ALLEGHENY RIVER CONSERVATION PLAN

PREPARED BY THE PENNSYLVANIA ENVIRONMENTAL COUNCIL

FINAL - NOVEMBER 2005

PA DEPARTMENT OF CONSERVATION
& NATURAL RESOURCES
RIVERS CONSERVATION PROGRAM

Pennsylvania Department of Conservation and Natural Resources
Rivers Conservation Program

DCNR Rivers Conservation Program

Allegheny River Conservation Plan

FINAL – November 2005

Prepared by:

The Pennsylvania Environmental Council
22 Terminal Way
Pittsburgh, PA 15219
(412) 481-9400

Pennsylvania Environmental Council

Mapping by:
Westsylvania Heritage Corporation
Johnstown, PA

This project was funded in part by a grant from the Keystone Recreation, Park, and Conservation Fund, administered by the Bureau of Recreation and Conservation, Pennsylvania Department of Conservation and Natural Resources. Matching funds were provided by the Vira I. Heinz Endowment, Western Pennsylvania Watershed Program, and an Anonymous donor.

CONTENTS

Acknowledgements……..vi

Acronyms……..vi-vii

EXECUTIVE SUMMARY

INTRODUCTION……1-4

PUBLIC PARTICIPATION……...5-12

DISCUSSION AND RECOMMENDATIONS……....13-20

CHAPTER 1 – PROJECT AREA CHARACTERISTICS……..21-32

A. Project Area Location and Size
B. Municipal Profiles
    1. Municipal Descriptions
    2. Population
C. Land Ownership
    1. Islands
D. Navigation and Transportation
    1. Working River
        a. Locks & Dams
        b. Safety on the River
    2. Transportation Projects
        a. Commuter Train
        b. East Brady Bridge Replacement
        c. Foxburg Bridge Replacement
        d. Transportation Improvement Program
    3. Railroads

Figure 1-1 Allegheny River Watershed Map

Table 1-1 Municipal Descriptions
Table 1-2 Change in Municipal Populations, 1970-2000
Table 1-3 River Islands
Table 1-4 Locks and Dams

Appendix:

- Port of Pittsburgh Public River Terminals

CHAPTER 2 – LAND……..33-47

A. Topography and Geology
    1. Formation of the River Valley
B. Soils
C. Land Cover
D. Land Use
    1. Land Use Tools
    2. Act 2 and the Land Recycling Program
    3. Industrial Sites for Sale
    4. Redevelopment
        a. PPG at Ford City
        b. Urban Redevelopment
    5. Mining Facilities
E. Waste Management
    1. Landfills & Recycling
    2. Illegal Dump Sites
    3. Hazardous Waste
    4. Toxics Release Inventory
F. Critical Areas
    1. Landslides
    2. Abandoned Mines
    3. Flood Prone Areas
    4. Ice Jams
    5. Natural Heritage Areas
    6. Viewscapes
    7. Natural Infrastructure

Figure 2-1 Physiographic Provinces
Figure 2-2 Historic Pennsylvania Geography
Figure 2-3 Ancestral Erie Basin
Figure 2-4 Pennsylvania Glacial Activity

Table 2-1 Land Cover
Table 2-2 Land Use Tools
Table 2-3 Act 2 Clean-up Sites
Table 2-4 CERCLA Sites
Table 2-5 Hazardous Sites Cleanup Act

Appendix:

- Surface Geology maps for Allegheny, Armstrong, Butler, and Westmoreland Counties
- Pennsylvania Maps: Geology, Physiographic Provinces, Glacial Deposits, Limestone and Dolomite Distribution, Coal Distribution, Oil and Gas Fields
- Summary – Armstrong County Multimunicipal Comprehensive Plan – Draft 2003
- Toxics Release Inventory for Armstrong County – 2002 Data

CHAPTER 3 – WATER……..48-61

A. Water Quality
- 1. Clean Water Act
- 2. Sources and Types of Water Pollution
  - a. Point Sources
  - b. Non-Point Sources
    - Abandoned Mine Drainage
    - Stormwater
  - c. Sewer Overflows
    - Combined Sewer Systems
    - Separate Sanitary Sewer Systems
  - d. Sewage Facilities
  - e. Bear Creek Area Chemical Site
  - f. Toxics Release Inventory
- 3. Impaired Streams and Rivers
- 4. Water Quality Testing
- 5. Fish Consumption Advisories
- 6. Contact Information

B. Water Supply
- 1. Source Water Assessment
  - a. Wellhead Protection Program
- 2. Groundwater
- 3. Water Resources Planning Act
- 4. Early Warning Detection System

C. Commercial Dredging

Table 3-1 Statewide Water Uses
Table 3-2 Tributaries and Chapter 93 Designated Uses
Table 3-3 Municipal Act 537 Plans
Table 3-4 Impaired Streams and Rivers on the 2004 303(d) List

Appendix:

- Source Water Assessment Summaries
- Redbank Creek Watershed Restoration Strategy
- Draft Environmental Impact Statement on Commercial Sand and Gravel Dredging Operations in the Allegheny and Ohio Rivers, Pennsylvania – Executive Summary

CHAPTER 4 – BIOLOGICAL RESOURCES……..62-82

A. Wildlife
    1. Mammals
    2. Birds
    3. Reptiles and Amphibians
    4. Fish
        a. Paddlefish Stocking
    5. Macroinvertebrates
B. Vegetation
C. Invasive Species
D. Pennsylvania Natural Heritage Program
    Tables of PNHP inventory for the six counties in the study area
E. Important Habitats
    1. Wetlands
    2. Riparian Corridors
    3. Steep Sloped Areas
    4. Natural Heritage Areas
    5. Allegheny River Pool 6
    6. State Game Lands

Table 4-1 Buffalo Creek Valley Bird Count
Table 4-2 Reptiles and Amphibians
Table 4-3 Fish
Table 4-4 Fish Stocking, 2003
Table 4-5 Invasive Aquatic Plants and Animals

CHAPTER 5 – RECREATION……...83-93

A. Trails
    1. Land
        a. Greenways
        b. Rails to Trails
        c. Federal Rails to Trails Act
    2. Water
B. Parks
C. Campgrounds
D. Boating
    1. River Access
    2. Boating Registrations
    3. Boating Safety
E. Fishing
    1. Access
    2. Fishing Registrations
    3. Restrictions
    4. Tournaments
F. Game Lands
G. Community Recreation Plans
H. Recreation and Economics

Table 5-1 Boat Access Areas
Table 5-2 State Gamelands
Table 5-3 Participation in Wildlife Activities in Pennsylvania

Appendix:
- PFBC Boating Rules and Regulations Recap

- PA Boat Registrations by County
- 2004 Fishing License & Trout Stamp Sales

CHAPTER 6 – HISTORY……..…94-96

A. Regional History
B. Local Municipal Histories
C. Unique Cultural Features
    1. River Towns – Heritage
    2. Local Points of Interest
D. National Register of Historic Places
E. Historical Marker Program

Appendix 6:

- Municipal History Summaries
- National Register of Historic Places
- Historical Marker Program

MAPS

Map 1 – Project Area
Map 2a – Land Cover (upper study area)
Map 2b – Land Cover (lower study area)
Map 3 – Critical Areas
Map 4 – Natural Resources
Map 5 – Recreational Opportunities

ALLEGHENY RIVER WATERSHED STEWARDSHIP & RESOURCE GUIDE
(Separate document - not included in this book)

Part A – River Conservation Tips
- Ten River Smart Tips
- River Smart Gardening
- Stream Care Guide for Residents & Businesses

Part B – Riparian Buffer Factsheets
- Introduction to Riparian Buffers
- Backyard Buffers
- Guidance for Communities

Part C – Natural Resource Conservation & Stewardship
- Wetland and Riparian Stewardship in Pennsylvania
- Humanely Resolving Conflicts with Canada Geese

Part D – Municipal and Organizational Resources
- Codes & Ordinances Worksheet
- MS4 Requirements
- Water Trail Technical Guidance Factsheets
- Boat Launch Technical Guidance

Important Contacts and Publications

ACKNOWLEDGEMENTS

The Pennsylvania Environmental Council would like to gratefully acknowledge the individuals who have provided valuable assistance in the development of the Allegheny River Conservation Plan:

David Beale……...Armstrong County Conservation District
Brian Clark……Alle-Kiski Revitalization Corporation
Mike Coonley…… Armstrong County Planning Department
Mark Devinney……..Freeport Terminals
Mike Ferris……River Navigation Coalition
Phyllis Framel……Resident, Allegheny Township
Dennis Frawley……..Crooked Creek Environmental Learning Center
Justin Goodlin……...Westsylvania Heritage Corporation
Hartley Johnston…….. Alle-Kiski Valley Historical Society
James Kwasneski……Intern
Terry Laux ……Buffalo Creek Important Bird Area
Eva Marcotrigiano…… Intern
Jeff Miller……Glacial Sand & Gravel Co.
T.L. Ralston……Armstrong County Planning Department
James Scahill…… Armstrong County Commissioner
Martin Scheerbaum……..Riverfront Landowner
James Seagriff……..Freeport Borough
Ron Steffey……Allegheny Valley Land Trust
Denny Steiner……...Steiners Outdoors and More

ACRONYMS Commonly Used Throughout this Document

ACCD – Armstrong County Conservation District
ACE – U.S. Army Corps of Engineers
AVLT – Allegheny Valley Land Trust
AKRC – Alle-Kiski Revitalization Corporation
AMD – Abandoned Mine Drainage
ATV – All-Terrain Vehicle
AVLT – Allegheny Valley Land Trust
BDA – Biological Diversity Area
BMP – Best Management Practice
CD – Conservation District
CERCLA – Comprehensive Environmental Response, Compensation, and Liability Act
CSO – Combined Sewer Overflow
CWA – Clean Water Act
DCED – Pennsylvania Department of Community and Economic Development
DCNR – Pennsylvania Department of Conservation and Natural Resources
DEP – Pennsylvania Department of Environmental Protection
EAC – Environmental Advisory Council
EFACTS – Environmental, Facility, Application, Compliance Tracking System
EIS – Environmental Impact Statement
EMPACT – Environmental Monitoring for Public Access and Community Tracking
EPA – U.S. Environmental Protection Agency
EPCRA – Emergency Planning and Community Right to Know Act
FEMA – Federal Emergency Management Agency
GIS – Geographic Information System
IBA – Important Bird Area
IMA – Important Mammal Area
L&D – Lock and Dam
MS4s – Municipal Separate Storm Sewer System

NHA – Natural Heritage Area
NHI – Natural Heritage Inventory
NPDES – National Pollutant Discharge Elimination System
NPL – National Priority List
NPS – Non-point source
OHA – Other Heritage Area
OLDS – On-lot Disposal System
PennDOT – Pennsylvania Department of Transportation
PABS – Pennsylvania Biological Survey
PASDA – Pennsylvania Spatial Data Atlas
PAT – Port Authority Transit
PEC – Pennsylvania Environmental Council
PFBC – Pennsylvania Fish and Boat Commission
PGC – Pennsylvania Game Commission
PHMC – Pennsylvania Historic and Museum Commission
PNHP – Pennsylvania Natural Heritage Program
PRC – Pennsylvania Resources Council
RCRA – Resource Conservation and Recovery Act
RCP – River Conservation Plan
RM – River Mile
SDWA – Safe Drinking Water Act
SEO – Sewage Enforcement Officer
SIHC – Steel Industry Heritage Corporation
SPC – Southwestern Pennsylvania Commission
SR – State Route
SSO – Storm Sewer Overflow
SWAP – Source Water Assessment and Protection
TEA-3 – Transportation Enhancement Act, 3rd Reauthorization
TIP – Transportation Improvement Program
TMDL – Total Maximum Daily Load
TRI – Toxics Release Inventory
USCG – U.S. Coast Guard
USFWS – U.S. Fish and Wildlife Service
USGS – U.S. Geologic Survey
WPC – Western Pennsylvania Conservancy

A. PROJECT AREA LOCATION AND SIZE

The Allegheny River Conservation Plan (RCP) encompasses 75 miles of river from Emlenton Borough in Venango County to Lock & Dam 3 at Harmar Township in Allegheny County. The study area of this RCP is pivotal because it links two other river studies: the Three Rivers Conservation Plan, which extends from the Point in Pittsburgh to Lock & Dam 3, and the Allegheny National Wild & Scenic River Management Plan, which extends approximately from Emlenton to Warren. Thus, these three studies cover a majority of the Allegheny River, which is 325 miles in length, draining a watershed of 11,770 square miles. Figure 1-1 shows the extent of the Allegheny River Watershed.

The study area for this RCP includes the river and 47 municipalities (see Map 1).

Figure 1-1. This map of the Allegheny River Watershed (green area outlined by white) shows county boundaries (tan lines), major roadways (gray lines), and tributaries (dark blue lines). The main stem of the River has been the subject of several studies. The bright green line indicates the area included in the Three Rivers Conservation Plan (from the Point at Pittsburgh to Lock & Dam 3). The bright blue line indicates the area included in this Allegheny River Conservation Plan (Lock & Dam 3 to Emlenton). The red lines are the portions of the River included in the National Wild & Scenic River Management Plan. The yellow lines indicate areas of the River that have not been studied.

Watershed
A basin-like landform defined by highpoints and ridgelines that descend into lower elevations and stream valleys. A watershed carries water "shed" from the land after rain falls and snow melts. Drop by drop, water is channeled into soils, groundwater, creeks, and streams, making its way to larger rivers and eventually the oceans. Water is a universal solvent, affected by all that it comes in contact with: the land it traverses and the soils through which it travels. The important fact about watersheds is: what is done on the land affects water quality and quantity for all communities living downstream.

B. MUNICIPAL PROFILES

1. Municipal Descriptions

The following general observations reflect the current status of the riverfronts of the 47 municipalities in the study area. The notes were taken from a combination of field observations, topographical maps, navigation charts, and municipal maps.

Table 1-1
Municipal Descriptions

Municipality	Area(Sq.Mi.)	Description
Allegheny County		
Brackenridge Borough	0.52	Memorial Park lies along 1st Avenue along the River. There is a trail, memorials, and private marinas.
Cheswick Borough	0.52	Mostly residential and industrial with railroads along the river. Reliant Energy owns much of the land and there is no public river access.
East Deer Township	2.15	Railroads and industry along river with steep wooded slopes behind them.
Harmar Township	6.00	A small portion of Harmar is included in this Plan. The riverfront is industrial with railroads.
Harrison Township	7.20	Riverfront is residential and light industrial. There is a small park at Lock & Dam 4 which is accessed by a back street (no signage). Along Karns road there are football fields, a scrap yard, water authority, and houses. Beyond the riverfront are steeply wooded slopes. On the top of the slopes is Harrison Hills Park, a county park that overlooks the river.
Plum Borough	28.88	Most of the riverfront is steep wooded slopes. There is an industrial area with railroads along the river.
Springdale Borough	0.99	Industrial and residential riverfronts with PPG plant. There is a PA Fish & Boat Commission boat launch at the end of Colfax St.
Springdale Township	2.32	Railroads along the river and steep wooded bluffs. Agan Park sits on a bluff overlooking the river.
Tarentum Borough	1.09	Residential areas with a Memorial Park that has a trail, playground, and marina. There is a PFBC boat launch under the Tarentum Bridge. Bull Creek flows into the river at the borough's southern border.
Armstrong County		
Applewold Borough	0.05	Small population center along floodplain of the river.
Bethel Township	15.30	Very steep slopes along banks of Allegheny River and Crooked Creek. The exceptions are Logansport and Kelly Station, where it is a wide, flat floodplain.
Boggs Township	24.10	A large wetland lies along the Allegheny River just north and west of State Game Lands 287. The Game Lands are on much steeper terrain. South of the Game Lands the slope is not as steep. Township is bounded by Pine Creek in the south.

Brady's Bend Township	12.70	Township lies within and around two oxbows of the Allegheny River. The northern part of the township is steeply sloped as it enters the curve of the river, then the slope becomes more gradual until it forms a floodplain along the river. This area is more developed. As the river enters the second oxbow, the land in the Township becomes steeper towards the stream valley of Sugar Creek and through State Game Lands 105.
Cadogan Township	0.90	Some mined or dredged areas occur along floodplain of river. Beyond the floodplain, the community is very hilly. Small park overlooks the river.
East Franklin Township	30.90	Steeply sloped riverfront until the town of Bridgeburg, where there is a large floodplain. Another significant floodplain occurs at Tarrtown. The slope south of Tarrtown to Applewold is very steep. Large population centers include the Boro of West Kittanning, which lies completely within East Franklin Township.
Ford City	0.70	Population center along large, wide floodplain and former industrial area of the Allegheny River.
Freeport Borough	1.20	Mostly flat riverfront population center that lies between the Allegheny River and Buffalo Creek. Borough becomes hilly away from the river. Riverside Drive Park has pavilion and marina with a cleared, dirt bank.
Gilpin Township	16.50	Some steep slopes along the river, except for wide floodplain near Godfrey and near the confluence of the Kiskiminetas River. Just north of the Kiskiminetas River are the industrial communities of Aladdin and Schenley.
Hovey Township	2.10	Mix of floodplains and steep slopes along the river. SR 268 is adjacent to the river through most of the township. Above the slopes, there is less relief and the presence of strip mines.
Kittanning Borough	1.00	Large, wide floodplain along river. A large population center. Riverfront Park has an amphitheater, trail, and ramp. Riverwall along northern part of borough.
Madison Township	30.30	Bounded by Redbank Creek and the Allegheny River, Madison Township has very steep slopes along the river except for the area between Cosmus and Rimer. South of Rimer, the riverfront is mostly steep (except for a small area around the town of Hooks) until the confluence of Mahoning Creek.
Manor Township	16.60	Most of the riverfront of this township is blocked by the communities of Manorville and Ford City. The southern end of the township has access to the Allegheny River and to Crooked Creek, which is its southern boundary. Away from the river, the township becomes very hilly.
Manorville Borough	0.10	Small riverfront community on floodplain of river.
North Buffalo Township	25.60	Large floodplain with industrial development along river in the north with slopes becoming dramatically steeper toward the township's southern border with Cadogan.
Parker City	1.10	Industrial area along floodplain of river, but steeply sloped going downriver towards Bear Creek. One of the more populated communities in this area of the corridor.
Perry Township	15.00	Riverfront varies from steep slopes to floodplains. Southern riverfront part of township is a long, wide floodplain.
Pine Township	4.90	Located at the confluence of Mahoning Creek and the

		Allegheny River, Pine Township has some floodplains at the confluence of the two waterways and along the Allegheny River at Templeton. Templeton is a very developed area bounded by the river and State Game Lands 287.
Rayburn Township	11.90	Steep slopes along much of riverfront except for small floodplain with campgrounds in the northern section of the township (between Pine Creek and Hays Run). The remainder of the riverfront is steep to moderately steep, particularly at the confluence of Cowanshannock Creek.
South Buffalo Township	29.20	Steep slopes along river, except for area around Clinton, a small population center along the river, and between River miles 32-33. There is a wide, flat floodplain at this second location, which also is the site of the mouths of two tributaries: Knapp Run and unnamed tributary.
Sugarcreek Township	27.1	Northeast corner of the Township is adjacent to Bradys Bend Township where the later is located along the Allegheny River. Depending on the maps Sugarcreek Township may or may not border directly on the River. Snyders Run which drains the NE portion of the township empties into the river at this point. The ground is mostly an extension of the floodplain on the outside bank of the large oxbow at East Brady. The ground slopes steeply away from the river once outside of the floodplain.
Washington Township	22.00	Township is steeply sloped along the river through State Game Lands 105 to the town of Van Buren where the riverfront becomes a large, long floodplain until about River mile 61.5. The slope becomes steep again until the river begins to curve around Reesdale, which contains industrial development along the river.
West Kittanning Borough	0.4	Small Borough located on the bluff overlooking the Allegheny River. Applewold Borough is located in the floodplain at the base of the bluff. Extremely steep slopes separate the Borough from the river. Location at the top of the bluff provides tremendous views of river valley from north of Kittanning to below Ford City.
Butler County		
Allegheny Township	26.59	Only the northeast corner of this township touches the river as a wide floodplain. Further inland, there are steep slopes along the valley of an unnamed tributary.
Buffalo Township	50.04	Only the southeastern most part of the township touches the Allegheny River at the confluence of Buffalo Creek. Area is very hilly except for parts near the waterways.
Clarion County		
Brady Township	16.90	Lies within the area where the river would normally form an oxbow lake. But Brady consists almost entirely of steep slopes and hills and is mostly wooded. Route 68 cuts through the ridge tops and offers a scenic overlook. Philipston lies at the southern end of the township on a small floodplain.
East Brady Borough	0.80	The borough lies within the oxbow area of the Allegheny River. The town lies in the floodplain area of the river's bend. The east end of town consists of wooded hills.
Foxburg Borough	0.30	The borough is surrounded by Richland Township. To the north the riverfront is wooded slopes. Just south of the slopes is the

		town, lying in the floodplain. Beyond the town there are some wooded hills and a golf course.
Madison Township	27.10	Township's riverfront consists of steep wooded slopes. Sarah Furnace lies in the floodplain area. Catfish Run flows into the Allegheny through the Sarah Furnace property. The southern border of the township follows Redbank Creek with a wooded, sloped valley.
Perry Township	20.00	Its northern border is the Clarion River, which has a wooded sloped valley. The Allegheny riverfront is mostly steep wooded slopes with railroads along its length. There is a small populated area of West Monterey further south along a small floodplain. Two tributaries, Dunlap Creek and Black Fox Run, flow into the Allegheny near the southern border of the township.
Richland Township	15.10	It is bounded on the north by Richey Run and Emlenton. The riverfront is steep wooded slopes. The township surrounds Foxburg. Below Foxburg there are more steep wooded slopes. The southern border is the Clarion River, with a steep wooded valley that hosts a 'jeep trail.'
Toby Township	28.90	Only a small portion of this large township has riverfront. It is wooded slopes. There is a small floodplain with some buildings.
Venango County		
Emlenton Borough	0.80	Borough sits just north of Route 80 on a floodplain of the Allegheny River. Some wooded hills sit just north of town and Richey Run is the borough's southern border with steep wooded slopes along its valley.
Scrubgrass Township	25.70	A small portion of the township faces Emlenton's riverfront. The banks are steep wooded slopes.
Westmoreland County		
Allegheny Township	32.00	The Township is bordered by the Kiskiminetas and Allegheny Rivers. There is a floodplain at the confluence of the Rivers at Kiski Junction. Riverfront has some residential area. Both riverfronts include wooded and unwooded hills. Chartiers Run flows into the Allegheny near the township's southern border. There are also several unnamed tributaries to the Allegheny and Kiski.
City of Arnold	0.70	Arnold is mainly industrial and developed riverfront. A small, southern portion has wooded slopes. There is a Fireman's Memorial Park with picnic area, baseball fields, and a fishing pier.
City of Lower Burrell	11.60	There are some wooded bluffs and also industrial areas which face Jack's Island.
City of New Kensington	3.81	It is mainly industrial and developed riverfront. Lighthouse Marina.

2. Population

The Allegheny River was an ideal location for industry in the early 1900s. It provided a source of water for manufacturing and a means of transporting goods by barge or adjacent rail. By the late 1900s,

however, industry declined in these river communities, accompanied by declines in populations. Some communities have lost a third or more of their population since 1970.

Table 1-2
Change in Municipal Populations of the Allegheny Corridor since 1970

Municipality	Area (Sq. Mi.)	1970 Pop	1980 Pop	1990 Pop	2000 Pop	% Change 1970-2000
Allegheny County						
Brackenridge Borough	0.52	4,796	4,297	3,784	3,543	-26.1
Cheswick Borough	0.52	2,580	2,336	1,971	1,899	-26.4
East Deer township	2.15	2,081	1,658	1,558	1,362	-34.6
Harmar Township	6.00	3,899	3,461	3,144	3,242	-16.9
Harrison Township	7.20	14,448	13,252	11,763	10,934	-24.3
Plum Borough	28.88	21,932	25,390	25,609	26,940	22.8
Springdale Borough	0.99	5,202	4,418	3,992	3,828	-26.4
Springdale Township	2.32	2,218	1,918	1,777	1,802	-18.8
Tarentum Borough	1.09	7,379	6,419	5,674	4,993	-32.3
Armstrong County						
Applewold Borough	0.05	515	395	388	356	-30.9
Bethel Township	15.30	1,128	1,349	1,261	1,290	14.4
Boggs Township	24.10	797	953	981	979	22.8
Brady's Bend Township	12.70	1,095	1,124	963	939	-14.2
Cadogan Township	0.90	563	459	427	390	-30.7
East Franklin Township	30.90	4,262	3,716	3,923	3,900	-8.5
Ford City	0.70	4,749	3,923	3,413	3,451	-27.3
Freeport Borough	1.20	2,375	2,381	1,983	1,962	-17.4
Gilpin Township	16.50	3,086	2,967	2,804	2,587	-16.2
Hovey Township	2.10	143	103	99	93	-35.0
Kittanning Borough	1.00	6,231	5,432	5,120	4,787	-23.2
Madison Township	30.30	1,012	1,030	941	943	-6.8
Manor Township	16.60	5,030	4,819	4,482	4,231	-15.9
Manorville Borough	0.10	445	409	418	401	-9.9
North Buffalo Township	25.60	2,521	2,827	2,897	2,942	16.7
Parker City	1.10	843	808	853	799	-5.2
Perry Township	15.00	375	396	322	404	7.7
Pine Township	4.90	704	656	534	499	-29.1
Rayburn Township	11.90	1,983	1,971	1,823	1,811	-8.7
South Buffalo Township	29.20	2,317	2,636	2,687	2,785	20.2
Sugar Creek Township	27.10	1,001	1,511	1,496	1,557	55.5
Washington Township	22.00	953	1,008	984	1,029	8.0
West Kittanning Borough	0.40	956	1,591	1,253	1,199	25.4
Butler County						
Allegheny Township	26.59	466	565	504	555	19.1

Buffalo Township	50.04	5,595	6,371	6,317	6,827	22.0
Clarion County						
Brady Township	16.90	92	94	78	62	-32.6
East Brady	0.80	1,218	1,153	1,047	1,038	-14.8
Foxburg	0.30	353	289	262	275	-22.1
Madison Township	27.10	1,453	1,524	1,423	1,442	-0.8
Perry Township	20.00	1,209	1,295	1,076	1,064	-12.0
Richland Township	15.10	553	541	490	553	0.0
Toby Township	28.90	1,206	1,314	1,153	1,166	-3.3
Venango County						
Emlenton	0.80	854	794	824	784	-8.2
Scrubgrass Township	25.70	735	719	673	799	8.7
Westmoreland County						
Allegheny Township	32.00	6,713	7,452	7,895	8,002	19.2
City of Arnold	0.70	8,174	6,853	6,113	5,667	-30.7
Lower Burrell	11.60	13,654	13,200	12,251	12,608	-7.7
New Kensington	3.81	20,312	17,660	15,894	14,701	-27.6
Source: PA State Data Center, Penn State Harrisburg - http://pasdc.hbg.psu.edu						

C. LAND OWNERSHIP

According to Pennsylvania Common Law, navigable rivers, streams, and lakes are public property. The public has a right to use them for transportation and other purposes without the permission from the streamside properties through which the waters flow. The Allegheny River and some of its tributaries were declared to be navigable by acts of the Pennsylvania legislature during the eighteenth and early nineteenth centuries. Therefore, the Allegheny River is public property surrounded mostly by private property (either industrial or full-time or part-time residential). Public access areas are needed to allow those who do not own property along the river a means to reach it. There are several public access areas along the river; they are listed in Chapter 5.

The Commonwealth holds the bed of a navigable waterway in trust for the public in order to protect the public's right to use the waters. The Commonwealth may permit private parties to use the bed of a navigable river for various purposes, for example the dredging of sand and gravel. The Commonwealth also owns the islands in the waterways and can convey them to a private landowner as described in the next section.

1. Islands[1]

The Allegheny River has numerous islands. Historically, they were desirable properties because of their fertile soils and location on a transportation route. To own an island, an individual had to secure a warrant (a sales agreement from the Commonwealth of Pennsylvania to the individual), a survey, and a patent (a release from the Commonwealth to any rights or interests in the land). Islands were auctioned off to the highest bidder until the late 1800s. Since the 1930s, a first purchase option was given to the Commonwealth and in 1990 the Interagency River Island Task Force was created. This gave the then Department of Environmental Resources (now the Department of Conservation and Natural Resources) responsibility "for the administration of the unappropriated or unpatented islands in the navigable rivers

[1] Information from Joseph Frassetta, Information Specialist, PA Bureau of Forestry. Spring, 2004

and in streams declared by law to be public highways." As a result, the DCNR's Bureau of Forestry currently maintains an inventory of the islands and their ownership for the Allegheny River.

Table 1-3
River Islands (see Map 5)

Island Name	Location	Municipality	Owner
Clarion Island	Near mouth of Clarion River	Clarion County	Private (Lawrence W. McConnell)
Unnamed Islands	Between River Miles (R.M.) 83.5-84.5	Clarion County	Not being taxed in either Armstrong or Clarion Counties – probably flooded during a large part of the year
Unnamed Island	Near R.M. 82.5	Clarion County	Probably flooded during a large part of the year.
Black Fox Island	Between R.M. 77-78	Clarion County	Not being taxed in either Armstrong or Clarion Counties – probably flooded during a large part of the year
Bald Eagle Island	Just north of R.M. 76	Clarion County	
Cogley Island (2 islands)	South of R.M. 43 near Dog Town	Armstrong County, Manor Township	Davison Sand and Gravel
Cast-off Island	Near Cadogan	Armstrong County	
Ross Island (or Green's Island)	Between R.M 39-40	Armstrong County, Manor Township	Davison Sand and Gravel
Nicholson Island	R.M. 37	Armstrong County, South Buffalo Township	Western PA Conservancy
Donley Island	South of R.M. 33	Gilpin Township	Private (Timothy S. and Patricia Dorn)
Upper Jack's Island	South of R.M. 26	Westmoreland County, Lower Burrell	
Unnamed Island	Between Upper Jack's Island and Jack's Island	Lower Burrell	
Jack's Island	Between R.M. 23-22	Lower Burrell	

Unnamed Island	North of R.M. 21	Allegheny and Westmoreland Counties	
Unnamed Island	South of R.M. 15 at lock and dam 3	Allegheny County	
Source: see footnote 1			

Islands that do not appear on the DCNR database include the Isle of White, located just below Lock 7, and a cluster of islands near R.M. 81. These and several other islands are under water during part of the year.

D. NAVIGATION AND TRANSPORTATION

1. Working River[2]

The Allegheny River is a commercially navigable waterway upstream to Lock & Dam 9. Thus, the study area falls partly within the Port of Pittsburgh, an eleven-county area that contains 200 miles of commercially navigable waterways in southwestern Pennsylvania. There are four public river terminals in this corridor that connect the barge industry with the railroads and highways. Information about these river terminals, including their contact information can be found in the appendix at the end of this chapter.

A towboat and barge

The Port of Pittsburgh Commission is part of the larger inland waterway system, which is approximately 10,000 miles of navigable waterways. Transport via the inland waterway system is considered to be one of the least costly modes of transportation. The Commission estimates that approximately 34,000 jobs in southwestern Pennsylvania are dependant upon the waterway system.

In 2002, the Port shipped and received nearly 53 million tons of cargo (more than 40 million was coal), making it the second busiest inland port in the nation and the thirteenth busiest of any kind in the nation. The Allegheny River only transports 2.9 million tons of that total port tonnage (5.6% of the total).

a. Locks & Dams

The lower 72 miles of the Allegheny River are navigable to commercial traffic due to the presence of the United States Army Corps of Engineers (ACE) navigational system. A series of locks and dams provide year-round pools and a navigational channel that is a minimum of 9 feet deep. The pools are a source of water for municipal and industrial uses. See also Map 1 for locations. The

Lock & Dam 4

[2] www.port.pittsburgh.pa.us

ACE website (http://wmw.lrp.usace.army.mil) provides daily updates on stage and flow data, reservoir pool and release information, and project information.

All of the dams on the Allegheny River in the study area are fixed crest dams, which provide no flood control. They are concrete walls that extend across the river and serve to keep the appropriate water level in the pool above. All of the locks have a single chamber with a width of 56 feet and a length of 360 feet. Many riverfront residents have had property damage due to the large flows of water in the Allegheny. While the dams cannot control that flow of water, it is important to know that the changes come from releases of the Allegheny Reservoir upstream on the Allegheny River, and from the Piney Reservoir on the Clarion River.

Table 1-4
Locks and Dams of the Allegheny River

Lock and Dam	Location (River Mile)	Nearest Town	Date Built	Length of Pool (miles going upstream)	Traffic (tons of freight per year)
#3	14.5	Harmar	1932-34	9.7	3.7 million
#4	24.2	Natrona	1920-27	6.2	1.8 million
#5	30.4	Freeport	1920-27	5.9	1.3 million
#6	36.3	Clinton	1927-28	21.5	100,000
#7	45.7	Kittanning	1928-31	6.9	100,000
#8	52.6	Mosgrove	1928-31	9.6	400,000
#9	62.2	Rimer	1935-38	9.8 to end of navigational channel	

Source: www.lrp.usace.army.mil

Dams 5, 6, 8, and 9 are equipped with commercially operated hydropower facilities that produce 9.5, 9.5, 13.6, and 18 Megawatts (MW), respectively.

Hydroelectric Plant at Lock & Dam 6

In addition to the commercial traffic that uses the lock system, a large number of recreational boaters use the locks to move from pool to pool on the Allegheny. Lock Number 7 has approximately 1,400 recreational lockages per year, Number 8 has 1,200, and Number 9 has 1,100. The government has established a priority list for lockages: federal and commercial vessels are locked through first; recreational boats last.
Funding for the operation of the locks comes from Congressional appropriations to the ACE. In recent years, limitations in the federal budget have caused a decrease in the amount of funds that Congress allocates to the ACE. As a result, the locks on the upper part of the river (Locks 5-9) are open for limited hours on weekends and holidays during the boating season – affecting the pleasure boaters who use them.[3]

Since the ACE cannot lobby Congress for funds, recreational boaters are pressuring Congress to restore the funding. For 2004, Congressman John Murtha was able to secure $250,000 in appropriations for the ACE to keep the locks open. This amount was still much less of what is needed to operate the locks.

[3] Lock and Dam Cuts Predicted, A.J. Panian, Leader Times, Saturday, August 9, 2003

A non-profit organization of commercial and pleasure boaters and nearly 30 riverfront communities, the River Navigation Coalition is fighting for additional federal money to maintain the lock schedule and has proposed a user's fee for Pennsylvania's registered recreational boaters. However, the ACE is prohibited from collecting a user fee.

In 1986, the Allegheny River Development Corporation commissioned the Upper Allegheny River Traffic Study, which was a report on traffic potential on the river north of Freeport. The study identified the ACE cutbacks in lock operation at that time and suggested potential to increase recreational and commercial use of the river. Another 1986 report – Recreation: The Other Allegheny River – was a study of the impact of recreation activities on and near the river between river miles 29-72. One of the recommendations was for the ACE to increase lock operations.

b. Safety on the River

The government entities responsible for various safety and regulatory issues on the river are:

- The United States Coast Guard (USCG), which oversees maritime safety, mobility, security, national defense, and protection of natural resources. Visit www.uscg.mil for complete information.
- The Pennsylvania Fish and Boat Commission (PFBC), which regulates boating and fishing, and issues safety rules and guidelines for those activities, as well as other activities such as paddling, jet-skiing, and water-skiing. Visit www.fish.state.pa.us for complete information.

The primary safety issue on the river is that it is a multiple use waterway with commercial and recreational traffic vying for space below East Brady. As a result, one current safety issue involves the lighting of barges at night. The Pittsburgh Safe Boating Council played a major role in improving lighting on barges and is still working toward future improvements.

2. Transportation Projects

The following list of proposed or planned projects is meant to highlight what changes are being planned for the future of the region's land-based transportation routes.

a. Commuter Train

The main transportation route from communities along this corridor to Pittsburgh is Rt. 28, an often congested roadway that is scheduled to be under construction for many years along its length. To alleviate the traffic problem, some Allegheny River valley communities have proposed creating a commuter train between Arnold and the Strip District in Pittsburgh – a total of 23 miles. The Allegheny Valley Railroad has offered the use of its tracks during the daytime for a commuter train in exchange for upgrades to the railroad crossings and other equipment for the commuter train. It is estimated that the Allegheny Valley Commuter Train would take 300 to 600 cars per day off of Rt. 28.

The Allegheny County Port Authority has developed an Eastern Corridor Transit Study, which identifies priorities for transportation improvements in eastern Allegheny County. Its estimates for a commuter train range from $64 million for two daily trains to a $258 million system of 21 daily trains with high quality stations and new locomotive coaches. These estimates rely on obtaining federal money; however, proponents of the train claim that a basic train system could be started for about $30 million from the state's capital budget.[4] The exact cost of the train will be determined by a feasibility study for which $400,000 is needed. By the end of 2004, Allegheny County and state officials had each pledged $100,000 towards this study. Despite pressure from constituents in the valley, the Allegheny County Council has not committed any additional funds for the feasibility study.

[4] New Councilwoman Questions Valley Commuter Train, Valley News Dispatch, November 27, 2003.

b. East Brady Bridge Replacement

The Pennsylvania Department of Transportation (PennDOT) plans to replace the existing bridge carrying SR 68 over the Allegheny River between Armstrong and Clarion Counties in East Brady.[5] Final designs were presented to the public in the fall of 2004. The section of the Allegheny River where construction of this new bridge and the demolition of the old will occur contains the habitat of two federally endangered mussels, the Clubshell and Northern Riffleshell. Under the direction of the U.S. Fish and Wildlife Service, mussels will be recovered from the project site. Common mussel species will be relocated, while endangered mussels will be bred in captivity. Upon completion of the project, the mussels will be reintroduced into the river where the original mussels were removed.

The bridge is currently under construction. The new span is located approximately 300 yards downstream from the current structure. There is also a second bridge being constructed over Sugar Creek to permit the relocation of Route 68 as required by the realignment of the East Brady Bridge.

c. Foxburg Bridge Replacement

The Foxburg Bridge is scheduled to be replaced upon completion of an Environmental Impact Study. Like the East Brady Bridge, the Foxburg Bridge occurs in mussel habitat.[6] PennDOT plans to build a two lane replacement bridge one half mile upstream of the current bridge.

d. State Transportation Improvement Program 2003-2006[7]

Other projects listed in the State Transportation Improvement Program (TIP) for the next few years include a study of the Freeport Bridge and enhancements for the Kittanning Bike Trail and Butler-Freeport Trail Extension.

3. Railroads

Historically, railroads supported the booming industrial communities along the river. While some of those rail lines have been abandoned due to the decline in industry, there are currently several existing rail lines along the corridor. (See Map 4)

Some groups and municipalities are working with the railroad companies to use abandoned rail beds or the space along active rail beds for trails and other recreational uses. This topic is described in more detail in Chapter 5.

The Kiski Junction Railroad carried freight on weekdays, and acted as a tourist attraction on the weekends by offering train rides along the Kiskiminetas River. However, in 2005 it shut down due to insurance issues and lack of volunteers.

[5] www.eastbradybridge.com
[6] www.pah2o.er.usgs.gov/reports/wrir00-4058.pdf
[7] www.dot.state.pa.us

Chapter 1

Appendix

Public Terminals on the Allegheny River

Information provided from the Port of Pittsburgh's website, www.port.pittsburgh.pa.us

RAM Terminals

Company Data

Headquarters:	1 Fifth Street New Kensington, PA 15068-6537
Phone:	(724) 339-1010
Fax:	(724) 339-4084
Contact:	George Boda Bobbi Garris Jack Braun
e-mail:	info@ramterminals.com

Facility Description

Number of Terminals: 2

River Location:	Allegheny -- Milepost 18.6 LDB
Commodities Handled:	Dry Bulk Commodities Package Materials Minerals Ferro Alloys
Storage Capacities:	Open: 238,040 sq. ft. (Additional storage at Logans Ferry site) Covered (for palletized material): 34,400 sq. ft. Covered (for bulk material): 35,500 sq.ft.
Equipment/Services:	Loading and unloading of barges, rail cars, and trucks Storage, crushing, screening, bagging, and drying of materials
Site Location/Access:	Readily accessible to route 28, route 422, Intersates I-279, I-579, I-79, and I-376 (PA Turnpike), and route 66.

Freeport Terminals, Inc.

Company Data

Headquarters:	514 North Main Street Butler, PA 16003
Phone:	(724) 287-7733
Fax:	(724) 287-5708
Contact:	Mark Devinney, VP/ Sales
Website:	www.nicholasinc.com/ freeport.html

Facility Description

Number of Terminals:	2
River Location:	Allegheny -- Milepost 29.6 RDB
Commodities Handled:	Pig Iron Scrap Salt Fertilizers Grains Coal Coke Graphite Bauxite Petroleum and other liquid bulk products
Storage Capacity:	Open: 30 acres Covered: 450,000 sq. ft.
Rail Siding Data:	Norfolk Southern
Highway Access:	PA 356, PA 28
Site Location:	700 Riverside Drive, Freeport

Armstrong Terminal

Company Data

Headquarters: P.O. Box 58
Schenley, PA 15682
Phone: (724) 295-4599
Fax: (724) 295-4699

Contact: Tom Boroski

Facility Description

Number of Terminals: 1

River Location: Allegheny -- Milepost 30.8 LDB

Commodities Handled: Dry Bulk
Sand and Gravel

Equipment: crane

Storage Capacity: Open: 4 acres
Covered: 212,000 sq. ft.

Rail Siding Data: Kiski Junction Railroad

Site Location: Located in Schenley, PA near Lock 5

A. TOPOGRAPHY AND GEOLOGY [1]

Physiographic Provinces, or landforms, are defined by geologists and describe the terrain of large regional landscapes. For instance, landforms differentiate mountainous terrains with steep valleys from plateaus flattened under the oppressive weight of ancient glaciers. Figure 2-1 shows the various landforms within and around the Allegheny River watershed. The study area is part of the Pittsburgh Low Plateau Section, characterized by a smooth, uneven surface with numerous narrow, relatively shallow valleys, and some high level terraces. It has moderate to low relief and a dendritic stream pattern.

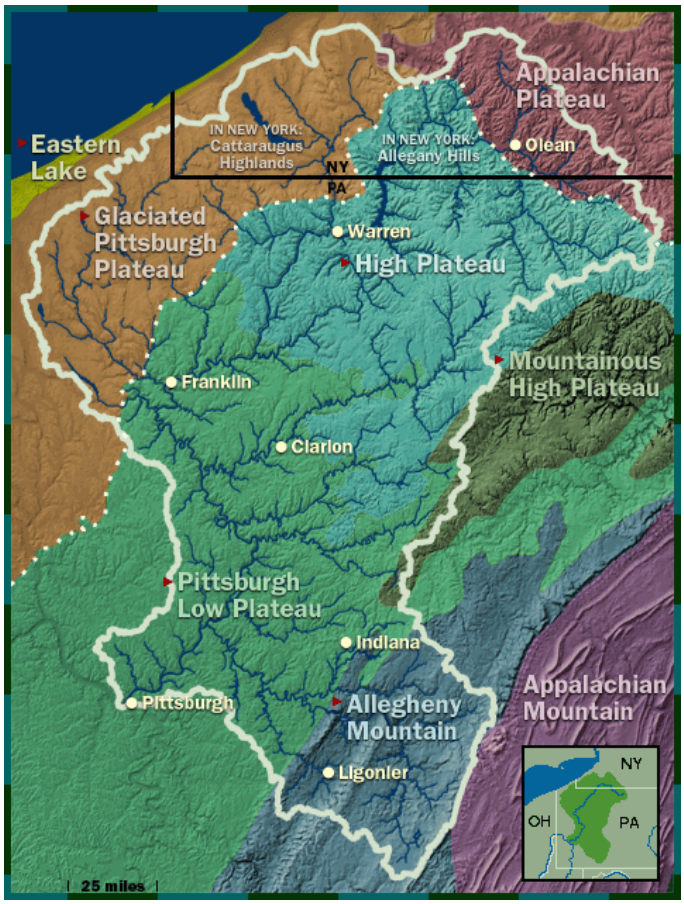


Figure 2-1. The portion of the Allegheny River included in this Plan is in the Pittsburgh Low Plateau. Taken from www.watershedatlas.org

Dendritic
A pattern for a stream or river that is tree like, with trunk and branches at acute angles

Most of the bedrock in this study area is Pennsylvanian, from 286 to 320 million years ago. It consists of cyclic sequences of sandstone, shale, conglomerate clay, coal, and limestone. The exception is the river valley between Clarion and Armstrong Counties toward Venango County. This bedrock is Mississippian, formed 320 to 360 million years ago. It is comprised of sandstone, shale, and limestone. The geologic history of the region is described below. (See also the geologic maps at the end of this chapter.)

[1] www.dcnr.state.pa.us/topogeo

1. Formation of the River Valley[2]

About 300 million years ago, western Pennsylvania was the coast of a western inland sea. Two great rivers flowed west across the state, the southernmost one draining at what is now Pittsburgh. Here, a delta formed with deposits of mud, sand, and vegetation, all of which later became shale, sandstone, and coal, respectively. The result is that much of western Pennsylvania, including Allegheny, Armstrong, Butler, and Westmoreland Counties, as well as most of Clarion and part of Venango Counties, now rest on the Main Bituminous Coal Field.

