and the presence of a gamefish may influence the strip miners to mitigate the effects of their mining to a greater extent than they might if a gamefish were not present.

RECOMMENDATIONS

Although the water chemistry data are well within the limits for stocking trout, I suggest periodic sampling of the chemistry to determine if stocking should continue.

I recommend that the majority of stocking be limited to the upper one kilometer of the stocking area where access is relatively easy.

An angler use survey should be conducted and unless fishing pressure dictates otherwise, I recommend the stocking of trout be reduced due to the low fertility and limited accessibility of the creek.

RDL/ldk
8/27/81

Literature Cited

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Brown, E.W. 1975- Water Pollution Report on East Branch of Mahoning Creek, Pennsylvania Fish Commission Files, Pleasant Gap, Pa.

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Davis, D.R. 1949- Water Pollution Report on the East Branch of Mahoning Creek, Pennsylvania Fish Commission Files, Pleasant Gap, Pa.

Donahue, J.H. 1968- Water Pollution Report on the East Branch of Mahoning Creek, Pennsylvania Fish Commission Files, Pleasant Gap, Pa.

Duvall, H.P. 1971- Water Pollution Report on the East Branch of Mahoning Creek, Pennsylvania Fish Commission File, Pleasant Gap, Pa.

Table I. Water Chemistry Data At Three Stations On The East Branch Of Mahoning Creek on June 15, 1979.

	Station 01	Station 02	Station 03
Time	12:50	12:15	11:30
Temperature (C^{O})	17	14	18
Specific Conductance (umhos)	425	450	530
pH	6.8	6.9	7.1
Total Alkalinity (ppm)	8	14	14
Total Hardness (ppm)	208	180	208
Dissolved Oxygen (ppm)	9.1	9.0	9.2

Table II. Invertebrate Data From the East Branch of Mahoning Creek (x signifies presence).

	Station 01	Station 02	Station 03
Ephemeroptera	X	X	X
Baetidae	X		X
Ephemerellidae	X		
Heptageniidae			X
Leptophlebiidae		X	
Plecoptera		X	X
Leuctridae			X
Perlidae		X	X
Trichoptera	X	X	X
Hydropsychidae	X	X	X
Polycentropodidae	X	X	X
Diptera	X	X	
Chironomidae	X	X	
Megaloptera			X
Corydalidae			X
Hemiptera	X		X
Gerridae	X		X
Decapoda	X	X	
Astacidae	X	X	

Table III. Fish Data From The East Branch of Mahoning Creek (x signifies presence).

Species	Station 01	Station 02	Station 03
Salmo trutta (Brown Trout)	X	X	
Rhinichthys Atratalus (Blacknose dace)		X	X
Semotilus corporalus (Fall fish)	X	X	
Catostomus commersoni (White sucker)	X	X	X
Hypentelium nigricans (Northern hogsucker)		X	X
Etheostoma caeruleum (Rainbow Darter)			X
Etheostoma nigrum (Johnny Darter)	X	X	
Percina maculata (Blackside darter)		X	
Cottus bairdi (mottled sculpin)	X	X	X

COMMENTS AND RECOMMENDATIONS

WATER: Canoe Creek (217D) Indiana County

EXAMINED: May 1990

BY: R. Lee and A. Woomer

Bureau Director Action: Delano R. Graff. for Date: 6-6-91

Division Chief Action: Richard A Snyder Date: 6-6-91

WW Unit Leader Action: Date:

CW Unit Leader Action: Martin Marcinko Date: 6/3/91

CW UNIT RECOMMENDATIONS

Canoe Creek (217D), Section 02, was characterized as a medium sized, shaded stream with long pools separated by riffle sections. Water quality and habitat supported a diverse fish community. Acid mine drainage was a historical problem but has been mitigated or neutralized to permit natural recruitment. Catchable trout management and stocking by classification was implemented in 1991. Stocking classification is Optimum Yield.

PENNSYLVANIA FISH COMMISSION
BUREAU OF FISHERIES
FISHERIES MANAGEMENT DIVISION

Canoe Creek (217D)
Section 02

Prepared by
Allen Woomer and Ron Lee

Date Sampled: May 1990 Date Prepared: January 1991

Introduction

Canoe Creek (217D) originates in North Mahoning Township, Indiana County, and flows north into Jefferson County 11 km to the confluence with Mahoning Creek near Punxsutawney. It has a drainage area of 49 sq km and is located on the Punxsutawney, Pa 7.5 minute USGS quadrangle. SR 2011 parallels Canoe Creek for much of its length providing good access.

Land use in the drainage is primarily strip mining and agriculture. Canoe Creek has been adversely affected by acid mine drainage in the past and has not previously been evaluated by Area Two staff. WCO Duvall requested a survey based on evidence that water quality had improved enough for him to observe people catching trout in the stream.

Based on physical characteristics, Canoe Creek was divided into two sections for management purposes. Section 01 is defined as running from the headwaters 6.4 km downstream to the confluence of Painter Run. Section 01 is low gradient, suffers from siltation, and was found lacking in acceptable trout habitat. After a visual examination of the area further assessment of Section 01 was deemed unnecessary. Section 02 runs from Painter Run 4.6 km downstream to the mouth. It has a mean width of 7.1 m and an area of 3.26 ha. Section 02 was found to be well shaded with long pools and frequent riffles. Substrate was composed of rubble and clay, and silt was not noted. Physical habitat in Section 02 appeared to be well suited for trout.

The objectives of this assessment were to examine the physical, social, chemical, and biological characteristics of Canoe Creek to determine if it meets criteria for inclusion in the catchable trout program, and to include those characteristics in the statewide inventory of streams. The survey was conducted by Lee on May 11, 1990 according to Procedures for Stream and River Inventory Information Input (Marcinko et al 1986).

Fishery Assessment

Canoe Creek is a medium sized stream which has recovered from acid mine drainage problems to a point where a stable fish population is present. It contains good habitat for trout and is located in an area with few trout stream fishing opportunities.

A 58 m site was electrofished and eight species were collected (Table 2). The sample site was cut short due to equipment failure. The diversity of species and abundance of fish found indicated a stable situation in terms of water quality. Two brown trout were collected at 300 and 325 mm and one brook trout was collected at 175 mm. It is likely these fish migrated in from other waters.

Chemical characteristics were acceptable for the catchable trout program but exhibited some influences from possible acid mine drainage treatment. The alkalinity was measured at 48 mg/l, hardness was 152 mg/l, specific conductance was 185 umhos, pH was 6.8 and water temperature was 8.8 C. Iron deposition was noted on the substrate but did not appear to be a serious problem.

Canoe Creek, Section 02 is 100 % privately owned and open to fishing. Access is good with 37% of the section within 100 m and 93% within 300 m of a road. Parking was fair with 23 spaces per km. The section is close to Punxsutawney and should be well utilized.

Canoe Creek is limited by chronic acid mine drainage problems. These problems appear to have been mitigated to the point where a catchable trout program is now possible and desirable.

Management Recommendations

Goal: To provide a catchable trout fishery in Canoe Creek (217D), Section 02, utilizing hatchery trout.

Sport Fishery Classification:

Biomass: D
Recreational Use Potential: G
Human Population Density: R
Width Class: 3

Specific Actions:

1. Stocking rate and frequency will be established by classification.

2. Stock a 50 percent mix of brook and brown trout both preseason and inseason.

3. Maintain DER chapter 93 classification CWF.

Table 1. Key Physical, Chemical and Social Characteristics of Canoe Creek, Section 02 (217D) on May 11, 1990.

Characteristics	Description
USGS Quadrangle:	Punxsutawney, Pa
Social:	
Ownership:	
Public	
Private	100%
Road Accessibility:	
within 100 m	37%
within 300 m	93%
Parking Spaces/km	23
Physical:	
Length (km)	4.6
Mean Width (m)	7.1
Area (ha)	3.26
Gradient (m/km)	3.1
Substrate	Rubble Clay
Chemical:	
River Mile Site	2.5
Water Temperature (C)	8.8
pH (S.U.)	6.8
Specific Conductance (umhos)	185
Total Alkalinity (mg/l)	48
Total Hardness (mg/l)	152

Table 2. Species Collected in Canoe Creek, Section 02 (217D) on May 11, 1990.