Eventually, millions of years later, the earth's plates began shifting, and the Allegheny Mountains began to form, severing the rivers and forcing new river and stream systems to flow downhill and erode the mountains. Over the centuries, the eroded material was deposited and formed the hills of our landscape that we see today.[3] (See Figure 2-2)

Bituminous
Soft coal that is used as a fuel, it has high heat content and high sulfur content and is found in relatively large supply

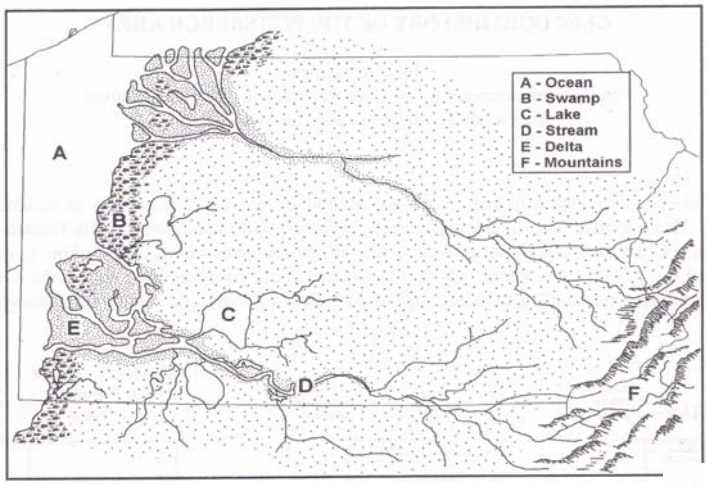


Figure 2-2. Pennsylvania's geography during the Pennsylvanian Period. Taken from John Harper's Geologic History of the Pittsburgh Area, Department of Conservation and Natural Resources (DCNR).

Approximately one million years ago, the drainage system of western Pennsylvania was vastly different. At that time, the rivers flowed north toward Canada. The Monongahela River was the dominant river in the system; it flowed along its present day channel, more or less, to Pittsburgh, then along the present channel of the Ohio River to the Beaver River. At that point, the Monongahela River flowed northward along the present day Beaver River Valley, eventually draining into an 'Ancestral Erie Basin.' The Ohio River was a tributary of the Monongahela, entering it just south of New Castle, Pennsylvania. The Allegheny River was three separate, unrelated rivers with the lower Allegheny River as a tributary of the Monongahela, and the middle and upper Alleghenies flowing directly into the Ancestral Erie Basin. The lower Allegheny River followed the present channel of the Clarion River and flowed south, joining the Monongahela River at Pittsburgh. (See Figure 2-3)

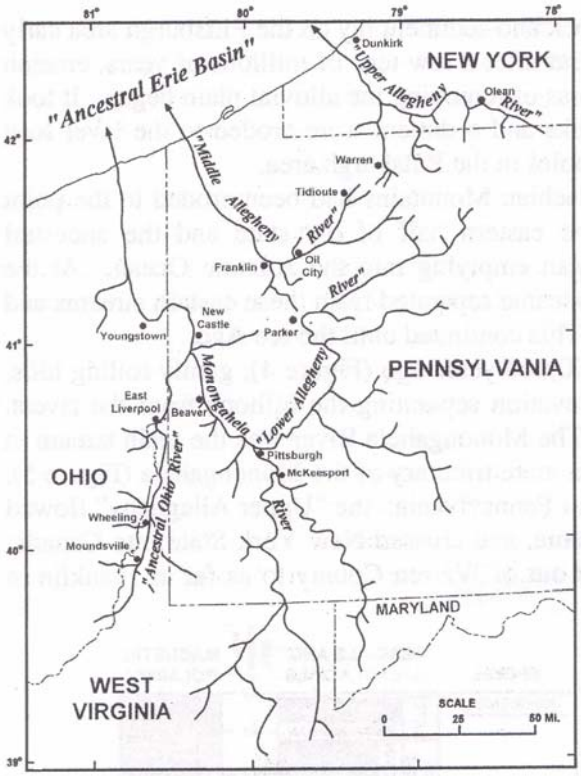


Figure 2-3. The rivers of western Pennsylvania once flowed north to an ancestral Erie Basin. Taken from John Harper's Geologic History of the Pittsburgh Area, DCNR.

[2] Harper, John. The Formation of the Allegheny River. Network Notes, December 1996. Volume 1, Issue 1. and April 1997, Volume 1, Issue 2.
[3] Kidney, Walter C. 1982. The Three Rivers. Pittsburgh History and Landmarks Foundation.

During the latter part of the Ice Age, about a half million years ago, the Illinoian glacier moved into northwestern Pennsylvania and blocked the flow of water of the northern flowing rivers. Water flowed over the ridges between the systems and carved out new valleys, took over existing channels, and reversed the flow of the rivers. As a result, the Monongahela River flowed northwest to Pittsburgh where it joined the Allegheny River – now one large river instead of three separate ones. These rivers became tributaries of the Ohio River, which now drained into the Mississippi River. (See Figure 2-4)

The retreat of the glaciers provided the river systems with additional water and energy to transport silt, sand, and gravel that had been brought to Pennsylvania by the glacier. This glacial sand and gravel would be extracted many years later as industry along these rivers developed. The land in western Pennsylvania, which had been depressed by the weight of the glaciers, rose after their retreat. Rivers were forced to cut new channels as old river valley floors were now high above the streams. The remnants of the old river valley floors, called terraces, are found within the project corridor. One example is Harmar.

The next major glaciation, the Wisconsinian, advanced into Pennsylvania 75,000 years ago. This glacial event added silt, sand, and gravel to the Allegheny and Ohio River valleys and caused the Monongahela River and its tributaries to build up their channels with sediments. By the time the Ice Age ended 10,000 years ago, the volume of water and the sediments in the rivers had declined. The rivers cut new, shallow channels in the sand and gravel, ultimately creating the modern river system.

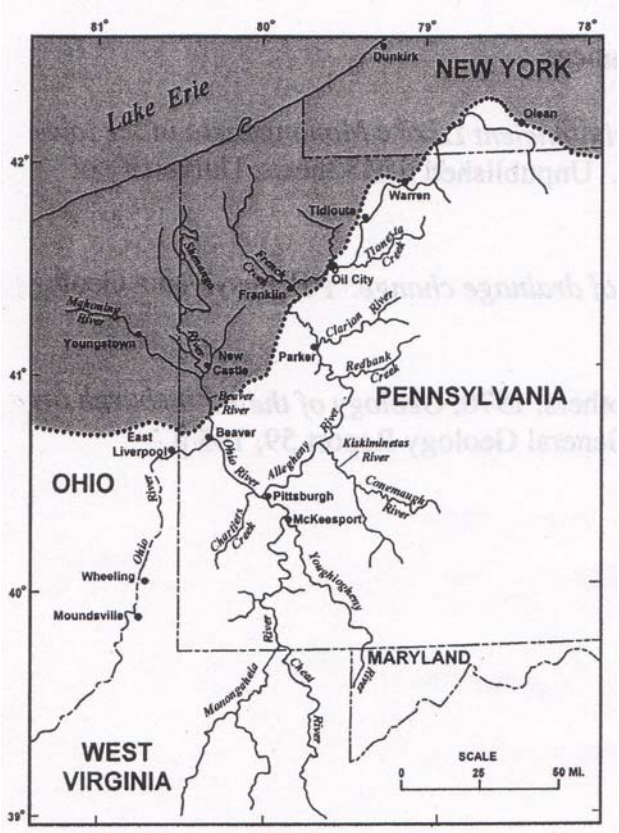


Figure 2-4. The formation of today's rivers by the southward flow of the glaciers (represented by the shaded area). Taken from John Harper's Geologic History of the Pittsburgh Area, DCNR.

B. SOILS

Following are the soil types and their percentage of area within the study area. The study area is approximately 75 miles long and includes one mile on both sides of the river.

Gilpin-Weikert-Ernest - 68%
Gilpin-Wharton-Weikert - 15%
Hazelton-Dekalb-Buchanan - 5%
Urban Land-Monongahela-Rainsboro - 4.5%
Hazelton-Cookport-Ernest - 2.3%
Uderthents-Ernest-Gilpin - 2%
Monongahela-Philo-Atkins - 1%

The soils that cover most of this area are well-drained and found on mostly upland aras. Additional information about soils within the project corridor can be found in the respective county's soil survey, produced by the U.S. Department of Agriculture Soil Conservation Service.

C. LAND COVER

Maps 2a and 2b show categories of land cover in the corridor. This information was obtained by satellite imagery. This involves using satellite pictures of the land and comparing how much light is reflected on the image to known reflectivities of certain land covers (e.g. grassland vs. forest vs. buildings). Some inaccuracies are inevitable.

The southern half of the corridor is more developed than the northern half due to its industrial past and subsequent urbanization. However, it still retains a significant rural flavor as indicated by the percentages of agricultural and forested areas.

Table 2-1
Land Cover
(corresponds to Maps 2a and 2b)

Category	Percent of Total Area in Northern Half of Corridor	Percent of Total Area in Southern Half of Corridor
Water	1.7	2.3
Low Density Urban	2.3	11.1
High Density Urban	0.3	2.1
Pasture	11.9	11.8
Row Crops	21.4	23
Forest	52.1	43.5
Wetland	0.05	0.1
Quarries	3.6	1
Coal Mines	0.2	0.1
Transitional Use	6.5	0.1

Source: PASDA

D. LAND USE

1. Land Use Tools

In Pennsylvania, decisions about land use are left to local governments. There are many tools available to local governments to help plan or manage their growth or to protect and maintain a quality of life. Four of the most prominent tools are: Planning Commissions, Comprehensive Plans, Subdivision and Land Development Ordinances, and Zoning. The following descriptions of these tools are taken from *An Inventory of Planning in Pennsylvania,* published by the Pennsylvania State College of Agricultural Sciences, 2001.

1. Planning Commission

Planning commissions "are advisors to their elected governing body on matters concerning the physical development of the community." This includes land use regulations, building structures, and planning for recreation.

2. Comprehensive Plan
A Comprehensive Plan is an important land use development tool as it "serves as a policy guide to decision making about physical development in the community. It is an explicit statement of future goals for the community and serves as a formal vision for the planning commission, elected officials, and other public agencies, private organizations, and individuals. A community's comprehensive plan provides context and direction for a community's land use ordinances and regulations and should be updated and modified continuously in response to changes in the community."

3. Subdivision and Land Development Ordinance
These regulations "establish procedures for controlling the dividing of parcels of land, [and] also set standards for creating adequate building sites. This ensures that sites are adequately served by permanent roads, a pure water supply, and proper means of waste disposal."

4. Zoning
Zoning is used to "control the location of different land uses in a community. It also may be used to restrict the types of uses to which the land may be put and the intensity of the development."

Table 2-2 looks at the presence of two of the most common tools – planning commissions and zoning – within the study area. More than half of the communities have at least one of the tools. The highest concentration of communities with both tools occurs in Allegheny and Westmoreland Counties.

Table 2-2
Land Use Tools

Municipality	Planning Commission	Zoning
Allegheny County		
Brackenridge Borough	yes	yes
Cheswick Borough	yes	yes
East Deer Township	yes	yes
Harmar Township	yes	yes
Harrison Township	yes	yes
Plum Borough	yes	yes
Springdale Borough	yes	yes
Springdale Township	yes	yes
Tarentum Borough	yes	yes
Armstrong County		
Applewold Borough	no	yes
Bethel Township	yes	no
Boggs Township	county	county
Brady's Bend Township	no	no
Cadogan Township	no	no
East Franklin Township	yes	yes
Ford City	yes	yes
Freeport Borough	yes	yes
Gilpin Township	yes	yes
Hovey Township	no	no

Kittanning Borough	yes	yes
Madison Township	no	no
Manor Township	no	no
Manorville Borough	no	no
North Buffalo Township	yes	no
Parker City	no	no
Perry Township	no	no
Pine Township	no	no
Rayburn Township	county	no
South Buffalo Township	yes	yes
Sugarcreek Township	yes	yes
Washington Township	no	no
West Kittanning Borough	no	no
Butler County		
Allegheny Township	county	no
Buffalo Township	yes	yes
Clarion County		
Brady Township	no	no
East Brady Borough	no	no
Foxburg Borough	no	no
Madison Township	no	no
Perry Township	no	no
Richland Township	no	no
Toby Township	no	no
Venango County		
Emlenton Borough	yes	yes
Scrubgrass Township	no	no
Westmoreland County		
Allegheny Township	yes	yes
City of Arnold	yes	yes
City of Lower Burrell	yes	yes
City of New Kensington	yes	yes
Source: www.pamunicipalitiesinfo.com/index2.htm (2004)		

While each local municipality may create its own comprehensive plan, countywide comprehensive plans are being created for Allegheny, Armstrong, and Westmoreland Counties. Clarion County has completed its plan. Municipalities also may choose to develop comprehensive plans jointly with other communities. The Armstrong County Multimunicipal Comprehensive Plan (Draft 2003) includes Cadogan, Freeport, West Franklin, West Kittanning, and Worthington (only Cadogan, Freeport, and West Kittanning are within the study area). More details about this plan are found at the end of this chapter.

These land use tools are very controversial in parts of Pennsylvania. While it is true that they can restrict the use of a property, they can also protect a community's character and quality of life by directing development to certain areas.

2. Act 2 and the Land Recycling Program

Act 2, or the Land Recycling and Environmental Remediation Standards Act, was signed into law by Governor Tom Ridge in 1995. This act established the Land Recycling Program, which encourages the voluntary reuse of contaminated industrial lands. Act 2 offers incentives for adaptive reuse of contaminated sites – they are:

- Uniform cleanup standards
- Liability relief
- Standardized reviews
- Financial assistance

Encouraging the development of these lands, commonly referred to as brownfields, offers many benefits, including:

- Cost-efficient development due to the existing infrastructure on the land.
- Preservation of farmland, forested areas, and open space from development.

Table 2-3
Act 2 Clean-up Sites
*site has been completed

Municipality	Name
Ford City	PPG*
Upper Burrell	ALCOA PILOT Atomizer*
Richland	Perryville Clarion*
North Buffalo	PPG Slurry Lagoon Rt. 128
Lower Burrell	Paul Taylor, John Farrar
Source: www.dep.state.pa.us	

3. Industrial Sites for Sale

Two programs offer information on land for sale. The Port of Pittsburgh lists on its website (www.port.pittsburgh.pa.us) riverfront properties for sale. In early 2005 they had listed the following sites: Reesedale Industrial Site, Snyder Industrial Site (Kittanning), Schenley Industrial Park, Springdale Power Station, Allegheny Valley Industrial Park.

The Pennsylvania Site Finder is a statewide program that aims to recycle properties instead of developing on greenfields (undeveloped open space). The inventory of sites is at www.pasitefinder.state.pa.us

4. Redevelopment

Examples of former industrial sites or declining communities that are undergoing revitalization include:

a. PPG at Ford City[4]

The Pittsburgh Plate Glass Company was established in 1883, and in 1887 it built a plant along the Allegheny River in Ford City. It was at one time the largest plate glass factory in the world, employing

[4] www.epa.gov

5,000 workers. However, business declined and by 1993 PPG Industries, the present name of the company, closed the factory. In 1981, the north end of the former plant property was sold to the Middle Armstrong County Area Development Organization (MACADO). Part of the MACADO property known as former PPG Shop 2 was eventually leased to a foundry company, AMCO, that later filed for bankruptcy. Ford City would later acquire the AMCO site from MACADO. Preliminary contaminant assessments were completed by DEP on the former AMCO site. In 1998, Ford City received an EPA Brownfields Pilot award, which enabled a more detailed assessment. Studies of the AMCO site showed that metals had contaminated the soils and that there were slight traces of volatile organic compounds in the groundwater.

In 2001, PPG completed remediation of the south end of the former PPG Ford City plant property under the Pennsylvania Land Recycling and Environmental Remediation Standards Act 2 of 1995 (Act 2). Remediation activities included the collection and analysis of soil and groundwater samples, the placement of a protective cover over affected soils, monitoring of natural attenuation for groundwater, a soil management plan for future excavation activities and institutional controls to restrict groundwater use on the plant property. The remediation activities demonstrated attainment of state soil and groundwater standards to allow reuse of the property. The Pennsylvania Department of Environmental Protection (DEP) reviewed and approved PPG's cleanup plan for the property. The deed to the south end of the former plant property was conveyed to Ford City Borough in October 2002.

The Greater Ford City Community Development Corporation, which had been created by the Borough in 1999 to administer grants and develop brownfields, has created a plan for the former AMCO site and south end of the former PPG plant called the Heritage Technology Park. The Heritage Technology Park will offer commercial, office and light industrial space, a business incubator, a video conference distance learning center, a museum about plate glass making, an office and public meeting house, 8,000 feet of walking trails along the river, a new parking area, and a wall to protect the area from flooding - a multi-million dollar endeavor. To date, the U.S. Department of Housing and Urban Development, the Economic Development Administration, the Commonwealth of Pennsylvania, the Steel Industry Heritage Corporation, the ACE and the DEP have provided funding. In February 2005, a ribbon-cutting ceremony was held to celebrate the newest company to occupy PPG's former Shop 2 building, which has been transformed into a new 9,200 square-foot state-of-the art manufacturing facility for silicon carbide wafers, which are used in the electronics industry.

A former PPG sand quarry and slurry lagoon area just outside of Ford City is a planned remediation project of PPG and Ford City, with assistance provided by the Wildlife Habitat Council, a non-profit organization that works with companies to establish wildlife habitat on industrial sites. PPG proposes to utilize phytoremediation technology to restore this Ford City Borough property. Recreational areas are planned as well, including ballfields, picnic areas, and a nature trail.

b. Urban Redevelopment

New Kensington and Arnold are part of an Urban Laboratory Project, conducted by Carnegie Mellon University's schools of architecture and public policy. Using significant public input, students created architectural schematics and economic and social revitalization plans for the communities at a macro-scale. The plan assumed the creation of a proposed commuter rail line that will connect Arnold and New Kensington with the city of Pittsburgh. Some of the students' initial ideas included creating parks along the riverfronts and moving businesses to Rt. 366. The two communities, along with the Urban Laboratory Project and the Weed and Seed program, are developing a committee that will work on a redevelopment project at a micro-scale. This effort will be a detailed, block-by-block restoration of the communities.

5. Mining Facilities

All mining operations must be permitted by the DEP. Those operations include surface and underground coal mining and mineral mining. The individual sites in this corridor are too numerous to note, however information can be viewed using DEP's eFacts, at www.dep.state.pa.us

Specific mining locations adjacent to the river include:

- Rosebud Mining operations - west bank above L&D 6, also in Logansport

Mining, or dredging, the river for commercial sand and gravel is addressed in Chapter 3.

E. WASTE MANAGEMENT

1. Landfills and Recycling

Title 25, Chapter 271 of the PA Code lays out the general provisions for municipal waste management. Waste disposal and landfill activities must obtain the proper permits and work through the DEP. There are no active landfills in the study area.

In an effort to reduce the waste stream and to promote recycling, Act 101 – the Municipal Waste Planning, Recycling, and Waste Reduction Act – was established in 1988. Act 101 mandates recycling in Pennsylvania's larger municipalities, requires counties to develop municipal waste management plans, and provides for grants to offset expenses.

The goals of the Act are to reduce Pennsylvania's municipal waste generation; recycle at least 25% of waste generated; procure and use recycled and recyclable materials in state governmental agencies; and educate the public as to the benefits of recycling and waste reduction. (The benefits of recycling and waste reduction include reduced pollution risks; conservation of natural resources, energy, and landfill space; and reduced disposal costs.)[5]

The counties in this study area each have a recycling program:

- Allegheny County Recycling Coordinator – Allegheny County Health Department Division of Waste Management
- Armstrong County Recycling Coordinator – Department of Planning and Development
- Butler County Recycling and Waste Management Coordinator – Department of Recycling and Waste Management
- Clarion County Recycling County – Department of Planning and Development
- Venango County Recycling Coordinator – Parks Unlimited
- Westmoreland County – Pennsylvania Cleanways

2. Illegal Dump Sites

There are numerous locations in the study area that have become informal and illegal dumping areas for refuse. The following organizations are addressing this problem.

- PA Cleanways is a non-profit organization whose mission is to empower people to eliminate illegal dumping and littering in Pennsylvania. The group, which is organized by county chapters, has the following active chapters in this study area: Allegheny, Butler, Westmoreland, and Venango Counties. See www.pacleanways.org for more information.

- PA DEP sponsors an annual River Sweep to clean up debris along rivers and streams in six southwestern Pennsylvania counties. In 2004, approximately 600 volunteers removed more than

[5] http://www.dep.state.pa.us/dep/deputate/airwaste/wm/RECYCLE/FACTS/Act101.htm

60 tons of trash along the rivers in Allegheny, Armstrong, Beaver, Greene, Washington, and Westmoreland Counties. See www.dep.state.pa.us for more information.

- PA Resources Council is a non-profit organization that works to reduce litter and promotes recycling throughout the state. They sponsor collection events for hard-to-dispose-items, such as large appliances, rimless tires, latex paint, electronics, and cell phones. See www.prc.org for more information.

- Construction Junction is a non-profit business that buys and sells construction debris and materials, such as cabinets, doors, windows, and lumber. See www.constructionjunction.org for more details.

3. Hazardous Waste

Hazardous waste sites and landfills near rivers and tributaries have the potential to contaminate surface and underground water supplies via runoff and leaching through the soil into the water table or aquifer. Aside from these potential threats to surface and ground water, landfills are also a possible danger to those who live, work, or play nearby. Therefore, the U.S. Environmental Protection Agency (EPA) has promulgated the following laws to deal with hazardous waste problems.

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (also known as Superfund) is a national program administered by the EPA to clean up hazardous waste sites that were contaminated before 1980. These sites are commonly abandoned industrial lands or landfills where disposal of hazardous material occurred prior to existing laws that regulated industrial activities and disposals. The National Priority List (NPL) contains those sites that are being remediated first due to the severity of their status. Table 2-4 shows the sites within this study area. It should be noted that there are sites outside of this area (i.e. upstream from the rivers or tributaries) that may affect water quality.

Table 2-4
CERCLA Sites

Site Name	Address	County	NPL Status (National Priority List)
Lindane Dump	RTE 28 and Spring Hill Road, Harrison Township, PA 15065	Allegheny	Currently on the Final NPL
Richardson Construction (DDT) Site	Springdale Hollow Rd. Sprindale PA, 15144	Allegheny	Not on the NPL
Bakerstown Road Assessment	1212 Bakerstown Rd. Tarentum, PA 15084	Allegheny	Not on the NPL
PPG Glass Dump	RTE 128 Ford City, PA 16226	Armstrong	Not on the NPL
Craig Farm Drum	SR 4001 Parker, PA 16049	Armstrong	Currently on the Final NPL

Wade Disposal	RD #1 TWP RTE 729 Parker, PA 16049	Armstrong	Not on the NPL
Hranica Landfill	Hranica Dr. Buffalo Township, PA 16055	Butler	Deleted from the Final NPL
RR2 Emlenton Lead Site	Rural Route 2, BOX 2 Emlenton, PA 16373	Venango	Not on the NPL
Source: http://www.epa.gov/enviro/index.html (Envirofacts Warehouse)			

The Commonwealth of Pennsylvania, under its Land Recycling and Environmental Remediation Standards Act, and the Hazardous Sites Cleanup Act, has the authority to order clean-ups of hazardous sites that are not normally included under CERCLA. The sites in Table 2-4 have been remediated at a cost of less than $2 million.

Table 2-5
Hazardous Sites Cleanup Act

Site Name	Muncipality	County	Date of Action
Phoenix Materials	East Franklin Township	Armstrong	8/24/1989
Delta Chemical	North Buffalo Township	Armstrong	9/19/1989
R.O. Murphy	Allegheny Township	Butler	NA
Source: www.dep.state.pa.us, keyword "waste management"			

The Federal Resource Conservation and Recovery Act (RCRA) requires the permitting of all hazardous waste handlers, including generators, transporters, treaters, storers, and disposers. States may administer their own RCRA permitting as does Pennsylvania, but still must report to EPA. There are too numerous RCRA-permitted facilities in this corridor to list in this Conservation Plan. To view those facilities, visit www.epa.gov/enviro/index_java.html

4. Toxics Release Inventory[6]

Following a fatal chemical-release accident in Bhopal, India, the Emergency Planning and Community Right-to-Know Act (EPCRA) was enacted to promote emergency planning, to minimize the effects of an accident such as occurred at Bhopal, and to provide the public with information on releases of toxic chemicals in their communities.

Section 313 of EPCRA established the Toxics Release Inventory (TRI), which is a database that contains information on the quantities of certain toxic chemicals released into the environment, including the specific sources and locations from which these releases occurred, and to which environmental media (i.e., land, air, water). Specifically, Section 313 of EPCRA requires certain facilities within certain industry

[6] Summary taken from www.epa.gov/tri/

sectors to file reports of their disposal or other environmental releases as well as other waste management quantities of chemicals listed on the EPCRA Section 313 list of toxic chemicals if they manufacture, process, or otherwise use more than established threshold quantities of these chemicals. The TRI Program is responsible for collecting the release and other waste management information and disseminating it to the public. These data inform the public of releases and other waste management quantities of toxic chemicals in their communities and enable citizens to make informed decisions regarding the consequences of such releases. The releases and other waste management quantities of a listed chemical are filed by completing an EPCRA Section 313 release report (Form R) and submitting it to the EPA, state, and tribal governments.

A facility must report yearly to TRI if it:
1. Operates within any of the following industry sectors:
- Manufacturing
- Metal mining
- Coal mining
- Electrical utilities that combust coal and/or oil for the purpose of generating power for distribution in commerce
- Resource Conservation and Recovery Act (RCRA) Subtitle C hazardous waste treatment and disposal facilities
- Chemical wholesalers
- Petroleum terminals and bulk stations
- Solvent recovery services
- A federal facility; and

2. Employs 10 or more full-time-equivalent employees; and
3. Manufactures or processes more than 25,000 pounds or otherwise uses more than 10,000 pounds of any listed chemical during the calendar year, except for PBT chemicals where the thresholds are 0.1 gram for dioxin and dioxin-like compounds, and 10 or 100 pounds for other PBT chemicals.

Users of TRI information should be aware that TRI data do not reveal whether or to what degree the public is exposed to listed chemicals. TRI data, in conjunction with other information, can be used as a starting point in evaluating exposures and risks. The determination of potential risk to human health and/or the environment depends upon many factors, including the toxicity of the chemical, the fate of the chemical in the environment, and the amount and duration of human or other exposure to the chemical.

For more detailed information on the TRI, and to view reports for each facility in each county, visit http://oaspub.epa.gov/enviro/ef_home2.toxics.

F. CRITICAL AREAS

1. Landslides

This region of Pennsylvania is highly susceptible to landslides. A combination of a humid temperate climate, locally steep and rugged topography, weak rock strata, springs, and a great diversity in the weathering and erosion characteristics of near surface sedimentary rocks makes this project area one of the most slide-prone areas in the state. In addition, landslides can be triggered by:
- Surface and subsurface excavations (including coal removal),
- Addition of fill, which increases the stress on underlying materials,
- Changes in quantity or the direction of water flow, and
- ‘Red Beds’- bedrock in hillsides composed of claystones and shales that are 40-60 feet deep. This bedrock weathers easily, especially when wet, and causes unstable slopes. Stabilization and repair can cost thousands to millions of dollars.

Because steep slopes are more susceptible to landslides, they are often not developed; therefore, they are generally suited for woodland and wildlife habitats. See Map 5 for areas of slope >25%.

2. Abandoned Mines / Problem Areas

Southwestern Pennsylvania's long history of coal mining and other mineral extraction has left a legacy of abandoned mines, which are now considered to be problem areas by DEP's Bureau of Abandoned Mine Reclamation. The Bureau's main focus is to identify and remediate any problem areas, such as subsidence, underground fires, and abandoned mine entry holes. (See Map 4)

3. Flood Prone Areas

Floodplains are the low-lying lands along a stream or river that are most prone to flooding. Building in floodplains is common, but often leads to heavier flooding due to 1) the loss of riparian vegetation, which normally helps to absorb excess waters, and 2) the cumulative effect of runoff from impervious surfaces, such as houses, streets, driveways, and parking lots throughout the watershed.

Riparian vegetation
The vegetation that grows along a body of water. These important areas filter sediments and utilize nutrients from runoff, maintain and stabilize streambanks, and provide habitat for aquatic species.

Flooding at Kittanning's Riverfront Park

FEMA
The Federal Emergency Management Agency is an independent agency reporting to the President and tasked with responding to, planning for, recovering from, and mitigating against disasters, including flooding. More information can be found at: www.fema.gov

In response to heavy flooding in Pittsburgh in 1907 and 1936, the US Army Corps of Engineers (ACE) built dams on the rivers' tributaries (Crooked and Mahoning Creeks) and the upper part of the river (Kinzua) to control the flow of water. Nonetheless, flooding still occurs today along streams and rivers in the region. Under the ACE, Section 205 of the Continuing Authorities Program allows for funding for small local flood damage reduction projects. The money allows for the study, design, and construction of projects that protect communities from flooding. In addition, the National Flood Insurance Program provides coverage for flood victims; however, insurance is only provided if local communities enact and enforce land-use controls in flood-prone areas.[7] The Pennsylvania Flood Plain Management Act (Act 166) requires municipalities in identified flood plain areas to adopt floodplain management ordinances, codes, or regulations.

The ACE also maintains a website with timely information on the conditions of reservoirs, rivers, and streams, as well as a release forecast for its reservoirs. Daily information may be obtained from http://wmw.lrp.usace.army.mil/.

[7] Flooding in Western PA. Pittsburgh Geological Society. www.pittsburghgeologicalsociety.org.

4. Ice Jams

The serpentine channel of the Allegheny River makes it susceptible to ice jams and related flooding, however it is difficult to predict when and where these jams may occur. According to the ACE, there are two types of ice jams[8]:

1. freezeup jams, which occur during the initial ice formation as the ice accumulates, restricting water flow, and
2. breakup jams, which occur when ice cover breaks up and clogs the river. As a result, water backs up and floods low lying areas upstream. When the jam breaks, a rapid surge of water can flood communities downstream.

The ACE's Cold Regions Research and Engineering Laboratory (CRREL) maintains an ice jam database, which is updated annually to provide a summary of the previous year's ice events. The database, found at www.crrel.usace.army.mil/ierd/ijdb/index.html, contains the following fields: location, river, jam date, water year (1 October to 30 September), jam type, damages, CRREL contact, local contact, visuals, reports, latitude, longitude, hydrologic unit, gauge number, index number, publications, and descriptions.

According to this database, the Allegheny River had eight documented ice jams from October 1, 2000 to September 30, 2001. Seven of those were located in the study corridor (West Monterey, two different days in Parker, Hillville, Foxburg, and two different days in East Brady). There were no documented ice jams during the 2001 – 2002 year. However, during the 2002-2003 year, there were seven records of ice jams on the Allegheny River with four of them in the study corridor (West Monterey, Parker, Emlenton, and East Brady). The 2003-2004 year had one reported ice jam at Parker.

The National Weather Service's Forecast Office in Pittsburgh issues river ice statements twice weekly during the ice season. It has eight forecast points in the corridor (Parker, Rimerton, Mosgrove, Kittanning, Freeport, Clinton, Natrona, and Acmetonia). The ice information can be found at www.erh.noaa.gov/er/pit/hydro.htm. The Forecast Office also keeps high water records for the entire Allegheny River basin.

5. Natural Heritage Areas

These are areas that are important due to the presence of high biological diversity, a rare or exemplary natural community, a species of special concern, or for a particular use, such as nature study or instruction. More information about these areas can be found in Chapter 4-E-4.

6. Viewscapes

Viewscapes are scenic areas that showcase the region's natural beauty, such as the overlook at Brady's Bend and the views of the river from Emlenton to Parker. These areas are important to preserve, as they help to define the character of the river corridor.

Overlook at Brady's Bend

[8] Ice Engineering. *Ice Jams*, Winter 2000-2001. U.S. Army Corps of Engineers Cold Research and Engineering Laboratory.

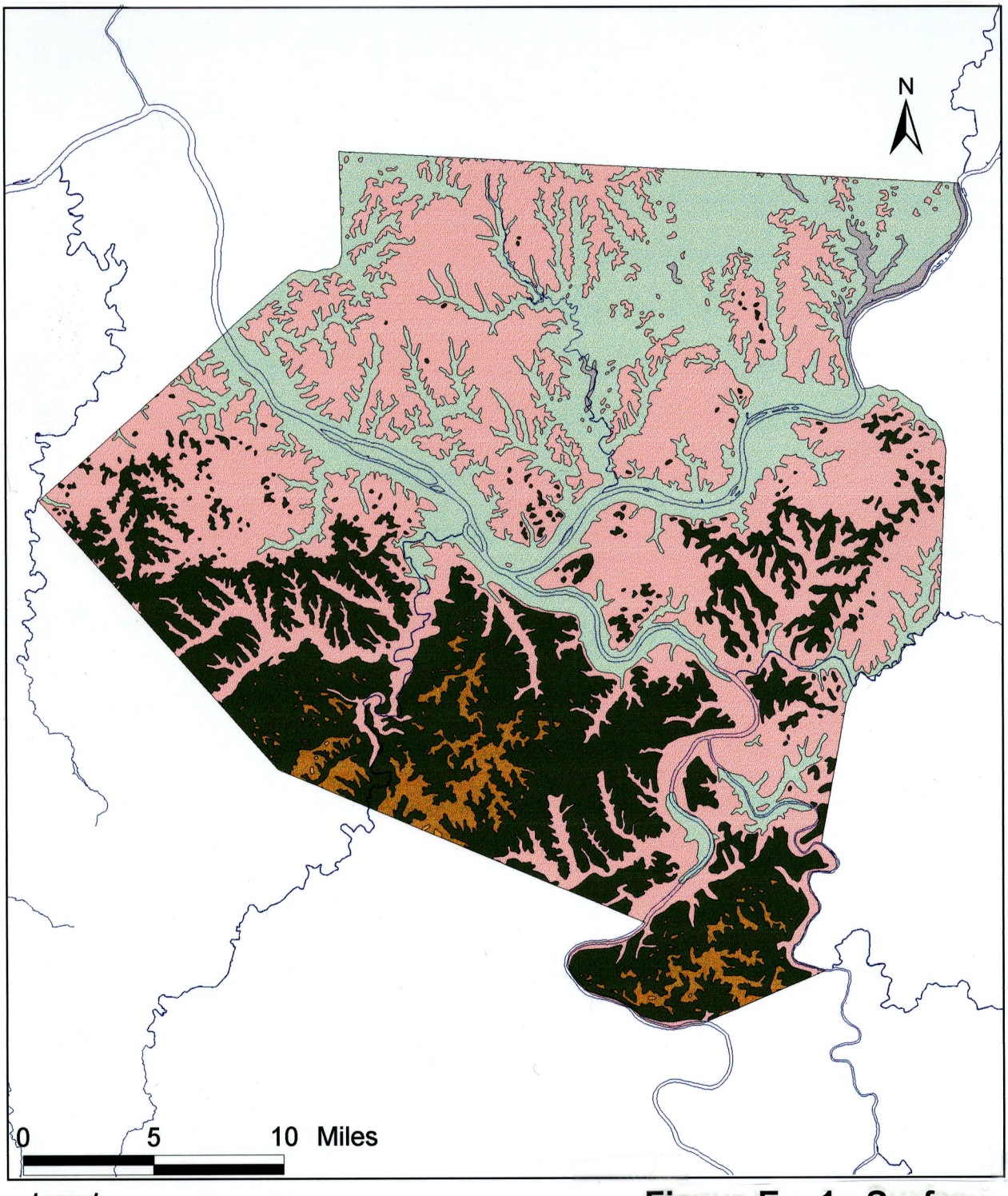
7. Natural Infrastructure

The Southwest Planning Commission, DCNR, Pennsylvania Environmental Council, and The Heinz Endowments have sponsored a project to catalog and evaluate the natural infrastructure of the region. The Natural Infrastructure Atlas is a series of maps and detailed descriptions of the region's natural environment, which supports human needs and desires (e.g. water resources, coal reserves). This Atlas is available for the counties in the Southwest Planning Commission area (Allegheny, Armstrong, Butler, and Westmoreland Counties of the RCP study area). This baseline data will allow people to make informed decisions about the use of those resources.

In addition to the Atlas, a Natural Infrastructure Framework exists as an integrated planning approach that can be applied to optimize the use of the resources. Each natural resource can be individually evaluated and valued. The goal is to achieve balance when conflicts between uses arise. For more information, contact the Southwest Planning Commission, www.spcregion.org.

Chapter 2

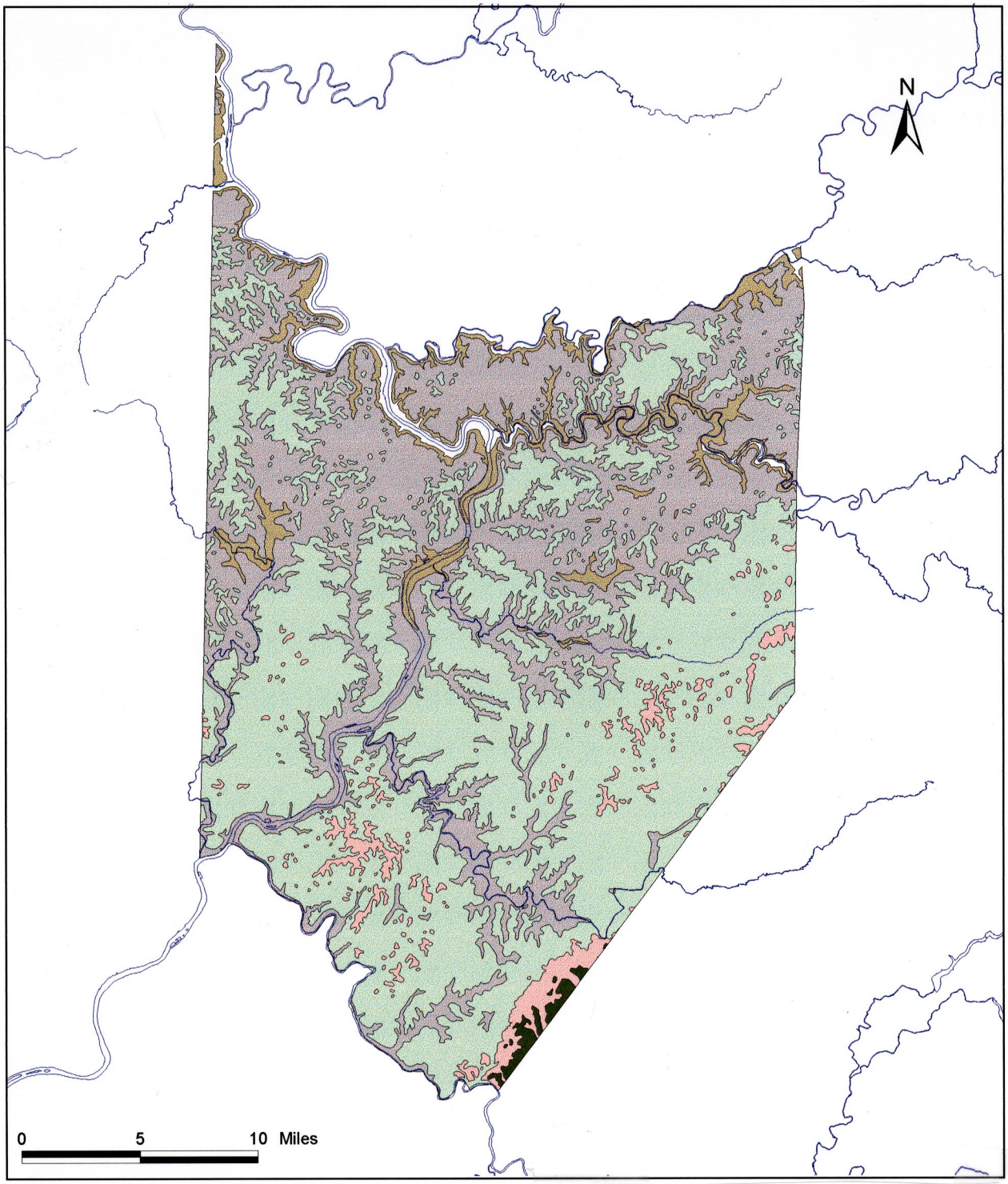
Appendix



Legend:

- *Allegheny Group*
- *Casselman Fm*
- *Glenshaw Fm*
- *Monongahela Group*
- *Washington Fm*
- *Waynesburg Fm*
- *Rivers and Streams*

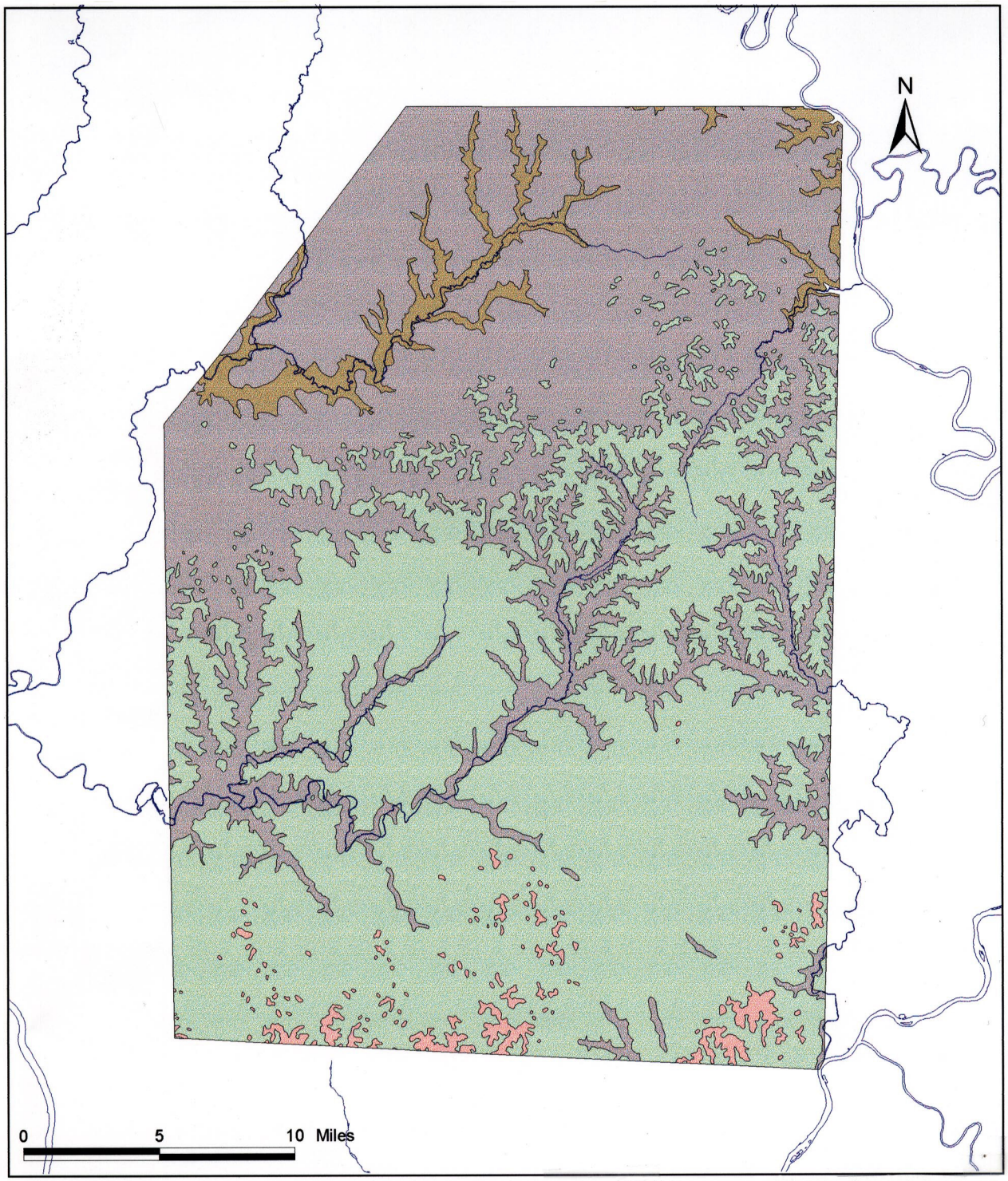
Figure E – 1. Surface Geology for Allegheny County



Legend:

- ***Allegheny Group***
- ***Burgoon Sandstone***
- ***Casselman Fm***
- ***Glenshaw Fm***
- ***Monongahela Group***
- ***Pottsville Group***
- ***Shenango Fm***
- ***Rivers and Streams***

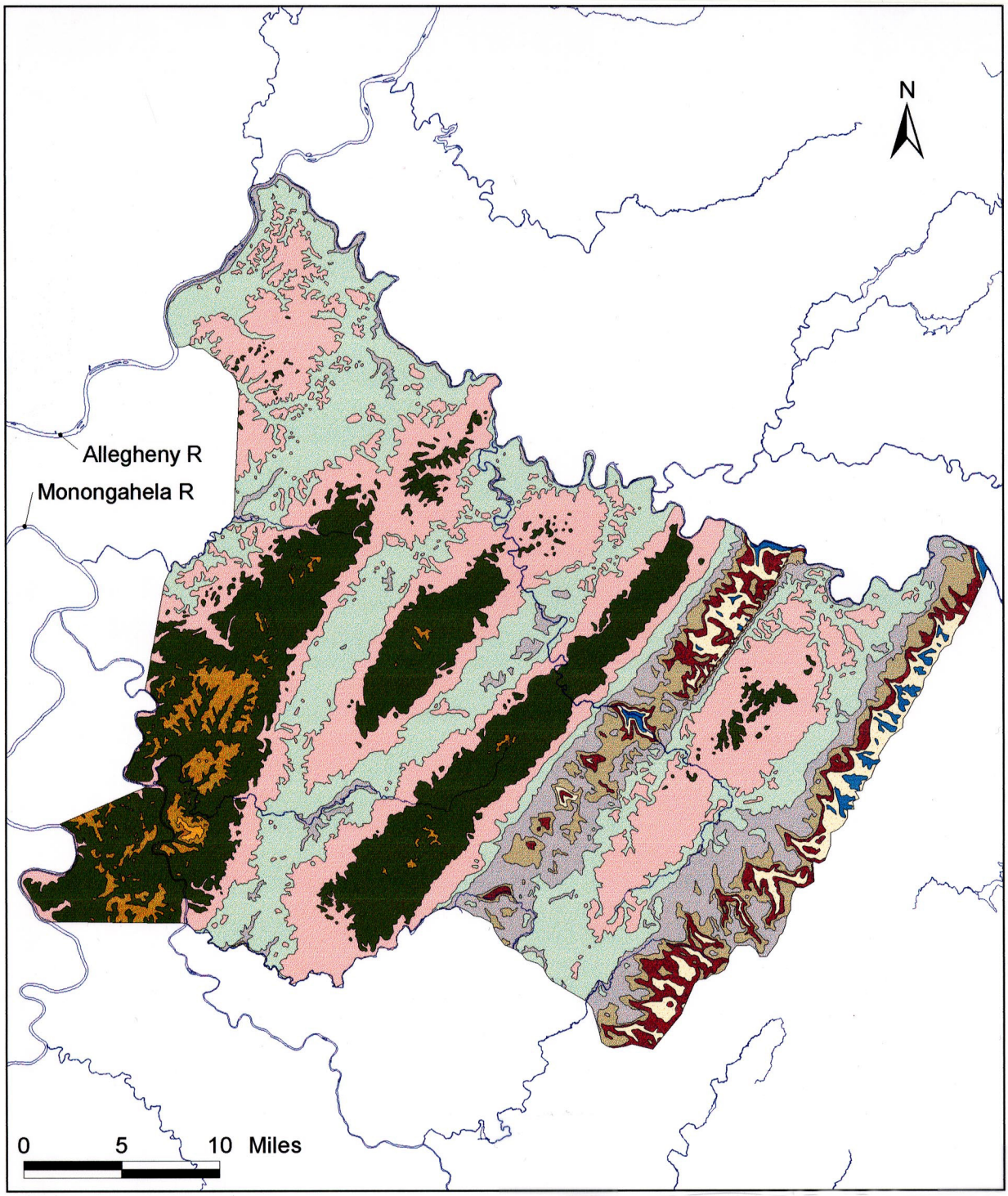
Figure E – 2. Surface Geology for Armstrong County



Legend:

- ***Allegheny Group***
- ***Casselman Fm***
- ***Glenshaw Fm***
- ***Pottsville Group***
- ***Shenango Fm***
- ***Rivers and Streams***

Figure E – 4. Surface Geology for Butler County



Legend:

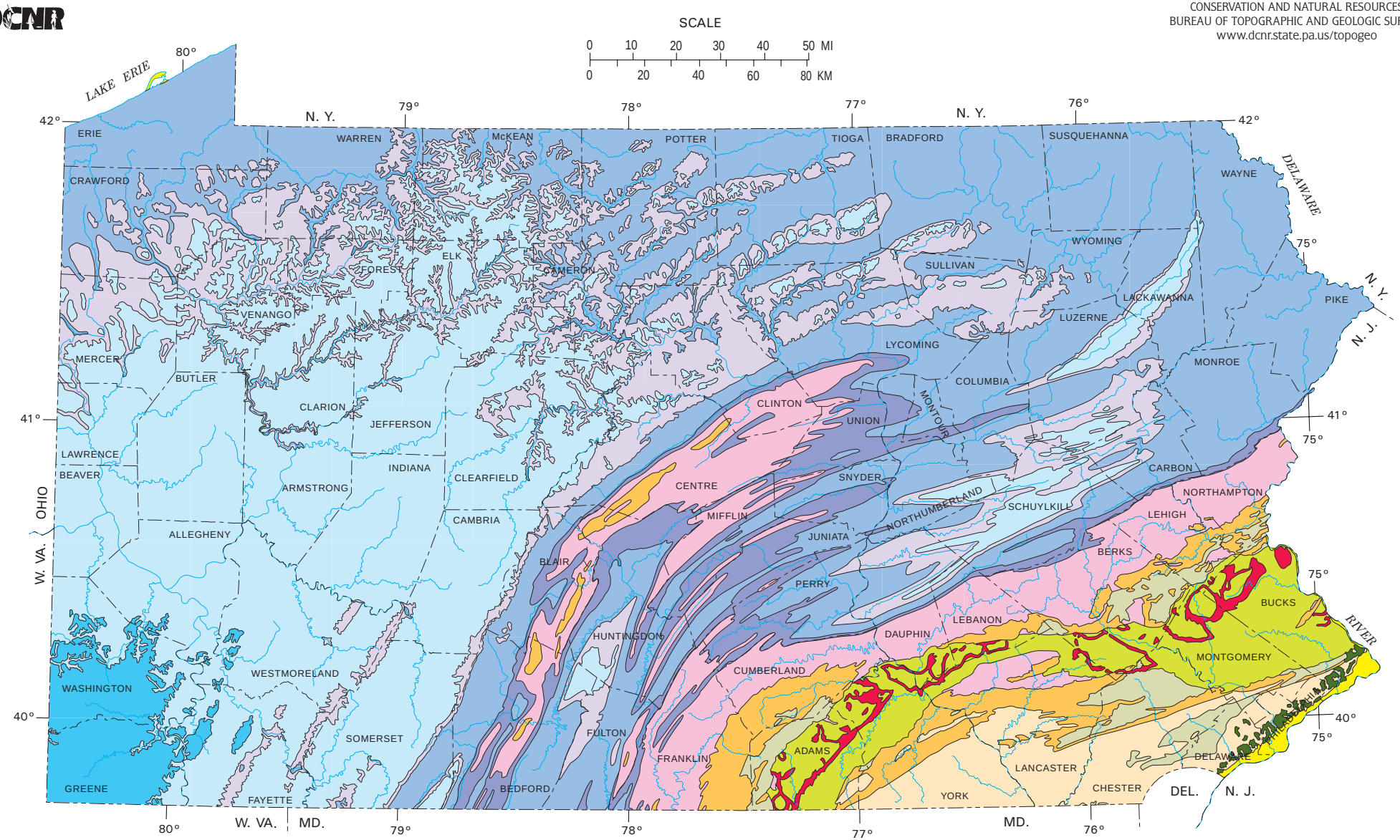
- *Allegheny Group*
- *Burgoon Sandstone*
- *Casselman Fm*
- *Glenshaw Fm*
- *Monongahela Group*
- *Pottsville Group*
- *Shenango Fm*
- *Waynesburg Fm*
- *Mauch Chunk Fm*
- *Washington Fm*
- *Streams and Rivers*

Figure E – 5. Surface Geology for Westmorland County

MAP 7

GEOLOGIC MAP OF PENNSYLVANIA

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF
CONSERVATION AND NATURAL RESOURCES
BUREAU OF TOPOGRAPHIC AND GEOLOGIC SURVEY
www.dcnr.state.pa.us/topogeo



EXPLANATION

QUATERNARY	TERTIARY	JURASSIC AND TRIASSIC	PERMIAN	PENNSYLVANIAN	MISSISSIPPIAN	DEVONIAN	SILURIAN	ORDOVICIAN	CAMBRIAN	LOWER PALEOZOIC	PRECAMBRIAN
(0–2 mil. yrs.)	(2–67 mil. yrs.)	(140–250 mil. yrs.)	(250–290 mil. yrs.)	(290–330 mil. yrs.)	(330–365 mil. yrs.)	(365–405 mil. yrs.)	(405–430 mil. yrs.)	(430–500 mil. yrs.)	(500–570 mil. yrs.)	(430–570 mil. yrs.)	(older than 570 mil. yrs.)
Sand, gravel, and silt. *Sand and gravel.*	Sand, gravel, silt, and clay. *Sand and gravel.*	Red sandstone, shale, and conglomerate (green), intruded by diabase (red). *Building stone, iron.*	Cyclic sequences of shale, sandstone, limestone, and coal. *Lime, clay.*	Cyclic sequences of sandstone, red and gray shale, conglomerate, clay, coal, and limestone. *Coal, clay, lime, building stone.*	Red and gray sandstone, shale, and limestone. *Flagstone, limestone, clay.*	Red sandstone, gray shale, black shale, limestone, and chert. *Flagstone, silica sand, clay, lime.*	Red and gray sandstone, conglomerate, shale, and limestone. *Lime, building stone.*	Shale, limestone, dolomite, and sandstone. *Slate, limestone, zinc, clay.*	Limestone, dolomite, sandstone, shale, quartzite, and phyllite. *Lime, building stone.*	Metamorphic rocks (metasedimentary and meta-igneous); schist, gneiss, quartzite, serpentine, slate, and marble. *Building stone, talc.*	Gneiss, granite, anorthosite, metadiabase, metabasalt, metarhyolite, and marble. *Building stone, graphite, sericite.*

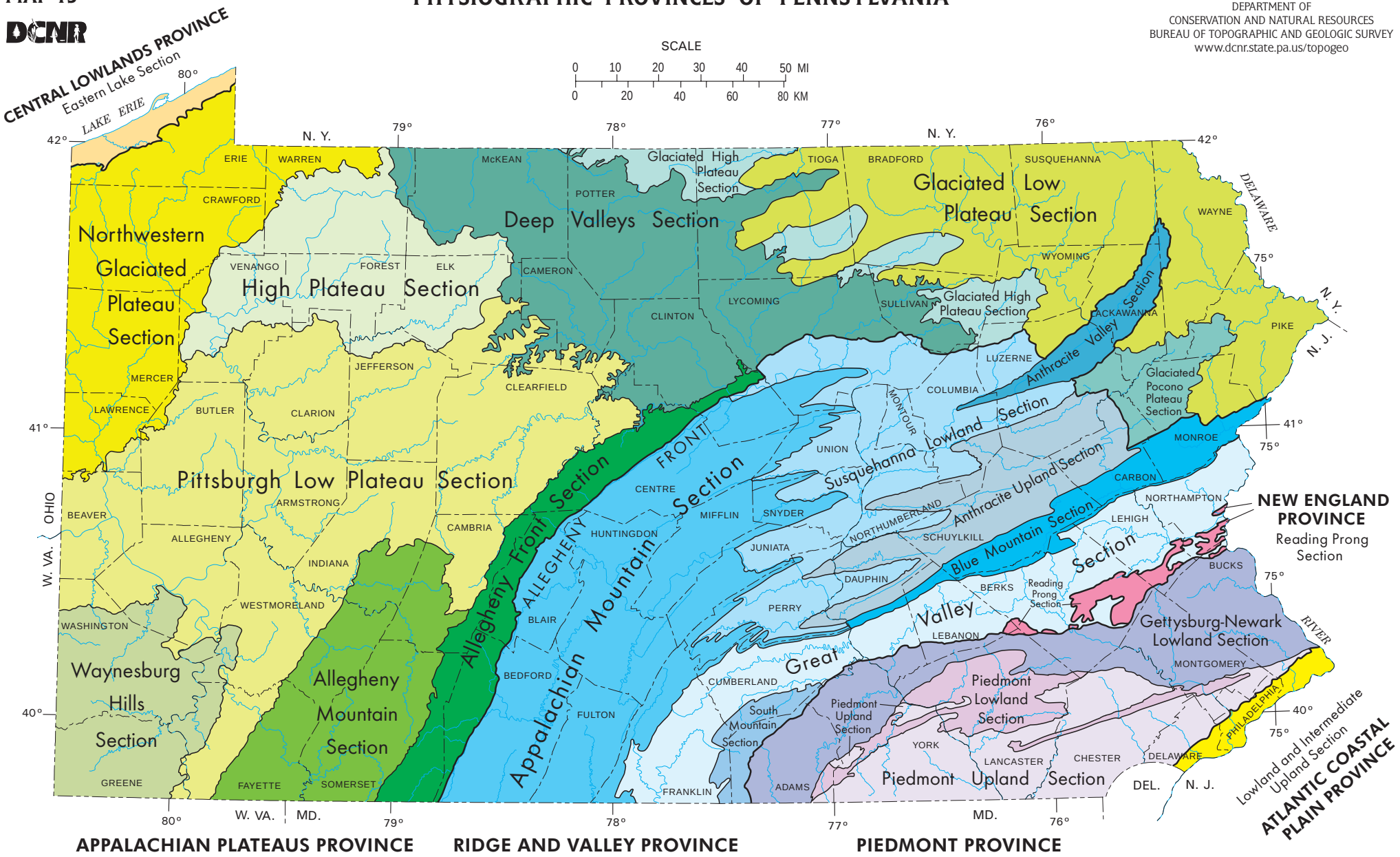
Prepared by Bureau of Topographic and Geologic Survey.
Third Edition, 1990; Third Printing, Revised, 2000.

2200–MP–DCNR0498
Printed on Recycled Paper

MAP 13

PHYSIOGRAPHIC PROVINCES OF PENNSYLVANIA

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF
CONSERVATION AND NATURAL RESOURCES
BUREAU OF TOPOGRAPHIC AND GEOLOGIC SURVEY
www.dcnr.state.pa.us/topogeo



EXPLANATION

CENTRAL LOWLANDS PROVINCE
- Eastern Lake Section

APPALACHIAN PLATEAUS PROVINCE
- Northwestern Glaciated Plateau Section
- High Plateau Section
- Pittsburgh Low Plateau Section
- Waynesburg Hills Section
- Allegheny Mountain Section
- Allegheny Front Section
- Deep Valleys Section
- Glaciated High Plateau Section
- Glaciated Low Plateau Section
- Glaciated Pocono Plateau Section

RIDGE AND VALLEY PROVINCE
- Appalachian Mountain Section
- Susquehanna Lowland Section
- Anthracite Valley Section
- Anthracite Upland Section
- Blue Mountain Section
- Great Valley Section
- South Mountain Section

NEW ENGLAND PROVINCE
- Reading Prong Section

PIEDMONT PROVINCE
- Gettysburg-Newark Lowland Section
- Piedmont Lowland Section
- Piedmont Upland Section

ATLANTIC COASTAL PLAIN PROVINCE
- Lowland and Intermediate Upland Section

SYMBOLS
- Approximate boundary between physiographic provinces
- Approximate boundary between physiographic sections

Compiled by W. D. Sevon. Fourth Edition, 2000.

PHYSIOGRAPHIC PROVINCES OF PENNSYLVANIA

PHYSIOGRAPHIC PROVINCE	PHYSIOGRAPHIC SECTION	DOMINANT TOPOGRAPHIC FORM	LOCAL RELIEF[1]	UNDERLYING ROCK TYPE	GEOLOGIC STRUCTURE	APPROXIMATE ELEVATION[2] Min.	Max.	DRAINAGE PATTERN	BOUNDARIES	ORIGIN
CENTRAL LOWLANDS	Eastern Lake	Northwest-sloping, lake-parallel, low-relief ridges.	Very low to low.	Shale and siltstone.	Beds either horizontal or having low south dip.	570	1,000	Parallel.	*Northwest:* Lake Erie. *Southeast:* Base of escarpment.	Glacial, lake, and fluvial deposition and erosion.
APPALACHIAN PLATEAUS	Northwestern Glaciated Plateau	Broad, rounded upland and deep, steep-sided, linear valleys partly filled with glacial deposits.	Very low to moderate.	Shale, siltstone, and sandstone.	Subhorizontal beds.	900	2,200	Dendritic.	*Northwest:* Base of escarpment. *Southeast:* Glacial border.	Fluvial and glacial erosion; glacial deposition.
	High Plateau	Broad, rounded to flat uplands having deep, angular valleys.	Moderate to high.	Sandstone, siltstone, shale, and conglomerate; some coal.	Low-amplitude, open folds.	980	2,360	Dendritic.	*Northwest:* Glacial border. *Northeast:* Margins of deep valleys. *South:* Arbitrary along drainage divides between coal and noncoal areas.	Fluvial erosion; periglacial mass wasting.
	Pittsburgh Low Plateau	Smooth to irregular, undulating surface; narrow, relatively shallow valleys; strip mines and reclaimed land.	Low to moderate.	Shale, siltstone, sandstone, limestone, and coal.	Moderate- to low-amplitude, open folds, decreasing in occurrence northwestward.	660	2,340	Dendritic.	*Northwest:* Glacial border. *Elsewhere:* Arbitrary at topographic changes with adjacent sections.	Fluvial erosion; periglacial mass wasting; strip mining.
	Waynesburg Hills	Very hilly with narrow hilltops and steep-sloped, narrow valleys.	Moderate.	Sandstone, shale, red beds, and limestone.	Horizontal beds.	848	1,638	Dendritic.	Arbitrary at change of topography.	Fluvial erosion and landslides.
	Allegheny Mountain	Wide ridges separated by broad valleys; ridge elevations decrease to north.	Moderate to high.	Sandstone, siltstone, shale, and conglomerate; some limestone and coal.	Large-amplitude, open folds.	775	3,210	Dendritic.	*East:* Arbitrary between coal and noncoal areas. *West:* Base of west flank of Chestnut Ridge. *North:* Approximates northeast terminus of large-amplitude, open folds.	Fluvial erosion; some periglacial mass wasting.
	Allegheny Front	*East:* Rounded to linear hills rising by steps to an escarpment; hills cut by narrow valleys. *West:* Undulating hills sloping away from escarpment.	Moderate to high.	Shale, siltstone, and sandstone.	*South:* Broad fold. *Elsewhere:* Beds having low northwest dip; some faults.	540	2,980	Parallel and trellis.	*East:* Stream at base of hills below escarpment. *West:* Arbitrary between coal and noncoal areas.	Fluvial erosion; periglacial mass wasting.
	Deep Valleys	Very deep, angular valleys; some broad to narrow uplands.	Moderate to very high.	Sandstone, siltstone, shale, and conglomerate.	Moderate-amplitude, open folds that control valley orientations.	560	2,560	Angulate and rectangular.	Arbitrary at margins of deep valleys, either at top of valley slope or along drainage divide.	Fluvial erosion; periglacial mass wasting.
	Glaciated High Plateau	Broad to narrow, rounded to flat, elongate uplands and shallow valleys.	Low to high.	Sandstone, siltstone, shale, and conglomerate; some coal.	Moderate-amplitude, open folds.	620	2,560	Angulate and dendritic.	*East:* Base of escarpment. *Elsewhere:* Arbitrary with margins of deep valleys.	Fluvial and glacial erosion; glacial deposition.
	Glaciated Low Plateau	Rounded hills and valleys.	Low to moderate.	Sandstone, siltstone, and shale.	Low-amplitude folds.	440	2,690	Dendritic.	Base of escarpments of adjacent uplands; base of Pocono escarpment. *Elsewhere:* Arbitrary.	Fluvial and glacial erosion; glacial deposition.
	Glaciated Pocono Plateau	Broad, undulatory upland surface having dissected margins.	Low to moderate.	Sandstone, siltstone, and shale; some conglomerate.	Beds having low north dip; some small folds.	1,200	2.320	Deranged.	*South and east:* Base of Pocono escarpment. *North:* Crest of drainage divide. *West:* Arbitrary.	Fluvial and glacial erosion; glacial deposition.
RIDGE AND VALLEY	Appalachian Mountain	Long, narrow ridges and broad to narrow valleys; some karst.	Moderate to very high.	Sandstone, siltstone, shale, conglomerate, limestone, and dolomite.	Open and closed plunging folds having narrow hinges and planar limbs; variety of faults.	440	2,775	Trellis, angulate, and some karst.	*Southeast:* Base of slope change on southeast side of Blue Mountain. *West and northwest:* Center of valley bottom west of westernmost linear ridge. *Elsewhere:* Base of slope change of eastern ridges; arbitrary between ridges.	Fluvial erosion; solution of carbonate rocks; periglacial mass wasting.
	Susquehanna Lowland	Low to moderately high, linear ridges; linear valleys; Susquehanna River valley.	Low to moderate.	Sandstone, siltstone, shale, conglomerate, limestone, and dolomite.	Open and closed plunging folds having narrow hinges and planar limbs.	260	1,715	Trellis and angulate.	Base of slope change to higher ridges of all surrounding areas; arbitrary in valley areas.	Fluvial erosion; some glacial erosion and deposition in northeast.
	Anthracite Valley	Narrow to wide, canoe-shaped valley having irregular to linear hills; valley enclosed by steep-sloped mountain rim.	Low to moderate.	Sandstone, siltstone, conglomerate, and anthracite.	Broad, doubly-plunging syncline; faults and smaller folds.	500	2,368	Trellis and parallel.	Outer base of surrounding mountain.	Fluvial and glacial erosion; some glacial deposition.
	Anthracite Upland	Upland surface having low, linear to rounded hills, strip mines, and waste piles; upland surrounded by an escarpment, a valley, and a mountain rim.	Low to high.	Sandstone, shale, conglomerate, and anthracite.	Many narrow folds having steep limbs; many faults.	320	2,094	Trellis.	*Northeast:* Arbitrary between coal and noncoal areas. *Elsewhere:* Outer base of surrounding mountain.	Fluvial erosion; some glacial erosion and periglacial mass wasting.
	Blue Mountain	Linear ridge to south and valley to north; valley widens eastward and includes low linear ridges and shallow valleys.	Moderate to high.	Sandstone, siltstone, and shale; some limestone and conglomerate.	*Southwest:* South limb of broad fold. *Northeast:* Small folds north of Blue Mountain.	300	1,680	Trellis.	*Southeast:* Base of slope change on southeast side of Blue Mountain. *Northwest:* Base of mountain; base of Pocono escarpment. *Northeast:* Arbitrary.	Fluvial erosion; some glacial erosion and deposition in northeast.
	Great Valley	Very broad valley. *Northwest half:* Dissected upland. *Southeast half:* Low karst terrain.	Low to moderate.	*Northwest:* Shale and sandstone; slate at east end. *Southeast:* Limestone and dolomite.	Thrust sheets, nappes, overturned folds, and steep faults; many third- and fourth-order folds.	140	1,100	Dendritic and karst.	*North:* Base of slope change on southeast side of Blue Mountain. *South:* Base of slope change to adjacent uplands.	Fluvial erosion; solution of carbonate rocks; some periglacial mass wasting.
	South Mountain	Linear ridges, deep valleys, and flat uplands.	Moderate to high.	Metavolcanic rocks, quartzite, and some dolomite.	Major anticlinorium having many second- and third-order folds.	450	2,080	Dendritic.	Base of slope change to adjacent lowlands.	Fluvial erosion of highly variable rocks; some periglacial mass wasting.
NEW BLGLAND	Reading Prong	Circular to linear, rounded hills and ridges.	Moderate.	Granitic gneiss, granodiorite, and quartzite.	Multiple nappes.	140	1,364	Dendritic.	Base of slope change to adjacent lowlands.	Fluvial erosion; some periglacial mass wasting.
PIEDMONT	Gettysburg-Newark Lowland	Rolling lowlands, shallow valleys, and isolated hills.	Low to moderate.	Mainly red shale, siltstone, and sandstone; some conglomerate and diabase.	Half-graben having low, monoclinal, northwest-dipping beds.	20	1,355	Dendritic and trellis.	Base of slope changes with adjacent uplands and lowlands. *Elsewhere:* Arbitrary.	Fluvial erosion of rocks of variable resistance.
	Piedmont Lowland	Broad, moderately dissected, karst valleys separated by broad, low hills.	Low.	Dominantly limestone and dolomite; some phyllitic shale and sandstone.	Complexly folded and faulted.	60	700	Dendritic and karst.	*South:* Base of slope change to adjacent upland. *North:* Mesozoic red rocks.	Fluvial erosion; some periglacial mass wasting.
	Piedmont Upland	Broad, rounded to flat-topped hills and shallow valleys.	Low to moderate.	Mainly schist, gneiss, and quartzite; some saprolite.	Extremely complexly folded and faulted.	100	1,220	Dendritic.	*East:* Base of low to vague Fall Line escarpment. *North:* Base of slope change to adjacent lowlands.	Fluvial erosion; some periglacial mass wasting.
ATLANTIC COASTAL PLAIN	Lowland and Intermediate Upland	Flat upper terrace surface cut by shallow valleys; Delaware River floodplain.	Very low.	Unconsolidated to poorly consolidated sand and gravel; underlain by schist, gneiss, and other metamorphic rocks.	Unconsolidated deposits underlain by complexly folded and faulted rocks.	0	200	Dendritic.	*Northwest:* Base of low to vague Fall Line escarpment. *East:* Arbitrary.	Fluvial erosion and deposition.

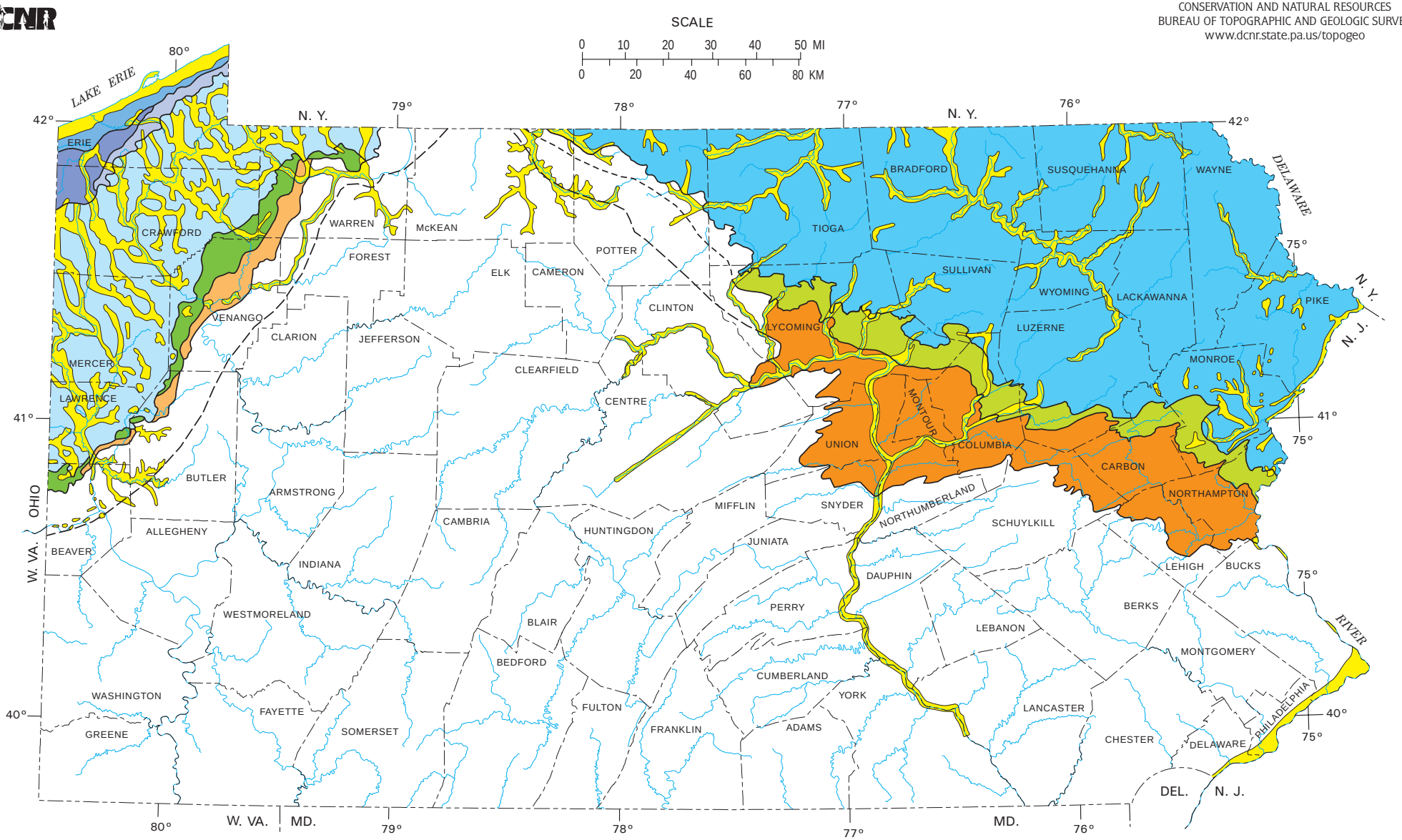
[1]Local relief: 0 to 100 feet, very low; 101 to 300 feet, low; 301 to 600 feet, moderate; 601 to 1,000 feet, high; >1,000 feet, very high.
(Relief categories listed here for Pennsylvania do not necessarily apply to other states or countries.)
[2]Elevations are in feet.

2200–MP–DCNR0382
Printed on Recycled Paper.

MAP 59

GLACIAL DEPOSITS OF PENNSYLVANIA

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF
CONSERVATION AND NATURAL RESOURCES
BUREAU OF TOPOGRAPHIC AND GEOLOGIC SURVEY
www.dcnr.state.pa.us/topogeo



EXPLANATION

RECENT TO LATE ILLINOIAN (0–198,000 yrs.)

STRATIFIED DRIFT

Sand and gravel in eskers, kames, kame terraces, and outwash, principally in valleys; silt and clay in lake deposits in formerly ice-dammed valleys; lake clays and beach sands and gravels along Lake Erie; thin (Recent) to thick (late Illinoian) soils.

WISCONSINAN (17,000–22,000 yrs.)

ASHTABULA TILL
HIRAM TILL
LAVERY TILL
KENT TILL

Thick, gray, clayey to silty to sandy till covering over 75 percent of the ground; topography is mainly gently undulating, but there is also some knob-and-kettle topography; thin soil.

OLEAN TILL

Moderately thick, gray to grayish-red, sandy till covering 25 to 50 percent of the ground; very thin till covers an additional 25 percent of the ground; topography reflects the underlying bedrock; thin soil.

LATE ILLINOIAN (132,000–198,000 yrs.)

TITUSVILLE TILL
UNNAMED TILLS

Thin, gray (Titusville) to brown and grayish-red (unnamed), clayey to sandy till covering 10 to 25 percent of the ground; topography reflects the underlying bedrock; moderately thick, well-developed soil.

PRE-ILLINOIAN (>770,000 yrs.)

MAPLEDALE TILL
UNNAMED TILLS

Thin, gray, clayey to silty till in patches covering up to 10 percent of the ground; topography reflects the underlying bedrock; thick, well-developed soil, commonly having a yellowish-red color.

SYMBOLS

Southern limit of glacial advance

Approximate limit of Illinoian advance

Approximate limit of pre-Illinoian advance

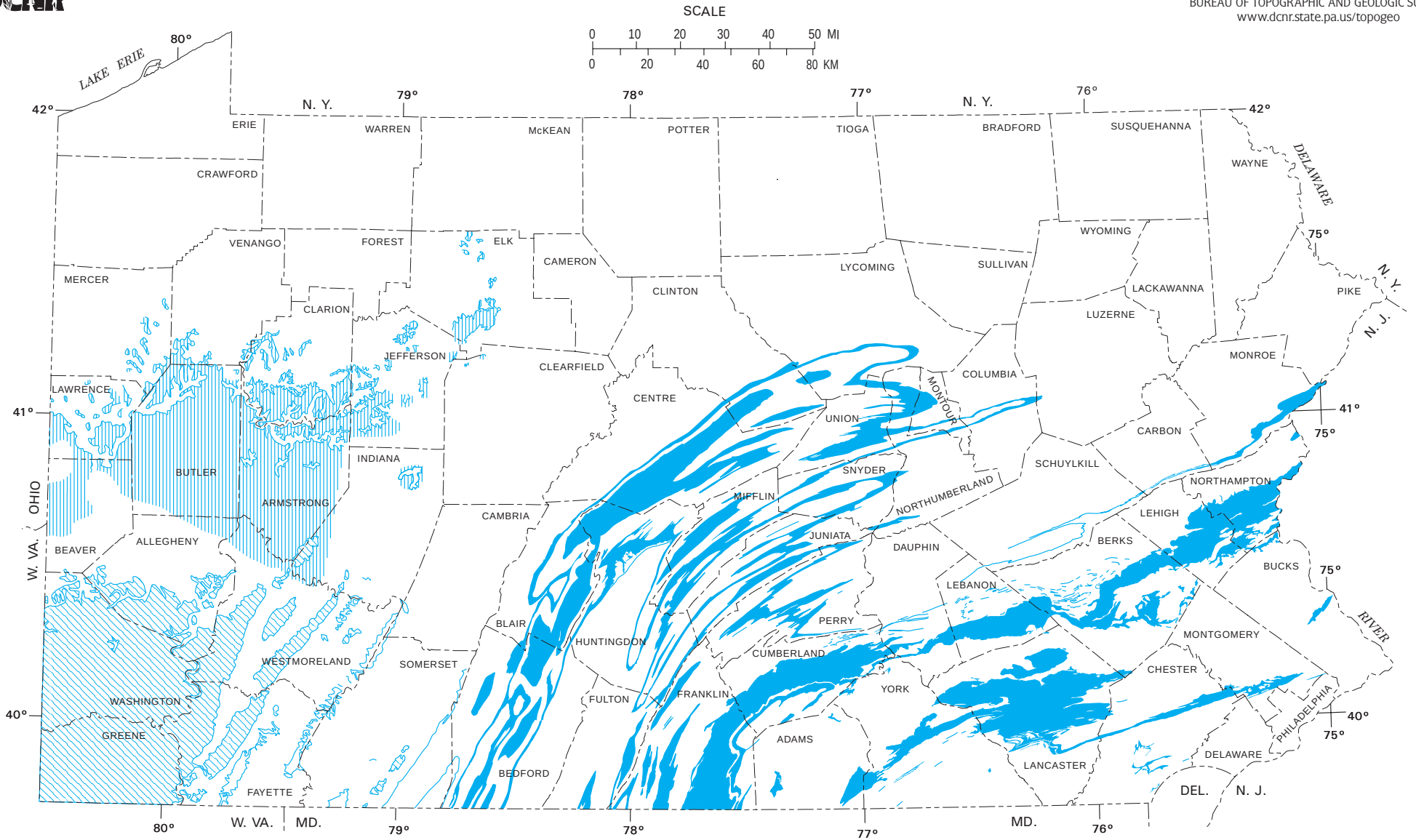
By W. D. Sevon and D. D. Braun.
Second Edition, 1997; Second Printing, 2000.

2200–MP–DCNR3027
Printed on Recycled Paper

MAP 15

LIMESTONE AND DOLOMITE DISTRIBUTION IN PENNSYLVANIA

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF
CONSERVATION AND NATURAL RESOURCES
BUREAU OF TOPOGRAPHIC AND GEOLOGIC SURVEY
www.dcnr.state.pa.us/topogeo



EXPLANATION

Area where limestone, dolomite, or both are at the surface. Layers are usually strongly folded and steeply dipping. Includes economically important high-calcium limestones of the Kinzers, Annville, Benner, and Keyser Formations and the Cockeysville Marble, as well as the high-magnesian dolomites of the Ledger Formation and the Cockeysville Marble. This area is most susceptible to sinkhole development.

Area underlain by flat-lying, generally thin, but locally thick, limestone beds, which are discontinuous in places and are commonly interbedded with shale.

Area underlain by the generally flat lying Pennsylvanian Vanport Limestone, a high-calcium limestone. This limestone is generally overlain by less than 100 feet of sedimentary rocks, except in the southern part of the area.

LIMESTONE AND DOLOMITE DISTRIBUTION IN PENNSYLVANIA

Carbonate rocks, consisting of limestone and dolomite, are significant among the great variety of rock types in Pennsylvania. These rocks affect man's activities in three major ways: as hazards, as mineral resources, and as groundwater reservoirs. This map shows the distribution of limestone and dolomite in Pennsylvania and will be of assistance to those engaged in planning and development in these carbonate areas.

HAZARDS—Carbonate rocks can present potential construction problems and hazards due to the presence of solution cavities and bedrock irregularities in the subsurface and sinkholes at the surface. The cavities are the result of the gradual dissolving of the rock by water, particularly along fractures or joints. In turn, joints and cavities are enlarged and can form caves. Related features, such as surface depressions and sinkholes, are caused by the movement of surficial materials into the cavities shaped by the dissolving process. Sinkholes also can result from the collapse of the roof of a cave. Because the potential exists for sinkhole development in most of the carbonate rocks of Pennsylvania, areas underlain by these rocks should receive a thorough subsurface investigation prior to construction so that remedial measures may be designed to cope with these hazards. These investigations should include local geologic mapping, test borings, and possibly geophysical surveys to establish subsurface conditions for such structures as highways, dams, bridges, disposal sites, transmission lines, and buildings.

RESOURCES—Limestone ($CaCO_3$-rich) and dolomite ($MgCO_3$-rich) are major sources of mineral raw materials for the construction, agricultural, and manufacturing industries of the Commonwealth. Except for coal, carbonates are the major rock type mined in Pennsylvania, accounting for about 80 percent of all nonfuel mineral production. Significant uses of mined limestone and dolomite in Pennsylvania include (1) crushed stone for roads, concrete, and railroads; (2) agricultural lime and grit; (3) the manufacture of cement; (4) fluxstone and refractory materials for the steel industry; (5) acid neutralization; (6) raw material for the glass industry; and (7) mineral fillers and whiting. Thus, the carbonates in various parts of Pennsylvania should be recognized as a valuable mineral resource, and land use planners should take this into account.

WATER—Because of the development of solution cavities in carbonate rocks, these rock formations may contain and yield large quantities of underground water. Areas underlain by limestones and dolomites may supply the water needs of a community through the proper development of the subsurface water resources. Those charged with the planning and development of water supplies should recognize the existence of this valuable underground water source.

The permeable nature of the carbonate rocks also makes them natural conduits for conveying solid and liquid wastes. Using these conduits, contaminants can rapidly enter the groundwater system and travel long distances underground over a relatively short period of time. Therefore, it is important to be particularly careful in conducting industrial, agricultural, or construction activities in limestone-dolomite areas to prevent the contamination of valuable groundwater resources.

STATEWIDE REFERENCES

ES 11 *Sinkholes in Pennsylvania,* W. E. Kochanov, 1999, 33 p.

G 66 *Geology and biology of Pennsylvania caves,* W. B. White, ed., 1976, 103 p.

Map 1 *Geologic map of Pennsylvania,* T. M. Berg, W. E. Edmunds, A. R. Geyer, and others, compilers, 2nd ed., 1980. Scale 1:250,000 (1 inch=4 miles), 3 sheets.

M 20 *Limestones of Pennsylvania,* B. L. Miller, 1934, 729 p.

M 50 *Atlas of Pennsylvania's mineral resources.*

Part 1, Limestones and dolomites of Pennsylvania, B. J. O'Neill, Jr., 1964, 40 p., 6 maps, scale 1:250,000.

M 50 *Atlas of Pennsylvania's mineral resources.*

Part 1, Supplement, Limestones and dolomites of Pennsylvania, G. F. Deasy, P. R. Griess, R. F. Balazik, and J. W. Burtnett, 1967, 83 p.

Part 4, The distribution of limestones containing at least 90 percent $CaCO_3$ in Pennsylvania, B. J. O'Neill, Jr., 1976, 2 p., 1 map, scale 1:500,000.

M 83 *Reconnaissance survey of potential carbonate whiting sources in Pennsylvania,* S. W. Berkheiser, Jr., 1983, 53 p.

OTHER PUBLICATIONS

PUBLICATIONS ON LIMESTONES AND DOLOMITES—For publications dealing with limestones and dolomites in local areas of Pennsylvania, please refer to *Pennsylvania Geological Publications*, available on-line at www.dcnr.state.pa.us/topogeo/pub/pub.htm, and upon request from the Pennsylvania Geological Survey, Department of Conservation and Natural Resources, P. O. Box 8453, Harrisburg, Pa. 17105–8453.

OPEN-FILE REPORTS—Open-file reports on sinkholes and karst-related features of various counties in central and southeastern Pennsylvania are available for inspection at the Pennsylvania Geological Survey office in Harrisburg; copies of these county reports are also available for a price to cover copying and handling. For further information, please contact the Survey at the address listed in the previous paragraph.

Prepared by Bureau of Topographic and Geologic Survey.
Fourth Edition, 1990; Third Printing, Revised, 2000.

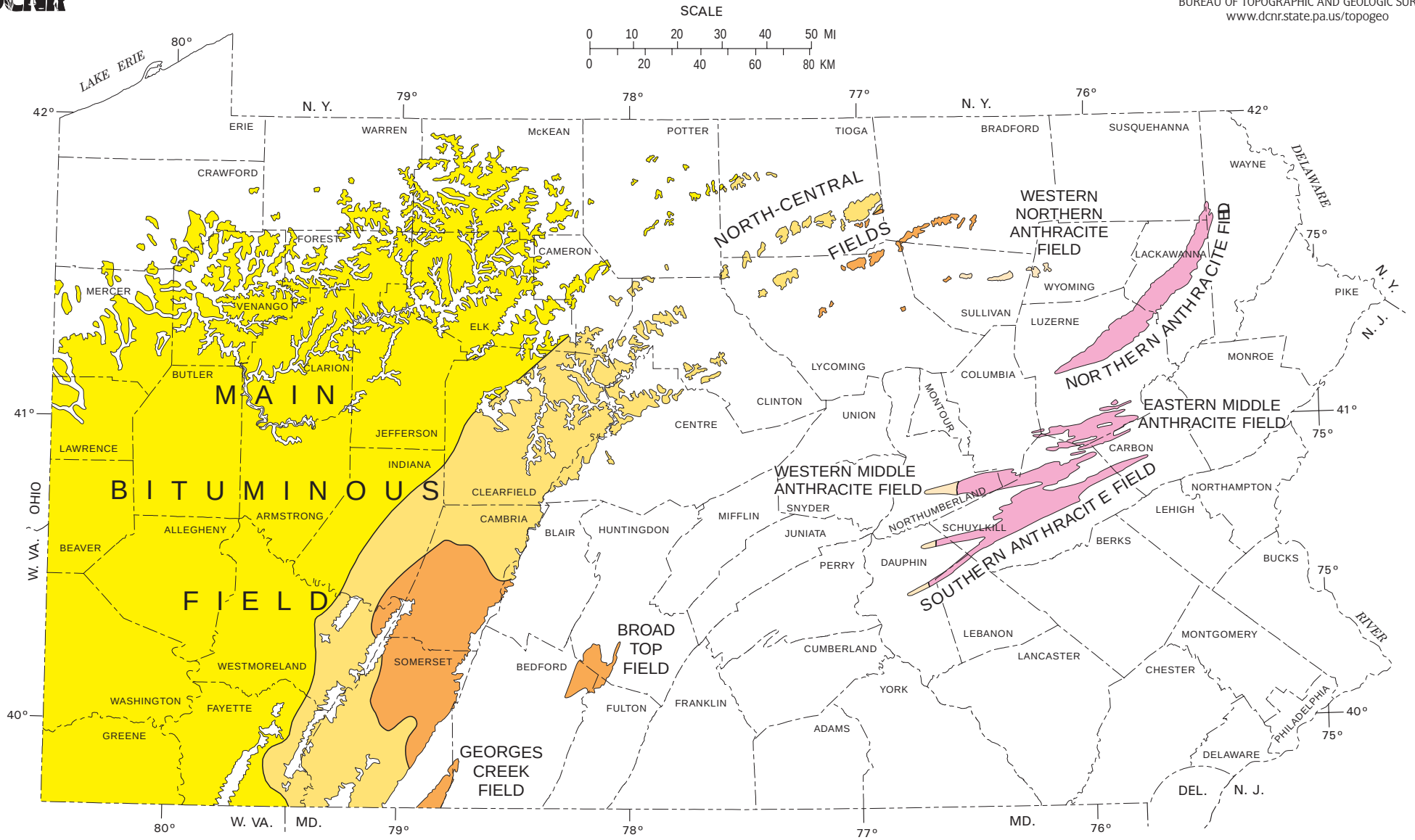
Recycled Paper

2200–MP–DCNR0497

MAP 11

DISTRIBUTION OF PENNSYLVANIA COALS

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF
CONSERVATION AND NATURAL RESOURCES
BUREAU OF TOPOGRAPHIC AND GEOLOGIC SURVEY
www.dcnr.state.pa.us/topogeo



EXPLANATION

BITUMINOUS FIELDS

- High-volatile bituminous coal
- Medium-volatile bituminous coal
- Low-volatile bituminous coal

ANTHRACITE FIELDS

- Anthracite
- Semi-anthracite

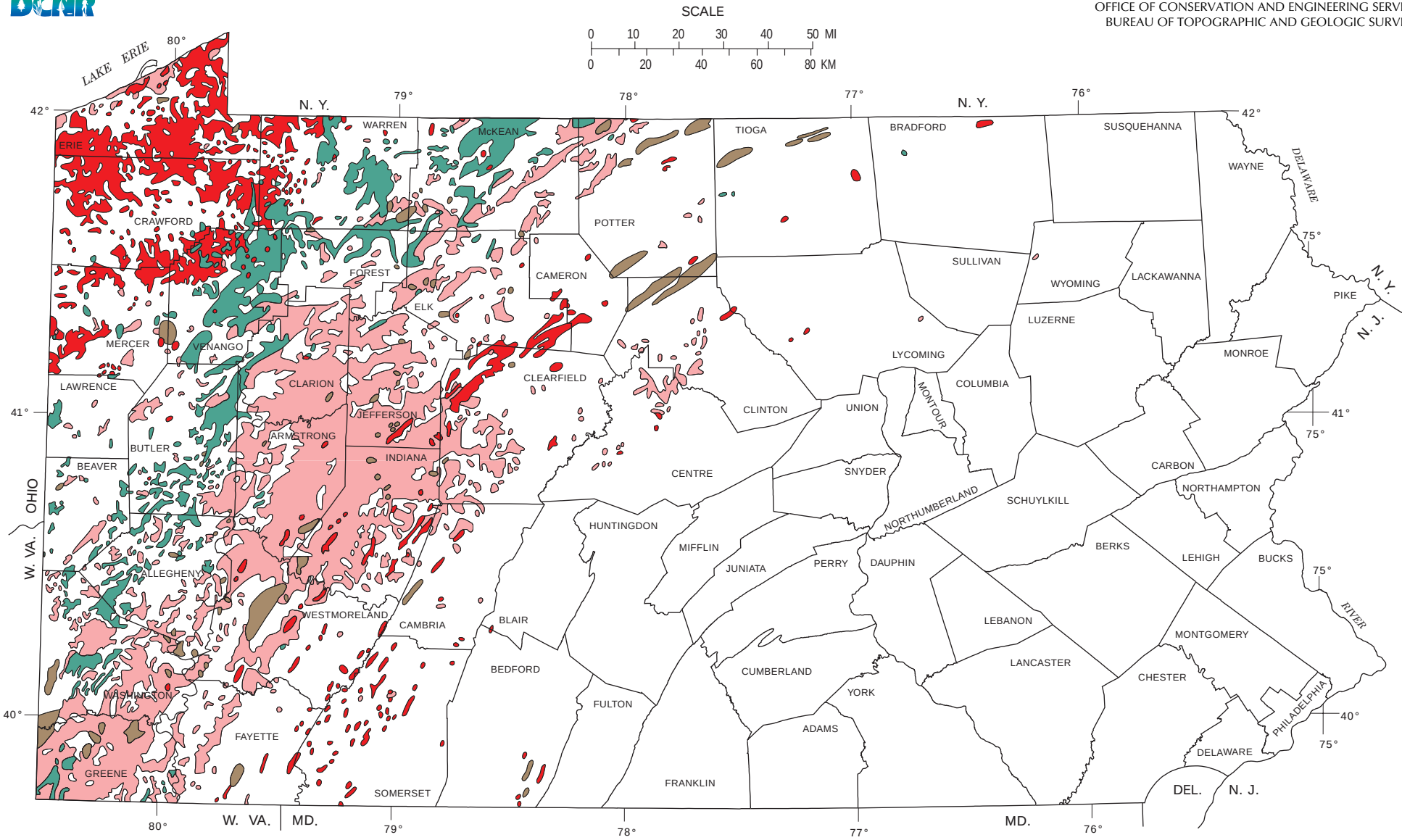
Prepared by Bureau of Topographic and Geologic Survey.
Third Edition, 1992; Second Printing, Revised, 2000.