SCIENTIFIC NAME	COMMON NAME
Salvelinus fontinalis	Brook Trout
Salmo trutta	Brown Trout
Notropis cornutus	Common Shiner
Rhinichthys atratulus	Blacknose Dace
Catostomus commersoni	White Sucker
Hypentelium nigricans	Northern Hog Sucker
Lepomis gibbosus	Pumpkinseed
Cottus bairdi	Mottled Sculpin

Literature Cited

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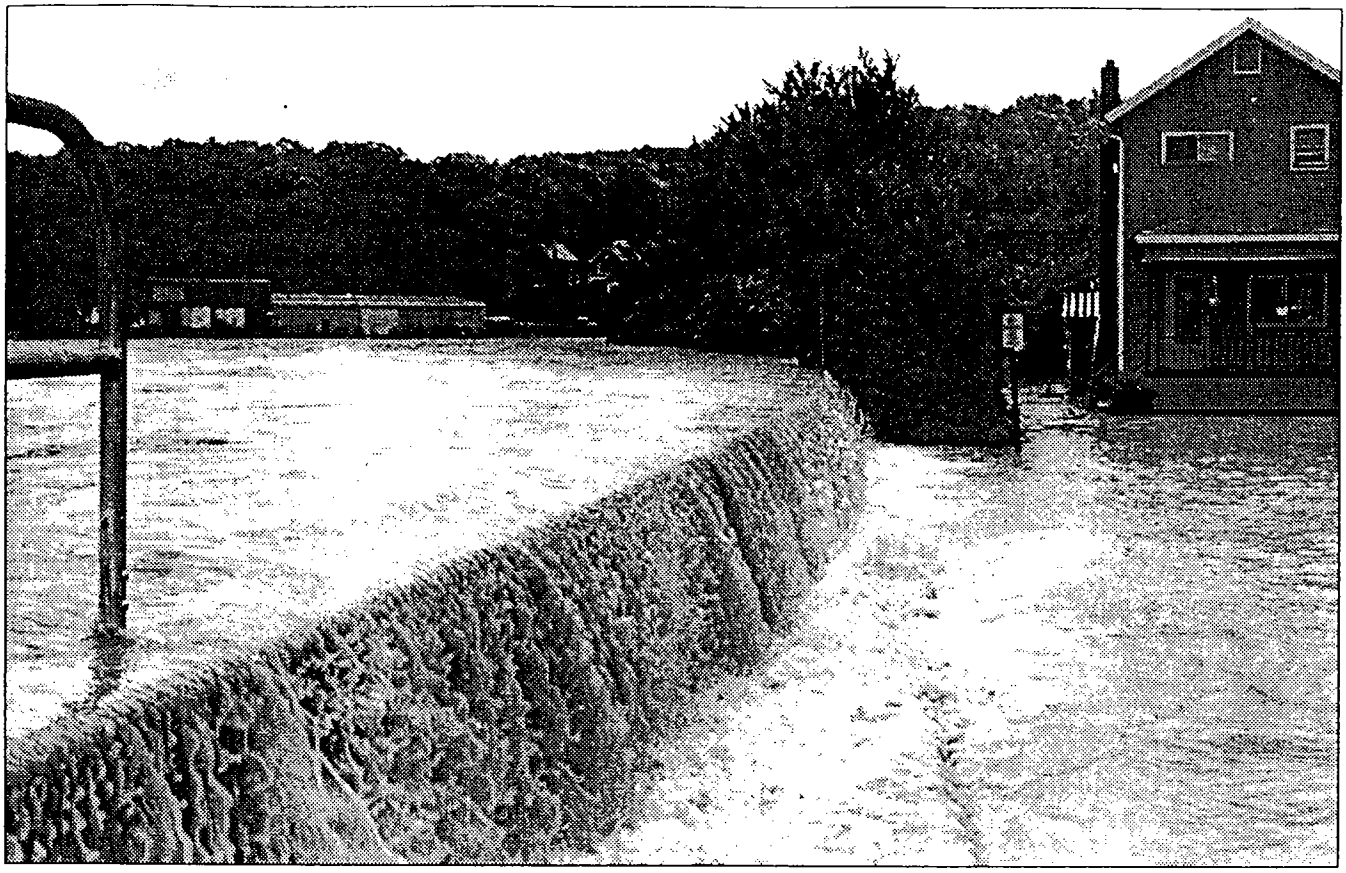
APPENDIX D

Newspaper Articles



OVER THE TOP . . . THE MOST SEVERE FLOOD IN HISTORY — Seeing is believing: water pours over the flood control wall at the east end of Union Street. The July 19 flood in Punxsutawney was the most severe flooding event in the borough in recorded history for sheer volume of water. The U.S. Army Corps of Engineers estimated a peak flow of 20,400 cubic feet per second at a gauge station just downstream of the lower limit of the borough flood control project. In other words, if you would have drawn a line a foot wide across Mahoning Creek during the flood, 20,400 cubic feet of water would have flowed past every second... 6,600 cubic feet per second more than the second-worst flooding period (July 20, 1977) in Punxsutawney history as recorded by the U.S. Army Corps of Engineers. It was the first time water spilled over the dikes. *(Spirit photo by Wick Divelbiss)*

'We Thought It Could Never Happen'

Waters Spill Over Mahoning Creek's Flood Control Wall

By Wick Divelbiss
Saturday, July 20, 1996

We never thought it could happen, but it did.

Flood water cascaded over the flood control wall of Mahoning Creek like it was just another lowhead dam, inundating Punxsutawney's Downtown residential and business areas and causing hundreds of people to evacuate their homes.

Water rose steadily after heavy early-morning downpours that dumped four to six inches on the area. A second downpour late in the morning sent the creek rushing over the dike walls along Hampton Avenue at the east end of Union Street, while water surged upstream outside the dike until it filled the western areas of the low-lying region of town at Punx'y Plaza and across the residential area of West Mahoning Street to Pine Street.

"I've been at the store since 1948," said Bill McLauglin of Mack's Auto Parts, one of some 200 people who took shelter at Punxsutawney Area High School. "I've never seen anything like this. I never thought I'd see water come over that dike."

Firefighters and other emergency personnel were on duty before dawn as the pounding rain sent creeks raging over their banks. Water surging into Elk Run carried a camping trailer, pickup truck and garage roof from Carter Avenue and piled them onto the Graffius Avenue bridge.

"Odds are it came from Carter Avenue, too," said Elk Run Assistant Fire Chief Brian Smith of a porch and steps smashed on Graffius Avenue.

Water surging down Elk Run Avenue carried two outdoor furnaces from Jack's Heating down past Vinnie's Comet. An aluminum canoe was wrapped around a pole in front of the grocery store. The Italian sausage wagon was askew in the parking lot and the store itself was swamped.

"It's pretty devastated. There was a lot of water in there, probably four or five feet," said Vinnie Villella.

"There was a big slug of water," said Sam Levy of Jefferson Wholesale Grocery, located upstream from the Carter Avenue area along the creek called Elk Run. "We have water in

WORST FLOOD IN PUNXSUTAWNEY CONFIRMED — As reported in The SPIRIT on Tuesday, August 13, "The event that happened here on July 19 was better than a 200-year event," said Ralph Bachaus of the U.S. Army Corps of Engineers. By comparison, the July 19 flood was 63 percent greater than the 1936 flood. Water spills over the flood control wall near the Punxsutawney Civic Center. *(Photo submitted by George and Betsy Bojalad, Robert Street, Punxsutawney)*

the basement. We have never had that."

Levy said the company's valuable cigarette inventory was in the basement. A trace of water and mud made it into the first floor.

Jefferson Grocery's neighbors in the industrial area, Acme Machine and NAC Carbon, were also damaged.

"The wall actually buckled there," Levy said of Acme Machine.

Boats manned by volunteers and firefighters evacuated more than 50 people in the Punxsutawney area, many of them in Elk Run, which appeared to have suffered the worst damage in the initial onslaught.

The Punxsutawney Fire Department's water rescue team evacuated about 50 people around Punxsutawney, and also made rescues in Brookville and Hamilton. Volunteers in their own boats rescued others.

"There were people in their own boats helping out all over the place," said Smith of Elk Run Fire Co.

"We were trapped upstairs around 7 (a.m.). Around 8 o'clock it was the worst," said Bonnie Braunns of Carter Avenue after she came ashore into a Graffius Avenue yard in a boat operated by Chuck Young.

"We couldn't get through the downstairs. We had to go off the porch roof into the boat," she said, adding that she and three children and a dog had to drop six to seven feet into the boat. She was accompanied by Jennifer Dotts, 17, Barbara Dotts, 15, and Justin Dotts, 12.

The five-year resident of Carter Avenue said she had never had water in her first floor before.

"This came up so fast it was unreal," said Dick Thompson after he and Raylene White waded out to the road in front of their house near Williams Crossing in the Cloe area. "The flood we had in January was bad, but it wasn't this bad."