2200–MP–DCNR0855
Printed on Recycled Paper

MAP 10

OIL AND GAS FIELDS OF PENNSYLVANIA

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF
CONSERVATION AND NATURAL RESOURCES
OFFICE OF CONSERVATION AND ENGINEERING SERVICES
BUREAU OF TOPOGRAPHIC AND GEOLOGIC SURVEY



EXPLANATION

Shallow oil field

Shallow gas field

Deep gas field

Gas storage area

Third edition, 1993

Armstrong County Multimunicipal Comprehensive Plan – Draft 2003

Plan begun in 2002 for Cadogan, Freeport, West Franklin, West Kittanning, and Worthington.

A comprehensive plan is a statement of policy regarding a community's intentions and aspirations. It is a vision for the community's future, formulates goals and strategies, and is a framework for policy makers. A communities zoning ordinance must be in conformity with the comprehensive plan.

Zoning notes:
Cadogan – proposes industrial use along the Allegheny River
Manor – intends to develop land compatible with Cadogan
Bethel – same as Manor
South Buffalo – light industrial and recreational uses for Allegheny River; recreation and open space along Buffalo Creek.
Harrison – majority of riverfront area opposite Freeport is a conservation zone
Allegheny – residential and commercial farming and light industrial

Issues explored in Comprehensive Plan: Housing, Land Use, Economic Development, Transportation, Public Utilities/Services/Facilities, Recreation/Open Space/Natural Resources

Cadogan

Residential community with village core surrounded by forested open space and vacant or underutilized industrial land. Some of the flattest land along the Allegheny River. Hopes to develop vacant industrial land, though there are suspected environmental constraints. Few businesses within its borders. Most residents would like to see riverfront land used for industry.

Timeframe for initiation or completion:
- Short: 1-3 years
- Middle: 4-7
- Long: 8+

<u>Economic Development</u>
Policy: Provide jobs for municipal residents and increase tax base
- Goal: Redevelop riverfront for industrial use
  - Obj: Identify owners of vacant land to provide access to river
  - Obj: Inventory brownfield sites for potential development
  - Obj: Identify environmental contaminants in ground and water and prepare strategy for remediation (25-50k; short – mid timeframe)
  - Obj: Conduct feasibility study concerning development of riverfront land for industrial use (25-100k; mid)
  - Obj: Identify companies to attract to riverfront (25-50k; mid. – long)

Goal: Redevelop bony pile?

Land Use

Policy: Identify and allocate a combination of land uses that addresses the needs of the present and future municipal residents

Goal: Assess and clean up environmental contaminants along Allegheny River to provide land for industrial development.

Obj: Determine past industrial uses of land and existing pollution (short)

Obj: Have land designated as brownfields and get funding for remediation (mid.)

Obj: Consult riverfront property owners regarding clean-up plans and long term plans (short)

Recreation

Policy: Provide recreation resources and preserve and protect natural resources for present and future residents.

Goal: Maintain and improve existing park and recreation resources

Obj: Complete first phase of improvements to Allegheny Overlook Park and initiate second phase implementation (20-25k, short –mid)

Obj: Maintain and improve playground at eastern end of 2nd Ave. (3-10k, short)

Goal: Protect township's natural areas: steep slopes, wooded areas, floodplains, etc.

Obj: Identify appropriate land uses for natural areas

Goal: Reduce stormwater run off problems

Obj: Produce stormwater plan that complies with Act 167

Freeport

722 acres. Chiefly a residential community with a mixture of land uses. Mining (deep and surface bituminous mining and surface industrial mineral mining) occurs in the northern and southern portion of borough. Largest percentage of workers in education, health and social services, and manufacturing. Freeport Historical Society working to save Valley Mill (Mickey's Mill), a grist mill on Buffalo Creek that was built in the 1700s.

Economic Development

Goal: Improve building facades, sidewalks, and overall aesthetics in central business district (500k-1M, short-mid)

Obj: Prepare and enforce street tree ordinance (5k, short)

Obj: Implement shade tree ordinance (short)

Land Use

Goal: Preserve and protect historical land uses and structures

Obj: Identify and inventory borough's historic resources (15-25k, short)

Obj: Design a historic preservation area (5-10k, short-mid)

Recreation and Open Space

Goal: Maintain, improve, expand existing recreational resources and develop future recreational resources.

Obj: Maintain and improve Riverside Park, including boat launch (1-5k, ongoing)
Obj: Complete recreation plan to determine current and future recreational needs (10-50k, short)
Obj: Develop small scale recreation area in Laneville (5-15k, short)
Obj: Complete walking trail in Laneville to the rest of town (short)
Obj: Establish bike system (10-25k, short-mid)
Obj: Establish formal working trail route along Riverside Drive around Freeport Terminals and through downtown (10-25k, short-mid)
Obj: Acquire Freeport Community Park and improve/upgrade it (500k-1M, short-mid)
Obj: Install public docking facilities (50-100k, mid)
Obj: Extend Butler-Freeport Trail (700k-1M, short-mid)

West Kittanning

West Kittanning is a fully-developed residential area. Their identified policies and goals include:

- Protect residential neighborhoods from commercial development by enacting land use regulations
- Replace water lines
- Conduct stormwater management project for Upper Whiskey Run Watershe
- Conduct recreational facility improvements
- Build new recreational facilities
- Construct new walking trails
- Identify and allocate a combination of land uses that address the needs of residents
- Provide recreational resources and protect natural resources
- Acquire Bluff St. property for public parklet for scenic river view

The implementation strategy calls for creating, adopting, and implementing a zoning ordinance; creating a zoning map in conformance with comprehensive plan; upgrading playground equipment at West Kittanning Park; constructing a roller hockey/basketball court at West Kittanning Park.

2002 Army Corps of Engineers Commerce Report of Great Lakes and Ohio River Navigation Systems indicated that most locks on the Allegheny River don’t meet needs of modern day operating standards and tow sizes (too small, too slow to fill and empty, and too costly to operate and maintain).

A. WATER QUALITY

1. Clean Water Act

The Federal Clean Water Act (CWA), which is carried out by the PA Department of Environmental Protection (DEP) under the Clean Streams Law, provides regulations that strive to "restore and maintain the chemical, physical, and biological integrity of the nation's waters."[1] Regulations dealing with water quality standards of the rivers and streams in this study corridor are found in The Pennsylvania Code Title 25, Chapter 93. http://www.pacode.com/

All surface waters in Pennsylvania have been assigned and should support *statewide water uses.* Table 3-1 lists and details each use. In addition to meeting the standards for each of these statewide uses, some water bodies meet standards that make them eligible for other uses, or *designations*. Tributaries and their designations are listed in Table 3-2.

Table 3-1
Statewide Water Uses

Use Category	Uses – These are the baseline uses (the goals) that all surface waters are supposed to meet (though they may not currently meet those uses)
Aquatic Life ("fishable")	Warm water fisheries
Water Supply ("drinkable")	Potable water supply, industrial water supply, livestock water supply, wildlife water supply, irrigation
Recreation ("swimmable")	Boating, fishing, water contact sports, aesthetics

Source: 25 Pa. Code § 93.4

[1] Section 101 (a)(2) Clean Water Act

Table 3-2
Tributaries and Chapter 93 Designated Uses
Tributaries can be found on Map 5
WWF = warm water fishery HQ= high quality TSF= trout stocking fishery
CWF=cold water fishery N= navigation

Tributary Name	Designated Use
Allegheny River	N
Blacks Run	WWF
Pucketa Creek	TSF
Tawney Run	WWF
Riddle Run	WWF
Crawford Run	WWF
Bailey Run	WWF
Bull Creek	TSF
Chartiers Run	TSF
Buffalo Creek	TSF
Kiskiminetas River	WWF
Knapp Run	WWF
Hill Run	WWF
Watson Run	WWF
Taylor Run	WWF
Nicholson Run	WWF
Crooked Creek	WWF
Garretts Run	WWF
Glade Run	CWF, TSF
Tub Mill Run	WWF
Furnace Run	Unlisted
Cowanshannock Creek	TSF
Limestone Run	WWF
Hays Run	WWF
Pine Creek	HQ-CWF
Mahoning Creek	WWF
Mast Run	CWF
Redbank Creek	TSF
Huling Run	TSF
Snyders Run	CWF
Sugar Creek	WWF
Catfish Run	WWF
Armstrong Run	WWF
Birch Run	WWF
Black Fox Run	WWF
Dunlap Creek	WWF
Bear Creek	CWF
Clarion River	CWF
Fowler Run	WWF
Lowry Run	WWF
Richey Run	CWF

Source: http://www.pacode.com/secure/data/025/chapter93/chap93toc.html

2. Sources and Types of Water Pollution

Pollution entering our waterways is typically assigned to one of two categories: point or non-point source pollution. Point source pollution comes from a defined point, such as a pipe, along a waterway. Permitted point source discharges from industrial, commercial, and municipal facilities are described below. Conversely, non-point source pollution comes from non-specific areas such as agricultural runoff and parking lots and is therefore more difficult to control and regulate. The following sections describe both pollution sources in more depth.

a. Point Sources

In order to control and regulate the amount and types of pollution entering our waterways, and to help achieve designated uses and prevent water quality degradation, point sources of pollution must have proper permits to discharge wastes into the nation's waters. The National Pollutant Discharge Elimination System (NPDES) is a permitting system that targets point source dischargers, such as industrial facilities and wastewater treatment plants. Permitted facilities must meet stringent effluent limits and are responsible for monitoring (water quality testing) and reporting to the DEP. These permits are referred to as "individual" permits. For other point dischargers, such as stormwater pollution or construction site runoff, a general permit is issued. General permits usually apply to smaller operations and are less stringent in the monitoring and reporting requirements.

The DEP eFACTS (environment, facility, application, compliance tracking system) database provides information on all NPDES-permitted facilities in the state and allows the public to search for facilities by name, county, or municipality (www.dep.state.pa.us/efacts/).

Some types of facilities and activities with NPDES permits under the DEP Bureau of Water Pollution Control include:

- Discharge of stormwater associated with industrial activities
- Discharge from gasoline-contaminated ground water remediation systems
- Discharge from industry
- Single residence sewage treatment plant
- Stormwater runoff from construction (greater than one acre disturbance)
- Publicly owned sewage treatment works
- Active mining operations
- Discharge of stormwater from municipal separate storm sewer systems (MS4s) (see section on stormwater below)

Examples of activities that are not permitted, but that affect water quality are: sanitary sewer overflows and illegal sanitary sewer tie-ins to storm drains (see section A-6).

b. Non-Point Sources

Although non-point source pollution is much more difficult to control than point source pollution, there are still efforts throughout the Commonwealth to prevent and control it. The DEP Water Quality Bureau has set up a "Non-Point Source (NPS) Management Program," which consists of action plans that address this type of pollution across the state. Some of the common sources of NPS pollution in Pennsylvania (and along the Allegheny River corridor) are:

- Abandoned mine drainage (AMD) (see section below)
- Agriculture (runoff of soil that contains fertilizers and excess nutrients)
- Silviculture (soil erosion and sediment loading from forestry operations)
- Construction (runoff of soil into the water which increases chance of flooding)
- Illegal land disposal
- Urban runoff (pesticides, lawn fertilizers, oil, and other chemicals and debris deposited or littered in urban areas)

Abandoned Mine Drainage[2]

Abandoned Mine Drainage
Drainage from, or caused by, deep mining, surface mining, or coal refuse piles. It may be acidic or alkaline with elevated levels of dissolved metals.
Acid Drainage Equation:
Pyrite+oxygen+water=iron hydroxide (rust)+ sulfuric acid

While coal was being formed in the Earth millions of years ago, the conditions for its formation also favored the concentration of iron- and sulfur-containing materials that eventually became pyrite (fool's gold). Therefore, pyrite is commonly found along coal seams. As long as pyrite remains undisturbed underground, it generally causes no problem. However, mining can expose pyrite to water and oxygen, which break it down. When this trio reacts, sulfuric acid and a rust-like compound high in iron form "yellowboy." Streams that run orange do so because of yellowboy depositions that tend to smother small aquatic life and destroy the food chain for larger animals, like fish. The acidity formed by the pyrite reaction can also dissolve clay which in turn releases heavy metals like aluminum. Aluminum presents itself as a white deposit and is toxic to fish.

These pollutants can be formed in the underground voids left by deep mining, from the coal refuse piles (slate dumps, gob piles, boney piles) brought to the surface, or by exposing pyrite through strip mining. If sufficient acidity enters a stream, its pH may be significantly lowered resulting in a very toxic environment for aquatic life. Acidity and precipitated metals are the major threats posed by AMD. The nature of AMD contamination varies greatly from site to site, as its formation is dependent upon a variety of factors. Therefore, several parameters are measured when studying AMD:
-Low pH (high acidity), i.e., acid mine drainage
-High metal concentrations (iron, aluminum, and manganese)
-Elevated sulfate levels
-Excessive suspended solids and/or siltation

Because the AMD reaction is dependent on the specifics of the geology and hydrology of the particular site, no two AMD discharges are exactly alike chemically. Suffice it to say, there is not one set way of treating AMD to mitigate its ill effects, but rather many, each depending on the particulars of the discharge. However, a general strategy is usually followed: (1) isolate the AMD, (2) reduce its acidity (if necessary), and (3) cause the iron (and other dissolved metals) to precipitate as a solid in a settling pond and/or wetland. The treated water is then allowed to enter the stream. Whatever the type of AMD, it is this pollution that degrades habitats, causes safety problems, destroys public and private water supplies, ruins the natural aesthetics and has a negative economic impact. .

Stormwater

Stormwater is water from rain or snow that flows over the land and either infiltrates the ground or drains into nearby streams and can be characterized as both point and non-point source pollution. Natural stormwater runoff from the land or from small construction sites under one acre are considered to be non-point source pollution because there is no discreet conveyance of the water – it runs over the land and into streams and rivers without controls.

[2] This section taken from *Monitoring Matters* Volume VII, Number 2, August 2004. Origins of Abandoned Mine Drainage. Pages 1,4. By Deb Simko.

Conversely, stormwater from construction sites larger than one acre or from municipal separate storm sewer systems (MS4s) are considered to be point source pollution, which must be managed and permitted.

Pennsylvania's Stormwater Management Program came out of the Stormwater Management Act (Act 167) of 1978. Under the Program, counties develop stormwater management plans for watersheds within the county boundaries. Municipalities then develop ordinances that meet the specifications of the county plans. When construction or other land disturbances take place, the developers must follow the guidelines set forth for stormwater management.

ACT 167
The Storm Water Management Act (Act 167) requires each county, in consultation with the municipalities involved, to prepare and adopt a stormwater management plan for each watershed in its boundary. Plans must be reviewed every five years and include an inventory of both existing and potential characteristics and problems of the area, such as run-off characteristics, soil impacts, and significant obstructions.

Best Management Practices
Actions put into place voluntarily or to comply with the requirements of a regulation, such as Act 167. e.g., pervious pavement to increase stormwater recharge.

The Clean Water Act established two Phases of the federal Stormwater Program:

Phase I (1992) requires NPDES permits for construction activities that disturb five or more acres of land. Permitees must use best management practices (BMPs) and erosion and sediment control plans to control stormwater runoff from sites.

Phase II (adopted in 2002) requires NPDES permits for construction activities that disturb one to five acres of land. This permit also requires the use of BMPs and erosion and sediment control plans. In addition to the construction permits, Phase II also requires NPDES permits for MS4s in urban areas. As part of the permit requirements, the MS4 operators must develop and implement BMPs to manage stormwater and must conduct public outreach. Operators within municipalities that have adopted an Act 167 Plan may already meet some of the requirements of the MS4 NPDES permit if their Act 167 Plan sufficiently addresses water quality issues. Other operators must develop their own stormwater management program or develop an Act 167 Plan to meet permit requirements. These permit requirements must be completed during the five-year permit period (the five year period ends March, 2008).

MS4s
Normally, sewer systems are separated into a sanitary system (sewage from homes and businesses), and a storm system (drainage from rain or snow). Water from a storm sewer system is not treated and empties into rivers. Municipalities are now required to have permits for these storm sewer discharges. See text on 'Phase II.'

Visit www.dep.state.pa.us, keyword "stormwater" for more details.

The only two Act 167 Watershed Plans within this study corridor are: Mahoning Creek and Glade Run (both in Armstrong County).

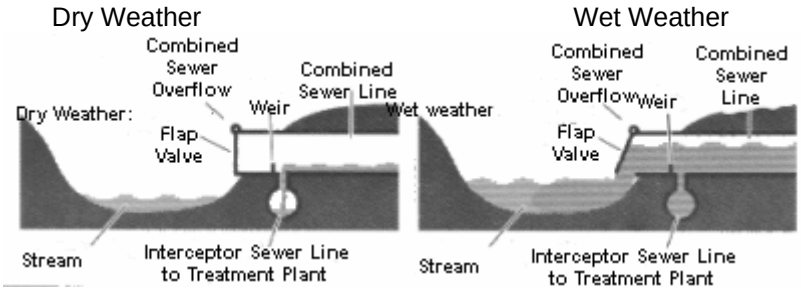
c. Sewer Overflows[3]

A combined sewer overflow warning in Kittanning

[3] The Regionalization Report: An initial study on options for regionalizing the management of sewage collection within the ALCOSAN service area, 3 Rivers Wet Weather, Inc., January 2002.

Combined sewer systems are designed to carry wastewater and stormwater. These are more common in communities with collection systems built before the 1940s. Water and waste from a variety of sources come together in one sewer system and are sent to a water treatment facility. However, during wet weather, the treatment plants cannot handle the capacity of sewage and water, so the pipes overflow to waterways.

When this type of overflow occurs in a combined collection system, it is called a combined sewer overflow (CSO). These were designed with overflow structures to deliberately release excess stormwater and wastewater at capacity. These structures are legal, though they require a permit, and their occurrence and volume must be reduced to a minimum.



Copyright © 2002 by the Louisville/Jefferson County Metropolitan Sewer District (MSD) Louisville, Kentucky
http://www.msdlouky.org/programs/sso.htm

Separate sanitary sewer systems are designed to carry only wastewater. Stormwater is managed through a different collection system. These systems were required for any new system built after the 1940s.

Sewer pipes are rarely full when wastewater is flowing from homes to the sewage treatment plant. Therefore, groundwater or stormwater can leak into cracked or broken pipes, taking up space that should be used to carry only wastewater. In some instances, stormwater is illegally piped into separate sanitary systems to control the runoff through storm drains in streets, parking lots, and gutters. During dry weather, the sewage systems generally operate effectively. During wet weather, the additional flow exceeds the capacity of the sewers causing the sewage to overflow into creeks, streams, or rivers, creating a large-scale problem.

When this type of overflow occurs in a separate sanitary system, it is called a sanitary sewer overflow (SSO) and may occur in an overflow structure, a structure that is intentionally designed to discharge flow into nearby streams. Occasionally, the overflow can occur in a street from a manhole or in the basements of homes. The overflow structures and unintentional overflows are illegal according to the Clean Water Act. The types of overflows that occur in streets or basements also are illegal.

d. Sewage Facilities

The Sewage Facilities Program (Act 537) was established in 1966 to ensure proper oversight and permitting of onlot disposal systems (OLDS), which are individual or community septic systems. The program is administered by local municipalities or county health departments, known as local agencies. Those agencies must hire a Sewage Enforcement Officer (SEO) to oversee the permitting process for OLDS (the PA DEP offers only technical and financial assistance). The local agencies must also have an Act 537 comprehensive plan that addresses current and future sewage disposal needs.

Armstrong County is administered by a Delegated Joint Local Agency, the Armstrong County Sewage Enforcement Agency, which may be authorized to review and make decisions on land development proposals. Allegheny County is administered by a Joint Local Agency, the Allegheny County Health

Department. Westmoreland County is administered by individual service areas, the municipalities. Clarion County is administered by the Clarion County Sewage Association. Scrubgrass Township and Emlenton Borough in Venango County, and Buffalo Township in Butler County are administered by individual service areas. Allegheny Township in Butler County is administered by a Joint Local Authority, the Butler County Sewage Association.

Table 3-3 lists each municipality and the date that their Act 537 Plan was approved.

Table 3-3
Municipal Act 537 Plans

Municipality	County	Plan Approval Date
Brackenridge Boro	Allegheny	12/1/1970
Cheswick Boro	Allegheny	12/1/1970
East Deer Township	Allegheny	12/1/1970
Harmar Township	Allegheny	12/1/1970
Harrison Township	Allegheny	12/1/1970
Plum Boro	Allegheny	10/4/1999
Springdale Boro	Allegheny	12/1/1970
Springdale Township	Allegheny	12/1/1970
Tarentum Boro	Allegheny	12/1/1970
Applewold Boro	Armstrong	6/1/1980
Bethel Township	Armstrong	6/1/1980
Boggs Township	Armstrong	6/1/1980
Bradys Bend Township	Armstrong	6/1/1980
Cadogan Township	Armstrong	8/1/2001
East Franklin Township	Armstrong	4/3/2001
Ford City Boro	Armstrong	6/1/1980
Freeport Boro	Armstrong	6/1/1980
Gilpin Township	Armstrong	12/27/1994
Hovey Township	Armstrong	6/1/1980
Kittanning Boro	Armstrong	6/1/1980
Madison Township	Armstrong	6/1/1980
Manor Township	Armstrong	6/1/1980
Manorville Boro	Armstrong	6/1/1980
North Buffalo Township	Armstrong	6/1/1980
Parker City	Armstrong	6/1/1980
Perry Township	Armstrong	6/1/1980
Pine Township	Armstrong	6/1/1980

Rayburn Township	Armstrong	6/1/1980
South Buffalo Township	Armstrong	6/1/1980
Sugarcreek Township	Armstrong	6/1/1980
Washington Township	Armstrong	6/1/1980
West Kittanning Boro	Armstrong	6/1/1980
Allegheny Township	Butler	4/20/1971
Buffalo Township	Butler	2/17/1994
Brady Township	Clarion	3/11/1971
East Brady Boro	Clarion	3/11/1971
Foxburg Boro	Clarion	3/15/2000
Madison Township	Clarion	3/11/1971
Perry Township	Clarion	1/31/1974
Richland Township	Clarion	3/11/1971
Toby Township	Clarion	3/29/1994
Emlenton Boro	Venango	5/26/1982
Scrubgrass Township	Venango	2/5/1999
Allegheny Township	Westmoreland	7/4/1998
Arnold City	Westmoreland	5/4/1971
Lower Burrell	Westmoreland	5/4/1971
New Kensington	Westmoreland	5/4/1971
Source: http://www.dep.state.pa.us/dep/deputate/watermgt/Wqp/WQP_WM/WM_Sewage.htm		

e. Bear Creek Area Chemical site[4]

Although just outside the project area, the contamination at the Bear Creek Area Chemical site in Petrolia, Butler County, may have an impact on the water resources of the Allegheny River. The Bear Creek site has 24 locations where industrial waste is either documented or suspected. This waste was disposed of between the 1950s and 1970s in various areas in Fairview, Parker, and Concord Township in Butler County and Perry Township in Armstrong County. Rain and snowmelt have seeped through the soil at the disposal areas and carried contamination to groundwater. The DEP has started remediation of these sites, which is expected to cost about $450,000. The remediation will create a barrier between precipitation and soil, preventing additional groundwater contamination. In the meantime, the Petrolium Valley Regional Water Authority will build and operate a public water system for residents of the area with East Brady Borough providing the water source for the new system.

f. Toxics Release Inventory

See Chapter 2-E-4 for information regarding toxic releases to water as reported in the Toxics Release Inventory.

[4] Work Begins on Cleanup Effort in Parker Area, The Derrick and News Herald, December 8, 2003

3. Impaired Streams and Rivers

While NPDES permits target point source pollution, another approach to targeting all pollution sources, especially non-point, is through the use of Total Maximum Daily Loads (TMDLs). The CWA calls for the development of TMDLs for all waterways that do not meet water quality standards.

Assessed waterways that do not meet their designated use must be listed by the state every two years in accordance with Section 303(d) of the CWA, which is the list of impaired streams and rivers. Waterways listed within Section 303(d) are prioritized for TMDL development based on the severity of impairment. The DEP is incorporating them on a watershed basis where local watershed groups actually implement the TMDL Plan and do testing with DEP's assistance.

More specifically, according to the PA DEP:

> TMDLs set an upper limit on the pollutant loads that can enter a water body so that the water will meet water quality standards. The Clean Water Act requires states to list all waters that don't meet their water quality standards even after required pollution controls are put into place. For these, the state calculates how much of a substance can be put in the stream without violating the standard and then distribute that quantity among all sources of the pollution on that water body. A TMDL plan includes waste load allocations for point sources, load allocations for non-point sources, and a margin of safety. States must submit TMDLs to the Environmental Protection Agency (EPA).

The Clean Water Act also requires a water quality assessment report (305(b)) on all impaired waters every two years along with the 303(d) list. "This report provides summaries of various water quality management programs including water quality standards, point source control, and non-point source control. It also includes descriptions of programs to protect lakes, wetlands, and groundwater quality."[5] Furthermore, the 305(b) report describes the extent to which waterways are supporting their designated uses. For example, if in a particular waterway all designated uses are achieved, the waterway is listed as “fully supporting.” (For 2004, the 303d and 305b are a combined report.)

The waterways described in Table 3-4 have been listed as "impaired" on the year 2004 303(d) list. Those that have been targeted for TMDLs are so noted. While the streams and rivers are assessed by small segments along their length, the summaries below indicate the general causes of pollution along stretches in and near the study corridor. Problems associated with aquatic life impacts are identified by biological community assessments; problems associated with human health impacts are identified by fish tissue sampling and raw water intake analysis; problems associated with recreational use impacts are identified by bacteriological testing.

Table 3-4
Impaired Streams and Rivers on the 2004 303(d) List

*All streams have been assessed for aquatic life use unless otherwise noted.
**AMD = Abandoned Mine Drainage

Stream Name	Source/Causes of Impairment	Year Listed as Impaired	TMDL Target Date	Use Assessed * Only the water quality standards for the use indicated were tested.
Richey Run	**AMD/salinity,dissolved solids,chlorides	1996	2005	

[5] PA DEP www.dep.state.pa.us

Clarion River	AMD/pH,metals	1996/2004	2009/2017	
	Mercury	2002	2011	Human health
Bear Creek	AMD/pH,metals	1996/2002	2015/2017	
Black Fox Run	AMD/pH,metals	2002	2017	
Catfish Run	AMD/pH,metals	2002	2015/2017	
Huling Run	AMD/pH,metals	2002	2015/2017	
	Agriculture/nutrients	1996	2007	
Redbank Creek	AMD/metals,inorganics, siltation,pH	1996/2002	2009/2015	
Cowanshannock Creek	AMD/metals,siltation Vegetation removal/siltation Wastewater/nutrients Grazing agriculture/siltation	2004	2015/2017	
Crooked Creek	AMD/metals,suspended solids,metals,pH	1996	2009	
	Agriculture/organic enrichment,low dissolved oxygen,nutrients	1998	2009	
	Wastewater and road runoff/excess algal growth	2004	2017	
	AMD/pH,metals,siltation	2004	2017	
Garretts Run	Vegetation removal/siltation,nutrients Urban runoff/storm sewers,siltation,nutrients	2002	2017	
Glade Run	Agriculture/siltation,nutrients Construction/siltation	1998	2011	
	AMD/metals	1998/2003	2011/2017	
Limestone Run	Wastewater/organic enrichment,low dissolved oxygen	2004	2017	
Pucketa Creek	Wastewater/nutrients	2002	2015	
Kiskiminetas River	AMD/siltation,metals	1996/2004	2009/2015	
	Bank modifications/siltation	2004	2017	
Buffalo Creek	AMD/metals		2009	
Allegheny River (lower)	Pathogens	2002	2017	Recreational use
	Urban runoff/storm sewers,nutrients	2002	2017	
Allegheny River (lower middle)	PCBs/surface mining,metals AMD/pH,siltation,metals	2004	2015/2017	Human health and aquatic life
Allegheny River (upper middle)	AMD/pH,metals	2002	2015/2017	
Allegheny River (upper)	Mercury	2002	2011	Human health
Source: DEP 2004 Integrated Water Quality Monitoring and Assessment Report http://www.dep.state.pa.us/dep/deputate/watermgt/wqp/wqstandards/303d-Report.htm				

4. Water Quality Testing

The Armstrong County Conservation District and other watershed groups have conducted many water quality assessments of the Allegheny's tributaries:

- Crooked Creek Water Quality Assessment and River Conservation Plan
- Cowanshannock Creek River Conservation Plan and water quality data
- All tributaries on the west bank of the river in Armstrong County do or will shortly have water quality assessments (see Map 5)
- Tributaries on the east bank of the river between Mahoning Creek and the Kiskiminetas River (aside from Crooked and Cowanshannock) will be assessed pending grant monies are received; Pine Creek field work has been completed
- Kiskiminetas River water quality data
- Redbank and Mahoning Creeks, as well as tributaries in between, have assessments (see the Watershed Restoration Strategy for Redbank Creek in the appendix)
- Tributaries from Redbank Creek to East Brady will be assessed in conjunction with Clarion County

Water Quality Definitions
pH - The pH scale ranges from 0 to 14, where 7 is neutral, values less than 7 are acidic, and values greater than 7 are basic. Therefore, to say that a river is *acidic* means that it has a low pH value. Typically, healthy streams and rivers have pH values ranging from 6-8.
Conductivity – Conductivity is a measurement of the ability of an aqueous solution to carry an electrical current. Commonly, the more dissolved solids, the greater the conductivity. When these values are high, water has limited uses for aquatic life and even commercial use.
Dissolved Oxygen - Oxygen gas dissolved in water. Oxygen in water is important for aquatic life (fish, insects, and plants). Values usually range from 0 mg/L (milligrams per liter) to 20 mg/L.

Most of the assessments include monitoring for abandoned mine drainage, as well as macroinvertebrate sampling.

The Army Corps of Engineers oversees the equipment and reporting of stream conditions and water quality at several stations along the Allegheny River. The United States Geological Survey also lists the Army Corps' data on their website.

http://wmw.lrp.usace.army.mil/current/index.html
http://pa.water.usgs.gov/current.html

Streamflow stations are located at Parker, Kittanning, Natrona, and Acmetonia (Harmar). The stations measure gage height, streamflow, average flow, and water temperature. One water quality monitoring station is located at Lock & Dam 3 at Acmetonia, which reports pH, conductivity, temperature, and dissolved oxygen.

The Army Corps of Engineers' Environmental Impact Study for Commercial Sand and Gravel Dredging also has data on Surface Water Quality. It can be found at http://www.lrp.usace.army.mil/or/or-f/toc.htm.

5. Fish Consumption Advisories

Due to the presence of pollutants in the streams and rivers, the PA Fish and Boat Commission (PFBC) and the DEP issue fish consumption advisories each year. They provide recreational fishermen with guidelines of how many fish they may eat in a certain time period based on the severity of the pollution. In the RCP study area, there is a 2004 Fish Consumption Advisory for carp in Pool 6. These fish are contaminated with Mercury, therefore it is recommended that people limit their consumption to one meal per month. One meal is defined as a half pound fish for a 150 pound person.

6. Contact Information

To report suspected water quality violations, contact one of the following:

DEP Southwestern Region (Allegheny, Westmoreland, Armstrong counties) 412-442-4184.
DEP Northwestern Region (Butler, Clarion, and Venango counties) 814-332-6839.

B. WATER SUPPLY

1. Pennsylvania Source Water Assessment Program

In August of 1996, Congress amended the Safe Drinking Water Act (SDWA) to include provisions for drinking water supply assessments. One year later, the EPA issued a guidance document for states to begin their Source Water Assessment and Protection (SWAP) program, the main goals of which are the prevention of drinking water contamination and citizen involvement in the clean-up and pollution prevention process.

The DEP, along with the consulting firm Spotts, Stevens, and McCoy, have assessed all the drinking water sources in the state. The assessments include one square mile surrounding all groundwater systems serving a population of 3,300 or more, small surface water systems with small, forested watersheds, and large surface water systems. The studies looked at the prime contributors to water pollution and how they affect the water quality of the drinking water source. Each of the assessments will be used to determine what preventative steps are required (by municipalities, water suppliers, and the government) to protect drinking water systems.[6]

The assessments summarized the greatest potential threats to water quality. While these threats may not be present within the boundaries of the study corridor, they still affect water quality as an upstream source. Summaries of each source water facility report are available at the end of this chapter. They include: Ford City Municipal Water Works, Kittanning Suburban Joint Municipal Authority, Manor Township Joint Municipal Authority, Borough of Springdale Water Department, Brackenridge Borough Water Department, Tarentum Borough Water Department, PA American Water Company Kittanning, Buffalo Township Municipal Authority – Freeport, New Kensington Municipal Authority, Harrison Township Water Authority, Parker Area Water Authority, Kittanning Suburb Joint Water Authority, Emlenton Water Company.

The source water reports only assess the quality of the source water (ground or surface). To obtain information on the quality of your tap water, contact your water authority about their annual consumer confidence reports.

Consumer Confidence Reports
Drinking water quality reports that must be distributed each year to customers of water suppliers. The reports must list the water source, average results of water quality tests (and whether they met standards), and how consumers can help to protect their water supply.

a. Wellhead Protection Program[7]

Section 1428 of the Federal Safe Drinking Water Act requires States to submit plans to the EPA that describe how they will protect ground-water sources used by public water systems from contamination. The **Wellhead Protection Program (WHPP)** is a proactive effort designed to apply proper management techniques and various preventive measures to protect ground-water supplies thereby ensuring public health and preventing the need for expensive treatment of wells to comply with drinking water standards. The underlying principle of the program is that it is much less expensive to protect ground water than it is to try to restore it once it becomes contaminated. Pennsylvania's WHPP was approved by EPA in March 1999 and it is the cornerstone of the Source Water Assessment Program which is also required under the SDWA.

[6] http://www.dep.state.pa.us/dep/deputate/watermgt/wc/subjects/srceprot/sourceassessment/default.htm
[7] http://www.dep.state.pa.us/dep/deputate/watermgt/wc/Subjects/SrceProt/source/whppover.htm

2. Groundwater

Water filtering through the soil moves first through an unsaturated zone where the spaces (pores) between solid particles or rocks contain both air and water. At this stage water is called soil water and some of it will be taken up by plants. The rest of it continues, pulled by gravity, in a generally downward path and eventually reaches the zone of saturation. Here the pore spaces are completely filled with water; this is groundwater. The top of the zone of saturation is called the water table. Rock or soil layers within the zone that can readily store and transmit usable amounts of water are called aquifers.[8]

Since much of the water supply for western Pennsylvanians comes from surface water, not much thought is given to groundwater. It is important to know, however, that groundwater provides about two thirds of water to streams, lakes, and wetlands (this discharge of groundwater to surface water is called "base flow"). In fact, most of Pennsylvania's fresh water comes from groundwater, which is commonly used for agriculture, industry, mining, domestic, and commercial uses. The amount of groundwater used per day in this study area is as follows:

Allegheny County: 148 million gallons per day (mgd)
Armstrong, Westmoreland, Butler, and Venango Counties: 6-20 mgd
Clarion County: 0-5 mgd[9]

3. Act 220 – The Water Resources Planning Act

Act 220 requires the state to update the State Water Plan. The update will include an in-depth look at how our water resources are being used. In other words, it will be a "water withdrawal and use registration and reporting program. This inventory will allow the DEP to determine how much water Pennsylvania has, how much is being used, and how much will be available in the future."[10] Water usage must be reported annually by all public water suppliers, hydropower stations, and individuals or businesses that withdraw more than 10,000 gallons per day (over a 30-day period). Any of those entities that withdraw over 50,000 gallons per day must meter their water use. Usages between 10,000 and 50,000 gallons must be estimated (DEP offers methods for estimating use). Homeowners are not required to monitor or report water usage (typically, households use 300 gallons per day).

Statewide Water Resources Committees have been established for the major river basins in the state (this Plan falls within the Ohio River Basin) and will "oversee the creation of water resources plans on the local level."

4. Early Warning Detection System

In 2003, an $870,000 monitoring system was put into place on the Allegheny, Monongahela, and Youghiogheny Rivers to detect water quality problems. Eleven monitors were installed to detect pollutants from acid mine drainage, sewage, oil spills, chemical spills, agricultural runoff, and acts of terrorism, all of which adversely affect water treatment plants, and thus drinking water quality. Data from these sites are posted on the Allegheny Monongahela Early Warning Detection System website (http://amewds.orsanco.org/) at half hour intervals allowing the public and watershed groups to document improvements in water quality as well as to alert the public about possible spills. The monitors in the study area are located in Emlenton, at Mahoning Creek, Kittanning, and Harrison. However, some of the monitors are not functioning as of printing of this report due to technical problems and lack of funding. Most water authorities are willing to help support the system, and they, along with DEP, are encouraged to continue the program.

---

[8] Groundwater: A Primer for Pennsylvanians. Water Resources Education Network.
[9] Fleeger, G.M., 1999, The geology of PAs groundwater (3rd ed.): PA Geological Survey, 4th Ser., Educational Series 3, 34p.
[10] www.dep.state.pa.us

C. COMMERCIAL DREDGING

The Allegheny and upper Ohio River beds contain extensive reserves of high quality sand and gravel, which were deposited as glacial till at the end of the Ice Age. These deposits represent a unique, finite natural resource in western Pennsylvania. These deposits and the riverbed are owned by the Commonwealth of Pennsylvania in trust for the public, but the Commonwealth may permit private parties to use the bed for various purposes, such as dredging, with proper permits from the DEP and ACE. Commercial sand and gravel dredging of the deposits has occurred in the study area for more than 100 years. Aggregates produced from the rivers have played a role in the development of the transportation system and infrastructure of western Pennsylvania. Currently, more than 65% of the dredged materials are used in publicly-funded infrastructure projects under rigid quality specifications, and approximately 38% is sold directly to the Pennsylvania Department of Transportation (PennDOT) for use in road paving materials. Furthermore, commercial traffic resulting from dredging supports the continued operation of the locks on the Allegheny River, and it provides local jobs. For more information on the socioeconomic impacts of commercial dredging, see Section 3.8 of the Environmental Impact Statement.

For years, several environmental organizations, government agencies, and concerned citizens have opposed dredging, based on the potential effect on fish and wildlife habitat. Substrate loss, diminution of shallow water area, siltation of clean gravel used for incubation of fish eggs and support of other aquatic organisms, the loss of islands due to slumping of supportive side slopes, and the effect on threatened and endangered species are all reported or alleged impacts on the Allegheny River. In response, a new Environmental Impact Statement (EIS) is under development. As is typically the case, the EIS is funded by the permit applicant (the dredging companies) and written by a consultant. In July 2002, the ACE issued a draft EIS on Commercial Sand and Gravel Dredging in the Ohio and Allegheny Rivers, which, when finalized, will replace the EIS completed in 1981. The EIS contains information on the following topics: analysis of the alternatives to river dredging, analysis of the affected environment (i.e. the river) including: hydrology, geology, surface water quality, biological resources, wetlands, air quality, noise, socioeconomic conditions, cultural resources. The Executive Summary is available in the appendix. The entire draft EIS may be viewed at http://www.lrp.usace.army.mil/or/or-f/toc.htm.

The development of an EIS and the issuance of permits are public processes. Questions and concerns about how the public may become involved should be directed to the appropriate government agencies, the ACE and the DEP.

EIS
A study and report of the impacts that an activity has on the environment. It is required of all federal government groups that propose a major project where natural resources will or may be disturbed. It is a main part of NEPA, the National Environmental Policy Act.

Dredging on the Allegheny

Chapter 3

Appendix

Watershed Restoration Action Strategy (WRAS)
State Water Plan Subbasin 17C
Redbank Creek Watershed (Allegheny River)
Jefferson, Armstrong, Clarion, and Clearfield Counties

Introduction

The 728 square mile subbasin 17C includes Redbank Creek and the Allegheny River and its tributaries from the confluence of Redbank Creek downstream to the above the confluence of the Clarion River. Several unnamed tributaries on west shore of the Allegheheny River upstream of the Clarion River are also included in the subbasin. The Redbank Creek watershed drains 573 square miles of this subbasin. The remaining 119 square miles are within the 63.1 square mile Bear Creek watershed and several minor tributaries. Major tributaries of the Redbank Creek include Sandy Lick Creek, 229 square miles, North Fork Redbank Creek, 98.2 square miles, and Little Sandy Creek, 73.2 square miles. The major tributary to Sandy Lick Creek, Mill Creek, drains 52.5 square miles. A total of 1,173 streams flow through the subbasin. The subbasin is included in **HUC Area 5010006**, Middle Allegheny River, Redbank Creek, classified as a Category I, FY99/2000 Priority watershed in the Unified Watershed Assessment.

Geology/Soils

The entire subbasin is within the Western Allegheny Plateau Pittsburgh Low Plateau (70c) Ecoregion, which is characterized by rounded or knobby hills, narrow valleys, entrenched rivers and fluvial terraces. Rock strata are comprised of sequences of sandstone, shale, limestone and coal. All soils in this ecoregion are derived from noncarbonate rocks and have slow to moderate rates of infiltration.

Mineable coals in the Allegheny Group and natural gas deposits are present throughout the watershed. Much of coal reserves were mined and abandoned and contribute polluted mine drainage to the subbasin. The highest total reserves were the Lower Kittanning coal. The Upper and Lower Freeport and the Brookville seams also contained mineable coals. Gas production also occurs in the subbasin.

Land Use

The subbasin has a combination of forested, agricultural, and surface mined land use. The most urbanized areas are the boroughs of DuBois and Brookville, which have industrial development and commercial facilities associated with exits off I-80. The population was 58,100 in 1990 and is projected to increase slightly to 59,000 by the year 2040.

Natural/Recreational Resources:

State Game Lands #244, 31, 108, 105, and 137 are relatively small isolated tracts scattered through the subbasin.

DEP Chapter 93 Exceptional Value (EV) and High-Quality (HQ) Stream Listings:

(EV) Streams:

- Silver Creek, source to SR1004 Bridge at Walley Mill

- South Branch North Fork
- Shippen Run
- Craft Run.

High Quality Streams:

- Silver Creek, SR1004 Bridge at Walley Mill to mouth
- Falls Creek
- Schoolhouse Run
- Little Mill Creek
- North Fork, basin, EXCEPT South Branch, Shippen Run and Craft Run
- Beaver Run, source to PA 36 Bridge

Water Quality Impairment

This largely rural landscape

Monitoring/Evaluation

Sixty percent of the subbasin was assessed under the Department's unassessed waters program in 2000. Nearly all the impairment is by metals and low pH from abandoned mine drainage. The 303d list indicates that the major problem is from precipitated metals, especially iron. Little Sandy Creek and Welch Run were listed as impaired from low pH from AMD. The South Branch Bear Creek was degraded by an industrial point source. Although agriculture land use makes up one third of the subbasin, only one stream, Huling Run, was listed as impaired by agriculture. Fivemile Run was impaired by nutrients and organic enrichment/low DO from a package plant. Discharges from gas well production and storage and disposal of brines has resulted in degraded surface and groundwater in some areas.

Future threats to water quality

The previous major threat to water quality has been from discharges from abandoned underground coal mines. The coal industry has been declining, many deep mines have closed, and operators are going out of business. The mine discharges are being cleaned up with the relatively recent development of passive treatment systems and some active chemical treatment facilities. Water quality, therefore, is expected to improve in the mined areas. Future threats to water quality from mining will likely be due to mine abandonment and cessation of pumping and treating of discharges by the current responsible owners. Water quality should also improve with the expanded schedule of well plugging contracted by the Department's Bureau of Oil and Gas Management.

Restoration Initiatives

Pennsylvania Growing Greener Grants:

- $33,476 (FY2002) to the Butler County Conservation District for an assessment abandoned oil and gas well seeps, abandoned surface mines, and deep mine discharges, and development of a restoration plan for North Branch Bear Creek.
- $131,140 (FY2002) to the Clarion County Conservation District for agricultural BMP's in Redbank Creek watershed.
- $20,000 (FY2002) to the Jefferson County Conservation District to conduct an assessment and develop a restoration plan for Soldier Run.

- $204,000 (FY2002) the Jefferson County Conservation District to backfill an abandoned surface mine and eliminate a 1400-foot highwall in Conifer area of Beaver Run.
- $31,790 (FY2001) to the Jefferson County Conservation District for start-up of the North Fork Watershed Association.
- $134,100 (FY2000) Jefferson County Commissioners for cleanup of 2,080 tons of waste from two illegal dump sites in Knox Township, one of which drains to Indian Camp Run and one of which flows to Redbank Creek, to seed and mulch 4 acres currently covered by these dumps and stabilize 400 feet of streambank.
- $149,570 (FY2000) to Armstrong/Jefferson/Clarion/Clearfield County Conservation Districts for a site assessment of the Redbank Creek watershed. Agricultural BMPs will also be installed the impaired Hulings Run. A variety of conservation measures will be provided included stream crossing, stream fencing, riparian buffers and water control structures.
- The Bureau of Oil and Gas Management has received funding for expansion of their orphan oil and gas wells plugging program (FY1999). A portion of this will be spent in this subbasin

US EPA Clean Water Act Section 319 Grants:

- $38,166 (FY2001) to Headwaters Charitable Trust to investigate an abandoned mine discharge upwelling through fractures in the stream channel of Beaver Run. The location of the discharge will make remediation difficult; therefore, a special treatment option must be developed.
- $117,991 (FY1999) to Hedin Environmental for restoration of Beaver Run, a tributary of Redbank Creek, through construction of passive treatment systems on 3 acidic discharges and one alkaline high iron discharge to Beaver Run near Confer, PA. This project area is located upstream of the passive treatment system installed by Hanley Brick Co. in 1998. The proposed treatment system is a limestone amended constructed wetland followed by an aerobic limestone bed. The alkaline discharge, known as the artesian discharge, enters Beaver Run ½ mile downstream of the other discharges.

DEP Bureau of Abandoned Mine Reclamation:

- 10% set-aside program
  - BAMR will deliver 4,000 tons of limestone for an anoxic drain to reclaim a refuse pile in Beaver Run watershed
- Bond Forfeiture Program
  - In the 1990's, DEP BAMR backfilled an open pit at Confer PA using spoil and refuse. The site was not adequately stabilized due to lack of cover material.

Public Outreach

Watershed Notebooks

DEP's website has a watershed notebook for each of its 104 State Water Plan watersheds. Each notebook provides a brief description of the watershed with supporting data and information on agency and citizen group activities. Each notebook is organized to allow networking by watershed groups and others by providing access to send and post information about projects and activities underway in the watershed. This WRAS will be posted in the watershed notebook to allow for public comment and update. The notebooks also link to the Department's Watershed Idea Exchange, an open forum to discuss watershed issues. The website is www.dep.state.pa.us. Choose Subjects/Water Management/Watershed Conservation/Watershed and Nonpoint Source Management/Watershed Notebooks.

Citizen/Conservation groups

- Redbank Creek Watershed Trust
- Headwaters Charitable Trust

Funding Needs

The total needed dollars for addressing all nonpoint source problems in the watershed is undetermined at this time and will be so until stream assessments are completed and necessary TMDLs are developed for the watershed. However, existing programs that address nonpoint source issues in the watershed will continue to move forward.

Pennsylvania has developed a Unified Watershed Assessment to identify priority watersheds needing restoration. Pennsylvania has worked cooperatively with agencies, organizations and the public to define watershed restoration priorities. The Commonwealth initiated a public participation process for the unified assessment and procedures for setting watershed priorities. Pennsylvania's assessment process was published in the *Pennsylvania Bulletin, DEP Update* publication and World Wide Web site. It was sent to the Department's list of watershed groups, monitoring groups, and Nonpoint Source Program mailing list. Department staff engaged in a significant outreach effort which included 23 additional events to solicit public comment. The Department received 23 written comments from a variety of agencies, conservation districts and watershed groups. Pennsylvania is committed to expanding and improving this process in the future.

After development of the initial WRAS a public participation process will take place to incorporate public input into expanding and "fine tuning" the WRAS for direction on use of 319 grant funds beyond FY2000.

Beaver Run Restoration:

Beaver Run watershed once contained a spur of the Pittsburg and Shawmut Railroad Co. Cleaning and loading of coal for transport by the railroad resulted in large piles of coal refuse in the watershed. Surface mining in the 1950's and 1960's further disturbed the area by creating abandoned highwalls, spoil piles, and a large mine pit. Clay for use in manufacturing of bricks was also mined in the watershed.

Hanley Brick Co., former owner of a brick manufacturing plant in Summerville, PA, had several outstanding violations associated with discharges from their clay mines. Hanley had been treating a highly acidic discharge from the Hanley #4A underground clay mine with chemicals until a July 1996 flood damaged their treatment plant. Rather than spending its remaining assets to continue expensive and unreliable chemical treatment, a settlement agreement was reached with DEP in August 1997. The settlement established the Redbank Creek Watershed Trust to finance future remediation projects in the Redbank Creek watershed. The DEP Knox District Mining Office was instrumental in negotiating the settlement. As part of the $2.4 million settlement, Hanley will spend $700,000 on treatment and portal reclamation at two clay mines known as Hanley 4A and Beaver Run. The remaining money will fund the trust. A steering committee consisting of an employee of the PA Fish and Boat Commission and two residents of Summerville were appointed to a committee to oversee the trust and determine what remediation

projects to fund with the trust. Trust fund money may be used in combination with other public or private funds to finance reclamation.

Studies by the DEP Knox District Mining Office identified 10 sources of polluted mine water in Beaver Run watershed. Hedin Environmental conducted a hydrologic unit study of Beaver Run to determine restoration needs in the watershed. Mine drainage to the watershed comes from two separated by the village of Confer, called Confer West and Confer East, and a third pool called the Lower Pool, located downstream of Confer. The Eastern and Western Pools produce acidic water contaminated with elevated levels of iron and aluminum. The Lower Pool is characterized by alkaline or mildly acidic water contaminated with iron.

Beaver Run is designated as a high quality cold water fishery and supports a reproducing population of brook trout upstream of PA Route 36. The quality of Beaver Run is substantially degraded in the village of Confer by inputs of acid mine drainage. These discharges eliminate the native trout fishery and degrade the aesthetic value of the stream with the iron precipitate which coats the stream bottom. Two-thousand feet downstream of Confer, Beaver Run is degraded by an unnamed tributary that is polluted by an artesian flow of mine water discharging from what is believed to be an abandoned well. Thirty-seven hundred feet farther downstream, Beaver Run is degraded by mine drainage flowing from fractures in the streambed. Below this last discharge, Beaver Run flows for 2.2 miles through scenic, forested land to its confluence with Redbank Creek. Beaver Run is not significantly impacted by other nonpoint source pollution.

The Redbank Creek Watershed Trust has funded construction of an automated chemical treatment system at an abandoned clay mine and construction of a passive treatment system in Confer. Long-term operation of the chemical treatment system will be funded through the trust. In 1999, the trust partnered with DEP Bureau of Abandoned Mine Reclamation to reclaim an acid producing refuse pile in Confer. Funding from a FY 1999 319 project will address four other discharges in the Beaver Run watershed. A 319 funded project scheduled to begin in fall 2000 will address treatment options for the remaining untreated discharge in Beaver Run, the mine drainage flowing from cracks in the streambed. A hydrologic assessment will be conducted to determine the source of the discharge and if remediation can be conducted without relocating the stream. Relocation of the stream would be costly (more than $250,000), risky, and may also move the discharge. When remediation of all discharges and refuse pile removal is completed, significant improvement in water quality and return of aquatic life is expected in over 6 miles of lower Beaver Run.

References/Sources of information

- State Water Plan, Subbasin 17, Central Allegheny River. Department of Environmental Protection, June 1979
- USGS Topographic Maps
- 319 project proposals and summaries
- DEP: Watershed Notebooks, Unified Assessment Document, and information from databases.
- Map of Draft Level III and IV Ecoregions of Pennsylvania and the Blue Ridge Mountains, Ridge and Valley, and Central Appalachians of EPA Regions III

Streams in Subbasin 17C: 303d/305b Listings

Stream	**Stream Code**	**Drainage area square miles**	**Miles Attained**	**Miles Impaired**	**Causes/Sources**
2-**Allegheny River**	42122		24.9 main stem; 16.0 of 14 UNTs	10.1	pH & metals from AMD
3- Fowler Run	51125	3.49		3.4 main stem; 2.9 of 3 UNTs	Metals from AMD
3-**Bear Creek**	49116	63.1	7.4 main stem	3.6	Metals, pH from AMD
4-Silver Creek & 19 UNTs	49168	7.38	All		*EV, upper basin; HQ-CWF, lower basin*
4-South Branch Bear Creek	49141	14.7	1.9 main stem; 11.54 of 10 UNTs	6.7	Cause & source unknown
4-North Branch Bear Creek	49118	16.8	0.6 main stem; 6.11 of 7 UNTs	7.7	Metals, pH from AMD
3-Dunlap Creek & one UNT	49112	1.23	All		
3-Black Fox Run	49082	8.38	4.3 main stem; 2.1 of 2 UNTs	3.4	Metals, pH from AMD
4-Fiddlers Run near upper Hillville & 4 UNTs	49086	2.12	All		
3-Catfish Run	49064	9.6	1.6 main stem; 5. 9 of 6 UNTs	1.0 main stem; 3.2 of 2 UNTs	Metals, pH from AMD
3-Sugar Creek	49035	17.5		5.2	Metals from AMD
4-Pine Run	49049	2.38			
4-Holder Run	49043	3.08			
4-Cove Run	49039	2.13			
4-Hart Run	49037	1.78			
3-Snyders Run	49019	3.78			
3-Huling Run	48997	10.8		0.48** of one UNT	Nutrients from AG
3-**Redbank Creek**	48064	**573**	1.3 main stem; 17.6 of 16 UNTs	0.8**; 13.9 of 14 UNTs	Metals from AMD

Stream	Stream Code	Drainage area square miles	Miles Attained	Miles Impaired	Causes/Sources
4-**North Fork Redbank Creek** & 28 UNTs	48851	**98.2**	All		*HQ-CWF*
5-Muddy Run near Schoffner Corner	48994	1.19			*HQ-CWF*
5-Williams Run & one UNT	48992	1.64	All		*HQ-CWF*
5-Bearpen Run	48991	1.80	All		*HQ-CWF*
5-Manner Dam Run & one UNT	48987	2.04	All		*HQ-CWF*
5-Mammy Hi Run & one UNT	48975	5.02	All		*HQ-CWF*
6-Hetrick Run & 2 UNTs	48978	2.19	All		*HQ-CWF*
6-Davis Run & one UNT	48976	1.20	All		*HQ-CWF*
5-Lucas Run	48972	3.07			*HQ-CWF*
6-Swede Run & one UNT	48973	1.14	All		*HQ-CWF*
5-South Branch North Fork Redbank Creek & 3 UNTs	48961	10.8	All		*EV*
6-Beaver Meadow Run & 2 UNTs	48965	3.29	All		*EV*
6-Bushley Run	48962	0.62	All		*EV*
5-Acy Run	48960	0.59	All		*HQ-CWF*
5-Seneca Run & 2 UNTs	48952	6.06	All		
6-Beaver Run near Egypt & 2 UNTs	48953	2.92	All		
5-Windfall Run & 9 UNTs	48934	5.98	All		*HQ-CWF*
5-Clear Run & 9 UNTs	48916	9.81	All		*HQ-CWF*
6-Dice Run	48930	1.07	All		*HQ-CWF*
6-Work Run & one UNT	48922	1.28	All		*HQ-CWF*
6-Clemens Run & 3 UNTs	48917	1.81	All		*HQ-CWF*

Stream	Stream Code	Drainage area square miles	Miles Attained	Miles Impaired	Causes/Sources
5-Tarklin Run near Sigel & 4 UNTs	48910	3.18	All		*HQ-CWF*
Miller Run	48915	0.97	All		*HQ-CWF*
5-Shippen Run & 6 UNTs	48903	3.38	All		*EV*
5-Craft Run & one UNT	48901	3.12	All		*EV*
5-Pekin Run & 8 UNTs	48878	10.3	All		*HQ-CWF*
6-Burns Run	48879	1.73	All		*HQ-CWF*
5-Red Lick Run & 4 UNTs	48870	3.50	All		*HQ-CWF*
5-Sugarcamp Run near Brookville & 9 UNTs	48857	3.57	All		*HQ-CWF*
4-**Sandy Lick Creek**	48527	**229**	7.5 main stem; 11.7 of 15 UNTs		
5-Coal Run	48844	3.36			
5-Muddy Run at Narrows Creek	48843	1.13			
5-Narrows Creek	48834	7.29		5.9**	Metals from AMD
5-Laborde Branch	48803	16.6		5.0**	Metals from AMD
6-Luthersburg Branch	48807	6.29		3.6**	Metals and other inorganics from AMD
7-Sugarcamp Run near Luthersburg	48809	1.21			
5-Reisinger Run	48799	2.67			
5-Pentz Run	48791	4.79			
5-Beaver Run	48788	1.58			*HQ-CWF, upper basin*
5-Clear Run	48782	3.61			
5-Slab Run	48788	1.97			
5-Wolf Run	48728	25.2			
6-Harveys Run	48757	1.56			
6-Falls Creek		14.0		0.4**	Metals from AMD *HQ-CWF*
7-Kyle Run	48746	2.46		1.3 **	Metals from AMD
7-Beaverdam Run	48734	6.37		5.6**	Siltation from AMD
5-Panther Run & 2 UNTs	48711	1.99	All		
5-Pitchpine Run & one UNT	48707	1.84	All		

Stream	Stream Code	Drainage area square miles	Miles Attained	Miles Impaired	Causes/Sources
5-Soldier Run	48684	12.7	4.0 main stem; 10.86 of 14 UNTs	2.8 main stem; 3.7 of 4 UNTs	Metals, pH from AMD
6-Fehley Run	48692	1.55	0.4 of one UNT	2.2 main stem	Metals, pH from AMD
6-McCreight Run	48685	1.13	0.9	1.1	Low pH from AMD
5-Trout Run	48669	10.8		10.1	Water/flow variability from natural sources
6-Front Run & 3 UNTs	48672	2.61	All		
5-Schoolhouse Run & 5 UNTs	48662	4.04	All		*HQ-CWF*
5-O'Donnell Run & 2 UNTs	48657	3.71	All		
5-Camp Run	48645	7.33			
5-Fuller Run	48642	1.62			
5-Cable Run	48636	1.02			
5-**Mill Creek** & 33 UNTs	48562	**52.5**	All		
6-Horm Run & 4 UNTs	48595	8.91	All		
7-Keys Run & 2 UNTs	48597	2.21	All		
6-Fivemile Run at South Sulger	48585	7.92	3.1 main stem; 2.6 of 4 UNTs	1.8 main stem 0.6 main stem 0.7 main stem	Nutients and organic enrichment/low DO from Package plants Metals from on-site wastewater Siltation from Habitat modification
6-Little Mill Creek & 14 UNTs	48564	9.81	All		*HQ-CWF*
7-Laurel Run & 2 UNTs	48575	3.37	All		
5-Fivemile Run at Brookville & 17 UNTs	48528	18.2	All		
6-Hunts Run	48543	0.23	All		
6- Swamp Run	48529	4.80	3.81 main stem; 4.2 of 6 UNTs	0.3 main stem	Metals from AMD
4-Coder Run	48504	10.4	3.32 main stem	1.9 main stem; 0.6 of one	Metals, pH from AMD

Stream	Stream Code	Drainage area square miles	Miles Attained	Miles Impaired	Causes/Sources
				UNT	
5-Campbell Run	48510	2.54	All		
5-Clement Run	48505	2.44		2.6 main stem & 2 UNTs	Water/flow variability from Road runoff
4-Rattlesnake Run	48497	1.70			
4-Simpson Run & one UNT	48493	2.05	All		
4-Welch Run	48486	4.24		4.5 main stem; 2.54 of 4 UNTs	Metals, pH from AMD
4-Runaway Run	48477	3.59		3.7 main stem s; 1.31 of 2 UNTs	Metals, pH from AMD
4-Carrier Run	48475	1.07			
4-Beaver Run at Heathville	48447	6.76		7.9	Metals from AMD *HQ-CWF, upper basin*
5-Eckler Run	48456	1.74			
4-Tarklin Run near Heathville	48438	2.34			
4-Patton Run	48425	2.40			
4-**Little Sandy Creek**	48289	73.2	10.56 of main stem & 22 UNTs	2.5**	Low pH from AMD
5-Middle Branch Little Sandy Creek	48414	2.23		1.4	Low pH from AMD
5-Hickok Run & one UNT	48410	1.62	All		
5-Clutch Run	48396	2.78	All		
6-Hadden Run	48397	3.22	All		
5-Indiancamp Run	48383	5.87			
5-Lick Run	48370	2.67			
5-Big Run	48327	17.7	8.2 main stem; 10.12 of 15 UNTs	2.6 main stem	Metals, pH from AMD
6-McCracken Run	48347	2.78	1.9 main stem; 2.36 of 4 UNTs	0.4 main stem	Metals, pH from AMD
5-Ferguson Run	48313	3.91	2.2 main stem; 1.55 of 3 UNTs	1.1 main stem	Metals, pH from AMD

Stream	Stream Code	Drainage area square miles	Miles Attained	Miles Impaired	Causes/Sources
6-Reitz Run	48314	1.70		2.2 main stem; 0.75 of 2 UNTs	Metals, pH from AMD
5-Cherry Run& 10 UNTs	48298	5.56	All		
5-Brocious Run & one UNT	48296	0.67	All		
5-Nolf Run	48290	3.05			
4-Pine Creek & 20 UNTs	48264	12.0	All		
4-Town Run	48226	9.41	3.3 main stem; 8.34 of 10 UNTs	3.2 main stem; 6.57 of 7 UNTs	
4-Middle Run at Fairmount City	48223	1.93	0.9 main stem	1.1 main stem; 1.2 of 2 UNTs	Metals from AMD
4-Long Run	48199	2.53			
4-Leatherwood Creek & 33 UNTs	48138	21.2	All		
5-West Fork Leatherwood Creek	48165	3.70	2.9 of 4 UNTs	0.6 main stem; 2.61 of 3 UNTs	Metals and other inorganics from AMD
5-Jack Run	48154	3.37	1.3 main stem s; 0.4 of one UNT	1.8 main stem; 1.11 of 3 UNTs	Metals from AMD
4-Middle Run at Leatherwood Station & 3 UNTs	48130	2.30	All		
4-Rock Run & 2 UNTs	48125	1.94	All		
4-Wildcat Run	48086	14.1		4.5 main stem; 6.71 of 6 UNTs	Metals, pH from AMD
5-East Fork Wildcat Run	48102		0.8 main stem; 4.01 of 6 UNTs	2.8 main stem	Metals, pH from AMD
5-Fiddlers Run at Diamond & 13 UNTs	48088	5.33	All		

The evaluation of the subbasin under the DEP unassessed waters project has not been completed.

**= Miles impaired are from a pre- 2001 303d/305b list- assessment not completed for the stream indicated.

Streams are listed in order from upstream to downstream. A stream with the number 2 is a tributary to a number 1 stream, 3's are tributaries to 2's, etc. Ohio River=1, Allegheny River=2

Classification in Chapter 93: HQ= High Quality, CWF= Cold Water Fishes, EV= Exceptional Value

AG= Agriculture; AMD= Abandoned mine drainage

Source Water Assessment Public Summary

Brackenridge Borough Water Department PWSID 5020006

Allegheny River MP- 23.2, 001

May 2002

Introduction

The Pennsylvania Department of Environmental Protection (DEP) has conducted assessments of potential contaminant threats to the raw water quality of all public drinking water sources as required by the 1996 Safe Drinking Water Act. This Source Water Assessment Public Summary provides information to support local and state efforts to protect the raw water quality of Brackenridge Borough Water Department's drinking water source. The information in this assessment pertains to the watershed that provides raw water to Brackenridge Borough Water Department which is then treated for drinking water use. The assessment pertains to "source" water, rather than "tap" water. Information on "tap" water quality is available in Brackenridge Borough Water Department's Consumer Confidence Report that can be obtained directly through the water supplier.

What is the Source of Your Drinking Water

Brackenridge Borough Water Department provides water for Brackenridge Borough, Fraiser Township, Fawn Township, and a portion of South Buffalo Township. The source of water for the Water Department is surface water from the Allegheny River which is designated for the protection of Warm Water Fishes (WWF). Because of the vast size of this watershed, there are many protected waters within it, most of which are protected for Cold Water Fishes. There are also many Exceptional Value streams within the Allegheny River watershed. The watershed encompasses approximately 11,500 square miles including 25 counties within Pennsylvania and New York. The Water Department serves a population of approximately 3,800 and is withdraws about 1.3 MGD (millions of gallons per day) from the river. The majority of the Allegheny River watershed is forested (65%) with large areas of agriculture (27%) and some pockets of urban or developed land (4%). Water storage, barren land, rangelands and wetlands comprise the remaining land usage.

Water Quality and Water Treatment Information

Water withdrawn for treatment at the purification plant is disinfected with chlorine, treated by coagulation/flocculation, settling, and filtration prior to distribution to customers. Water quality testing performed by the Water Department indicated that results of tap water sampling done in 2001 were acceptable. Additional information about treated water quality can be obtained from Brackenridge Borough Water Department's Consumer Confidence Report.

Evaluation of Significant Potential Sources of Contamination

The assessment evaluates contaminants that **may** enter the raw water from the watershed that contributes to the Allegheny River before treatment. The contaminants addressed in this assessment include those regulated under the federal Safe Drinking Water Act as well as those DEP has determined may present a concern to health. Descriptions of the significant potential sources of contamination associated with the watersheds are provided below. Each potential source of contamination has been analyzed and given a qualitative susceptibility rating (A = high priority through F = low priority) according to its potential to impact the water supply. The greatest potential sources of contamination are summarized below.

Potential Sources of Contamination	Contaminants of Concern	Description	Protection Priority
Transportation corridors, bridges	Metals, turbidity, SOCs	Road deicing and potential for spills along roads, bridges	A
Boating, Marina	Petroleum products	Accidental release/spill	A
Road Maintenance Depot, Salt Storage	Sodium chloride	Runoff from storage areas, application of salt on roads	A
Auto repair shops, Truck or bus terminals	MTBE, BTEX, Metals	Disposal of products/byproducts	A
Utility substations	Heavy metals, SOCs, VOCs	Accidents near water source	A
Combined Sewer Outfalls	Pathogens, bacteria, viruses, nutrients	Raw sewage entering water source	A
Residential Developments, golf courses	Nitrates/Nitrites, pathogens, VOCs, SOCs, nutrients, pesticides, herbicide	Stormwater runoff, lawn care, on-lot waste disposal	A

As indicated above, roads, bridges, boating, salt storage, auto repair and truck terminals, utility substations, combined sewer outfalls and runoff from non-point sources such as residential developments and golf courses are the most significant potential sources of contamination within the watersheds that contribute water to the Allegheny River intake. Roads and bridges receive a high ranking due to the locations (near streams and reservoirs) and possible release of a variety of substances from accidents. The boating permitted on the Allegheny River could yield cumulative amounts of petroleum products entering the source water in a short amount of time. Auto repair shops and truck terminals also pose a threat of releasing petroleum products such as BTEX and MTBE. The list includes storm water and CSO discharges in Brackenridge and Natrona. They were given an “A” ranking because of the large quantities of untreated water that can be conveyed through these systems. During the course of a storm, many contaminants can be picked up from industrial facilities and streets. Pesticides and herbicides can come from golf courses, field croplands, and lawns. In addition, many communities have combined sewers that transport raw sewage with storm water that can result in raw sewage going directly into the river by way of a combined sewer overflow, (CSO) without treatment during heavy rain events.

Source Water Protection Needs

It has been determined that existing state and federal regulations should provide adequate protection of Brackenridge Borough Water Department's water source. Overall, the watershed contributing raw water to the purification plant has moderate risk of significant contamination. Many impaired waters exist within the watershed mainly due to agricultural practices and abandoned mine drainage. Should a group (watershed organization, water supplier, municipalities) implement a watershed protection plan, the focus should be placed on controlling stormwater runoff along transportation corridors near the streams leading to the intake and within the towns of Brackenridge and Natrona, including combined sewer overflows. Best Management Practices should be used to divert runoff from agricultural areas away from streams, reservoirs and other waterways. Lastly, Best Management Practices for spill prevention and containment can reduce the threat of PCB exposure to the streams from utility substations. In Brackenridge, and at other locations along the Allegheny watershed, it is recommended that an organization be brought into effect to monitor the river, specifically regarding accidental spills and pollutant discharge. The organization can forewarn all water purveyors on the river of an upstream occurrence or accidental discharge, and thus protect the health and welfare of water users on the Allegheny.

Source Water Assessment Public Summary

Buffalo Township Municipal Authority-Freeport PWSID 5030019

Allegheny River MP- 29.4, 001

May 2002

Introduction

The Pennsylvania Department of Environmental Protection (DEP) has conducted assessments of potential contaminant threats to the raw water quality of all public drinking water sources as required by the 1996 Safe Drinking Water Act. This Source Water Assessment Public Summary provides information to support local and state efforts to protect the raw water quality of Buffalo Township Municipal Authority-Freeport's drinking water source. The information in this assessment pertains to the watershed that provides raw water to Buffalo Township Municipal Authority-Freeport which is then treated for drinking water use. The assessment pertains to "source" water, rather than "tap" water. Information on "tap" water quality is available in Buffalo Township Municipal Authority's Consumer Confidence Report that can be obtained directly through the water supplier.

What is the Source of Your Drinking Water

Buffalo Township Municipal Authority-Freeport provides water for Borough of Freeport, and Buffalo and South Buffalo Townships. The source of water for the Authority is surface water from the Allegheny River which is designated for the protection of Warm Water Fishes (WWF) from Clarion River to Kiskiminetas River. Because of the vast size of this watershed, there are many protected waters within it, most of which are protected for Cold Water Fishes. There are also many Exceptional Value streams within the Allegheny River watershed. The watershed encompasses approximately 11,000 square miles including 24 counties within Pennsylvania and New York. The Authority serves a population of approximately 5,000 and is permitted to withdraw 1.25 million gallons per day from the river. The majority of the Allegheny River watershed is forested (66%) with large areas of agriculture (27%) and some pockets of urban or developed land (4%). Water storage, barren land, rangelands and wetlands comprise the remaining land usage.

Water Quality and Water Treatment Information

Water withdrawn for treatment at the purification plant is filtered and disinfected with chlorine prior to distribution to customers. Water quality testing performed by the Authority indicated that results of tap water sampling done in 2001 were acceptable. Additional information about treated water quality can be obtained from the Buffalo Township Municipal Authority-Freeport's Consumer Confidence Report.

Evaluation of Significant Potential Sources of Contamination

The assessment evaluates contaminants that **may** enter the raw water from the watershed that contributes to the Allegheny River before treatment. The contaminants addressed in this assessment include those regulated under the federal Safe Drinking Water Act as well as those DEP has determined may present a concern to health. Descriptions of the significant potential sources of contamination associated with the watersheds are provided below. Each potential source of contamination has been analyzed and given a qualitative susceptibility rating (A = high priority through F = low priority) according to its potential to impact the water supply. The greatest potential sources of contamination are summarized below.

Potential Sources of Contamination	Contaminants of Concern	Description	Protection Priority
Transportation corridors, bridges, railroads	Metals, turbidity, SOCs	Road deicing and potential for spills along roads, bridges, railroads	A
Boating, Marina, Barge traffic	Petroleum products, coal, oil	Accidental release/spill	A
Auto repair shops	MTBE, BTEX, Metals	Disposal of products/byproducts	A
Utility substations, power plants	Heavy metals, SOCs, VOCs, waste piles	Accidents near water source	A
Combined Sewer Outfalls	Pathogens, bacteria, viruses, nutrients	Raw sewage entering water source	A
Pipelines	Oil, petroleum products	Ruptures in the pipes	A
Residential Developments	Nitrates/Nitrites, pathogens, VOCs, SOCs, nutrients, pesticides, herbicide	Stormwater runoff, lawn care, on-lot waste disposal, golf courses	A

As indicated above, roads, bridges, railroads, boating, barge traffic, auto repair, utility substations/power plants, combined sewer outfalls, pipelines and runoff from non-point sources such as residential developments are the most significant potential sources of contamination within the watersheds that contribute water to the Allegheny River intake. Roads, railroads and bridges receive a high ranking due to the locations (near streams and reservoirs) and possible release of a variety of substances from accidents. The boating permitted on the Allegheny River could yield cumulative amounts of petroleum products entering the source water in a short amount of time, as well as barge traffic which adds the potential for coal and oil contamination. Auto repair shops and truck terminals also pose a threat of releasing petroleum products such as BTEX and MTBE. Although pipeline ruptures seldom occur, these events have been some of the most significant causes of pollution in recent decades. The list includes storm water and CSO discharges in several of the surrounding communities. They were given an “A” ranking because of the large quantities of untreated water that can be conveyed through these systems. During the course of a storm, many contaminants can be picked up from industrial facilities and

streets. Pesticides and herbicides can come from golf courses, field croplands, and lawns. In addition, many communities have combined sewers that transport raw sewage with storm water that can result in raw sewage going directly into the river by way of a combined sewer overflow, (CSO) without treatment during heavy rain events.

Source Water Protection Needs

It has been determined that existing state and federal regulations should provide adequate protection of Buffalo Township Municipal Authority-Freeport's water source. Overall, the watershed contributing raw water to the purification plant has moderate risk of significant contamination. Many impaired waters exist within the watershed mainly due to agricultural practices and abandoned mine drainage. Should a group (watershed organization, water supplier, municipalities) implement a watershed protection plan, the focus should be placed on controlling stormwater runoff along transportation corridors near the streams leading to the intake and within the surrounding communities, including combined sewer overflows. Best Management Practices should be used to divert runoff from agricultural areas and abandoned mines away from streams, reservoirs and other waterways. Lastly, Best Management Practices for spill prevention and containment can reduce the threat of PCB exposure to the streams from utility substations. In the Buffalo Township area, and at other locations along the Allegheny watershed, it is recommended that an organization be brought into effect to monitor the river, specifically regarding accidental spills and pollutant discharge. The organization can forewarn all water purveyors on the river of an upstream occurrence or accidental discharge, and thus protect the health and welfare of water users on the Allegheny River.

Source Water Assessment Public Summary

Emlenton Water Company PWSID 6610019
Allegheny River, 066

February 2003

Introduction

The Pennsylvania Department of Environmental Protection (DEP) has conducted assessments of potential contaminant threats to the raw water quality of all public drinking water sources as required by the 1996 Safe Drinking Water Act. This Source Water Assessment Public Summary provides information to support local and state efforts to protect the raw water quality of Emlenton Water Company's drinking water source. The information in this assessment pertains to the watershed that provides raw water to the company, which is then treated for drinking water use. The assessment pertains to “source” water, rather than “tap” water. Information on “tap” water quality is available in the Emlenton Water Company *Consumer Confidence Report* that can be obtained directly through the water supplier.

What is the Source of Your Drinking Water

Emlenton Water Company has approximately 500 customers serving a population of approximately 2,000. The company provides water to Emlenton Borough and Richland Township, Venango County. The source of water for Emlenton is one surface water intake located on the Allegheny River in Emlenton Borough. The intake’s watershed covers approximately 6,400 square miles and 194 municipalities in 12 different counties. Three hundred and seventy-four basins within the Allegheny River watershed have been assigned Water Quality Standards. Over 100 basins have been established for the High Quality protection of Cold Water Fishes (HQ-CWF). Another 221 basins are protected for Cold Water Fishes (CWF) and nearly 50 basins receive high quality protection as Warm Water Fishes. Campbell Run, Little Shenango River, and Potato Creek are protected as Trout Stocking Facilities (TSF). Some waters receive the highest protection regulated under Chapter 93’s water quality standards, Exceptional Value (EV). These basins include: Arnot Run, Beaver Run, Crane Run, Dennison Run, Fourmile Run, Hemlock Creek, Minard Run, Railroad Run, South Branch Cole Creek, South Branch Oswayo Creek and Wildcat Run. The Allegheny River watershed is largely forested (66%) with large areas of agriculture (28%) and pockets of urban or developed lands (3%). Water storage, barren land and wetlands comprise the remaining land usage within the watershed.

Water Quality and Water Treatment Information

The Emlenton Water Company is permitted to withdraw up to 1.0 MGD (millions of gallons per day) from the Allegheny River. On average, approximately 130,000 gallons are distributed each day. Before the water is distributed to customers, it is disinfected with chlorine and treated by coagulation/flocculation, sedimentation, and filtration at the water treatment facility located along the Allegheny River in the Emlenton Borough. Additional information about treated water quality can be obtained from Emlenton Water Company's *Consumer Confidence Report*.

Evaluation of Significant Potential Sources of Contamination

The assessment evaluates contaminants that **may** enter the raw water from the watershed that contributes to the Allegheny River before treatment. The contaminants addressed in this assessment include those regulated under the federal Safe Drinking Water Act as well as those DEP has determined may present a concern to health. Descriptions of the significant potential sources of contamination associated with the watersheds are provided below. Each potential source of contamination has been analyzed and given a qualitative susceptibility rating (A = high priority through F = low priority) according to its potential to impact the water supply. The greatest potential sources of contamination are summarized below.

Potential Sources of Contamination	Contaminants of Concern	Description	Protection Priority
Transportation corridors, railroads and bridges	Metals, turbidity, SOCs, Sodium chloride	Road deicing and potential for spills along roads, railroads and bridges	A
Boating	Petroleum products, oil	Accidental release/spill	A
Utility substations, power plants	Heavy metals, SOCs, VOCs	Accidents near water source, waste piles	A
Auto Repair Shops	MTBE, BTEX, Metals	Accidental spill or disposal of products/byproducts	A
Stormwater Runoff	Nitrates/Nitrites, pathogens, VOCs, SOCs, nutrients, pesticides, herbicide	Runoff from agricultural fields, lawn care, golf courses, residential areas, industrial facilities	B
Package Plants, Wastewater Treatment Plants	Pathogens, bacteria, viruses, nutrients, turbidity	Regulated discharges and overflow	B

As indicated above, transportation corridors, auto repair shops, boating, utility substations, wastewater treatment plants and package plants and runoff from non-point sources such as residential developments, farms, industrial facilities and golf courses are the most significant potential sources of contamination within the watersheds that contribute water to the surface water intakes. Roads, railroads and bridges receive a high ranking due to the locations (near streams) and possible release of a variety of substances from accidents including road deicing. Boating permitted on the Allegheny River could yield cumulative amounts of petroleum products entering the source water in a short amount of time. Auto repair shops also pose a threat of releasing petroleum products such as BTEX and MTBE. Wastewater contamination from discharges and overflow from treatment plants may serve as a source of nitrate, bacteria, viruses, and parasites that threaten the public health causing gastrointestinal problems or transmitting contagious diseases. The list also includes stormwater runoff due of the large quantities of untreated water that can be conveyed through the systems. During the course of a storm, many contaminants can be picked up from industrial facilities and streets. Pesticides and herbicides can come from golf courses, field croplands, and lawns.

Source Water Protection Needs

Overall, the watershed contributing raw water to the purification plant has moderate risk of significant contamination. On review of the Section 303d List, many basins within the watershed are identified as impaired, due to the large size of the watershed. The areas of most concern regarding impaired waters should be Little Scrubgrass Creek, Lockard Run, and to a lesser extent, Scrubgrass Creek. These impaired waters are considered to be within a five hour time of travel period from the intake. All are impaired due to Acid Mind Drainage resulting in elevated metals and organics. Should a group (watershed organization, water supplier, municipalities) implement a watershed protection plan, the focus should be placed on controlling stormwater runoff along transportation corridors near the streams leading to the intake. Best Management Practices should be used to divert runoff from agricultural, residential and industrial areas away from streams, reservoirs and other waterways. Lastly, Best Management Practices for spill prevention and containment can reduce the threat of PCB exposure to the streams from utility substations and power plants.

FORD CITY MUNICIPAL WATER WORKS
Neale Avenue, PO Box 112, Ford City, PA 16226
PWS ID #5030005

Source Water Assessment Public Summary

Introduction

The Pennsylvania Department of Environmental Protection (DEP), Bureau of Water Supply Management, is completing assessments of the contaminant threats to the raw water quality of all public drinking water sources as required by the 1996 reauthorization of the Safe Drinking Water Act. DEP has prepared this Report to provide information to support local and state efforts to protect the raw water quality of Ford City Municipal Water Works' drinking water source. The information in this assessment pertains to the land area that provides groundwater to Ford City Municipal Water Works (FCM) that is then treated for drinking water use. The assessment is of "source" (groundwater) rather than tap water. Information on tap water quality is available in FCM's *Annual Consumer Confidence Report.*

What is the Source of Your Drinking Water?

The sources of water for FCM are three (3) groundwater wells. An average of 639,795 gallons of water are withdrawn each day. The assessment area for these three wells is approximately 0.70 square miles and is within the municipalities of Ford City Borough and Manor Township. The water system serves a population of approximately 3,431 people. FCM has an interconnection with Manor Township Joint Municipal Authority. Approximately 61 percent of the assessment area is low/high density development (residential, commercial and industrial), 18 percent is water (Allegheny River), and 21 percent is undeveloped, vegetated areas.

Water Quality and Water Treatment Information

Water pumped from the wells is treated and filtered before entering the distribution system. Treatment includes water softening, pH adjustment, filtration, fluoridation and disinfection. Water quality testing performed by FCM indicated that results of entry point and tap water sampling done in 2002 were acceptable. For further information regarding the quality of the system's finished (tap) water, please refer to their *Annual Consumer Confidence Report.*

Evaluation of Significant Potential Sources of Contamination

This assessment evaluates contaminants that **may** enter the water drawn directly from the Borough's wells. The contaminants addressed in this assessment include those regulated under the federal Safe Drinking Water Act as well as those DEP has determined may present a concern to public health. The table below provides a brief description of only the **most significant** potential sources of contamination associated with the assessment area. A more complete and detailed description of all potential sources of contamination can be found in Section 4.3. Each significant potential source of contamination has been analyzed and prioritized (A=high priority, F=low priority) in accordance with their potential to impact the raw water quality.

Potential Sources Of Contamination	Contaminants Of Concern	Description	Protection Priority
Transportation Corridors	Petroleum products, heavy metals, various compounds in transit	Accidents and spills associated with vehicular traffic and barges	A
Former Industrial Site	Arsenic, lead, volatile organics	Known contamination due to past industrial manufacturing activity	A
Scrap Yard	Petroleum products, volatile organics, metals	Lack of best management practices to prevent runoff or contamination of groundwater	B
Auto Repair Garages / Tube Cleaning Shop	Petroleum products, heavy metals, metals, volatile organics	Accidents and spills, unknown use of best management practices	B
Wood Products Shop	VOCs, solvents, adhesives, sealants, stains	Accidents and spills, unknown use of best management practices	B

Many of the significant potential sources of contamination store, treat, use and/or discharge petroleum products and/or volatile organic compounds (VOC). The aquifer for FCM is sensitive to VOC contamination, since routine water quality monitoring has had a detect of Trichloroethylene in 1999 and 2002 (below the maximum contaminant level).

Source Water Protection Needs

US Environmental Protection Agency (EPA) has a goal that by 2005, 50 percent of consumers, that receive their drinking water from public water supplies, will receive their drinking water from protected sources. For this reason and because of the various potential sources of contamination identified in this report, it's recommended that the development of a voluntary, local wellhead protection plan should be considered.

How to Obtain Additional Information

A copy of the Source Water Assessment report will be given to the community water system, the municipality(s) in which the drinking water sources are located, the primary municipality served, the county planning agency, the regional DEP office, and the district DEP office. In addition, a summary of this report will be available at the local library. Electronic copies of the summary of this report are available at www.dep.state.pa.us.

Source Water Assessment Public Summary

Harrison Township Water Authority PWSID 5020108
Allegheny River MP- 24.2, 001

May 2002

Introduction

The Pennsylvania Department of Environmental Protection (DEP) has conducted assessments of potential contaminant threats to the raw water quality of all public drinking water sources as required by the 1996 Safe Drinking Water Act. This Source Water Assessment Public Summary provides information to support local and state efforts to protect the raw water quality of Harrison Township Water Authority's drinking water source. The information in this assessment pertains to the watershed that provides raw water to Harrison Township Water Authority which is then treated for drinking water use. The assessment pertains to "source" water, rather than "tap" water. Information on "tap" water quality is available in Harrison Township Water Authority's Consumer Confidence Report that can be obtained directly through the water supplier.

What is the Source of Your Drinking Water

Harrison Township Water Authority provides water for Natrona and the Natrona Heights area of Harrison Township. The source of water for the Authority is surface water from the Allegheny River which is designated for the protection of Warm Water Fishes (WWF) from Plum Creek to its confluence with the Monongahela River. Because of the vast size of this watershed, there are many protected waters within it, most of which are protected for Cold Water Fishes. There are also many Exceptional Value streams within the Allegheny River watershed. The watershed encompasses approximately 11,500 square miles including 25 counties within Pennsylvania and New York. The Authority serves a population of approximately 10,700. The majority of the Allegheny River watershed is forested (65%) with large areas of agriculture (27%) and some pockets of urban or developed land (4%). Water storage, barren land, rangelands and wetlands comprise the remaining land usage.

Water Quality and Water Treatment Information

Water withdrawn for treatment at the purification plant is disinfected with chlorine and treated by coagulation/flocculation, sedimentation, and filtration prior to distribution to customers. Water quality testing performed by the Authority indicated that results of tap water sampling done in 2001 were acceptable. Additional information about treated water quality can be obtained from the Harrison Township Water Authority's Consumer Confidence Report.

Evaluation of Significant Potential Sources of Contamination

The assessment evaluates contaminants that **may** enter the raw water from the watershed that contributes to the Allegheny River before treatment. The contaminants addressed in this

assessment include those regulated under the federal Safe Drinking Water Act as well as those DEP has determined may present a concern to health. Descriptions of the significant potential sources of contamination associated with the watersheds are provided below. Each potential source of contamination has been analyzed and given a qualitative susceptibility rating (A = high priority through F = low priority) according to its potential to impact the water supply. The greatest potential sources of contamination are summarized below.