Despite water rushing across their yard and dropping about four feet down an embankment with a roar, a trash can set out for a garbage truck that never came somehow withstood the flood.

"That is unreal, that sittin' there," said Thompson.

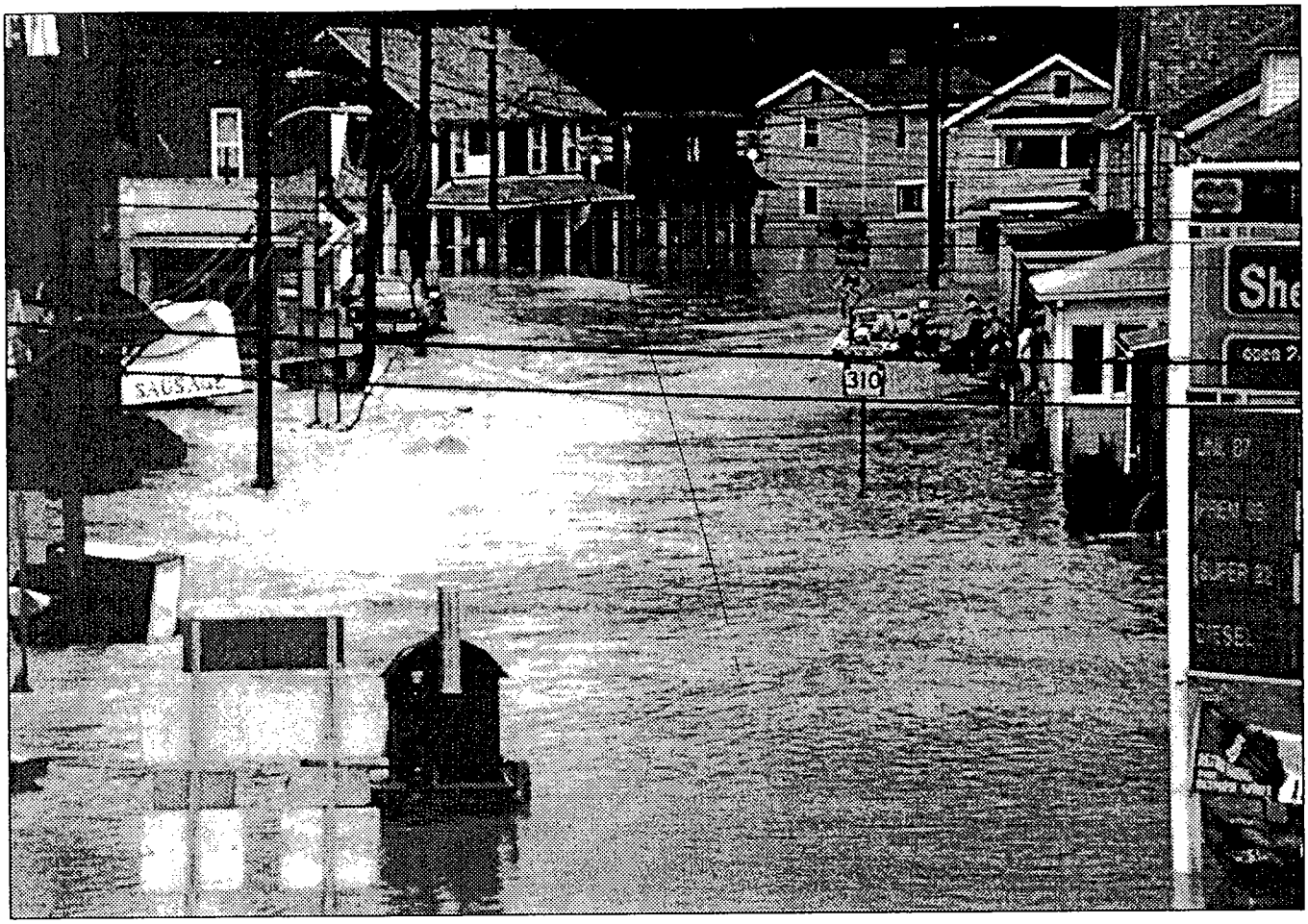
Cloe also flooded during the morning as Canoe Creek and Mahoning Creek flows joined and spread through the community, but the blow to Punxsutawney didn't come until afternoon.

People gathered with cameras as word spread that the creek was pouring over the flood control wall.

Shortly after the surge began, Mayor John Hallman ordered the evacuation of the low-lying Downtown area from the East End Bridge to overhead railroad trestle in front of Punx'y Plaza, and from Liberty Street to Clark Street.

Borough police called in off-duty officers and Hallman took it upon himself to ask that the National Guard be called out. One Guard member called the unit's participation "unofficial," but Hallman wasn't concerned.

"The National Guard is Downtown to make sure nobody does any break-



ELK RUN — Flood waters ravage the Elk Run section of Punxsutawney. *(Photo submitted by Marlene States, Marion Ave., Punxsutawney)*

ins," he said. Businesses closed throughout the community.

The Guard provided Humvees and large tandem-axle trucks to give borough police the mobility they lacked with their cars, often driving through nearly hood-deep water. It wasn't without incident, though.

A Humvee that evacuated a woman on West Mahoning Street stalled in five-foot water in front of S&T Bank's office near Punx'y Plaza. A Guard truck sent to rescue the police officer, Guard member and woman from the roof of the Humvee picked them up and got as far as Midway Inn before it stalled with a puff of white smoke from the exhaust stacks. A truck sent in from the western end of the flooded area, under the railroad trestle, nearly reached the stalled truck before it, too, belched a cloud of smoke and stopped.

Firefighters waded water nearly chest deep to push a john boat to the trucks to bring out a police officer, Guardsmen and the woman. Another Guardsman and a police officer retrieved a rubber raft from the back of a stalled truck and paddled their way out. The trucks were later winched out of the water.

"They're out there working their butts off," Hallman said of the police, Guard, firefighters and other volunteers. State police, sheriff's deputies and Game Commission officers also helped. Local radio staff members also did yeoman work providing on-scene reports from around the community.

"We did the best we could. I think, all in all, everybody was alerted when they should have been," the mayor said.

Blose-McGregor Health Care residents and staff were evacuated to the National Guard Armory, then to the high school. Two shelters Downtown, at the Salvation Army and Human Resources Center, were evacuated to the high school. Lane Avenue Personnel Care Home residents and staff took shelter at the Guard Armory.

"Lots of people don't like to leave their homes," said Lindsey Fire Chief Joe Defelice. "Some of them stayed, but most of them left."

Defelice said firefighters used squad trucks, Guard personnel, private vehicles and boats for evacuations.

"Just about everything we could use," he commented.