Potential Sources of Contamination	**Contaminants of Concern**	**Description**	**Protection Priority**
Transportation corridors, bridges	Metals, turbidity, SOCs	Road deicing and potential for spills along roads, bridges	A
Boating, Marina, Barge traffic	Petroleum products, coal, oil	Accidental release/spill	A
Auto repair shops, Truck or bus terminals	MTBE, BTEX, Metals	Disposal of products/byproducts	A
Utility substations	Heavy metals, SOCs, VOCs	Accidents near water source	A
Combined Sewer Outfalls	Pathogens, bacteria, viruses, nutrients	Raw sewage entering water source	A
Road Deicing, Salt Storage	Sodium chloride	Runoff from storage areas, application of salt on roads	A
Pipelines	Oil, petroleum products	Ruptures in the pipes	A
Residential Developments	Nitrates/Nitrites, pathogens, VOCs, SOCs, nutrients, pesticides, herbicide	Stormwater runoff, lawn care, on-lot waste disposal, golf courses	A

As indicated above, roads, bridges, boating, barge traffic, auto repair and truck terminals, salt storage, utility substations, combined sewer outfalls, pipelines and runoff from non-point sources such as residential developments and golf courses are the most significant potential sources of contamination within the watersheds that contribute water to the Allegheny River intake. Roads and bridges receive a high ranking due to the locations (near streams and reservoirs) and possible release of a variety of substances from accidents. The boating permitted on the Allegheny River could yield cumulative amounts of petroleum products entering the source water in a short amount of time, as well as barge traffic which adds the potential for coal and oil contamination. Auto repair shops and truck terminals also pose a threat of releasing petroleum products such as BTEX and MTBE. Although pipeline ruptures seldom occur, these events have been some of the most significant causes of pollution in recent decades. The list includes storm water and CSO discharges in several of the surrounding communities. They were given an “A” ranking because of the large quantities of untreated water that can be conveyed through these systems. During the course of a storm, many contaminants can be picked up from industrial facilities and streets. Pesticides and herbicides can come from golf courses, field croplands, and lawns. In addition, many communities have combined sewers that transport raw sewage with storm water

that can result in raw sewage going directly into the river by way of a combined sewer overflow, (CSO) without treatment during heavy rain events.

Source Water Protection Needs

It has been determined that existing state and federal regulations should provide adequate protection of Harrison Township Water Authority's water source. Overall, the watershed contributing raw water to the purification plant has moderate risk of significant contamination. Many impaired waters exist within the watershed mainly due to agricultural practices and abandoned mine drainage. Should a group (watershed organization, water supplier, municipalities) implement a watershed protection plan, the focus should be placed on controlling stormwater runoff along transportation corridors near the streams leading to the intake and within the surrounding communities, including combined sewer overflows. Best Management Practices should be used to divert runoff from agricultural areas and abandoned mines away from streams, reservoirs and other waterways. Lastly, Best Management Practices for spill prevention and containment can reduce the threat of PCB exposure to the streams from utility substations. In the Harrison Township area, and at other locations along the Allegheny watershed, it is recommended that an organization be brought into effect to monitor the river, specifically regarding accidental spills and pollutant discharge. The organization can forewarn all water purveyors on the river of an upstream occurrence or accidental discharge, and thus protect the health and welfare of water users on the Allegheny River.

Source Water Assessment Public Summary

Kittanning Suburb Joint Water Authority PWSID 50300043
Allegheny River, 003

May 2002

Introduction

The Pennsylvania Department of Environmental Protection (DEP) has conducted assessments of potential contaminant threats to the raw water quality of all public drinking water sources as required by the 1996 Safe Drinking Water Act. This Source Water Assessment Public Summary provides information to support local and state efforts to protect the raw water quality of Kittanning Suburb Joint Water Authority's drinking water source. The information in this assessment pertains to the watershed that provides raw water to Kittanning Suburb Joint Water Authority which is then treated for drinking water use. The assessment pertains to "source" water, rather than "tap" water. Information on "tap" water quality is available in Kittanning Suburb Joint Water Authority's Consumer Confidence Report that can be obtained directly through the water supplier.

What is the Source of Your Drinking Water

Kittanning Suburb Joint Water Authority provides water for the west Kittanning suburbs. The source of water for the Authority is surface water from the Allegheny River which is designated for the protection of Warm Water Fishes (WWF) from Clarion River to Kiskiminetas River. Because of the vast size of this watershed, there are many protected waters within it, most of which are protected for Cold Water Fishes. There are also many Exceptional Value streams within the Allegheny River watershed. The watershed encompasses approximately 9,000 square miles including 19 counties within Pennsylvania and New York. The Authority serves a population of approximately 6,000. The majority of the Allegheny River watershed is forested (67%) with large areas of agriculture (26%) and some pockets of urban or developed land (3%). Water storage, barren land, rangelands and wetlands comprise the remaining land usage.

Water Quality and Water Treatment Information

Water withdrawn for treatment at the purification plant is filtered and disinfected with chlorine prior to distribution to customers. Water quality testing performed by the Authority indicated that results of tap water sampling done in 2001 were acceptable. Additional information about treated water quality can be obtained from the Kittanning Suburb Joint Water Authority's Consumer Confidence Report.

Evaluation of Significant Potential Sources of Contamination

The assessment evaluates contaminants that **may** enter the raw water from the watershed that contributes to the Allegheny River before treatment. The contaminants addressed in this assessment include those regulated under the federal Safe Drinking Water Act as well as those

DEP has determined may present a concern to health. Descriptions of the significant potential sources of contamination associated with the watersheds are provided below. Each potential source of contamination has been analyzed and given a qualitative susceptibility rating (A = high priority through F = low priority) according to its potential to impact the water supply. The greatest potential sources of contamination are summarized below.

Potential Sources of Contamination	Contaminants of Concern	Description	Protection Priority
Transportation corridors, bridges	Metals, turbidity, SOCs	Road deicing and potential for spills along roads, bridges	A
Auto repair shops, Truck terminals	MTBE, BTEX, Metals	Disposal of products/byproducts	A
Unregulated sanitary discharge	Pathogens, bacteria, viruses	Raw sewage entering water source	A
Utility substations, power plants	Heavy metals, SOCs, VOCs	Accidents near water source, waste piles	A
Residential Developments	Nitrates/Nitrites, pathogens, VOCs, SOCs, nutrients, pesticides, herbicide	Stormwater runoff, lawn care, on-lot waste disposal, golf courses	A-B
Boating, Marina, Barge traffic	Petroleum products, coal, oil	Accidental release/spill	B

As indicated above, roads, bridges, auto repair and truck terminals, utility substations/power plants, barge traffic, boating, unregulated sanitary discharge and runoff from non-point sources such as residential developments are the most significant potential sources of contamination within the watersheds that contribute water to the Allegheny River intake. Roads and bridges receive a high ranking due to the locations (near streams and reservoirs) and possible release of a variety of substances from accidents. The boating permitted on the Allegheny River could yield cumulative amounts of petroleum products entering the source water in a short amount of time, as well as barge traffic which adds the potential for coal and oil contamination. Auto repair shops and truck terminals also pose a threat of releasing petroleum products such as BTEX and MTBE. The list includes storm water discharges in several of the surrounding communities. They were given an “A” ranking because of the large quantities of untreated water that can be conveyed through these systems. During the course of a storm, many contaminants can be picked up from industrial facilities and streets. Pesticides and herbicides can come from golf courses, field croplands, and lawns. Furthermore, in the Templeton area, raw sewage is discharged into the river, which will cause contamination until a treatment plant is installed.

Source Water Protection Needs

It has been determined that existing state and federal regulations should provide adequate protection of Kittanning Suburb Joint Water Authority’s water source. Overall, the watershed contributing raw water to the purification plant has moderate risk of significant contamination. Many impaired waters exist within the watershed mainly due to agricultural practices and

abandoned mine drainage. Should a group (watershed organization, water supplier, municipalities) implement a watershed protection plan, the focus should be placed on controlling stormwater runoff along transportation corridors near the streams leading to the intake and within the surrounding communities, including combined sewer overflows. Best Management Practices should be used to divert runoff from agricultural areas and abandoned mines away from streams, reservoirs and other waterways. Lastly, Best Management Practices for spill prevention and containment can reduce the threat of PCB exposure to the streams from utility substations and power plants. In Kittanning, and at other locations along the Allegheny watershed, it is recommended that an organization be brought into effect to monitor the river, specifically regarding accidental spills and pollutant discharge. The organization can forewarn all water purveyors on the river of an upstream occurrence or accidental discharge, and thus protect the health and welfare of water users on the Allegheny River.

KITTANNING SUBURBAN JOINT WATER AUTHORITY
RR 1, Box 23, Adrian, PA 16210
PWS ID #5030043

Source Water Assessment Public Summary

Introduction

The Pennsylvania Department of Environmental Protection (DEP), Bureau of Water Supply Management, is completing assessments of the contaminant threats to the raw water quality of all public drinking water sources as required by the 1996 reauthorization of the Safe Drinking Water Act. DEP has prepared this Report to provide information to support local and state efforts to protect the raw water quality of Kittanning Suburban Joint Water Authority's drinking water source. The information in this assessment pertains to the land area that provides groundwater to Kittanning Suburban Joint Water Authority (KSJWA) that is then treated for drinking water use. The assessment is of "source" (groundwater) rather than tap water. Information on tap water quality is available in KSJWA's *Annual Consumer Confidence Report.*

What is the Source of Your Drinking Water?

The sources of water for KSJWA are two (2) groundwater wells and a surface water intake on the Allegheny River. A separate Source Water Assessment Report, created by Spotts, Stevens & McCoy, Inc., covers the surface water source. This Report only covers their two groundwater wells. An average of 850,176 gallons of water are withdrawn each day. The assessment area for these two wells is approximately 0.40 square miles and is within the municipality of East Franklin Township. The water system serves a population of approximately 4,552 including some residents of East Franklin, North Buffalo, Cadogan, and Sugarcreek Townships. KSJWA has three reserve interconnections, one with PA American Water, one with West Kittanning Borough, and one with Worthington Borough. Approximately 40 percent of the assessment area is water (Ohio River), 50 percent is undeveloped, vegetated areas, and 10 percent is low/high density development (primarily residential with a few commercial/industrial sites).

Water Quality and Water Treatment Information

Water pumped from the wells is treated and filtered before entering the distribution system. Treatment includes iron and manganese removal, softening, filtration, fluoridation and disinfection. Water quality testing performed by KSJWA indicated that results of entry point and tap water sampling done in 2002 were acceptable. For further information regarding the quality of the system's finished (tap) water, please refer to their *Annual Consumer Confidence Report.*

Evaluation of Significant Potential Sources of Contamination

This assessment evaluates contaminants that **may** enter the water drawn directly from the Authority's wells. The contaminants addressed in this assessment include those regulated under the federal Safe Drinking Water Act as well as those DEP has determined may present a concern to public health. The table below provides a brief description of only the **most significant** potential sources of contamination associated with the assessment area. A more complete and detailed description of all potential sources of contamination can be found in Section 4.3. Each

significant potential source of contamination has been analyzed and prioritized (A=high priority, F=low priority) in accordance with their potential to impact the raw water quality.

Potential Sources Of Contamination	**Contaminants Of Concern**	**Description**	**Protection Priority**
Transportation Corridors	Petroleum products, heavy metals, various compounds in transit	Accidents and spills associated with vehicular traffic, railroads and barges	A
Septic Systems	Bacteria, virus pathogens, petroleum products	Malfunctioning and/or improperly maintained septic systems	B
Industrial Plants	Petroleum products, volatile organics, synthetic organics, metals	Accidents, leaks and spills, unknown use of best management practices	C

Many of the significant potential sources of contamination store, treat, use and/or discharge petroleum products and/or volatile organic compounds (VOC). The aquifer for KSJWA is sensitive to contamination, based on well pumping rates, well depths, and aquifer characteristics.

Source Water Protection Needs

US Environmental Protection Agency (EPA) has a goal that by 2005, 50 percent of consumers, that receive their drinking water from public water supplies, will receive their drinking water from protected sources. For this reason and because of the various potential sources of contamination identified in this report, it's recommended that the development of a voluntary, local wellhead protection plan should be considered.

How to Obtain Additional Information

A copy of the Source Water Assessment report will be given to the community water system, the municipality(s) in which the drinking water sources are located, the primary municipality served, the county planning agency, the regional DEP office, and the district DEP office. In addition, a summary of this report will be available at the local library. Electronic copies of the summary of this report are available at www.dep.state.pa.us.

MANOR TOWNSHIP JOINT MUNICIPAL AUTHORITY
2310 Pleasant View Drive, Ford City, PA 16226
PWS ID #5030006

Source Water Assessment Public Summary

Introduction

The Pennsylvania Department of Environmental Protection (DEP), Bureau of Water Supply Management, is completing assessments of the contaminant threats to the raw water quality of all public drinking water sources as required by the 1996 reauthorization of the Safe Drinking Water Act. DEP has prepared this Report to provide information to support local and state efforts to protect the raw water quality of Manor Township Joint Municipal Authority's drinking water source. The information in this assessment pertains to the land area that provides groundwater to Manor Township Joint Municipal Authority (MTJMA) that is then treated for drinking water use. The assessment is of "source" (groundwater) rather than tap water. Information on tap water quality is available in MTJMA's *Annual Consumer Confidence Report.*

What is the Source of Your Drinking Water?

The sources of water for MTJMA are four (4) groundwater wells (Well 2 is a reserve well). An average of 392,090 gallons of water are withdrawn each day. The assessment area for these four wells is approximately 0.38 square miles and is within the municipalities of Manor Township, Ford City Borough, and Manorville Borough. The water system serves a population of approximately 7,731, including residents of Manor, Bethel, Kittanning, Rayburn, and Valley Townships and Ford Cliff and Manorville Boroughs. MTJMA has a reserve interconnection with Ford City Borough. Approximately 39 percent of the assessment area is low/high density development (primarily commercial/industrial), 22 percent is water (Allegheny River), and 39 percent is undeveloped, vegetated areas.

Water Quality and Water Treatment Information

Water pumped from the wells is treated before entering the distribution system. Treatment includes ion exchange for softening, and chlorination for disinfection. Water quality testing performed by MTJMA indicated that results of entry point and tap water sampling done in 2002 were acceptable. For further information regarding the quality of the system's finished (tap) water, please refer to their *Annual Consumer Confidence Report.*

Evaluation of Significant Potential Sources of Contamination

This assessment evaluates contaminants that **may** enter the water drawn directly from the Authority's wells. The contaminants addressed in this assessment include those regulated under the federal Safe Drinking Water Act as well as those DEP has determined may present a concern to public health. The table below provides a brief description of only the **most significant** potential sources of contamination associated with the assessment area. A more complete and detailed description of all potential sources of contamination can be found in Section 4.3. Each significant potential source of contamination has been analyzed and prioritized (A=high priority, F=low priority) in accordance with their potential to impact the raw water quality.

Potential Sources Of Contamination	Contaminants Of Concern	Description	Protection Priority
Transportation Corridors	Petroleum products, heavy metals, various compounds in transit	Accidents and spills associated with vehicular traffic and barges	A
Auto Repair Shops	Petroleum products, heavy metals, metals, volatile organics	Accidents and spills, unknown use of best management practices	B
Gas Station	Petroleum products, volatile organics	Accidents or spills, or leaking underground gasoline storage tanks	C
Wood Products Shop, Asphalt Contractor, Paint Shop	VOCs, solvents, adhesives, sealants, stains	Accidents and spills, unknown use of best management practices	C
Sewage Treatment Plant	Bacteria, virus pathogens	Accidents, leaks, flood events at the adjacent STP	C

Many of the significant potential sources of contamination store, treat, use and/or discharge petroleum products and/or volatile organic compounds (VOC). The aquifer for Manor Township Joint Municipal Authority is sensitive to VOC contamination due to high pumping rates, shallow well depths, and aquifer characteristics.

Source Water Protection Needs

US Environmental Protection Agency (EPA) has a goal that by 2005, 50 percent of consumers, that receive their drinking water from public water supplies, will receive their drinking water from protected sources. For this reason and because of the various potential sources of contamination identified in this report, it's recommended that the development of a voluntary, local wellhead protection plan should be considered.

How to Obtain Additional Information

A copy of the Source Water Assessment report will be given to the community water system, the municipality(s) in which the drinking water sources are located, the primary municipality served, the county planning agency, the regional DEP office, and the district DEP office. In addition, a summary of this report will be available at the local library. Electronic copies of the summary of this report are available at www.dep.state.pa.us.

Source Water Assessment Public Summary

New Kensington Municipal Authority PWSID 5650070
Allegheny River MP- 20.8, 001

May 2002

Introduction

The Pennsylvania Department of Environmental Protection (DEP) has conducted assessments of potential contaminant threats to the raw water quality of all public drinking water sources as required by the 1996 Safe Drinking Water Act. This Source Water Assessment Public Summary provides information to support local and state efforts to protect the raw water quality of New Kensington Municipal Authority's drinking water source. The information in this assessment pertains to the watershed that provides raw water to New Kensington Municipal Authority which is then treated for drinking water use. The assessment pertains to "source" water, rather than "tap" water. Information on "tap" water quality is available in New Kensington Municipal Authority's Consumer Confidence Report that can be obtained directly through the water supplier.

What is the Source of Your Drinking Water

New Kensington Municipal Authority provides water for New Kensington, Arnold, Upper and Lower Burrell, Washington Township, and portions of Plum Township. The source of water for the Authority is surface water from the Allegheny River which is designated for the protection of Warm Water Fishes (WWF) from the Kiskiminetas River to Plum Creek. Because of the vast size of this watershed, there are many protected waters within it, most of which are protected for Cold Water Fishes. There are also many Exceptional Value streams within the Allegheny River watershed. The watershed encompasses approximately 11,500 square miles including 25 counties within Pennsylvania and New York. The Authority serves a population of approximately 48,000. The majority of the Allegheny River watershed is forested (65%) with large areas of agriculture (27%) and some pockets of urban or developed land (4%). Water storage, barren land, rangelands and wetlands comprise the remaining land usage.

Water Quality and Water Treatment Information

Water withdrawn for treatment at the purification plant is treated by coagulation/flocculation, sedimentation, filtration, and disinfection. The water is further treated with fluoride, chlorine, and a corrosion inhibitor prior to distribution to the consumer. Water quality testing performed by the Authority indicated that results of tap water sampling done in 2001 were acceptable. Additional information about treated water quality can be obtained from New Kensington Municipal Authority's Consumer Confidence Report.

Evaluation of Significant Potential Sources of Contamination

The assessment evaluates contaminants that **may** enter the raw water from the watershed that contributes to the Allegheny River before treatment. The contaminants addressed in this assessment include those regulated under the federal Safe Drinking Water Act as well as those DEP has determined may present a concern to health. Descriptions of the significant potential sources of contamination associated with the watersheds are provided below. Each potential source of contamination has been analyzed and given a qualitative susceptibility rating (A = high priority through F = low priority) according to its potential to impact the water supply. The greatest potential sources of contamination are summarized below.

Potential Sources of Contamination	Contaminants of Concern	Description	Protection Priority
Transportation corridors, bridges	Metals, turbidity, SOCs	Road deicing and potential for spills along roads, bridges	A
Boating, Marina	Petroleum products	Accidental release/spill	A
Auto repair shops, Truck or bus terminals	MTBE, BTEX, Metals	Disposal of products/byproducts	A
Utility substations, power plants	Heavy metals, SOCs, VOCs, wastepiles	Accidents near water source	A
Combined Sewer Outfalls, Malfunctioning Septic Systems	Pathogens, bacteria, viruses, nutrients	Raw sewage entering water source	A
Pipelines	Oil, petroleum products	Ruptures in the pipes	A
Residential Developments, golf courses	Nitrates/Nitrites, pathogens, VOCs, SOCs, nutrients, pesticides, herbicide	Stormwater runoff, lawn care, on-lot waste disposal	A

As indicated above, roads, bridges, boating, auto repair and truck terminals, utility substations/power plants, combined sewer outfalls, malfunctioning septic systems, pipelines and runoff from non-point sources such as residential developments and golf courses are the most significant potential sources of contamination within the watersheds that contribute water to the Allegheny River intake. Roads and bridges receive a high ranking due to the locations (near streams and reservoirs) and possible release of a variety of substances from accidents. The boating permitted on the Allegheny River could yield cumulative amounts of petroleum products entering the source water in a short amount of time. Auto repair shops and truck terminals also pose a threat of releasing petroleum products such as BTEX and MTBE. Although pipeline ruptures seldom occur, these events have been some of the most significant causes of pollution in recent decades. The list includes storm water and CSO discharges in nearby communities. They were given an “A” ranking because of the large quantities of untreated water that can be conveyed through these systems. During the course of a storm, many contaminants can be picked

up from industrial facilities and streets. Pesticides and herbicides can come from golf courses, field croplands, and lawns. In addition, many communities have combined sewers that transport raw sewage with storm water that can result in raw sewage going directly into the river by way of a combined sewer overflow, (CSO) without treatment during heavy rain events.

Source Water Protection Needs

Overall, the watershed contributing raw water to the purification plant has moderate risk of significant contamination. Many impaired waters exist within the watershed mainly due to agricultural practices and abandoned mine drainage. Should a group (watershed organization, water supplier, municipalities) implement a watershed protection plan, the focus should be placed on controlling stormwater runoff along transportation corridors near the streams leading to the intake and within such towns as Tarentum, Brackenridge and Natrona, including combined sewer overflows. Best Management Practices should be used to divert runoff from agricultural areas away from streams, reservoirs and other waterways. Also, malfunctioning septic system concerns could be mitigated by proper septic tank inspection and maintenance as part of a municipal sewage management program. Lastly, Best Management Practices for spill prevention and containment can reduce the threat of PCB exposure to the streams from utility substations. In New Kensington, and at other locations along the Allegheny watershed, it is recommended that an organization be brought into effect to monitor the river, specifically regarding accidental spills and pollutant discharge. The organization can forewarn all water purveyors on the river of an upstream occurrence or accidental discharge, and thus protect the health and welfare of water users on the Allegheny River.

Source Water Assessment Public Summary

Parker Area Water Authority PWSID 5030011
Allegheny River MP- 83.8, 001

May 2002

Introduction

The Pennsylvania Department of Environmental Protection (DEP) has conducted assessments of potential contaminant threats to the raw water quality of all public drinking water sources as required by the 1996 Safe Drinking Water Act. This Source Water Assessment Public Summary provides information to support local and state efforts to protect the raw water quality of Parker Area Water Authority's drinking water source. The information in this assessment pertains to the watershed that provides raw water to Parker Area Water Authority which is then treated for drinking water use. The assessment pertains to "source" water, rather than "tap" water. Information on "tap" water quality is available in Parker Area Water Authority's Consumer Confidence Report that can be obtained directly through the water supplier.

What is the Source of Your Drinking Water

Parker Area Water Authority provides water for Parker City and a portion of Parker Township. The source of water for the Authority is surface water from the Allegheny River which is designated for the protection of Warm Water Fishes (WWF) from Clarion River to Kiskiminetas River. Because of the vast size of this watershed, there are many protected waters within it, most of which are protected for Cold Water Fishes. There are also many Exceptional Value streams within the Allegheny River watershed. The watershed encompasses approximately 7,600 square miles including 18 counties within Pennsylvania and New York. The Authority serves a population of approximately 950 and is permitted to withdraw 288,000 gallons per day from the river, but current daily production is about 75,000 gal per day. The majority of the Allegheny River watershed is forested (68%) with large areas of agriculture (26%) and some pockets of urban or developed land (3%). Water storage, barren land, rangelands and wetlands comprise the remaining land usage.

Water Quality and Water Treatment Information

Water withdrawn for treatment at the purification plant is filtered and disinfected with chlorine prior to distribution to customers. Water quality testing performed by the Authority indicated that results of tap water sampling done in 2001 were acceptable. Additional information about treated water quality can be obtained from the Parker Area Water Authority's Consumer Confidence Report.

Evaluation of Significant Potential Sources of Contamination

The assessment evaluates contaminants that **may** enter the raw water from the watershed that contributes to the Allegheny River before treatment. The contaminants addressed in this

assessment include those regulated under the federal Safe Drinking Water Act as well as those DEP has determined may present a concern to health. Descriptions of the significant potential sources of contamination associated with the watersheds are provided below. Each potential source of contamination has been analyzed and given a qualitative susceptibility rating (A = high priority through F = low priority) according to its potential to impact the water supply. The greatest potential sources of contamination are summarized below.

Potential Sources of Contamination	Contaminants of Concern	Description	Protection Priority
Transportation corridors, bridges	Metals, turbidity, SOCs	Road deicing and potential for spills along roads, bridges	A
Auto repair shops, Truck or bus terminals	MTBE, BTEX, Metals	Disposal of products/byproducts	A
Beaver Colonies	Giardia Cysts	Animal wastes	A
Residential Developments	Nitrates/Nitrites, pathogens, VOCs, SOCs, nutrients, pesticides, herbicide	Stormwater runoff, lawn care, on-lot waste disposal, golf courses	A-B

As indicated above, roads, bridges, auto repair and truck terminals, beaver colonies and runoff from non-point sources such as residential developments are the most significant potential sources of contamination within the watersheds that contribute water to the Allegheny River intake. Roads and bridges receive a high ranking due to the locations (near streams and reservoirs) and possible release of a variety of substances from accidents. Auto repair shops and truck terminals also pose a threat of releasing petroleum products such as BTEX and MTBE. The list includes storm water discharges in several of the surrounding communities. They were given an “A” ranking because of the large quantities of untreated water that can be conveyed through these systems. During the course of a storm, many contaminants can be picked up from industrial facilities and streets. Pesticides and herbicides can come from golf courses, field croplands, and lawns.

Source Water Protection Needs

It has been determined that existing state and federal regulations should provide adequate protection of Parker Area Water Authority’s water source. Overall, the watershed contributing raw water to the purification plant has low to moderate risk of significant contamination. Many impaired waters exist within the watershed mainly due to abandoned mine drainage. Should a group (watershed organization, water supplier, municipalities) implement a watershed protection plan, the focus should be placed on controlling stormwater runoff along transportation corridors near the streams leading to the intake and within the surrounding communities. Best Management Practices should be used to divert runoff from abandoned mines and agricultural areas away from streams, reservoirs and other waterways.

BOROUGH OF SPRINGDALE WATER DEPARTMENT
325 School Street, Springdale, PA 15144
PWS ID #5020053

Source Water Assessment Public Summary

Introduction

The Pennsylvania Department of Environmental Protection (DEP), Bureau of Water Supply Management, is completing assessments of the contaminant threats to the raw water quality of all public drinking water sources as required by the 1996 reauthorization of the Safe Drinking Water Act. DEP has prepared this Report to provide information to support local and state efforts to protect the raw water quality of Borough of Springdale Water Department's drinking water source. The information in this assessment pertains to the land area that provides groundwater to the water supply wells that is then treated for drinking water use. The assessment is of "source" (groundwater) rather than tap water. Information on tap water quality is available in Borough of Springdale Water Department's *Annual Consumer Confidence Report.*

What is the Source of Your Drinking Water?

The sources of water for Springdale Borough are two (2) groundwater wells. The two withdraw, on average, 450,800 gallons of water per day. The assessment area for these two wells is approximately 2.6 square miles and is within the municipalities of Springdale Borough, Springdale Township, Plum Borough and Frazer Township. The water system serves a population of approximately 3,992 people including some residential customers from Springdale Township. Borough of Springdale Water Department also has emergency interconnections with Fawn/Frazer Water Authority and Cheswick Borough. Land use in the assessment area is approximately 28 percent residential, 10 percent commercial/industrial, 7 percent water (Allegheny River), and 50 percent is primarily undeveloped, vegetated areas (Zone III).

Water Quality and Water Treatment Information

Water pumped from the wells is treated before entering the distribution system. Treatment includes iron and manganese removal, aeration for VOC removal, softening, corrosion control, and disinfection. Water quality testing performed by Borough of Springdale Water Department indicates that results of entry point and tap water sampling done in 2002 were acceptable. For further information regarding the quality of the system's finished (tap) water, please refer to the *Annual Consumer Confidence Report.*

Evaluation of Significant Potential Sources of Contamination

This assessment evaluates compounds that **may** enter the water drawn directly from the Borough's wells. The compounds addressed in this assessment include those regulated under the federal Safe Drinking Water Act as well as those DEP has determined may present a concern to public health. The table below provides a brief description of only the **most significant** potential sources of contamination associated with the assessment area. A more complete and detailed description of all potential sources of contamination can be found in Section 4.3. Each significant potential source of contamination has been analyzed and prioritized (A=high priority, F=low priority) in accordance with their potential to impact the raw water quality.

Potential Sources Of Contamination	Contaminants Of Concern	Description	Protection Priority
Transportation Corridors	Petroleum products, heavy metals, various compounds in transit	Accidents and spills associated with vehicular traffic, railroads and barges	A
Petroleum Storage Facility	Petroleum products	Accidents, spills, and leaks	A
Marina Dump	Petroleum products, heavy metals, metals, volatile organics	Unknown control practices on prohibiting contaminants from entering aquifer	A
Former Scrap Yard	Petroleum products, heavy metals, metals, volatile organics	Unknown control practices on prohibiting contaminants from entering aquifer	A

Many of the significant potential sources of contamination store, treat, use and/or discharge petroleum products and/or volatile organic compounds (VOC). The aquifer for Borough of Springdale Water Department is sensitive to VOC contamination, since there has been a history of VOC contamination causing the Water Department to treat their water for VOC removal.

Source Water Protection Needs

US Environmental Protection Agency (EPA) has a goal that by 2005, 50 percent of consumers, that receive their drinking water from public water supplies, will receive their drinking water from protected sources. Springdale Borough has shown forethought and initiative by producing a DEP-approved Wellhead Protection Plan.

How to Obtain Additional Information

A copy of the Source Water Assessment report will be given to the community water system, the municipality(s) in which the drinking water sources are located, the primary municipality served, the county planning agency, the regional DEP office, and the Allegheny County Health Department. In addition, a summary of this report will be available at the local library. Electronic copies of the summary of this report are available at www.dep.state.pa.us.

Source Water Assessment Public Summary

Tarentum Borough Water Department PWSID 5020055
Allegheny River MP- 22.4, 001

May 2002

Introduction

The Pennsylvania Department of Environmental Protection (DEP) has conducted assessments of potential contaminant threats to the raw water quality of all public drinking water sources as required by the 1996 Safe Drinking Water Act. This Source Water Assessment Public Summary provides information to support local and state efforts to protect the raw water quality of Tarentum Borough Water Department's drinking water source. The information in this assessment pertains to the watershed that provides raw water to Tarentum Borough Water Department which is then treated for drinking water use. The assessment pertains to "source" water, rather than "tap" water. Information on "tap" water quality is available in Tarentum Borough Water Department's Consumer Confidence Report that can be obtained directly through the water supplier.

What is the Source of Your Drinking Water

Tarentum Borough Water Department provides water for Tarentum Borough and portions of East Deer Township. It also has an interconnection with the Brackenridge Borough Water Department. The source of water for the Department is surface water from the Allegheny River which is designated for the protection of Warm Water Fishes (WWF) from Plum Creek to it's confluence with the Monongahela River. Because of the vast size of this watershed, there are many protected waters within it, most of which are protected for Cold Water Fishes. There are also many Exceptional Value streams within the Allegheny River watershed. The watershed encompasses approximately 11,400 square miles including 25 counties within Pennsylvania and New York. The Water Department serves a population of approximately 6,900 and is withdraws about 1.0 MGD (millions of gallons per day) from the river. The majority of the Allegheny River watershed is forested (65%) with large areas of agriculture (27%) and some pockets of urban or developed land (4%). Water storage, barren land, rangelands and wetlands comprise the remaining land usage.

Water Quality and Water Treatment Information

Water withdrawn for treatment at the purification plant is treated by chemical coagulation and flocculation, sedimentation, and filtration, followed by disinfection. Corrosion control (caustic soda or soda ash) is added prior to distribution. to customers. Water quality testing performed by the Water Department indicated that results of tap water sampling done in 2001 were acceptable. Additional information about treated water quality can be obtained from Tarentum Borough Water Department's Consumer Confidence Report.

Evaluation of Significant Potential Sources of Contamination

The assessment evaluates contaminants that **may** enter the raw water from the watershed that contributes to the Allegheny River before treatment. The contaminants addressed in this assessment include those regulated under the federal Safe Drinking Water Act as well as those DEP has determined may present a concern to health. Descriptions of the significant potential sources of contamination associated with the watersheds are provided below. Each potential source of contamination has been analyzed and given a qualitative susceptibility rating (A = high priority through F = low priority) according to its potential to impact the water supply. The greatest potential sources of contamination are summarized below.

Potential Sources of Contamination	Contaminants of Concern	Description	Protection Priority
Transportation corridors, bridges	Metals, turbidity, SOCs	Road deicing and potential for spills along roads, bridges	A
Boating, Marina	Petroleum products	Accidental release/spill	A
Auto repair shops, Truck or bus terminals	MTBE, BTEX, Metals	Disposal of products/byproducts	A
Utility substations	Heavy metals, SOCs, VOCs	Accidents near water source	A
Combined Sewer Outfalls	Pathogens, bacteria, viruses, nutrients	Raw sewage entering water source	A
Pipelines	Oil, petroleum products	Ruptures in the pipes	A
Residential Developments, golf courses	Nitrates/Nitrites, pathogens, VOCs, SOCs, nutrients, pesticides, herbicide	Stormwater runoff, lawn care, on-lot waste disposal	A

As indicated above, roads, bridges, boating, auto repair and truck terminals, utility substations, combined sewer outfalls, pipelines and runoff from non-point sources such as residential developments and golf courses are the most significant potential sources of contamination within the watersheds that contribute water to the Allegheny River intake. Roads and bridges receive a high ranking due to the locations (near streams and reservoirs) and possible release of a variety of substances from accidents. The boating permitted on the Allegheny River could yield cumulative amounts of petroleum products entering the source water in a short amount of time. Auto repair shops and truck terminals also pose a threat of releasing petroleum products such as BTEX and MTBE. Although pipeline ruptures seldom occur, these events have been some of the most significant causes of pollution in recent decades. The list includes storm water and CSO discharges in Tarentum, Brackenridge and Natrona. They were given an “A” ranking because of the large quantities of untreated water that can be conveyed through these systems. During the course of a storm, many contaminants can be picked up from industrial facilities and streets. Pesticides and herbicides can come from golf courses, field croplands, and lawns. In addition, many communities have combined sewers that transport raw sewage with storm water that can

result in raw sewage going directly into the river by way of a combined sewer overflow, (CSO) without treatment during heavy rain events.

Source Water Protection Needs

It has been determined that existing state and federal regulations should provide adequate protection of Tarentum Borough Water Department's water source. Overall, the watershed contributing raw water to the purification plant has moderate risk of significant contamination. Many impaired waters exist within the watershed mainly due to agricultural practices and abandoned mine drainage. Should a group (watershed organization, water supplier, municipalities) implement a watershed protection plan, the focus should be placed on controlling stormwater runoff along transportation corridors near the streams leading to the intake and within the towns of Tarentum, Brackenridge and Natrona, including combined sewer overflows. Best Management Practices should be used to divert runoff from agricultural areas away from streams, reservoirs and other waterways. Lastly, Best Management Practices for spill prevention and containment can reduce the threat of PCB exposure to the streams from utility substations. In Tarentum, and at other locations along the Allegheny watershed, it is recommended that an organization be brought into effect to monitor the river, specifically regarding accidental spills and pollutant discharge. The organization can forewarn all water purveyors on the river of an upstream occurrence or accidental discharge, and thus protect the health and welfare of water users on the Allegheny River.

Draft Environmental Impact Statement on Commercial Sand and Gravel Dredging Operations in the Allegheny and Ohio Rivers, Pennsylvania

Executive Summary

EXECUTIVE SUMMARY

E.1 INTRODUCTION

This document evaluates the environmental consequences associated with granting and extending permits for proposed commercial dredging activities within the Allegheny River (between river miles 0 - 69.5) and Ohio River (between river miles 0-40) (defined as the study area, which includes adjacent terrestrial habitat) in the general vicinity of southwestern Pennsylvania. The study area encompasses a series of river pools created by a network of locks and dams maintained by the U.S. Army Corps of Engineers (USACE). Permits for commercial dredging activities within the study area are regulated by the USACE, Pittsburgh District and the Pennsylvania Department of Environmental Protection (PADEP). These permits allow for the extraction of sand and gravel from the river bottom at specified locations using a variety of procedures. The extracted material is processed for subsequent sale and distribution either on the river, using a floating processing plant, or on a fixed land based plant.

Dredging activities have taken place in the Allegheny River and Ohio River for over a century, providing needed sand and gravel, primarily from glacial deposits, for a wide variety of infrastructure projects throughout the region. In general, dredging activities have increased river-bottom relief through formation of pockets, troughs, and deeper areas. To date, approximately 13 percent of the river bottom within the study area has been disturbed by dredging. Current dredging activities have the potential to increase the river bottom depth by 15 to 35 feet relative to current depths, to a maximum water depth of 50 feet. The current average water depth in all dredged areas is 30 feet across the entire study area. As a result of dredging, eight percent of the river bottom is 20 to 40 feet deep (approximately two-thirds of all dredged areas) and 2 percent of the river bottom is greater than 40 feet deep (approximately one-tenth of all dredged areas).

E.2 PURPOSE AND NEED

The commercial dredging companies seek extension of their existing permits from various permitting agencies including: U.S. Army Corps of Engineers (USACE) dredging permits; the Pennsylvania Department of Environmental Protection (PADEP) Water Obstruction and Encroachment Permits; and the PADEP Sand and Gravel License Agreements. These permits may be issued, suspended, or modified pending completion of the NEPA process. The correct purpose described by these commercial sand and gravel companies, is the extraction of sand and gravel for commercial sale. These companies, referred to as the “Applicants” include: Hanson Aggregates PMA, Inc. (formerly Pioneer Mid-Atlantic, Inc. and Davison Sand & Gravel); Glacial Sand and Gravel Company; Lane Construction Corporation; and Tri-State River Products. The underlying need for this action, as stated by the applicants, for this action, is to provide materials supporting diverse infrastructure and construction requirements to a wide variety of customers in the region.

In addition to the applicant's stated purpose and need, there are recognized societal needs for this product which must be met regardless of whether the permits are granted, extended or modified. The feasibility of meeting these needs through means other than dredging (e.g., land based operations or importation of aggregate material from other locations) is evaluated in this environmental document.

The applicants seek to continue mineral extraction to ensure a continuous supply of relatively inexpensive, high quality, aggregate used by their customers for highway building, construction, and maintenance; commercial and private construction; related infrastructure development; and other uses. In calendar year 1998, the applicants extracted over four million tons of sand and gravel material. Table E-1 presents a summary of material produced by the applicants in 1998. This material was sold and distributed to customers throughout western Pennsylvania, portions of northern West Virginia (primarily northern panhandle and Morgantown area) and eastern Ohio (primarily counties east of Interstate 77). Although, the customer base includes a relatively large geographic area, the majority of the material was used in southwestern Pennsylvania.

Table E-1
Tons of Sand and Gravel Produced by the Applicants, 1998

Material	Tons Produced
Sand (Type A)	1,500,000
Coarse Aggregate (SRL E)	680,000
Other Coarse Aggregate	1,900,000
Total Sand and Gravel	4,100,000

The applicants also supply distinct high quality aggregates which meet the rigorous anti-skid requirements specified by the Pennsylvania Department of Transportation (PennDOT). The applicants produced and sold approximately 700,000 tons of Level E skid resistance level (SRL) coarse aggregate material, the highest rated skid resistance material identified by PennDOT. Only SRL E designated coarse aggregate material can be used on road surfaces with an average daily traffic of 20,000 or more vehicles.

E.3 SCOPE OF THE ENVIRONMENTAL DOCUMENT

This document was developed in accordance with:

- National Environmental Policy Act (NEPA),
- Implementing regulations issued by the President's Council on Environmental Quality (CEQ)
- Federal regulations for implementing NEPA for federal actions involving navigable waters under the jurisdiction of the Corps of Engineers as presented in 33 CFR Part 230 and 325

This Environmental Impact Statement (EIS) will provide the District Engineer, U.S. Army Engineer District, Pittsburgh, with information regarding the environmental impacts to consider as part of the public interest review of the applications in accordance with Corps of Engineers regulations. The EIS also will serve to provide information to other regulatory and commenting agencies and the general public about the likely environmental consequences of the proposed action and alternatives. The NEPA process ensures that the public has an opportunity to raise issues and concerns to the District Engineer.

An interdisciplinary team of environmental scientists, aquatic and terrestrial biologists, toxicologists, ecologists, geologists, planners, economists, engineers, and cultural resource specialists have analyzed the proposed action and other alternatives in light of existing conditions. The team has identified relevant beneficial and adverse effects associated with the action. This document analyzes both the direct effects (those caused by the action and occurring at the same time and place) and the indirect effects (those caused by the action and occurring later in time or farther removed in distance but still reasonably foreseeable), as well as the effects from secondary actions (reasonably foreseeable actions taken by others). The potential for cumulative effects is also addressed, and mitigation measures are identified where appropriate.

In reviewing the findings of this EIS it is important to note that over the past two hundred years, human activity has profoundly altered the characteristics of the Allegheny and Ohio Rivers within the study area. In addition to dredging, human activities which have altered these rivers include: agricultural development and deforestation, urbanization, mining, industrial waste discharges, canalization, and navigation. This report evaluates the environmental consequences associated with river dredging activities as the rivers currently exist rather than relative to virginal conditions (i.e., pre-colonial periods). In addition, the document addresses cumulative impacts associated with river dredging activities that have occurred in the past and present, and are predicted to occur in the foreseeable future.

E.4 ALTERNATIVES EXAMINED

This document evaluates three alternatives:

Alternative 1 is the complete cessation of commercial river dredging within the study area following expiration of existing permits held by the applicants and denial of permit extensions. This alternative would essentially place a moratorium on future commercial dredging activities (other than for navigational purposes) on the entire navigable Allegheny River and between river miles 0 to 40 on the Ohio River. This alternative, which is considered the “no action” alternative, will evaluate the effects of cessation of river dredging relative to baseline conditions (i.e., current conditions) within the study area.

Denial of these permit extensions will ultimately result in the termination of business operations and

the inability of the applicants to continue to meet the needs and contracts of customers who have routinely purchased sand and gravel materials. As a result, secondary producers (i.e., concrete and asphalt production companies) throughout Pennsylvania, West Virginia, Maryland, and Ohio who currently purchase sand and gravel from the applicants, will be required to find alternative sources of material under this alternative. Alternative 3, discussed below, will evaluate the effects associated with obtaining needed sand and gravel material from other sources within the region, such as land-based quarries.

Alternative 2 consists of obtaining sand and gravel from the Allegheny and Ohio Rivers through commercial dredging. Alternative 2 allows for the granting and extending of Department of the Army permits to commercial sand and gravel companies for the removal of sand and gravel between river miles 0 - 69.5 on the Allegheny River and between river miles 0 - 40 on the Ohio River. The companies seek extension of their existing permits from various permitting agencies including: USACE dredging permits; the PADEP Water Obstruction and Encroachment Permits; and the PADEP Sand and Gravel License Agreements.

Under Alternative 2, the applicants would be required to conduct dredging activities in accordance with permit conditions established by the permitting agencies. The permit conditions include requirements applicable to all activities within the study area (referred to as universal permit conditions), as well as site-specific permit restrictions and mitigation that may be applied by the permitting authorities. The universal permit conditions include all permit conditions currently in place. In addition, Alternative 2 requires more comprehensive sampling in accordance with a mussel sampling protocol developed through an interagency effort due to resource agency concerns. Permitting agencies might also require site-specific mitigation strategies to further protect natural and biological resources in specified locations within the study area. Additional site-specific mitigation strategies may include such items as modifying dredged trench dimensions to increase flushing and improve dissolved oxygen levels, as well as restricting dredging in high value aquatic habitat (e.g., portions of Pool 6).

Under existing permits, the applicants are granted site-specific permits to dredge within specified river miles on the Ohio or Allegheny Rivers. These site-specific permits identify permit conditions and mitigation requirements under which the applicants must operate. A summary of the primary permit conditions and site-specific mitigation strategies are presented below:

- *Islands and Shores*. No dredging within 150' of the 6' river depth contours, as measured at normal pool water elevation. No dredging on the backchannel side of any island, or within 1000' upstream and 300' downstream of any island. Site-specific mitigation may include restrictions to protect distinct areas identified by the District.

- *Dams*. No dredging within 1000' of the downstream face of any navigable dam or lock.

- *Bridges and Piers.* No dredging within 500' of any bridge, pier, or abutment.

- *Navigation Channels.* No dredging within 150' of the centerline of the navigable channel unless authorized by USACE. No unreasonable interference with the free discharge of the river or stream or navigation during dredging. If it is determined that water obstruction or encroachment causes unreasonable obstruction to the free passage of floodwaters or navigation, the licensee, upon notification, will remove or alter the water obstruction or encroachment at their own expense.

- *Hydrology.* To mitigate stagnant flows in deeper areas which may result in short-term and localized anoxic conditions at specific locations, permitting agencies may impose as needed site-specific mitigation strategies to increase flushing thereby improving dissolved oxygen levels (discussed further in Section 4).