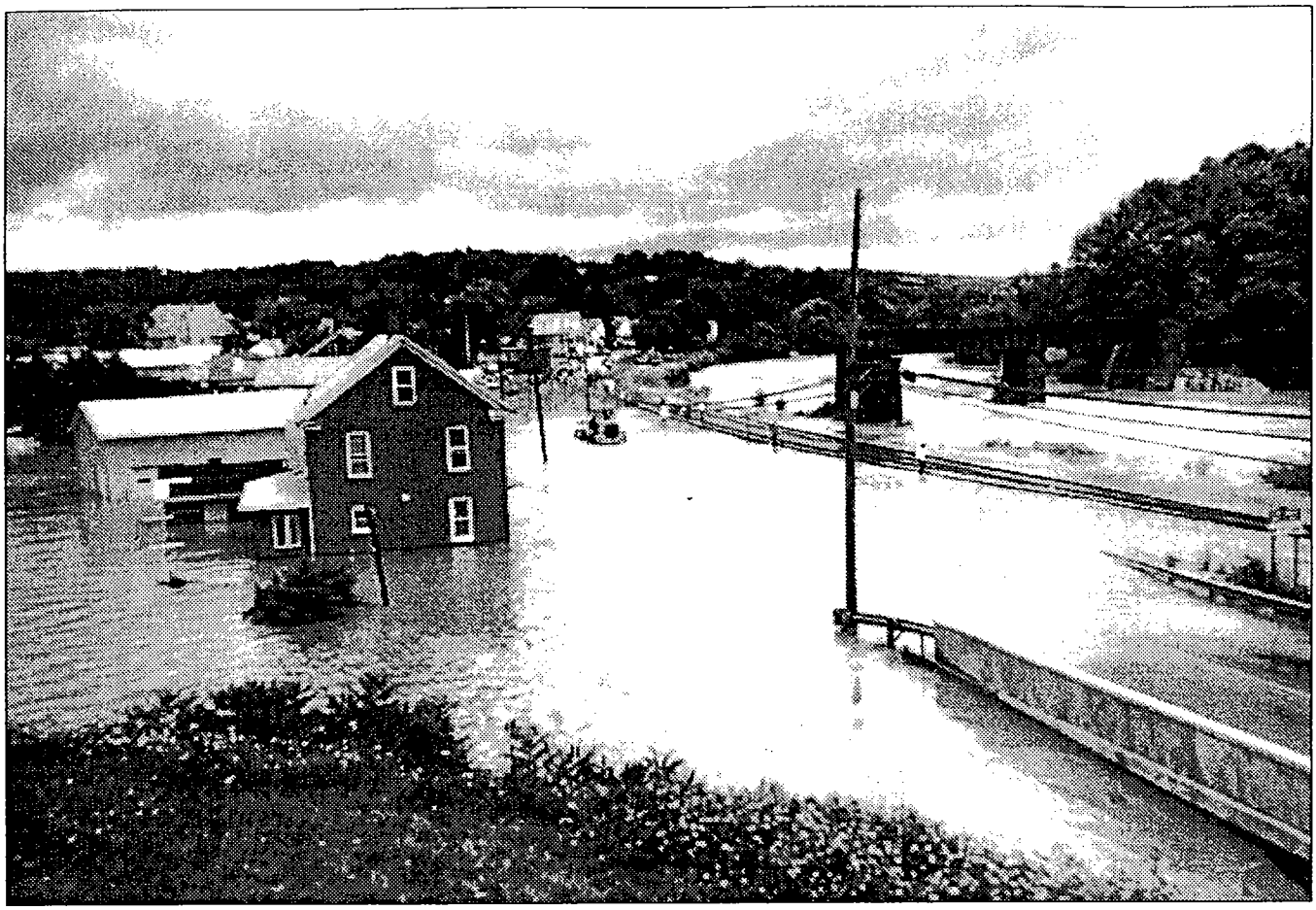
"They kept us dry," said Hattie Kelly after she and her husband, John, were evacuated to the high school from their Church Street home by National Guardsmen at about 4:30 p.m. "It was about two steps from our front porch."

Punxsutawney Area School District administration, teachers, office staff and custodial and cafeteria personnel reported to the high school to help open the school for the shelter, said Dr. John Ivey, superintendent of schools.

"I can't remember, in my tenure here, it being used as a shelter," Ivey said of the high school.

Shelter check-in workers counted 185 people before those staying at the Elk Run Fire Hall and other shelters moved to the high school.

"We've got gym mats out for people to sleep on. They've rounded up as many cots as they could find, but



ELK RUN — Flood waters inundate the Elk Run section of Punxsutawney, looking up Route 119, and transformed into a lake on Friday, July 19. Note the truck in the center of the photo. *(Photo submitted by Marlene States, Marion Avenue, Punxsutawney)*

we don't have near the number we need," Ivey said.

Cafeteria and shelter volunteers worked side by side to prepare food for the evacuees.

One of the biggest problems for emergency personnel was the large number of sightseers who drove, rode bikes and walked to view the flooded areas.

"We've been chasing them off the dikes. They don't use common sense," said Central Fire Chief Don Bosak.

"A lot of people were walking along the dikes today and they shouldn't have been. One slip and they'd be gone," said Elk Run's Smith.

Once the evacuation began and police and Guardsmen closed off the evacuation zone, the police radio crackled with reports of unauthorized people walking into the areas.

"Our biggest problem was people just riding around and standing on bridges where they shouldn't be," said Hallman.

Punxsutawney's three main Downtown area bridges — East End, South Penn Street and Indiana Street — were closed.

Hallman was also concerned that someone wading through the murky water would step into an open manhole. "Manhole covers have actually popped out of the sewers," the mayor said.

The Salvation Army set up a mobile canteen, driven to Punxsutawney from Johnstown, in the front parking lot of The Spirit's newspaper building, not far from water that rose several feet into Calabrese Garage and more than two feet into the Jefferson County EMS ambulance station.

Water appeared to be receding slowly by night fall, although there were reports that while it had dropped three to four feet at the East End Bridge, it was still rising or holding steady further west.

Debris such as lumber, barrels, trash cans and tree limbs floated everywhere. A beach ball bobbed crazily as it followed the flood across Graffius Avenue from Carter Avenue. A 55-gallon barrel traveled from the East End Bridge to the South Penn Street bridge in the brief time it took for a vehicle to hurry from one to the other through East End and over Oakland Avenue and State Street.

Much of that debris, along with mud and water-filled basements, will be left behind when the waters recede.

"We're not doing a lot of pumping. It will just run back in because there's no place for it to go," said Defelice of Lindsey Fire Co. "It's a mess. I've never seen such a mess."

One place in the flood zone was clear, at least, until late in the afternoon.

"We went over about 4:30 or 5 o'clock and the pool water was crystal clear," said Chuck Cressley, manager of Jefferson County EMS, who flew over Punxsutawney in a Lifeflight helicopter and said flood water surrounded, but didn't fill, the George C. Brown Community Pool.

There were no immediate reports of flood-related injuries.

BRIDGE ON GRAFFIUS AVENUE — Debris piles up against this truck and trailer on the Graffius Avenue bridge to Jenks Hill Friday morning, July 19. *(Photo submitted by Maxine Mason, 221 Elk Run Avenue, Punxsutawney)*

July 19 Storm Damage Heavy

Communities Isolated By High Water

By Tom Chandler
Saturday, July 20, 1996

Flood waters washed away houses and mobile homes, damaged others and isolated communities yesterday when roads and bridges were closed by high water.

A tornado touched down and destroyed mobile homes and a barn in the Devil's Elbow area near Johnsonburg, and United Electric reported that tornados caused extensive damage and knocked out power in both southern Jefferson County and southern Clearfield County. Approximately 3,500 United Electric customers were affected by power outages as of 4 p.m. yesterday, and both United Electric and Penelec crews were busy working to restore power to customers who were affected by the devastating weather.

Homes were washed down Red Bank Creek in both Summerville and Brookville.

"We have nine missing structures. We lost seven houses and two trailers," Summerville Fire Chief Carl Martin reported at 5:30 p.m. yesterday. "Rumor has it that two or three houses are hung up on the bridge here, but I can't get there now to see it. The water made it over Route 28 on both ends of town."

The Cool Spring Run bridge on State Route 3018 near Coolspring was washed away and PennDOT closed all bridges spanning Redbank Creek south of Brookville.

"We probably still have a dozen or 15 roads closed," said Jefferson County assistant maintenance manager Dave Reams late in the afternoon. "Some are closed because of flooding, some because of mud slides and some because of downed trees. It's been unusual day to say the least."

The closed roads shut off traffic to several communities.

"There's just no way into Big Run from the south end of town," said Mayor Joe Buterbaugh. "From the lower end of town there's just no getting in or out."

He said overnight shelter and meals were being provided to residents affected by the flooding at the First Christian and Methodist churches in the borough.

"I would say there would be 75 to 100 people here who won't be able to be in their homes tonight," Buterbaugh said yesterday. "I have never in my life seen the ballfield here completely covered in water. And it was coming through here with such force it almost tore the outfield fence right off. The picnic tables were all knocked down and washed away. One right now is on pitcher's mound."

Perry Township Fire Co.

spokesman Leonard Plyler said the road between Valier and Hamilton was completely submerged and closed to motorists. Firefighters were aiding flood victims in the Hamilton and Sprankle Mills areas.

McCalmont Township Fire Chief Orrie Manners said firemen had to evacuate seven people in Anita and surrounding areas due to high water.

"We've had flooded basements, stranded cars and people we had to evacuate," Manners said. "We had a duplex home, another house and a trailer where we had to evacuate people from."

Manners said the Anita area of the township seemed to take the brunt of the damage. "But I haven't been out in the country, yet, because we've been too busy pumping out basements," he said.

Reynoldsville Fire Chief John Scolise concurred that it was a busy and hectic day for firefighters responding to calls for flood damage and to aid victims and evacuate people from homes.

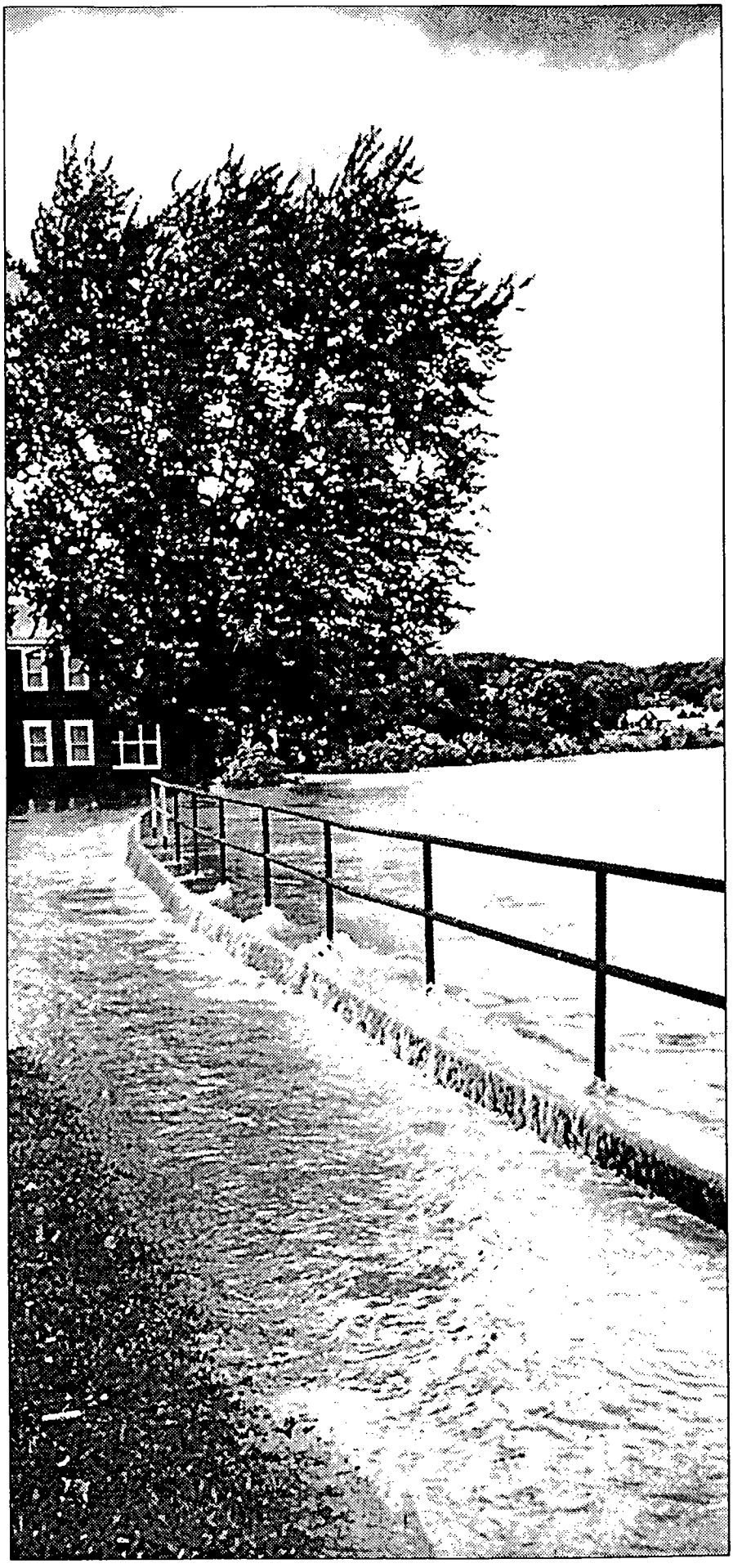
"We've evacuated people, but I can't even say how many. We've been out since 5 o'clock in the morning, and we're still out there," said Scolise around 6:30 p.m.

Punxsutawney Postmaster Gary Pontani said deliveries were planned for today, but he said some mail couldn't be delivered yesterday due to the floods.

"We had R.D. 2, R.D. 3 and R.D. 5 carriers go out and come back," Pontani said. "They went out to attempt it, but came back due to bridges being out and roads covered with water. We plan on coming in and delivering on Saturday."

Brookville Postmaster Alan Ridenour also said mail deliveries were expected for today.

"The post office here was evacuated at 10 a.m.," said Ridenour. "Two of our routes, one city and one rural, actually were delivered, though. We plan on delivery Saturday."



FIRST TIME IN HISTORY — Water makes its way over the retaining wall adjacent to Hampton Avenue, in front of County Market, on Friday afternoon, July 19. It was the first time in the near half-century history of the flood control project that water came over the top. *(Photo submitted by Lisa Haught, Punxsutawney)*

BIG RUN — The contents of the basement and first floor of this Big Run home were lost to the flood. "We were fortunate," Hugh Elkin of Big Run and a neighbor of the residence pictured above said. "As bad as it looks, there were folks that lost everything. This is the second time this has happened (in Big Run) in 19 years. Everyone says you should have flood insurance, but the premiums are hard to deal with. You go through this and you think it won't happen again. You wake up Friday morning and the next thing you know you have gallons of water. We had twenty inches on our first floor, but some folks had six to seven feet. The only good thing is, as fast as it came up, it went down just as fast." *(Spirit photo by Bill Anderson)*

Big Run Flood Damage High

Piles of Flood-Damaged Refuse Continue to Grow

By Tom Chandler
Monday, July 22, 1996

Problems persist for property owners affected by Friday's flooding, including community-wide problems with mounting piles of flood-damaged furniture, appliances and other property in Big Run and other towns.

"We have a lot of problems," said Big Run Mayor Joe Buterbaugh. "The biggest problem we have right now is how to get rid of everything that was damaged in the flood, and we're going to have a health problem. We have a lot of people who have damaged food set out on curbs, and it's going to be a health problem."

Buterbaugh said the Pennsylvania National Guard can't pick up refuse and debris unless it receives instructions from authorities that it can perform such a task.

The large amount of flood-damaged property in Big Run will also be too much for regular refuse haulers to truck away during normal runs, said Buterbaugh, noting that he had contacted Weaver Sanitation about the situation.

"Dave Weaver told me has a place near Punxsutawney he could burn things like old furniture, but he needs permission from the state Department of Environmental Protection to do that," Buterbaugh said. "He's at home now waiting for a call. Other than that, he can't do anything more than his regular routes through town on Tuesday to get just his regular pickups."

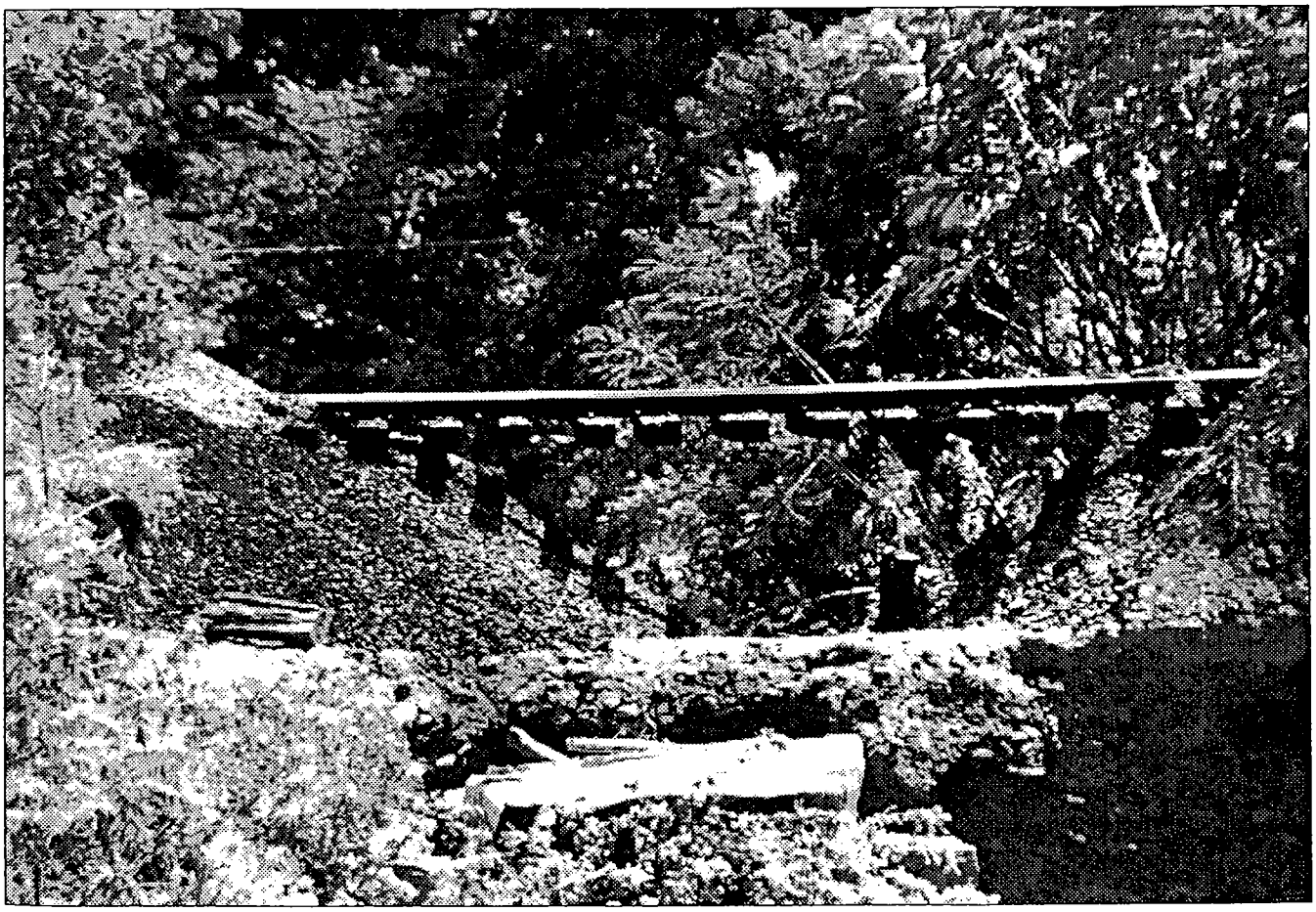
Buterbaugh said he has also placed calls to Jefferson County Emergency Management Agency for assistance, and the mayor said state Rep. Sam Smith said he would see if he could help in the matter.