- *Public Water Supply Intakes*. No dredging within 1000' upstream or laterally of any public water supply intake.

- *Public Water Supply Well.* No dredging within the capture zone of any public water supply well or well field.

- *Underwater Structures*. No dredging within 300' of pipelines, submarine cable, dock, or public launching area.

- *Water Quality.* Monthly tests of total suspended solids will be conducted to ensure compliance with permit conditions. Bilge, ballast, or wash water pumped from barges will not be discharged to the river without removal of oil or toxic compounds. No refuse, sludge, oils, or petroleum products shall be discharged to the river.

- *River Bottom Substrate*. A minimum of 5' of sand and gravel must be maintained on top of bedrock.

- *Tributaries.* No dredging within the mouth of a major stream entering the river.

- *Threatened and Endangered Species and Habitat.* In accordance with the Endangered Species Act (ESA), formal consultation with the USFWS is required if dredging activities have the potential to harm either Federally-listed species or critical habitat. At this time, Federally-listed species have been identified in Pools 8 and 9. Based on these findings**,** (as of April 2001) USFWS has requested Section 7 consultation for dredging activities within Pools 5, 6, 7, 8, and 9. Through this consultation process with USFWS and other agencies, an appropriate mussel sampling protocol and buffer restrictions will be developed and implemented to specifically

protect Federally-listed species and their critical habitat. As part of the requested USFWS consultation, dredging may be restricted from certain river segments within the study area in order to protect Federally-listed species and/or their critical habitat. The mussel sampling protocol is a living document that will be updated through adaptive management as new information becomes available.

- *Aquatic Life and Habitat*. Dredging activities must avoid both areas marked in permits designated as productive aquatic habitat and potential bank failures that may impact habitat. To this end, permitting agencies may impose additional site-specific mitigation (e.g., restrict dredging in portions of certain pools [e.g., portions of Pools 6 and 9]) to further protect distinct areas with shallow, high-value, aquatic habitat identified by the permitting authority.

- *Mussel Beds*. The Licensee must conduct mussel surveys in accordance with approved mussel sampling protocols developed and maintained by PADEP, USACE, and USFWS (when ESA applies) using adaptive management techniques and must adhere to restrictions specified in the protocol.

- *Noise*. Implement sufficient noise abatement measures, if, upon written notification, operations pose a noise problem to residential communities.

- *Geological Resource Conservation*. Provide all customers with written notices encouraging conservation of Type A and SRL E aggregates in order to reserve their use when required.

- *Cultural Resources*. All dredging must cease and the Pennsylvania Bureau of Historical Preservation must be notified in the event that previously unidentified historical or archaeological sites are encountered.

Selection of Alternative 2 should not be construed as an approval to dredge any and all areas of the river. As outlined above, Alternative 2 includes many permit conditions that limit the extent of dredging activity in the river so as to mitigate adverse impacts. Furthermore, Alternative 2 provides permitting agencies the flexibility to adopt site-specific restrictions, as necessary, to further reduce adverse impacts that may occur. For example, current permit conditions allow permitting agencies to impose restrictions necessary to mitigate significant noise issues. In the past, when significant noise issues were raised, site-specific permit restrictions were issued to mitigate noise impacts. Thus, this adaptive management process for mitigating adverse impacts, as well as avoiding violation of state, federal, or local laws and ordinances, is considered part of Alternative 2.

Using the current permit conditions discussed above, an extensive analysis was conducted to identify areas that may be considered for future site-specific dredging permits under Alternative 2. Permit restriction data and bathymetry data collected by both resource agencies and the applicants were compiled to estimate the volume of mineable sand and gravel in each pool. The mineable reserves estimate for each pool was then used to estimate the potential life cycle of the industry.

The theoretical maximum tonnage of sand and gravel material in all pools of the Allegheny and Ohio Rivers is 200 million tons (assuming a uniform depth of 50 feet and excluding areas with known permit restrictions). When considering site-specific permits restrictions, mussel resources, and dredging operation issues, the estimated recoverable reserves were estimated between 102 and 144 million tons of sand and gravel.

Given current production rates and estimated recoverable reserves, commercial dredging could conceivably continue over the next 25 to 35 years. Over the next 10 years, it is estimated that dredging would disturb approximately eight percent of the river bottom. In any one year, commercial sand and gravel dredging would occur over a much smaller area between 0.3 to 3 percent of the river bottom annually (on average, approximately 100 acres or 0.8 percent of the river bottom, annually).

Alternative 3 consists of using land-based operations or importation of sand and gravel from other locations to meet the regional need for this material. This alternative includes the complete cessation of commercial river dredging (other than for navigational purposes) and denial to extend existing permits held by the applicants. Alternative 3 evaluates the short-term and long-term, direct and indirect effects, associated with obtaining sand and gravel from land-based quarries and other sources within the region.

In the short term, existing sources of sand and gravel would be utilized to meet the short fall in current river based production. The results of detailed market analysis indicate that there is enough production capacity from land-based quarries within the region to meet the demand for sand and gravel products in the region (i.e., in the absence of river-based sources). In the long-term, market forces would lead to the development of new land-based quarries within western Pennsylvania.

In the short-term, it is estimated that approximately 50 existing quarries would need to increase production by 30 percent in order to make up for the immediate loss of four million tons annually of river-based aggregate. It appears in the long-term, the land-based sand and gravel resources of Pennsylvania could be developed to supply the needs of the applicant's customers, so long as environmental permits are issued and local land use approvals are obtained for the expansion and/or creation of new quarries in the region. It is estimated that about 20 new local quarries would be needed to offset the demand for sand and gravel products in the market. Due to the capital investment required and public opposition to new land-based operations, it is uncertain whether the existing 50 quarries would increase production or whether new quarries would be added. However, for the purpose of evaluating this alternative, the assumption is made that quarries would be expanded or created.

E.5 ENVIRONMENTAL AND SOCIOECONOMIC EFFECTS OF THE ALTERNATIVES

A summary of the environmental and socioeconomic effects of Alternatives 1, 2, and 3 are

presented in Table E-2. Overall, significant adverse effects to hydrology, water quality, and rare mussels (i.e., rare, threatened, and endangered species) were associated with Alternative 2. Several mitigation measures were identified to reduce these effects as detailed in the environmental document, including adaptive management, intensive mussel sampling, restricting river segments from future dredging, and modifying dredged trench morphology to enhance flushing. Significant adverse effects to public safety including child protection were identified for Alternative 1 and Alternative 3 (as a result of induced effects associated with increased land-based quarry operations). These consequences may be reduced if new land-based quarries are constructed near customers in the long-term (thereby increasing traffic safety), as well as requiring additional reclamation of quarries to reduce long-term public safety hazards. Negligible, minor, or moderate effects were identified for the remaining resource areas for each of the alternatives. In addition to these effects, several cumulative adverse effects were identified, including adverse impacts to hydrology (approximately eight percent of the river bottom will be irreversibly disturbed in the next 10 years through the creation of trenches), and potential impacts to dissolved oxygen levels, mussels, and fish due to past, present, and foreseeable future actions within the watersheds of these river systems. Other actions which have resulted in major impacts to the river systems include:

- Lock and dam system and other man-made modifications to the river (e.g., navigation dredging, civil works projects) have contributed to further hydrologic modifications, sedimentation, and anoxia;

- Industrial and municipal facilities have contributed to BOD, toxics, nutrient loadings, and pathogens; and

- Agricultural and urban runoff has contributed to BOD, toxics, sedimentation, and pathogens.

Table E-2. Summary of Environmental and Socioeconomic Effects

Resource Areas	Alternatives		
	Alternative 1 **No Action**	**Alternative 2** **River Dredging**	**Alternative 3** **Land-Based Quarries (assumes 50 quarries expand and/or 20 new quarries permitted)**
Hydrology	***Study Area Effects*** • No change in effects relative to current baseline conditions. • Sand and gravel barge traffic makes up 98% of commercial navigation in Pools 8 and 9, 57% in Pool 7, 50% on Pools 2-5, and approximately 13% in Ohio River Pools. Potential for long-term adverse effects to navigational services in upper pools. ***Induced Regional Effects*** • Minor adverse effects to streams in localized areas within the region due to increases in land-based quarry operations (see Alternative 3).	• Moderate adverse effects to hydrology as a result of permanent changes to the river bottom morphology in the form of trenches. In the next 10 years, 8% of river bottom would be dropped by 15' to 35' ft. • Significant cumulative adverse effects from past, present, and future dredging activities. In 10 years, approximately 20 percent of the rivers would be dredged, 30 to 40 percent could be disturbed if dredging continues for the next 25 to 35 years. • Morphology of trenches has changed little over time due to the substrate (sand and gravel) and lock and dam system. • Minor adverse effects to navigation. Permit conditions already require immediate corrective actions if dredging activities interrupt free discharge of the river or navigation.	• Minor adverse effects to streams near quarries in the region, including sedimentation, increased stream flow, bank erosion, dewatering, and direct alteration of stream bed channels.
Geology/ Hydrogeology	***Study Area Effects*** • No change in effects relative to current baseline conditions. ***Induced Regional Effects*** • Negligible to minor adverse effects to geologic resources and moderate adverse effects to groundwater resources in localized areas within the region due to increases in land-based quarry operations (see Alternative 3).	• Minor adverse effects to geologic resources as a result of changes to particle size distribution, as well as depletion of nonrenewable resources. Anecdotal accounts of siltation and debris in certain dredged trenches. Field studies did not find any significant differences in particle size distribution between dredged and non-dredged areas. • No adverse effects to groundwater from dredging. Intensive hydrogeological study at Springdale indicated no effect to groundwater from dredging.	• Negligible to minor adverse effects to geologic resources due to depletion of nonrenewable resources. • Moderate adverse effects to groundwater near land-based quarries due to dewatering activities may occur, resulting in adverse effects to nearby private wells.

Table E-2. Summary of Environmental and Socioeconomic Effects

Resource Areas	Alternatives		
	Alternative 1 **No Action**	**Alternative 2** **River Dredging**	**Alternative 3** **Land-Based Quarries (assumes 50 quarries expand and/or 20 new quarries permitted)**
Water Quality	***Study Area Effects*** • No change in effects relative to current baseline conditions. ***Induced Regional Effects*** • Minor adverse effects to water quality in localized areas within the region due to increases in land-based quarry operations (see Alternative 3).	• Minor adverse effects to water column turbidity, dissolved oxygen, and resuspended sediment contaminants. Significant cumulative adverse effects to DO under extreme conditions (low flow, high temperature, and certain hydrologic conditions). Mitigation measures include: creating elongated dredged trenches, as opposed to small deep pockets to enhance flushing; maximum depth restrictions; and DO monitoring. • Minor adverse effects to turbidity levels. Turbidity levels within 1000 ft downstream of dredging may be 2-3 times low flow background levels but within normal ranges observed under other flow conditions. Turbidity and suspended solids ∃ 1000 ft downstream of dredging are equivalent to upstream levels. • Minor adverse effects to dissolved oxygen, with significant cumulative effects. Dissolved oxygen in some locations of Pools 7 and 8 were anoxic below 30 ft under summer drought conditions. Montgomery Pool locations at similar depths and flows were unaffected. Anoxic conditions were not generally observed under low baseflow conditions in summer field studies or in 20 years of STORET records. Impact of DO is apparently localized and short term in nature. Factors impacting DO include depth, flow rate, water temperature, dredge trench configuration, tug boat activity, and hydroelectric discharges. No evidence of abiotic conditions was found from infrequent anoxic conditions in dredged areas of Pools 7 and 8.	• Minor adverse effects to stream turbi ity and suspended solids near land-based quarries due to material processing, non-point run-off, and overflow of settling ponds/lagoons. • Minor adverse effects to sediment contaminants and sediment embeddedness near land-based quarries due to inputs of very fine sediments and trace contaminants (metals) from quarries and material processing.

Table E-2. Summary of Environmental and Socioeconomic Effects

Resource Areas	Alternatives		
	Alternative 1 **No Action**	**Alternative 2** **River Dredging**	**Alternative 3** **Land-Based Quarries (assumes 50 quarries expand and/or 20 new quarries permitted)**
Water Quality (cont'd)		• Minor adverse effects to sediments. Sediment contaminants could possibly be resuspended in the water column during dredging although no toxicity or water quality standards violations were observed in field studies. For much of the upper Allegheny River (Pool 5 and upstream) the likelihood of dredging contaminated sediments appears unlikely due to fewer potential sources.	•
Aquatic Life: Plankton, Periphyton, Flora	***Study Area Effects*** • No change in effects relative to current baseline conditions. ***Induced Regional Effects*** • Minor adverse effects to plankton, periphyton, and macrophytes in localized areas within the region due to increases in land-based quarry operations (see Alternative 3).	• Minor adverse effects on plankton, periphyton, and macrophytes within the turbidity plume downstream of dredging due to excessive light attenuation. Effects are likely to be within 1000 ft of dredging, temporary and intermittent. • Current permit conditions will mitigate adverse effects to macrophytes that occur in the river margins, around islands, and tributary confluences all of which are restricted under current permit conditions.	• Minor to moderate (in the short-term) adverse effects on plankton, periphyton, and aquatic plants in streams near land-based quarries due to siltation and turbidity from material processing and run-off.
Aquatic Life: Macro-invertebrates	***Study Area Effects*** • No change in effects relative to current baseline conditions. ***Induced Regional Effects*** • Minor adverse effects to benthic macroinvertebrates in localized areas within the region due to increases in land-based quarry operations (see Alternative 3).	• Minor adverse effects on benthic invertebrates located within or directly downstream of dredging activity due to dislodgement, removal, or sedimentation. However, field studies indicated that recruitment is high and effects relative to baseline are minor and temporary. • 0.8% of the river is dredged per year on average, indicating that most of the invertebrate recruitment pool is intact. Invertebrate dispersal and recolonization is often rapid suggesting high resilience to temporary dredging effects.	• Minor adverse effects on benthic invertebrates in streams near land-based quarries due to physical disturbance of temperature and flow regimes, and siltation effects and turbidity from quarry operations and run-off.

Table E-2. Summary of Environmental and Socioeconomic Effects

Resource Areas	Alternatives		
	Alternative 1 **No Action**	**Alternative 2** **River Dredging**	**Alternative 3** **Land-Based Quarries (assumes 50 quarries expand and/or 20 new quarries permitted)**
Aquatic Life: Mussels	***Study Area Effects*** • No change in effects relative to current baseline conditions. ***Induced Regional Effects*** • Minor adverse effects to mussels in localized areas within the region due to increases in land-based quarry operations (see Alternative 3).	• Minor adverse effects to common species of mussels and in areas with marginal habitat. Over the long-term (25 to 35 years), potentially significant cumulative adverse effects to uncommon/rare mussel species may occur, when effects are combined with other past, present, and future anthropogenic activities. These impacts are primarily associated with dredging high quality habitat, currently not used by mussels. • Rigorous sampling protocol , which is modified through adaptive management, will substantially mitigate effects to mussels. Use of a revised protocol identified T&E mussels, resulting in the area being restricted from dredging. Other mitigation measures to reduce effects which may be applied on a site-specific basis include: protection of high quality habitats and habitat enhancement measures.	• Minor adverse effects to mussels that may be present in streams downstream of land-based quarries due to increased siltation and sedimentation. These effects may occur in the event that these species are undetected in the stream and not sufficiently protected. • Formal consultation with regulatory agencies would mitigate any moderate or significant adverse impacts.
Aquatic Life: Fish	***Study Area Effects*** • No change in effects relative to current baseline conditions. ***Induced Regional Effects*** • Overall, minor adverse effects to fish in localized areas within the region due to increases in land-based quarry operations (see Alternative 3).	• Minor adverse effects to fish due to disturbance in the vicinity of active dredging. Moderate cumulative adverse effects from past, present, and future dredging activities, when combined with other anthropogenic activities in the rivers. In small portion of the study area, dredging may result in a reduction in habitat suitability for selected channel-specialist species (e.g., walleye). • Mitigation measures include site-specific protection of high quality habitat that provides important spawning or feeding habitat, and habitat enhancement measures (e.g., artificial reefs).	• Overall, minor adverse effects on fish in streams near land-based quarries due to physical disturbance of temperature and flow regimes, and siltation effects and turbidity from run-off and quarry operations. Short-term moderate impacts to fish may occur during certain conditions.

Table E-2. Summary of Environmental and Socioeconomic Effects

Resource Areas	Alternatives		
	Alternative 1 **No Action**	**Alternative 2** **River Dredging**	**Alternative 3** **Land-Based Quarries (assumes 50 quarries expand and/or 20 new quarries permitted)**
Wetlands and Terrestrial Life	***Study Area Effects*** • No change in effects relative to current baseline conditions. ***Induced Regional Effects*** • Minor adverse effects to wetlands and fauna in localized areas within the region due to increases in land-based quarry operations (see Alternative 3).	• Minor adverse effects to wetlands (due to sedimentation, disturbance). Impacts to wetlands would be mitigated by site-specific permits in compliance with Title 25. • Localized, short-term minor adver • se effects to terrestrial fauna from operational noise.	• Minor to moderate adverse effects to fauna (from habitat loss and noise) and terrestrial habitat (including wetlands) would be expected. Approximately 100 acres of terrestrial habitat would be lost per year (2,000 acres if all new quarries are constructed). Impacts may include: loss of sensitive habitat, impacts to State-listed species, nesting disturbance, weland loss, and habitat fragmentation.
Threatened & Endangered Species: Aquatic Life	***Study Area Effects*** • No change in effects relative to current baseline conditions. ***Induced Regional Effects*** No adverse effects to minor adverse effects to State- and Federally-listed aquatic species in localized areas within the region due to increases in land-based quarry operations (see Alternative 3).	• Potentially significant adverse effects (such as incidental taking an individual or its habitat) to Federally-listed mussels (i.e., clubshell mussel, northern riffleshell mussel) may occur within their range. Including significant cumulative adverse effects when considering past, present, and future dredging activities combined with all other anthropogenic activities. Federally-listed mussels have been found in Pools 8 and 9. Significant effects could occur if the sampling protocol would fail to identify their location and dredging commences in areas where they occur. Furthermore, unidentified habitat that could possibly be important to Federally-listed species may be disturbed through dredging. Implementation of formal consultation with regulatory agencies will likely reduce significant adverse impacts.	• Minor adverse effects to State- and Federally-listed aquatic species. • Formal consultation with regulatory agencies would likely mitigate any significant adverse impacts.

Table E-2. Summary of Environmental and Socioeconomic Effects

Resource Areas	Alternatives		
	Alternative 1 **No Action**	**Alternative 2** **River Dredging**	**Alternative 3** **Land-Based Quarries (assumes 50 quarries expand and/or 20 new quarries permitted)**
Threatened & Endangered Species: Aquatic Life (cont'd)		• Rigorous sampling protocol, modified through adaptive management, and results of formal consultation with USFWS (for dredging in Pools 5 through 9), should mitigate most if not all significant adverse effects to listed mussels. Use of a revised protocol identified T&E mussels and the area was restricted from dredging. • Adverse impacts to State-listed species may also occur, although significant impacts should be avoided through implementation of the sampling protocol, which is modified over time through adaptive management. In the long-term (25 to 35 years), potentially significant cumulative adverse effects to rare and state-listed mussel species may occur, when effects are combined with other past, present, and future anthropogenic activities. These impacts are primarily associated with dredging high quality habitat, currently not used by mussels.	
Threatened & Endangered Species: Terrestrial Life	***Study Area Effects*** • No change in effects relative to current baseline conditions. ***Induced Regional Effects*** • No adverse effects to minor adverse effects to State- and Federally-listed terrestrial species due to increases in regional land-based quarry operations (see Alternative 3).	• No adverse effects to marginal adverse effects to terrestrial species are expected. No terrestrial Federally-listed species were identified by regulatory agencies in their correspondence letters. Searches of databases revealed 3 species that may be in or near the study area (Massasauga rattlesnake [candidate], Indiana bat [endangered], and bald eagle [threatened]). Furthermore, seven state-listed species were identified within the study area.	• Minor adverse effects would be expected to State- and Federally-listed terrestrial species from habitat loss and noise if a listed species was in the vicinity of an active quarry. Federally-listed species that may be affected by land-based quarry operations include the Indiana bat (endangered) and the Massasauga rattlesnake (candidate). • Formal consultation with regulatory agencies would likely mitigate any significant adverse impacts. • Controversies related to quarries impacting listed terrestrial species were identified.

Table E-2. Summary of Environmental and Socioeconomic Effects

Resource Areas	Alternatives		
	Alternative 1 **No Action**	**Alternative 2** **River Dredging**	**Alternative 3** **Land-Based Quarries (assumes 50 quarries expand and/or 20 new quarries permitted)**
Air Quality	***Study Area Effects*** • No change in effects relative to current baseline conditions. ***Induced Regional Effects*** • Marginal adverse effects to air quality in the region, and localized adverse effects near quarries, due to increases in land-based quarry operations (see Alternative 3).	• No adverse effects to air quality from operation of dredging units. Emissions are extremely small compared to other regional sources.	• Marginal adverse effects to overall air quality within the region due to increases in regional truck traffic. • Localized adverse effects due to fugitive dust emissions from land-based quarries operations (including increased truck traffic, and crushing and sorting operations).
Noise	***Study Area Effects*** • No change in effects relative to current baseline conditions. ***Induced Regional Effects*** • Minor adverse effects from noise in localized areas within the region due to increases in land-based quarry operations (see Alternative 3).	• Minor short-term adverse effects will occur near dredging units. Adverse effects would be localized, with no long-term adverse effects. At certain locations, noise complaints have been made. Noise modeling and monitoring shows that bank noise levels may range from 50 to 70 db depending on site-specific conditions. These results indicate the potential for noise conflicts under certain site conditions. Current permit conditions require noise abatement measures when necessary; thereby, mitigating significant noise problems. • Noise abatement options include moving locations, reorienting dredging unit, limiting night-time operations, and enhancing sound-proofing through engineering controls, thereby avoiding significant adverse effects.	• Minor short-term adverse effects. Land-based quarry operations generate noise from blasting, earthmoving, crushing, and truck transport. Noise complaint issues have been raised against some land-based quarry operations in the region. Typically, these noise issues can be mitigated as they arise; thereby, avoiding persistent significant noise problems.

Table E-2. Summary of Environmental and Socioeconomic Effects

Resource Areas	Alternatives		
	Alternative 1 **No Action**	**Alternative 2** **River Dredging**	**Alternative 3** **Land-Based Quarries (assumes 50 quarries expand and/or 20 new quarries permitted)**
Socioeconomics (ROI and State Impacts)	• Minor adverse impacts to the economy of the Region of Influence (ROI) and State of Pennsylvania would be expected. • 400 Jobs would be lost in the ROI, 700 jobs in the entire State of Pennsylvania. • Economic output would be reduced by $40 million in the State, personal income loss by $10 million and total value added loss of $17 million. • Major increase in aggregate prices (up to 200 percent or more) borne primarily by government and taxpayer. • Increases in cost for highway construction and repaving projects. • Short-term immediate shortfalls in aggregate materials resulting in potential delays in certain economic development projects and public infrastructure projects that require large quantities of aggregates. • Minor reduction in tax revenues • Elimination of royalty fees paid to PFBC (currently $1 million each year). • Possible closure of locks and dams, especially for Pools 5 and higher. • Reduction in the cost effectiveness of the lock and dam system in the upper pools.	• No change in effects relative to current baseline conditions.	• Same as listed under Alternative 1.

Table E-2. Summary of Environmental and Socioeconomic Effects

Resource Areas	Alternatives		
	Alternative 1 **No Action**	**Alternative 2** **River Dredging**	**Alternative 3** **Land-Based Quarries (assumes 50 quarries expand and/or 20 new quarries permitted)**
Quality of Life	***Study Area Effects*** • No change in effects to recreational fishing would be expected relative to current baseline conditions. • Minor beneficial effects to aesthetics (removal of dredging units), traffic (reduced near river terminals), recreational boating (removal of dredging units and reduced barge traffic), and safety (reduced truck traffic near terminals and reduced barge traffic) would be expected from cessation of river dredging within the study area. • Potential for long-term adverse effects to recreational boating in upper pools due to possible curtailment of lock usage. ***Induced Regional Effects*** • Minor adverse effects to recreation, aesthetics, and traffic in localized areas due to increases in land-based quarry operations (see Alternative 3). • Significant adverse effects to public safety including increases in traffic fatalities and injuries, worker accidents, and trespasser accidents due to increases in land-based quarry operations (see Alternative 3).	• Minor adverse effects to recreation due to dredging effects on fish and navigation. • No change in effects to traffic or safety relative to current baseline conditions.	• Minor to potentially moderate adverse effects to recreation, aesthetics, and traffic from increased land-based quarry operations relative to the quality of life in the region as a whole. Adverse effects may include: impairment of recreational sport fishing; landscape disturbance; increase in truck traffic. • Significant adverse effects to public safety as a result of trucking and land based quarry activities: ➢ Trucks will travel 12 million miles/year resulting in an increase in truck-related fatalities, accidents, and injuries. Mitigation to reduce traffic risks would include creation of new land-based quarries near producers in the Pittsburgh area. ➢ Expected increase in quarry work-related accidents and potential fatalities. ➢ Potential for fatal accidents or serious injuries resulting from children trespassing on quarry property (swimming/diving accidents, off-road vehicle accidents, falling rocks, bank failures, blasting debris). Mitigation would include requiring restoration of quarries to eliminate steep cliffs and lake formation.

Table E-2. Summary of Environmental and Socioeconomic Effects

Resource Areas	Alternatives		
	Alternative 1 **No Action**	**Alternative 2** **River Dredging**	**Alternative 3** **Land-Based Quarries (assumes 50 quarries expand and/or 20 new quarries permitted)**
Environmental Justice & Protection of Children	• No disproportionate effects to minority communities, low-income communities, or children. • Significant adverse effects to children safety as a result of increased land-based quarry operations, as documented by a number of trespassing accidents and fatalities within the region (see Alternative 3, Quality of Life).	• No disproportionate effects to minority communities, low-income communities, or children.	• No disproportionate effects to minority communities or low-income communities are expected from implementation of Alternative 3. Minor changes in regional economic indices should result in a measurable disproportionate effect to minority communities or low-income communities. • Significant adverse effects to children safety as a result of increased land-based quarry operations, as documented by a number of trespassing accidents and fatalities within the region (see Alternative 3, Quality of Life).
Cultural Resources	***Study Area Effects*** • No change in effects relative to current baseline conditions. ***Induced Regional Effects*** • Potential adverse effects to cultural resources in localized areas within the region due to increases in land-based quarry operations (see Alternative 3).	• No adverse effects to cultural resources would be expected. The Pennsylvania SHPO has stated that the proposed project will have no effect on any archaeological resources, and that no archaeological investigations are necessary in the project area.	• Potential adverse effects to cultural resources would be expected as new quarries are opened and existing quarries are expanded. Some quarry sites (particularly limestone quarries) have been known to contain prehistoric archaeological remains, burials, prehistoric quarry operations, stone tool-making locations, hunting blinds or villages, historic sites, and cemeteries. • Significant adverse effects should be mitigated through performance of field studies and consultation with the SHPO.

A. WILDLIFE

1. Mammals

The most common habitats within the corridor consist of undeveloped forested slopes, game lands, forested areas, riparian corridors, river islands, and the Allegheny River and its tributaries.

Pennsylvania's mammal and bird wildlife is managed by the PA Game Commission (PGC). "Wildlife management is the process used to manage game and other wildlife populations and includes: monitoring wildlife populations, establishing laws and regulations, setting seasons and bag limits, making habitat improvements, providing outright protection, informing and educating the public (www.pgc.state.pa.us)." The Game Commission also reintroduces species and manages endangered and threatened species.

Common mammals in the corridor include white-tailed deer *(Odocoileus virginianus)*, eastern cottontail *(Sylvilagus floridanus)*, raccoon *(Procyon lotor)*, opossum *(Didelphis virginaniana)*, squirrel sp. *(Sciurus sp.)*, beaver (*Castor Canadensis*), muskrat (*Ondatra zibethicaus*), otter (*Lutra canadensis*), mink (*Mustela vison*), fox (*Vulpes vulpes*), and coyote (*Canis latrans*). Black bear (*Ursus americanus*) are known to inhabit the area, but are not a common species. Several species of bats also thrive in the Allegheny River corridor, including the threatened Indiana Bat (*Indiana Myotis*) and the more common Little Brown Bat (*Myotis lucifugus*).

Currently, there is no complete scientific list of wildlife specific to this river corridor, although comprehensive lists do exist for the state. However, several organizations are working toward conservation and stewardship of wildlife in the study area. The Important Mammal Areas Project (IMAP) is a "voluntary grass roots project with two goals: 1) to designate areas in Pennsylvania that are important for mammal conservation, and 2) to help people learn more about mammals and their habitats." The project is a partnership of the PA Wildlife Federation, National Wildlife Federation, Indiana University of Pennsylvania, Carnegie Museum of Natural History, PA Game Commission, PA Federation of Sportsmens Clubs, and the Mammal Technical Committee of the Pennsylvania Biological Survey.[1]

Important Mammal Areas (IMA) are geographic areas that host either game or non-game species of concern and meet one or more of several criteria: diverse or unique mammals, high density population, species listed as endangered or threatened, species that are declining or vulnerable, and/or important for public education. Currently, there are 45 IMAs in Pennsylvania.

Two IMAs are located west of the Allegheny River in Armstrong County. Because the species for which the sites have been nominated are of special concern, and the property they are found on is private, details about them, or the exact locations cannot be released. The IMAP partners are currently working on completing conservation assessments on all sites in western Pennsylvania. Once those assessments are complete, a conservation/stewardship plan may be written for each.

2. Birds

The common birds of prey that exist within the study corridor include the great horned owl *(Bubo virginianus)*, barred owl *(Strix varia)*, eastern screech owl *(Otus asio)*, northern harrier *(Circus cyancus)*, sharp-shinned hawk *(Accipiter striatus)*, cooper's hawk *(Accipiter cooperii)*, northern goshawk *(Accipter gentiles)*, red-tailed hawk *(Buteo jamaicensis)*, and American kestrel *(Falco sparverius).* Additionally, several species of songbirds and various migratory birds inhabit the river valley. Common species include Canada goose (*Branta canadensis*), mallard (*Anas platrhynchos*), and American black duck (*Anas*

[1] www.pawildlife.org

rubripes). There are also several Bald Eagles (*Haliaetus leucocephalus*), which are a recovery species that has only recently begun to thrive in this area again, and Osprey (*Pandion haliaetus*).

The Buffalo Creek Valley is home to an Important Bird Area (IBA). The Important Bird Areas Project, administered by National Audubon Society, was developed to identify locations important to nesting, migrating, or wintering birds. Pennsylvania was chosen as the first state to develop an IBA program (in 1995). There are currently 81 IBAs in Pennsylvania. The Buffalo Creek IBA (#22) lies along the Butler-Armstrong County line and was selected because of the deep valleys of Buffalo and Little Buffalo Creeks. These valleys contain extensive tracts of hemlock, moist deciduous forest, and relatively large tracts of Sycamore. These undisturbed forest communities provide exceptional habitat for resident forest, neotropical forest interior, and migrant species. Regionally significant populations of warblers, flycatchers, thrushes, tanagers, and vireos have been noted there.[2]

Table 4-1
Buffalo Creek Valley – Christmas Bird Count – December 20, 2003

Common Name	Scientific Name	Number Sighted
Canada Goose	*Branta canadensis*	326
Dark-eyed Junco	*Junco hyemalis*	166
Mourning Dove	*Zenaida macroura*	163
Rock Pigeon	*Columba livia*	151
American Crow	*Corvus brachyrhynchos*	123
House Sparrow	*Passer domesticus*	117
Wild Turkey	*Meleagris gallopavo*	105
European Starling	*Sturnus vulgaris*	88
Black-capped Chickadee	*Poecile atricapillus*	87
American Tree Sparrow	*Spizella arborea*	84
Tufted Titmouse	*Baeolophus bicolor*	75
Mallard	*Anas platyrhynchos*	67
Northern Cardinal	*Cardinalis cardinalis*	62
American Goldfinch	*Carduelis tristis*	50
Blue Jay	*Cyanocitta cristata*	41
Song Sparrow	*Melospiza melodia*	39
Red-bellied Woodpecker	*Melanerpes carolinus*	20
White-breasted Nuthatch	*Sitta carolinensis*	20
Eastern Bluebird	*Sialia sialis*	19
Red-tailed Hawk	*Buteo jamaicensis*	18
Horned Lark	*Eremophila alpestris*	18
Downy Woodpecker	*Picoides pubescens*	15
Golden-crowned Kinglet	*Regulus satrapa*	14

[2] Shema, Brian. Conservation and Research, pp. 6-7. Bulletin Newsletter of the Audubon Society of Western Pennsylvania. March, April, May, 2004. Vol. 69 No 2.

White-throated Sparrow	*Zonotrichia albicollis*	14
Carolina Wren	*Thryothorus ludovicianus*	11
House Finch	*Carpodacus mexicanus*	8
Eastern Screech Owl	*Otus asio*	7
Hairy Woodpecker	*Picoides villosus*	7
Cedar Waxwing	*Bombycilla cedrorum*	6
American Kestrel	*Falco sparverius*	5
Ring-necked Pheasant	*Phasianus colchicus*	5
Brown Creeper	*Certhia americana*	5
Cooper's Hawk	*Accipiter cooperii*	4
Northern Harrier	*Circus cyaneus*	3
Sharp-shinned Hawk	*Accipiter striatus*	3
Pileated Woodpecker	*Dryocopus pileatus*	3
Purple Finch	*Carpodacus purpureus*	3
Field Sparrow	*Spizella pusilla*	2
Swamp Sparrow	*Melospiza georgiana*	2
Swan spp.	*Cygnus*	2
Merlin	*Falco columbarius*	1
Ring-billed Gull	*Larus delawarensis*	1
Great Horned Owl	*Bubo virginianus*	1
Belted Kingfisher	*Ceryle alcyon*	1
Yellow-bellied Sapsucker	*Sphyrapicus varius*	1
American Robin	*Turdus migratorius*	1
Northern Mockingbird	*Mimus polyglottos*	1
White-crowned Sparrow	*Zonotrichia leucophrys*	1
Source: http://cbc.audubon.org/cbccurrent/current_table_display.jsp		

Canada Geese also are commonly found in parks and open grassy areas in the river corridor. Historically a stop on their migration route, the geese now inhabit areas of Pennsylvania year-round due in part to the temperate weather, ideal resting areas, and abundant food sources. They prefer to congregate on large grassy open areas near water, especially areas that are free of tall grass and brush. Canada Geese recently have been considered a nuisance species because of their droppings. While many reports indicate that geese droppings pose a threat to human health, there are no substantiated scientific studies to prove that. For communities or land owners that do not want the nuisance of geese droppings on their property, there are many humane ways to keep the geese from resting and feeding in certain areas. See the Stewardship & Resource Guide for more information about Canada Geese and how to resolve conflicts with them. See also http://www.hsus.org/ace/12096.

3. Reptiles and Amphibians

The common reptile and amphibian species that occur in the corridor are found in Table 4-2. The Pennsylvania Fish & Boat Commission (PFBC) is in charge of this group of animals in Pennsylvania.

Table 4-2
Reptiles and Amphibians Within the Allegheny River Corridor
C = common, U = uncommon, H = historical, I = introduced, N = not found

	Allegheny	Armstrong	Butler	Clarion	Venango	West
Salamanders						
Eastern Hellbender, *Cryptobranchus alleganiensis alleganiensis* (Daudin, 1803)	H	H	H	U	U	H
Common Mudpuppy, *Necturus maculosus maculosus* (Rafinesque, 1818)	C	C	C	C	C	C
Red-spotted Newt, *Notophthalmus viridescens viridescens* (Rafinesque, 1820)	U	U	U	C	C	U
Jefferson Salamander, *Ambystoma jeffersonianum* (Green, 1827)	U	U	U	U	U	U
Spotted Salamander, *Ambystoma maculatum* (Shaw, 1802)	C	C	C	C	C	C
Northern Dusky Salamander, *Desmognathus fuscus* (Green, 1818)	C	C	C	C	C	C
Seal Salamander, *Desmognathus monticola* (Dunn, 1916)	U	U	U	U	U	U
Allegheny Mountain Dusky Salamander, *Desmognathus ochrophaeus* (Cope, 1859)	C	C	C	C	C	C
Northern Two-lined Salamander, *Eurycea bislineata* (Green, 1818)	C	C	C	C	C	C
Long-tailed Salamander, *Eurycea longicauda longicauda* (Green, 1818)	C	C	C	C	C	C
Northern Spring Salamander, *Gyrinophilus porphyriticus porphyriticus* (Green, 1827)	U	U	U	U	U	U
Four-toed Salamander, *Hemidactylium scutatum* (Schlegel, 1838)	U	U	U	U	U	U
Red-backed Salamander, *Plethodon*	C	C	C	C	C	C

cinereus (Green, 1818) *						
Northern Slimy Salamander, *Plethodon glutinosus* (Green, 1818)	C	C	C	C	C	C
Valley and Ridge Salamander, *Plethodon hoffmani* (Highton, 1972)	N	U	N	N	N	U
Northern Ravine Salamander, *Plethodon electromorphus* (Highton, 1999)	U	N	N	N	N	U
Wehrle's Salamander, *Plethodon wehrlei* (Fowler and Dunn, 1917)	N	U	N	U	N	U
Northern Red Salamander, *Pseudotriton ruber ruber* (Latreille, 1801)	U	U	U	U	U	U
Frogs						
Eastern American Toad, *Bufo americanus americanus* (Holbrook, 1836)	C	C	C	C	C	C
Fowler's Toad, *Bufo fowleri* (Hinckley, 1882)	U	U	U	U	U	U
Pickerel Frog, *Rana palustris* (LeConte, 1825)	C	C	C	C	C	C
Northern Leopard Frog, *Rana pipiens* (Schreber, 1782)	U	U	U	U	U	U
American Bullfrog, *Rana catesbeiana* (Shaw, 1802)	C	C	C	C	C	C
Northern Green Frog, *Rana clamitans melanota* (Rafinesque, 1820)	C	C	C	C	C	C
Wood Frog, *Rana sylvatica* (LeConte, 1825)	C	C	C	C	C	C
Northern Cricket Frog, *Acris crepitans crepitans* (Baird, 1854)	H	N	N	N	N	N
Western Chorus Frog, *Pseudacris triseriata* (Wied-Neuwied, 1838)	H	N	H	N	H	N
Mountain Chorus Frog, *Pseudacris brachyphona* (Cope, 1889)	H	H	N	N	N	H
Northern Spring Peeper, *Pseudacris crucifer crucifer* (Wied-neuwied, 1838)	C	C	C	C	C	C

Gray Treefrog, *Hyla versicolor* (LeConte, 1825)	U	U	U	U	U	U
Turtles						
Eastern Snapping Turtle, *Chelydra serpentina serpentina* (Linnaeus, 1758)	C	C	C	C	C	C
Stinkpot, *Sternotherus odoratus* (Latreille, 1801)	N	N	H	N	N	N
Spotted Turtle, *Clemmys guttata* (Schneider, 1792)	U	N	N	N	U	U
Wood Turtle, *Clemmys insculpta* (LeConte, 1830)	U	U	U	U	U	U
Eastern Box Turtle, *Terrapene carolina carolina* (Linnaeus, 1758)	U	U	U	U	U	U
Northern Map Turtle, *Graptemys geographica* (LeSueur, 1817)	H	N	N	N	N	N
Eastern Painted Turtle, *Chrysemys picta picta* (Schneider, 1783)*	U	U	U	U	U	U
Eastern Spiny Softshell, *Apalone spinifera spinifera* (Lesueur, 1827)	C	C	C	C	C	C
Midland Smooth Softshell, *Apalone mutica mutica* (Lesueur, 1827) [5]	N	H	N	H	N	N
Lizards						
Northern Coal Skink, *Eumeces anthracinus anthracinus* (Baird, 1850)	N	N	N	U	U	N
Common Five-lined Skink, *Eumeces fasciatus* (Linnaeus, 1758)	H	N	N	U	U	U
Northern Fence Lizard, *Sceloporus undulatus hyacinthinus* (Green, 1818)	U	N	N	N	N	U
Snakes						
Eastern Wormsnake, *Carphophis amoenus amoenus* (Say, 1825)	H	N	N	H	H	H
Kirtland's Snake, *Clonophis kirtlandii* (Kennicott, 1856) [1]	H	N	H	N	N	H
Northern Black Racer, *Coluber constrictor constrictor* (Linnaeus,	C	C	C	C	C	C

1758)						
Northern Ring-necked Snake, *Diadophis punctatus edwardsii* (Merrem, 1820)	C	C	C	C	C	C
Black Ratsnake, *Elaphe obsoleta obsoleta* (Say, 1823)	C	C	C	C	C	C
Eastern Hog-nosed Snake, *Heterodon platirhinos* Latreille, 1801	U	U	N	N	N	N
Eastern Milksnake, *Lampropeltis triangulum triangulum* (Lacepede, 1788)	C	C	C	C	C	C
Northern Watersnake, *Nerodia sipedon sipedon* (Linnaeus, 1758)	C	C	C	C	C	C
Smooth Greensnake, *Opheodrys vernalis* (Harlan, 1827)	U	U	U	U	U	U
Queen Snake, *Regina septemvittata* (Say, 1825)	C	C	C	C	C	C
Northern Brownsnake, *Storeria dekayi dekayi* (Holbrook, 1836)	C	C	C	C	C	C
Northern Red-bellied Snake, *Storeria occipitomaculata occipitomaculata* (Storer, 1839)	C	N	C	C	C	C
Short-headed Gartersnake, *Thamnophis brachystoma* (Cope, 1892)	I	N	I	I	I	N
Common Ribbonsnake, *Thamnophis sauritus sauritus* (Linnaeus, 1766)	U	U	N	N	U	N
Northern Ribbonsnake, *Thamnophis sauritus septentrionalis* (Rossman, 1963)	N	N	N	C	C	N
Eastern Gartersnake, *Thamnophis sirtalis sirtalis* (Linnaeus, 1758)	C	C	C	C	C	C
Mountain Earthsnake, *Virginia valeriae pulchra* (Richmond, 1954)	N	N	N	C	C	N
Northern Copperhead, *Agkistrodon contortrix mokasen* (Palisot de Beauvois, 1799)	U	U	U	U	U	U

Timber Rattlesnake, *Crotalus horridus* (Linnaeus, 1758 [3]**)**	N	U	N	U	U	U
Eastern Massasauga, *Sistrurus catenatus catenatus* (Rafinesque, 1818) [1]	H	U	U	U	U	N

[1] listed as State Endangered by the Pennsylvania Fish and Boat Commission
[2] listed as State Threatened by the Pennsylvania Fish and Boat Commission
[3] listed as a species of special concern by the Pennsylvania Fish and Boat Commission
[4] listed as Endangered under the Federal Endangered Species Act
[5] considered extirpated from Pennsylvania
* confliction w/names due to different sources/ subject to change
Source: (PA Herpetological Atlas Project, Hulse et al. 2001), list edited by Terry Laux, 2005.

While there are many more animal species in the corridor, including arthropods, no comprehensive list exists. However, several groups are taking initiatives to develop a statewide list: Pennsylvania Natural Heritage Program (formerly called PNDI), Pennsylvania Biodiversity Partnership (PBP), Pennsylvania Biological Survey (PABS), and Carnegie Museum of Natural History.

Arthropod
Of the phylum Arthropoda, they make up 90% of organisms classified as animals. Various classes of arthropods include insects, spiders, and crustaceans.

4. Fish

Studies by the Pennsylvania Fish and Boat Commission[3] (PFBC) have indicated that all of the fisheries have rebounded from once being primarily carp and bullheads in the 1950's to becoming a diverse fish community composed of both game and non-game fish species. The improvements made in water quality have allowed the presence of candidate and state threatened and endangered species. Table 4-3 lists a composite of the sampling results for the fish species collected in the river.

Waters approved by PFBC for trout stocking include: Bull Creek, Buffalo Creek, Cowanshannock Creek, Glade Run, Huling Run, Pine Creek, Plum Creek, Scrubgrass Creek, Redbank Creek, Richey Run, Nicholson Run, and Tom's Run (these streams are not necessarily stocked every year). Streams that support natural reproduction of trout include Crooked Creek, Glade Run, North Fork of Pine Creek, Snyder's Run, Sugar Creek, Catfish Run, and the Allegheny River.