According to Buterbaugh, almost every home from just north of the War Memorial building south through Big Run along U.S. Route 119 and along other low-lying areas has flood damage and debris piled up outside.

"The water upset chest freezers full of food in basements, and in many houses the water was up four to five feet in the first floor," said Buterbaugh. "There's just so many stoves and refrigerators and TVs sitting out the whole way through the lower end of town. And the big concern now is the health problem because a lot of people had food that was damaged and have placed it out with the other items."

Buterbaugh said as of last night that natural gas service was still shut off in

BIG RUN — Big Run lies in a lake of water on Friday afternoon, July 19. The picture was taken from the Foxburg Bridge, looking north to Big Run. *(Photo submitted by Fred Roberts, RD 2, Punxsutawney)*



RAILROAD TRACKS NEAR BIG RUN — Flood waters washed out these railroad tracks near Big Run. *(Photo submitted by Eleanor Stumpf, Big Run)*

BIG RUN HARD HIT — Residences at the lower edge of Big Run were devastated by flood waters. Shirley Kelichner's home (center) and Clarence Kerr's home (right) were typical of the homes heavily damaged. "Everything I own is right here," Kerr said, pointing to the pile of his water-soaked possessions piled next to the curb on Main Street. "I've had experience with wood furniture. The glue on the joints don't hold. I've saved very little. I might as well throw it away today as throw it away tomorrow." *(Spirit photo by Bill Anderson)*

the southern or lower end of the borough. He said T.W. Phillips had crews at the scene, but there were several areas with the odor of gas and the utility company had shut off service while checking for possible damage.

Electricity was also out in the lower end of the town Friday but has since been restored, said Buterbaugh.

Red Cross officials reported that the emergency shelter in the borough has been closed. Red Cross will still offer three free meals until further notice at the Big Run First United Methodist Church. Breakfast will be served from 8 to 10 a.m., lunch from noon to 2 p.m. and supper from 5 to 7 p.m.

Buterbaugh said the other problems facing the borough are sightseers and scavengers.

"There have been lots of sightseers, and the traffic through here has just been solid," he said. "It's been like that all day long. The state police told our fire chief that if people stop, to tell them to keep moving or they could be cited. And then you have the scavengers. You know you'll see a lot of this stuff they pick up discarded in old strip jobs after they realize they don't want it, and that just causes more problems."

Buterbaugh estimated approximately 20 homes and mobile homes in the borough had extensive damages from the flood, although he pointed out he didn't have any definite figures of the damage at this time.

The mayor reported that an insurance adjuster will check damage to one of Big Run Fire Co.'s older fire trucks that was swept away after stalling out in water Friday.

"The truck had been submerged in water. It looks very much like it will be totalled, but that's up to the insurance company," said Buterbaugh, explaining that firemen had been using the truck Friday for flood-related rescue work when it stalled out.

"They were trying to go up Smyers Street and it conked out on them, and the water picked up and the truck was washed down into a field," Buterbaugh said. "It just stalled out, and they could get it started again."

He said the truck has since been towed behind the Big Run fire station.

1-23-97

16 PAGES – 1 SECTIONS VOL. 124 — NO. 187 PUNXSUTAWNEY, PA., T

Historic Districts Defined, Explained

By Tom Chandler
Of The Spirit

Boundary areas for three proposed historic districts in Punxsutawney and the economic benefits of having districts listed on the National Register of Historic Places were presented to business and property owners last night at a public meeting at the Pantall Hotel.

Identified were a commercial historic zone in the Downtown area and historic districts in the East End and West End sections of the borough.

A $5,000 grant from the Pennsylvania Historic and Museum Commission to the Punxsutawney Area Historical & Genealogical Society is being used to prepare nominations of districts to be listed on the National Register.

Project consultant Bonnie Wilkinson said inclusion on the National Register would benefit the community by allowing for tax incentive credits for rehabilitation of income-producing properties, require federally-funded agencies to recognize the historic district designations during any type of proposed projects, assist with local planning and zoning and instill pride in the community and its history.

"I think one of the opportunities when you have a historic district is that other federal moneys can then also become available," said Wilkinson, noting the possibility of the designation leading to additional block grant and other types of funding for community improvement projects.

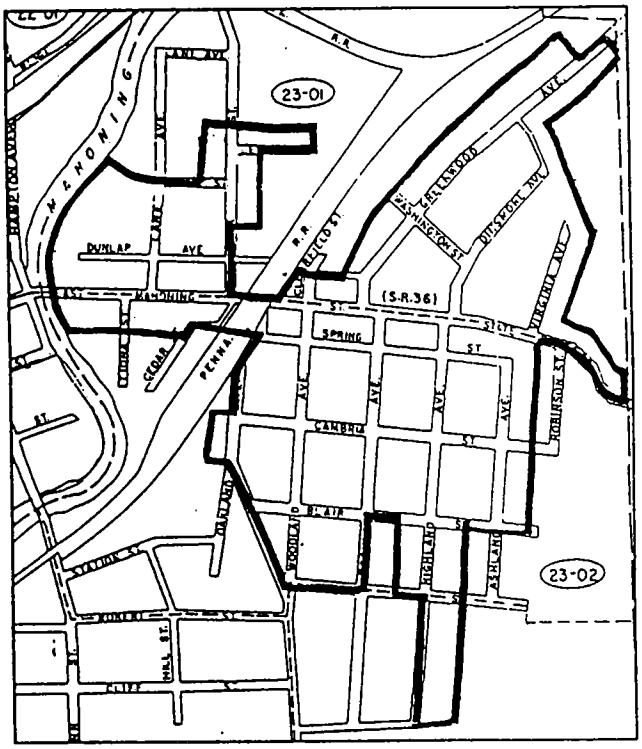
She said community districts listed on the National Register of Historic Places help attract additional money to the area through tourism and also attract new businesses.

"When you go around the United States and you do a lot of traveling the historic districts are something that a lot of people want to stop and see," said Wilkinson. "A lot of times when you want to attract new businesses they will look at the historic district designations. It shows you have pride in your community and your history."

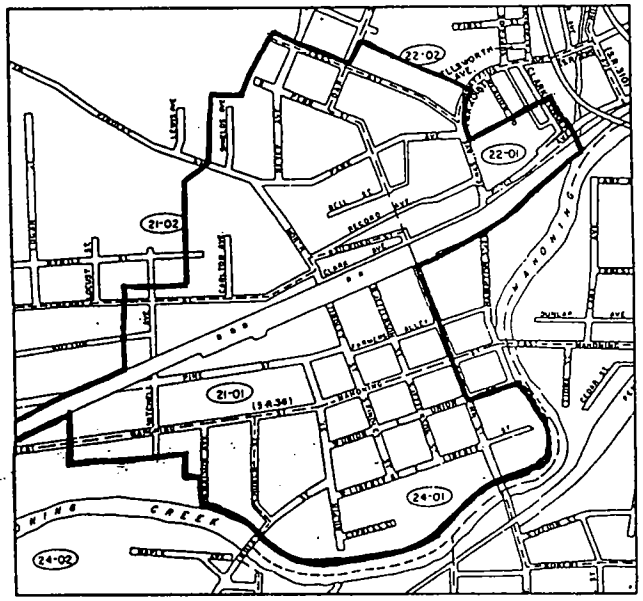
Nanci Puchy, Punxsutawney Chamber of Commerce executive director, told the audience that historic district designations should not only boost tourism and help attract businesses, but complement other improvements in the community and make the areas eligible for funding for improvements such as street design, lighting, curbing, sidewalks or other renovations.

"This historic district designation will be an added incentive to go with our new school, our fine hospital and now our new industrial park," said Puchy. "All of this gives us tools as a community to move forward rather than just sit still."

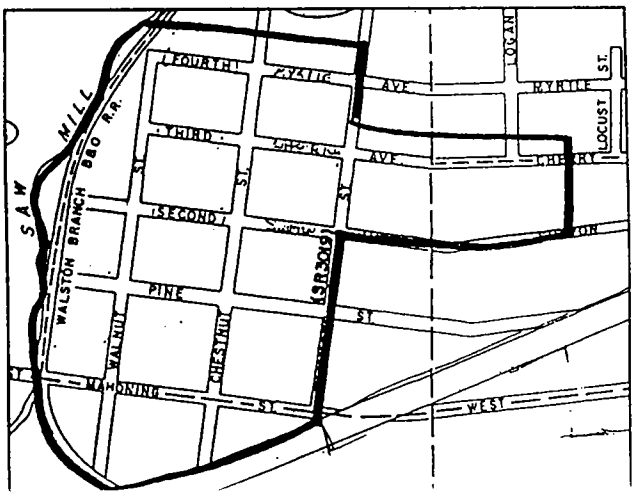
East End District

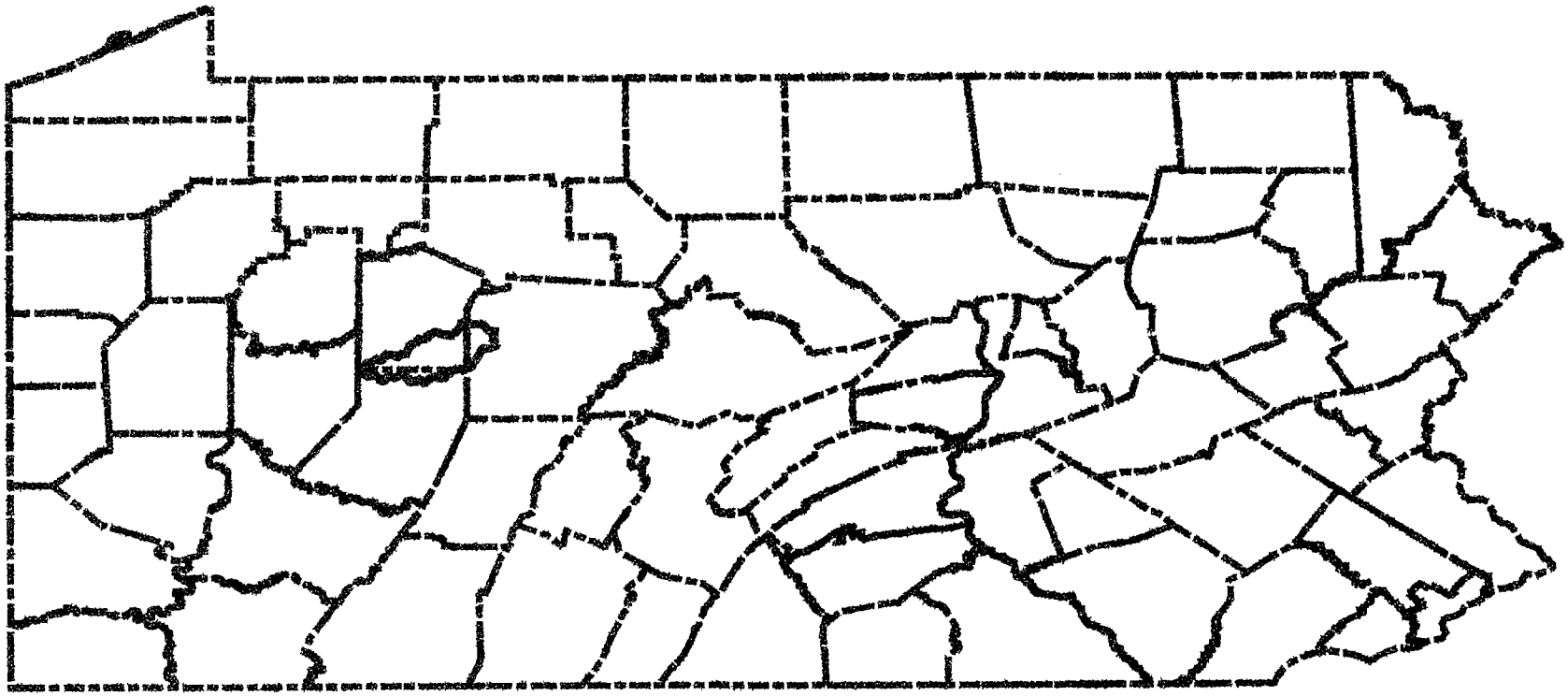


Commercial-Downtown District



West End District





UPPER MAHONING CREEK WATERSHED BOUNDARY

MAP NOT TO SCALE

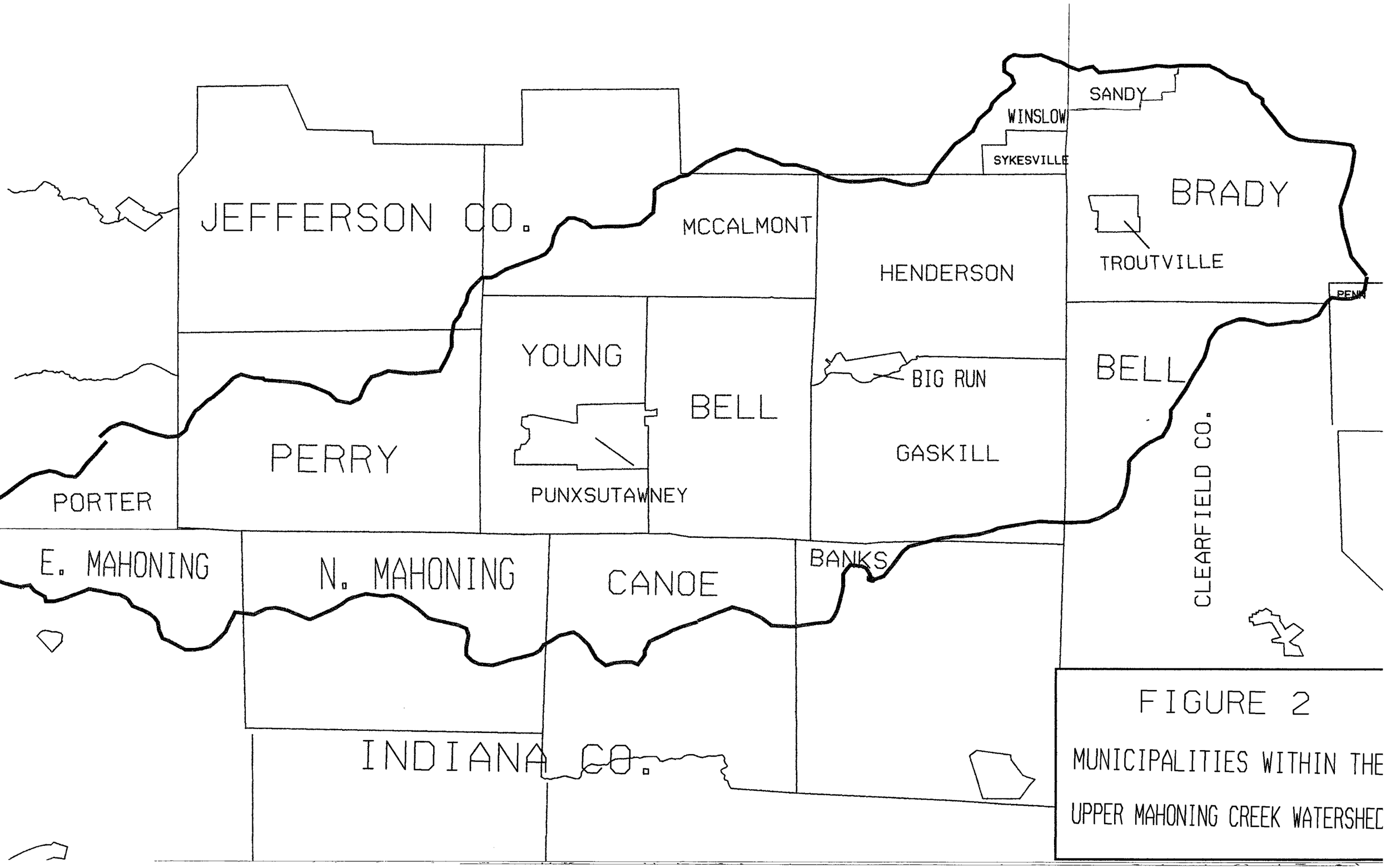
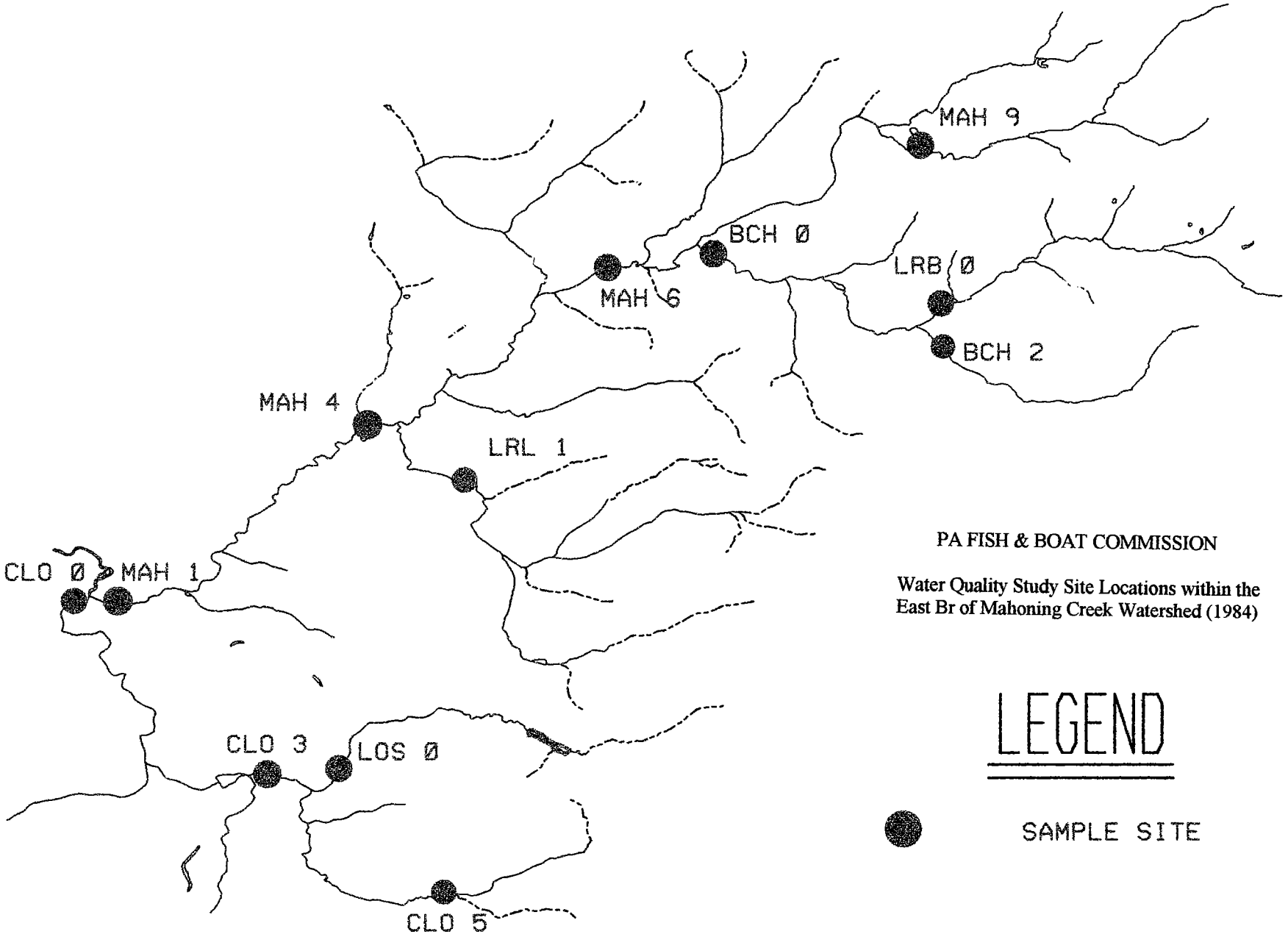


FIGURE 2

MUNICIPALITIES WITHIN THE

UPPER MAHONING CREEK WATERSHED



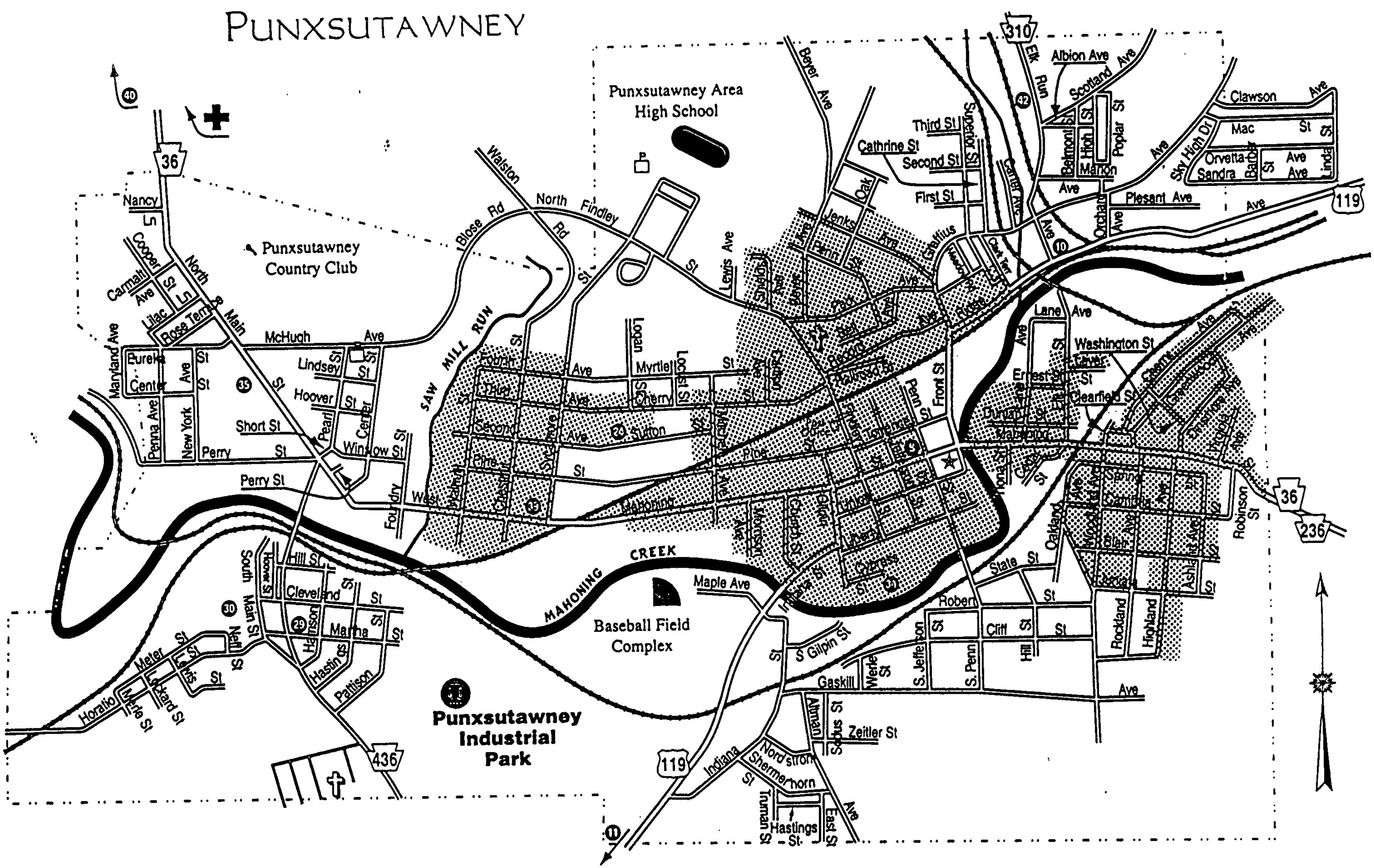
PA FISH & BOAT COMMISSION

Water Quality Study Site Locations within the East Br of Mahoning Creek Watershed (1984)

LEGEND

● SAMPLE SITE

NOT TO SCALE



- Area of Boundary

Proposed National Register
Historic District Boundary
for Punxsutawney Borough