Table 4-3
Fish in the Allegheny River

Scientific Name	Common Name
Alosa chrysochloris	Skipjack herring
Ambloplites rupestris	Rock bass
Ameiurus nebulosus	Brown bullhead
Anguilla rostrata	American eel
Aplodinotus grunniens	Freshwater drum
Campostoma anomalum	Central stoneroller
Carpiodes cyprinus	Quillback carpsucker

[3] Pennsylvania Fish and Boat Commission's Management Reports of the Monongahela River, Section 04 through 06, 1996, Allegheny River, Sections 19 through 22, 1994 and Ohio River, Sections 01 through 04, 1994

Catostomus commersoni	White sucker
Cyprinella spiloptera	Spotfin shiner
Cyprinus carpio	Common carp
Dorosoma cepedianum	Gizzard shad
Erimystax dissimilis	Streamline chub
Esox americanus vermiculatus	Grass pickerel
Esox lucius	Northern pike
Esox masquinongy	Muskellunge
Etheostoma blennioides	Greenside darter
Etheostoma caeruleum	Rainbow darter
Etheostoma nigrum	Johnny darter
Etheostoma zonale	Banded darter
Hiodon alosoides	Goldeye
Hiodon tergisus	Mooneye
Hypentelium nigricans	Northern hogsucker
Ictalurus punctatus	Channel catfish
Ictiobus bubalus	Smallmouth buffalo
Labidesthes sicculus	Brook silverside
Lepisosteus oculatus	Spotted gar
Lepisosteus osseus	Longnose gar
Lepomis	Lepomis
Lepomis cyanellus	Green sunfish
Lepomis gibbosus	Pumpkinseed
Lepomis macrochirus	Bluegill
Luxilus chrysocephalus	Striped shiner
Micropterus dolomieu	Smallmouth bass
Micropterus punctulatus	Spotted bass
Micropterus salmoides	Largemouth bass
Morone chrysops	White bass
Moxostoma	Moxostoma
Moxostoma anisurum	Silver redhorse
Moxostoma carinatum	River redhorse
Moxostoma duquesnei	Black redhorse
Moxostoma erythrurum	Golden redhorse
Moxostoma macrolepidotum	Shorthead redhorse
Nocomis micropogon	River chub
Notemigonus crysoleucas	Golden shiner
Notropis	Notropis

Notropis atherinoides	Emerald shiner
Notropis hudsonius	Spottail shiner
Notropis photogenis	Silver shiner
Notropis rubellus	Rosyface shiner
Notropis stramineus	Sand shiner
Notropis volucellus	Mimic shiner
Noturus flavus	Stonecat
Oncorhynchus mykiss	Rainbow trout
Perca flavescens	Yellow perch
Percina caprodes	Logperch
Percina macrocephala	Longhead darter
Percina maculata	Blackside darter
Percopsis omiscomaycus	Trout perch
Pimephales notatus	Bluntnose minnow
Pomoxis annularis	White crappie
Pomoxis nigromaculatus	Black crappie
Pylodictis olivaris	Flathead catfish
Salmo trutta	Brown trout
Sander canadense	Sauger
Sander vitreum	Walleye
Semotilus atromaculatus	Creek chub
Source: Western Pennsylvania Conservancy – September 2004 – Aquatic Classification Project. Printed with permission by the PFBC.	

Anglers that consume fish species within the Allegheny River should be aware of the fish consumption advisories posted by the PFBC (see Chapter 3).

The PFBC maintains supplemental stocking activities for the Allegheny to create a trophy fishery within the plan area. Table 4-4 presents the stocking activities by pool.

Table 4-4
Stocking Schedule for the Allegheny River: January – December

Pool	Species	Lifestage
1 and 2	Paddlefish White x Striped bass	Fingerling
2	Tiger Muskellunge	Fingerling
3	Muskellunge Paddlefish	Fingerling
4	Tiger Muskellunge	Fingerling
5	Muskellunge	Fingerling
6	Walleye	Fry

7	Muskellunge Walleye	Fingerling Fry
8	Walleye	Fry
9 to Sugar Creek	Muskellunge Walleye	Fingerling Fry
Source: www.fish.state.pa.us, 2003		

a. Paddlefish Stocking

The Paddlefish is a species that is native to the Ohio basin, but which disappeared across much of its range in the early 1900s due to water pollution. With the improvements in water quality over the past 30 years, restoration of this species is now possible. The PFBC has been stocking Paddlefish in the Allegheny River from Pittsburgh to Lock and Dam 6 at Clinton in an effort to establish a reproducing Paddlefish population in the state. Since the program started in 1991, almost 89,000 fish have been stocked. In 1995, PFBC began tagging the fish prior to stocking. These tags contain codes of where and when the fish were stocked so that upon their recapture, scientists can determine the movement of stocked fish and their survival rates. The tagging is a cooperative project between PFBC and California University of Pennsylvania.

5. Macroinvertebrates

Macroinvertebrates are also important to consider when discussing river health. The presence of macroinvertebrates is important because they are a food source for other organisms. Near the bottom of the food chain, their abundance indicates a healthy food supply for the rest of the chain. Their presence is also an indicator of water quality. When pollution intolerant species are found in the rivers, it is a good sign of healthy waterways. The more pollution tolerant species, though, the more degraded the water quality.

Freshwater mussels are common in the rivers and have been the subject of debate due to their susceptibility to commercial dredging. They typically thrive in more shallow depths with coarse sand or gravel beds that are free from siltation. Siltation is often caused by barge and commercial traffic, which can affect the oxygen intake and filter feeding of the mussels. They require good water quality and water velocity that is not too fast or too stagnant. Studies have shown that they are found more often at the upstream (head) portion of the river pools.

More information about animals and plants are available in the Army Corps EIS for Commercial Sand and Gravel Dredging, found at http://www.lrp.usace.army.mil/or/or-f/toc.htm.

B. VEGETATION

The study area is situated within the Eastern Deciduous Forest Biome. While not an exhaustive list, several native tree species that commonly occur are: Red maple *(Acer rubra)*, Silver maple *(Acer saccharinum)*, Sugar maple *(Acer saccharum),* Box-elder *(Acer negundo)*, American sycamore *(Platanus occidentalis)*, Eastern cottonwood *(Populus deltoids),* Black cherry *(Prunus serotina),* White oak *(Quercus alba),* Red Oak *(Quercus rubra)*, Pin oak *(Quercus palustris)*, Northern hackberry *(Celtis occidentalis)*, Sassafras *(Sassafras albidum)*, Staghorn sumac *(Rhus typhina)*, Shagbark hickory *(Carya ovata)*, Pignut hickory *(Carya galbra)*, Green ash *(Fraxinus pennsylvanica)*, White ash *(Fraxinus americana),* Black locust *(Robinia pseudoacacia)*, Black walnut *(Jugluns nigra)*, American beech (*Fagus grandifolia*), Eastern hemlock (*Tsuga canadensis*), Yellow birch (*Betula lutea*), Black birch (*Betula lenta*), Eastern white pine (*Pinus strobes*), Slippery elm (*Ulmus fulva*), Tulip poplar (*Liriodendron tulipifera*), and Black willow *(Salix nigra)*. Native shrub species that commonly occur within the corridor include Flowering dogwood, *(Cornus florida)*, Silky dogwood *(Cornus amomum)*, Hawthorn sp. *(Crataegus sp.)*, Spice bush

(Lindera benzoin), American witch-hazel *(Hamamelis virginiana)*, Northern arrow-wood *(Viburnum regognitum)*, Ninebark, and Elderberry *(Sambucus canadensis)*.

C. INVASIVE SPECIES

Invasive species are some of the most precarious and unnoticed forms of environmental decline and have been introduced via several methods, including: purposeful introduction in the 19th and early 20th centuries for various reasons; and unintentional introduction such as transport by ship, plane, barge, highway freight, and railroad cars. Once established, seeds of invasives can be spread by water, wind, or animal droppings, further exacerbating the problem. Invasive species pose a threat to the biodiversity of the native flora and fauna along the Allegheny River as well as across the United States. They easily overtake areas, especially where there is currently little vegetation. Once established, they grow rapidly, overtaking, for example, riverbanks, pastures, and public areas like parks and trails. They can crowd out native species that cannot survive the competition for nutrients and sunlight, thus leading to the decline of local biodiversity, and the increase in invasive monocultures.

Invasive species
These are species that grow aggressively, spread, and displace other species. They are difficult and expensive to control and can dominate whole areas, thereby threatening native plant and animal species. Most invasive species arrive from overseas; however, any that have been introduced into and thrive in an area where they weren't found before (e.g. from another geographic region) is an invasive species.

Adapted from "Invasive Plants in PA," PA DCNR brochure

Table 4-5 lists the invasive aquatic animal and plant species in the Allegheny River watershed.

Table 4-5
Invasive Aquatic Animals and Plants
Native = from a different geological area in North America* Exotic = from another continent

Grouping	Common Name	Scientific Name	Type of Invasive
Fish	American Shad	*Alosa sapidissima*	Native
Fish	Brown Trout	*Salmo trutta*	Exotic
Fish	Burbot	*Lota lota*	Native
Fish	Common Carp	*Cyprinus carpio*	Exotic
Fish	Rainbow Trout	*Oncorhynchus mykiss*	Native
Fish	Redear Sunfish	*Leomis microlophus*	Native
Fish	Spottail Shiner	*Notropis hudsonius*	Native
Fish	Striped Bass	*Morone saxatilis*	Native
Fish	Yellow Perch	*Perca flavescens*	Native
Mollusks	Asian Clam	*Corbicula fluminea*	Exotic
Mollusks	Mud Bithynia	*Bithynia tentaculata*	Exotic
Mollusks	Zebra Mussel	*Dreissena polymorpha*	Exotic
Coelenterates	Freshwater Jellyfish	*Craspedacusta sowerbyii*	Exotic
Crustaceans	Spiny Water Flea	*Bythotrephes cederstroemii*	Exotic
Plants	Brittle Naiad	*Najas minor*	
Plants	Carolina fanwort	*Cabomba caroliniana*	
Plants	Curly Pondweed	*Potamogeton crispus*	

Plants	Dotted Duckweed	*Landoltia punctata*	
Plants	Eurasian water-milfoil	*Myriopyllum spicatum*	
Plants	Purple Loosestrife	*Lythrum salicaria*	
Plants	Water Cress	*Nasturtium officinale*	
Plants	Yellow Iris	*Iris pseudacorus*	

* Although this list defines native as occurring in North America, plants or animals that are not native to this region of Pennsylvania can cause problems and also are referred to as exotic.

Source: USGS Nonindigenous Aquatic Species Database http://nas.er.usgs.gov

Although the zebra mussel has been identified in relatively small numbers within the Allegheny River, it has been known to display rapid dispersal throughout the Great Lakes and major river systems. This is accomplished through 'hitch-hiking' on boats navigating these watercourses. Its rapid range expansion into connected and unconnected waterways was probably due to barge traffic and recreational boating where it is theorized that attached mussels fell off during routine navigation. While they are not a substantial problem yet, zebra mussels can affect water treatment plants by clogging the water intake valves in the rivers. Additionally, it is noteworthy to mention that under cool, humid conditions, zebra mussels can stay alive for several days out of water; therefore boaters that utilize the river and other watercourses should take extra precautions to inspect their watercraft before and after boating, especially when transporting the watercraft to a different body of water.

Zebra Mussel

Invasive plant species are a more prominent problem in this study corridor than invasive animals. While Table 4-5 lists invasive aquatic species, there are also several terrestrial plant species that are cause for concern. Japanese knotweed (*Polygonum cuspidatum*), purple loosestrife (*Lythrum salicaria*), multiflora rose (*Rosa multiflora*), and tree of heaven (*Ailanthus altissima*) are the four most common invasives in the study area. Other invasives that may be a problem are Amur Honeysuckle and Asiatic Bittersweet.These species tend to invade areas that have been disturbed, or stripped of native vegetation, which allows for easy propagation of invasives.

Invasive plants are difficult to eradicate, but measures can be taken to control their spread. Japanese knotweed spreads by rhizomes, or shallow underground stems. Therefore, knotweed should not be removed by digging because rhizomes in the soil can wash downstream and invade other shorelines. Instead, knotweed can be controlled by cutting it four times a year, by planting native trees to shade it (knotweed is shade intolerant), or by spraying the plant with an herbicide that is safe to use near water.

Multiflora rose is currently being controlled naturally by a viral pathogen disease called 'rose-rosette.'

D. PENNSYLVANIA NATURAL HERITAGE PROGRAM (PNHP)

(formerly called the Pennsylvania Natural Diversity Inventory)

The PNHP is a partnership among the Pennsylvania Bureau of Forestry, Western Pennsylvania Conservancy, and The Nature Conservancy who "conduct inventories and collect data to identify and describe Pennsylvania's rarest and most significant ecological features, which are needed for conservation, development planning, and natural resource management." [4]

A survey of the PNHP database was completed for species of special concern and threatened and endangered terrestrial, aquatic, invertebrate, and plant species that potentially exist within the corridor. Several endangered and threatened species found in the study area but that are not listed in the PNHP are: Peregrine Falcon, Sedge Wren, Small-Footed Bat, Eastern Massasauga, Gilt Darter, Spotted Darter, Tippecanoe Darter, Small Whorled Pagonia.

Data appearing in this report were provided by the Western Pennsylvania Conservancy in April 2004. All species not documented in the past 40 years are considered to be historic.

Extant
A species that exists across its entire range in PA.
Threatened
A species that may become endangered within the foreseeable future throughout their range in PA.
Endangered
A species in imminent danger of extinction or extirpation.
Extirpated
A species that has disappeared from PA, but still exists elsewhere in its range.
Extinct
A species that occurred in PA, but no longer exists across its entire range.

[4] http://www.dcnr.state.pa.us

Species Extirpated from Pennsylvania					
Scientific Name	**Common Name**	**Occurrence**	**Global Rank**	**State Rank**	**Date Last Observed**
Apalone mutica	Smooth Softshell	H	G5	SX	NO DATE
Cyclonaias tuberculata	Purple Wartyback	H	G5	SX	1919-PRE
Cyprogenia stegaria	Fanshell	H	G1	SX	1919-PRE
Elliptio crassidens	Elephant Ear	H	G5	SX	1919-PRE
Lampsilis abrupta	Pink Mucket	H	G2	SX	1919-PRE
Pleurobema cordatum	Ohio Pigtoe	H	G3	SX	1919-PRE
Pleurobema plenum	Rough Pigtoe	H	G1	SX	1909-08-10
Pleurobema rubrum	Pyramid Pigtoe	H	G2	SX	1919-PRE
Quadrula metanevra	Monkeyface	H	G4	SX	1919-PRE
Quadrula pustulosa	Pimpleback	H	G5	SX	1919-PRE

Species Documented Since 1980					
Scientific Name	**Common Name**	**Occurrence**	**Global Rank**	**State Rank**	**Date Last Observed**
Baptisia australis	Blue False-indigo	E	G5	S3	1990's
Epioblasma torulosa rangiana	Northern Riffleshell	E	G2T2	S2	2001
Erimystax x-punctatus	Gravel Chub	E	G4	S1	1981-08-13
Etheostoma camurum	Bluebreast Darter	E	G4	S2	1986-05-10
Fusconaia flava	Wabash Pigtoe	H	G5	S2	1995-06-29
Hiodon alosoides	Goldeye	E	G5	S2?	1986------
Hiodon tergisus	Mooneye	E	G5	S2?	1988------
Lepisosteus osseus	Longnose Gar	E	G5	S2S3	1981-06-07
Moxostoma carinatum	River Redhorse	E	G4	S3	1988------
Myotis leibii	Eastern Small-footed Myotis	E	G3	S1B,S1N	1993-04-20
Myotis septentrionalis	Northern Myotis	E	G4	S3B,S3N	2001-02-28
Percina copelandi	Channel Darter	E	G4	S1S2	1988------
Percina macrocephala	Longhead Darter	E	G3	S2	1986-12-09
Pleurobema clava	Clubshell	E	G2	S1S2	2000-09---
Pleurobema sintoxia	Round Pigtoe	E	G4	S2	1998-09
Potamilus alatus	Pink Heelsplitter	E	G5	S2	1990's
Simpsonaias ambigua	Salamander Mussel	E	G3	S1?	1990's
Villosa fabalis	Rayed Bean Mussel	E	G1G2	S1S2	2000-09---

Species Not Documented Since 1980					
Scientific Name	**Common Name**	**Occurrence**	**Global Rank**	**State Rank**	**Date Last Observed**
Ameiurus melas	Black Bullhead	H	G5	S1?	1935-04-11
Asplenium pinnatifidum	Lobed Spleenwort	H	G4	S3	1969-06-29
Astragalus canadensis	Canadian Milkvetch	H	G5	S2	1921-09-06
Carex typhina	Cattail Sedge	H	G5	S2	1925-07-23
Clonophis kirtlandii	Kirtland's Snake	H	G2	SH	1906-05-11
Crataegus brainerdii	Brainerd's Hawthorne	H	G5	SU	1923-10-22
Ellipsaria lineolata	Butterfly Mussel	H	G4	S1S2	1919-PRE
Epioblasma triquetra	Snuffbox	H	G3	S1	1919-PRE
Filipendula rubra	Queen-of-the-prairie	H	G4G5	S1S2	1927-07-20
Fusconaia subrotunda	Long-solid	H	G3	S1	1919-PRE
Helianthemum bicknellii	Bicknell's Hoary Rockrose	H	G5	S2	1897-09---
Heterodon platirhinos	Eastern Hognose Snake	H	G5	S3S4	NO DATE
Ichthyomyzon bdellium	Ohio Lamprey	H	G3G4	S2S3	1968-09-18
Leptodea fragilis	Fragile Papershell	H	G5	S2	1919-PRE
Lythrum alatum	Winged-loosestrife	H	G5	S1	1890-07---
Notropis ariommus	Popeye Shiner	H	G3	S1	1853------
Obovaria subrotunda	Round Hickorynut	H	G4	S1	1919-PRE
Phaseolus polystachios	Wild Kidney Bean	H	G4	S1S2	1955-09-10
Plethobasus cyphyus	Sheepnose Mussel	H	G3	S1	1919-PRE
Populus balsamifera	Balsam Poplar	H	G5	S1	1929-10-19
Potamogeton illinoensis	Illinois Pondweed	H	G5	S3S4	1963-09-21
Prunus alleghaniensis	Alleghany Plum	H	G4	S2S3	NO DATE
Quadrula cylindrica	Rabbitsfoot	H	G3	S1	1919-PRE
Salix caroliniana	Carolina Willow	H	G5	S1	1900-06---
Salix myricoides	Broad-leaved Willow	H	G4	S2	1900-06-23
Salix x subsericea	Meadow Willow	H	G5	S1	1920-05-22
Scleria pauciflora	Few Flowered Nutrush	H	G5	S2	1869-08-07
Scutellaria saxatilis	Rock Skullcap	H	G3	S1	1902-06-22
Simpsonaias ambigua	Salamander Mussel	H	G3	S1?	1970-11---
Sisyrinchium albidum	Blue-eyed Grass	H	G5?	SH	1918-05-01
Toxolasma parvum	Lilliput	H	G5	S1S3	1969------
Trillium flexipes	Declined Trillium	H	G5	S2	1938-05-01
Trillium nivale	Snow Trillium	H	G4	S3	1894-04-01
Tritogonia verrucosa	Pistolgrip Mussel	H	G4	S1	1919-PRE
Villosa iris	Rainbow Mussel	H	G5	S1	1919-PRE

Basic Global Rank Codes and Definitions

G2 Imperiled - Imperiled globally because of rarity or because of some factor(s) making it very vulnerable to extinction. Typically 6 to 20 occurrences or few remaining individuals (1,000 to 3,000) or acres (2,000 to 10,000) or stream miles (10 to 50).

G3 Vulnerable - Vulnerable globally either because very rare and local throughout its range, found only in a restricted range (even if abundant at some locations), or because of other factors making it vulnerable to extinction. Typically 21 to 100 occurrences or between 3,000 and 10,000 individuals.

G4 Apparently Secure - Uncommon but not rare, and usually widespread. Possibly cause for long-term concern. Typically more than 100 occurrences and more than 10,000 individuals.

G5 Secure - Common, typically widespread and abundant. Typically with considerably more than 100 occurrences and more than 10,000 individuals.

G#G# Range Rank - A numeric range rank (e.g., G2G3) is used to indicate uncertainty about the exact status of a taxon.

G? Unranked - Global rank not yet assessed.

State Rank Codes and Definitions

SX Extirpated - Element is believed to be extirpated from the "state" (or province or other subnational unit).

SH Historical - Element occurred historically in the state (with expectation that it may be rediscovered), perhaps having not been verified in the past 20 years, and suspected to be still extant. Naturally, an Element would become SH without such a 20-year delay if the only known occurrences in a state were destroyed or if it had been extensively and unsuccessfully looked for. Upon verification of an extant occurrence, SH-ranked Elements would typically receive an S1 rank. The SH rank should be reserved for Elements for which some effort has been made to relocate occurrences, rather than simply ranking all Elements not known from verified extant occurrences with this rank.

S1 Critically Imperiled - Critically imperiled in the state because of extreme rarity or because of some factor(s) making it especially vulnerable to extirpation from the state. Typically 5 or fewer occurrences or very few remaining individuals or acres.

S2 Imperiled - Imperiled in the state because of rarity or because of some factor(s) making it very vulnerable to extirpation from the state. Typically 6 to 20 occurrences or few remaining individuals or acres.

S3 Vulnerable - Vulnerable in the state either because rare and uncommon, or found only in a restricted range (even if abundant at some locations), or because of other factors making it vulnerable to extirpation. Typically 21 to 100 occurrences.

S4 Apparently Secure - Uncommon but not rare, and usually widespread in the state. Usually more than 100 occurrences.

S? Unranked - State rank is not yet assessed.

SU Unrankable - Currently unrankable due to lack of information or due to substantially conflicting information about status or trends. NOTE: Whenever possible, the most likely rank is assigned and a question mark added (e.g.., S2?) to express uncertainty, or a range rank (e.g.., S2S3)
is used to delineate the limits (range) of uncertainty.

S#S# Range Rank - A numeric range rank (e.g., S2S3) is used to indicate the range of uncertainty about the exact status of the Element. Ranges cannot skip more than one rank.

E. IMPORTANT HABITATS

1. Wetlands

Wetlands, commonly known as marshes, bogs, swamps, or shallow ponds, are areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions.[5] Wetlands are important ecological resources; they filter runoff (and thus help to purify water quality), absorb heavy water flow (which alleviates flooding), provide habitat for many species, and promote recreation and tourism. There are wetlands in the corridor, for example: 1) upstream of Donley Island (east bank), 2) above Nicholson Island (east bank) (owned by Allegheny Valley Land Trust), 3) above L&D 8, just below Templeton, and 4) Cogley Island (Map 4).

Most wetland location data is obtained from on-the-ground surveys, such as a County Natural Heritage Inventory (NHI). The NHI has limitations in data gathering, so it should not be considered an exhaustive list for wetlands in the county.

Wetlands along the east bank of the Allegheny River

2. Riparian Corridors

Riparian zones refer to the area between the land and water along a stream, river, lake, pond, or wetland. In this region of the country, riparian buffers are typically forested and are important to the ecological health of the waterways as they stabilize the stream bank, reduce erosion, decrease nutrient loads from runoff, provide habitat, maintain water temperature, and provide a source of food for aquatic life.

Example of a forested riparian area along the Allegheny

Example of residential areas without riparian vegetation

[5] DEP Wetlands Factsheet www.dep.state.pa.us

A guide for voluntary wetland and riparian stewardship can be found in the Stewardship and Resources Guide that accompanies this publication.

Streambank (riparian) stabilization projects have occurred in the project area: 1) mouth of Cowanshannock Creek and 2) mouth of Mahoning Creek. These stabilization projects occur in areas where water action has eroded the streambanks. In the two projects along this corridor, riprap – large stones – are placed in the streambank to help prevent soil erosion.

Streambank stabilization project at the mouth of Cowanshannock Creek

3. Steep Sloped Areas

Steep forested slopes provide habitat for terrestrial species within the plan area largely due to the fact that these areas are unlikely to be developed. These areas are typically composed of pole stage and mature tree species, which contain diverse under-stratum habitats.

4. Natural Heritage Areas (NHA)

The Western Pennsylvania Conservancy (WPC) maintains the Natural Heritage Inventory in western Pennsylvania; it is a database of Natural Heritage Areas (NHA), or natural areas, that are significant, unique, or uncommon. This information can be used in planning for the protection of the biological diversity and ecological integrity of the Allegheny River corridor. There are two types of NHA: Biological Diversity Areas and Other Heritage Areas. The Biological Diversity Areas (BDAs) are so noted because they include habitat that harbors one or more occurrence of plants or animals recognized as state or national species of concern; they possess a high diversity of plant and animal species native to the county; or they support a rare or exemplary natural community. Other Heritage Areas (OHAs) are so noted because they are consistently utilized for scientific monitoring of the environment or other natural science study, or they are lands that are regularly used by educational institutions, local organizations, or the general public for nature study or instruction.

Only three counties in the study area have a natural heritage inventory: Allegheny, Westmoreland, and Butler. BDAs in the corridor include: the Allegheny River, which is described as "providing habitat for a number of state listed animal species…the river continues to be altered by human influences including effluent discharges, point source discharges, navigational locks and dams, and dredging of river bed,"[6] portions of game lands 287 and 105, the wooded slopes across the river from Emlenton, Allegheny County Regional Park in Harrison, and the wooded riparian slopes of Plum.

[6] Western Pennsylvania Conservancy

5. Allegheny River Pool 6 [7] [8] [9] [10]

Allegheny River Pool 6 can be considered an important habitat because it is protected from dredging. The following studies compare the habitats of Pools 5 (dredged) and 6 (not dredged).

The Pennsylvania Fish and Boat Commission performed a study to assess the impacts of dredging and chose to compare the more natural Pool 6 with the excessively dredged and deep Pool 5, which is nearly devoid of natural river bottom. The purpose of the assessment was to determine the diversity of fish species in each pool, and to establish relative numbers of game and panfish present. The study found that while both Pools 5 and 6 contain diverse fish populations, those in Pool 6 appear to have attained their diversity through reproductive success and completion of life cycles within the pool. Pool 5, by contrast, had smaller populations and no individuals of certain forage species. This indicates that the Pool 5 populations had little to no reproductive success, and that fish populations from adjacent pools and tributaries are not migrating into Pool 5. The study's conclusion: overall fish productivity is considerably higher in Pool 6 than Pool 5.

Species absent from Pool 5 but present in Pool 6 are mostly all dependent on one or more of the following habitat requirements:
1) Absence of silt or sediment build up;
2) Clean sand and gravel substrate;
3) Shallow flowing waters/riffles.

Dredging removes all three of these habitat traits. The fact that all three still exist in Pool 6 explains the greater diversity of fish populations there (including dense smallmouth bass and walleye).

The U.S. Army Corps of Engineers Pittsburgh District also performed a study comparing Pools 5 and 6. Their study focused on three factors: substrate size, benthic macroinvertebrate communities, and background water quality.

Substrate particle sizes were determined using four categories for gravel (the largest being cobble) and three for sand and fine sediment (silts and clays). The Corps found the substrate of both pools to be generally coarse. However, there was about 19 percent more cobble in Pool 6 than in Pool 5. And over 10 percent more silts and clays in the substrate of Pool 5.

The amount of gravels, sand, and silt affects the distribution of benthic macroinvertebrates living in these pools. There were twice as many living in Pool 6 compared to Pool 5. Also, the Pool 6 samples had significantly fewer Corbicula (Asian clams – an invasive specie). The likely reason: shallower waters generally have more diverse and more productive invertebrate communities.

The water quality tests showed little difference between the water of the two pools. This was expected due to the watersheds feeding into them, which are characterized by relatively little tributary drainage. Of the 9,351 square miles draining into the Allegheny at Lock and Dam 5, only 19 square miles, or 0.2 percent of the drainage is local, as a result, 99.8 percent of the water in Pool 5 is received from Pool 6. The total drainage area at Lock and Dam 6 is 9,332 square miles, of which only 350 square miles or 3.8 percent of the total is from local drainage tributary. Acid mine drainage does emanate from the 369 square miles of local drainage into Pools 5 and 6. The impact of acid mine drainage pollution, however, was not even measurable at the mid-channel and/or the lock and dams' monitoring stations.

---

[7] Lee, Lorson, Shervinskie, and Woomer, Executive Summary.

[8] U.S. Army Engineer District, Pittsburgh, Corps of Engineers, Commercial Sand and Gravel Dredging Impacts on Substrate Particle Size Distribution, Macroinvertebrate Communities, and the Water Quality of Allegheny River Pools 5 and 6, River Miles 30.4 to 45.7, (Pittsburgh: U.S. Army Engineer District, Pittsburgh, Corps of Engineers, 1993), pp. 11-13.

[9] Richard McCoy, Special Report 92-4, Lower Allegheny River Wetland Survey, River Miles 41.5-45.5, Navigation Pools 5 and 6, (Fish and Wildlife Service, 1992) pp.all.

[10] www.watershedatlas.org

Lead concentrations, however, were higher in Pool 5 (6.9 ug/l) than Pool 6 (2.3 ug/l). And differences in the amount of dissolved oxygen sampled in both pools was negligible.

In a special study conducted by the U.S. Fish and Wildlife Service, biologist Richard McCoy surveyed the wetlands in Pools 5 and 6. Wetlands provide food, cover, and nesting habitat for a variety of shore birds, waterfowl, mammals, reptiles, and amphibians. Numerous black duck, mallards, and great-blue herons were observed around the Cogley Island complex in Pool 6. Some of these wetlands also provide valuable spawning, nursery, and feeding areas for many river fishes. Rare fishes still inhabit the shallow-water wetlands around Cogley Island including bluebreast darter, channel darter, goldeye, longhead darter, and river redhorse.

Approximately 118 acres of wetlands (42 acres emergent, 7 acres scrub-shrub, 68 acres forested, and 1 acre submerged aquatic bed) exist in Pool 6. With 71 species of plants identified, the wetlands of Pool 6 were much more diverse than those of Pool 5. Emergent wetlands varied from almost solid stands of reed-canary grass, water- willow, and smartweed, to the highly diverse wetlands in the back channels of Cogley Island. Dominant plants included spotted jewelweed, wingstem, tall coneflower, smartweeds, water-willow, goldenrods, and rice cut-grass. Cogley Island is the largest riverine wetland found along the Allegheny River.

In contrast, there are less than 12 acres of wetland in Pool 5, with almost 3 acres of emergent/scrub-shrub and 9.0 acres of forested wetlands. These wetlands were restricted to river mile 32.8 near Donley Island. The forested wetlands were dominated by silver maple with spicebush in the understory, and spotted jewelweed and wingstem co-dominating the herbaceous layer. False nettle and white snakeroot were also common. The emergent/scrub-shrub wetlands were created by beaver activity and an abandoned railroad bed.

The differences in substrate and other physical characteristics between the two pools and surrounding landscape account for the difference in wetland acreage.

6. Game Lands

State Game Lands are lands owned by the Commonwealth of Pennsylvania and managed by the Pennsylvania Game Commission (PGC) for recreational hunting, fishing, and trapping. They provide a relatively undisturbed habitat for the species listed in Section A. (See Chapter 5-F for more information.)

A. TRAILS

1. Land

a. Greenways

Greenways are defined as dedicated corridors of open space. They vary in terms of size, purpose, and amount or quality of green. Some serve mainly as recreational corridors, as in rail trails, while others may be environmental corridors, like riparian (streamside) buffers. Greenways provide many environmental benefits, including improved air and water quality, habitat for wildlife, and the protection of environmentally sensitive areas like wetlands and steep slopes. Greenways are also economically beneficial; they increase property values, attract local businesses, connect communities, and improve the quality of life.

The Pennsylvania Greenways Partnership Commission, a coalition of government and private organizations established by Governor Tom Ridge in 1998, has produced an action plan for developing a statewide greenway network by 2020. Called *PA Greenways: An Action Plan for Creating Connections*, the document calls for connecting "hubs" of public lands with national, state, local, or regional greenways.[1] The Plan also encourages each county to apply greenways as a land use strategy and to map these important areas.

Pittsburgh to Harrisburg Mainline Canal Greenway

The Pittsburgh-Harrisburg Mainline Canal Greenway traces the historic path of the Pennsylvania Mainline Canal System in a corridor along the Allegheny, Kiski-Conemaugh, Juniata, and Susquehanna Rivers, along with all of the communities in between.[2] This project, also known as the Millennium Legacy Trail, focuses on four themes: recreational opportunities, heritage preservation, environmental stewardship, and economic development. The Greenway will link land- and water-based trails to identified heritage sites and hub communities, which are downtown areas that offer amenities like trail connections and unique natural and historic areas. The plan identified Freeport as a hub community.

b. Rails to Trails

Rail trails are examples of recreational greenways. Abandoned rail beds provide an ideal starting point for cycling or walking trails: they are free from traffic, have a gentle grade, are close to many communities, and provide closer access to the rivers. Rail trails are made possible due to a 1983 amendment to the National Trail System Act of 1968. The amendment allows old railroad beds to be used by the public and allows for rail banking, which authorizes a railroad company to reclaim the abandoned railways if needed.

[1] www.dcnr.state.pa.us/pagreenways/index.htm
[2] www.alleghenyridge.org

c. Federal Rails to Trails Act

The Railbanking Act

In 1976, the federal government deregulated the railroads with the Railroad Revitalization and Regulatory Reform Act. The purpose of this act was to make it easier for the railroad companies to get rid of unprofitable lines freely, either by sale or abandonment, allowing it to become part of the adjacent property.

In 1983, Congress passed the National Trails System Act "to provide for the ever-increasing outdoor recreation needs…and in order to promote the preservation of, public access to, travel within, and enjoyment and appreciation of the open-air, outdoor areas and historic resources of the Nation" through trail creation. The National Trails System Act is also known as the "railbanking act." Under "STATE AND METROPOLITAN AREA TRAILS," Section 8 (d) of the National Trails System Act, 16 U.S.C. §1247(d), the Act calls for encouraging State and local agencies and private interests to establish appropriate trails using the provisions of the National Trails System Act in administering the Railroad Revitalization and Regulatory Reform Act. Section 8 (d) spells out the "national policy to preserve established railroad rights-of-way for future reactivation of rail service, to protect rail transportation corridors, and to encourage energy efficient transportation use." The act allows rails-to-trails groups to take over the railroad land and assume responsibility for them, with the promise to sell the land back to the railroads if they are ever needed again. As a way to straighten out the railroad transferring process and as a way to preserve the right-of-way for the future, Congress created the railbanking act.

Private Landowners

Commonly, the railroad right-of-ways are acquired through outright purchases, easements, condemnations, and land grants. Usually, it is a combination of all four types. After a railroad "abandons" the line, people may question ownership. At this point a lawyer should be retained to do a title search to sort through the conflicting ownership claims. Many families who have owned the surrounding land for generations contend that the land was essentially borrowed subject to railroad use. When that use ceased, they believed the land would revert back to the family. This is essentially how an easement works. An easement is "the right to use the real property of another for a specific purpose." Legal title is retained by the original owner. When that specific purpose ceases, such as an abandonment of the line, the land reverts back to the original owner.

Now, however, the National Trails System Act allows the government to hold onto that land in case railroads are needed in the future, while making productive recreational use of the land in the present. The U.S. Congress was concerned about losing the existing rail network to abandonment, so now a line proposed for abandonment is preserved through interim conversion to trail use. What happened to the private landowners' rights? Sometimes, a line proposed for abandonment contains sections that are easements as opposed to the railroad outright owning the section. If an abandonment occurs, the land reverts back to the family who owns the land. However, if a line is railbanked, the line is not considered abandoned. Therefore, the land does not revert back to the family. The line can not be broken into segments. The railbanking act deposits the landowners' interests into a fictitious National Rail Bank, which holds them in public trust for future use.

Constitutionality

In 1990, the U.S. Supreme Court ruled that railbanking was constitutional, but it also allowed property owners to seek damage claims through the U.S. Court of Claims in Washington, D.C. Right now, seeking a damage claim seems to be the only redress for a private landowner, and the landowner can only take such action after the trail is created, because there must be an injury to the landowner in order for him or her to bring a claim in court. While private landowner groups have fought rail trails and held up the trail creation process in court, more times than not the trail wins out. The law favors productive use of the land.

Examples of rail trails in the corridor include:

AVLT Campsites available for lease

Armstrong Trail –This 52 mile trail is a former Conrail right of way that begins in Schenley, Gilpin Township (River Mile 30.4) and follows the eastern shore of the Allegheny River to East Brady. The Allegheny Valley Land Trust (AVLT) has been the owner and developer of the trail since 1992.

The trail surface is mostly unimproved, but in some areas (Ford City, Kittanning) the trail is developed with either a paved or crushed limestone surface. Primitive camping is allowed on AVLT's property with a permit from the Trust. There are other privately owned camp sites along the trail, which are available for lease.

Trail signage in Templeton

There are numerous fishing spots along the trail, both on the Allegheny River and at the mouths of the many tributaries in the corridor. Public boat launches exist and there is the potential to develop more non-motorized access areas on AVLT property. Sites of historical and cultural significance, such as former coke ovens and ancient sea fossils can be seen periodically along the trail. More information about the trail can be found through the 'rails-to-trails' link at www.dcnr.state.pa.us.

Landowner's posting along a stretch of the Armstrong Trail

There are ongoing legal challenges to the AVLT's right to own and use the land along some segments of the trail. In these places, adjacent landowners have either posted or obstructed the trail. As a result, trail users are directed away from these properties and along city streets.

Stretches of unpaved and paved sections of Armstrong Trail

Aside from the conflict over land ownership of the trail, residents have complained about restricted ATV use, vandalism, and littering. (See the Public Participation section for more detailed comments.) While ATV users argue that the trail is underutilized by bikers and walkers and that ATVs serve a useful

purpose by removing brush from the trail, others argue that ATVs can damage the trail and surrounding terrain and create a disturbance with their noise (regardless of opinions, ATV use on trails is illegal). Specific instances of vandalism on private property were not provided during the public meetings, however vandalism has been reported on areas that are open to the public, specifically the trail and the park across from the Cowanshannock Boat Launch.

Butler to Freeport Trail – Nearly 12 miles of this trail is developed, and the plan is for a 21- mile trail that extends from the City of Butler to the Borough of Freeport along a former Conrail Line. The trail is owned by Buffalo, Jefferson, and Winfield Townships, and operated by the Butler-Freeport Community Trail Council, Inc. The rail line was abandoned in 1987, and the trail opened in 1989. As with the Armstrong Trail, court challenges have taken place over the actual ownership of the property. The courts have sided with the townships and Trail Council. Although an appeal was made to the U.S. Supreme Court, the Court chose not to hear the case, essentially ending the challenges.

Tredway Trail – This 2.5 mile long trail begins at the Allegheny Township – Lower Burrell line and follows the Allegheny River north to the River Forest Golf Course. Restrooms and picnic areas are available. The trail is operated by Allegheny Township. It is expected that one day this trail will connect with the other rail-trails in the region.

Alle-Kiski Heritage Trail – This is a network of trails, parks, historic attractions, and destinations that are being developed to improve the economy of the Alle-Kiski Valley. The network includes the Armstrong Trail, the Butler to Freeport Trail, the Kiski River Trail, and eventually, the Allegheny River Trail. The Alle-Kiski Revitalization Corporation (AKRC) has received grant money to purchase a permanent trail easement on nearly eight miles of rail corridor from the Borough of Oakmont to the City of Arnold. This section will become part of the Allegheny River Trail. The AKRC hopes to connect the Allegheny River Trail to the Pittsburgh Three Rivers Heritage Trail System.

Rail trails are not the only type of trail in the corridor. Other trails include:

Rachel Carson Trail – This is a 34-mile hiking trail that extends from Harrison Hills County Park in northeast Allegheny County to North Park in the north central part of the county. In Harrison Hills Park, the trail begins along the bluffs overlooking the Allegheny River. The trail crosses parks, follows power and gas line rights of way, and winds through suburban communities. Most of this trail is on private land, and it is considered to be primitive with no shelters or bridges and some very steep terrain. One spur of the trail leads to the Rachel Carson Homestead in Springdale.

Baker Trail – This is a 140-mile trail that extends from Freeport to the Allegheny National Forest. It is a hiking and backpacking trail that crosses several state parks, state forests, and game lands. There are shelters and campsites along the route. The trail originally began near Aspinwall in Allegheny County, but increased development in the area forced the abandonment of the lower section of the trail.

For many years, the Pittsburgh Council of the American Youth Hostel maintained the Rachel Carson and Baker Trails. In 2004, the Harmony Trails Council expanded its mission to become the Rachel Carson Trails Conservancy. Each year, there is a Rachel Carson Challenge, which earns funds for the maintenance of both the Rachel Carson and Baker Trails. The Rachel Carson Trail Challenge is a one-day sunrise to sunset endurance hike that attracts hundreds of participants. Only a fraction of the participants actually complete the hike. When the Freeport Bridge is rebuilt, there is the opportunity to link the Carson and Baker Trails. More information about these trails can be found at www.rachelcarsontrail.com.

North Country Scenic Trail – This hiking trail was authorized by Congress in 1980. When complete, it will stretch from New York to North Dakota. The trail's path through Pennsylvania has not been finalized, as several routes are being proposed and explored. Within the RCP study area, hikers typically follow the Allegheny River Trail past Emlenton and cross the bridge into Parker, where they continue hiking through Gameland #95. For more information on this trail visit www.northcountrytrail.org.

2. Water

Other recreational trails include water trails. These are waterways that can be navigated using human-powered and/or motor-powered boats and have many access/rest points along the route. Users are guided by maps and sometimes information kiosks at various points along the trail. The Lower Allegheny River Water Trail is the first leg of the Three Rivers Water Trail System being developed by Friends of the Riverfront, a non-profit organization. The trail follows 30 miles of the Allegheny River from the mouth of the Kiskiminetas River to Pittsburgh. It is accessible to non-motorized and motorized boats. Emlenton is the terminus of the Middle Allegheny Water Trail, an 85-mile long trail that begins at the Kinzua Dam. This trail is sponsored by the U.S. Forest Service and the Oil Heritage Region. The Clarion and Kiskiminetas Rivers are also designated water trails. Visit http://www.fish.state.pa.us/ and click on the link for "water trails" for detailed information and maps.

B. PARKS

Riverfront Parks are listed on Map 5.

Most of the larger, formal riverfront parks are found in the lower section of the river corridor. There are also public picnic areas, such as the Bernard Snyder Picnic Area at the Cowanshannock Creek boat launch. The Cowanshannock Creek Watershed Association owns a 300-acre tract of land near the picnic area (Canfield Holmes Sanctuary), which is to be donated to the county for a public park; however, since there is no county parks and recreation department in Armstrong County, this project has not been initiated.

There are several large parks that are not on the riverfront: Freeport Community Park, Arnold Rosevelt Park, and Harrison Hills Park.

There are also several golf courses in the corridor: River Forest in Allegheny Township (Westmoreland County), Buffalo Valley, Foxburg, and Cabin Greens in South Buffalo.

Kittanning Riverfront Park

Freeport Riverfront Park

C. CAMPGROUNDS

This area of the Allegheny River has many riverfront campgrounds. Access to many of them requires a lease, while some public areas require permits.

- Johnetta (just north of Godfrey on east bank) – private
- Godfrey – private
- Mouth of Kiskiminetas River – trailer campground
- Kelly's Station (just below Lock 6) - private
- Smith's (Mosgrove) – private
- Allegheny Valley Land Trust (Mosgrove) – public, permits

- Dewey's (Brady's Bend) – private
- Bernard Snyder Picnic Area (at mouth of Cowanshannock Creek) – permits from Cowanshannock Creek Watershed Association
- Allegheny Valley Land Trust lands are available for camping with permits – contact AVLT for camping areas

D. BOATING

1. River Access

Private Marina - Tarentum

PFBC Public Boat Launch - Templeton

There are many private marinas and public boat launches along the corridor, although general opinion indicates that more public access is needed, as well as more facilities for boaters, such as pump-out stations, gas, food, and restrooms. A 1986 publication by the Allegheny River Development Corporation– *Recreation: The Other Allegheny River* – is a study of the impact of recreational activities on and near the river between river miles 29 to 72. In it, there are recommendations for establishing good launch sites and for more fueling stations. Those recommendations may have been met, but it is obvious that demand for river access and amenities is still growing.

According to the PFBC's 2004 Fishing and Boating Opportunities Map, and the Army Corps of Engineers Navigation Charts, the following table lists the access areas within the study corridor.

Table 5-1
Public and Private Boat Access Along the Allegheny River (See Map 5)

Access	Ownership	Location	Amenities/Comments
Springdale Public Launch	Public/ PFBC	Pool 3 – Springdale	Shore fishing, launch ramp, dock, parking lot
Blair's Marina	Private	Pool 3 - Plum	Launch ramp, dock, fees, no parking lot
Logan's Ferry Marina	Private	Pool 3 – Plum	Launch ramp, dock, fees, no parking lot
Lighthouse Marina	Private	Pool 3 – New Kensington	Launch ramp, fuel, overnight mooring, parking lot, fees
Tarentum Public Launch	Public/PFBC	Pool 3 – Tarentum	Fishing pier, shore fishing, launch ramp, dock, parking lot
Unknown	Private Docks	Pool 3 - Tarentum	
Brackenridge Boat Docks	Private	Pool 3 – Brackenridge	
Boyer Boat Docks	Public	Pool 4 – Freeport	Public ramp

Freeport Public Launch	Public/PFBC	Pool 4 – Freeport	Shore fishing, launch ramp, dock, parking lot
Schenley Yacht Club	Private	Pool 5 – Gilpin	Fuel, overnight mooring
South Buffalo Public Ramp	Informal – not an official ramp	Pool 5 – South Buffalo	Informal – road extends to river
Rosston/Crooked Creek Public Launch	Public/PFBC	Pool 6 – Rosston	Shore fishing, launch ramp, parking lot
Coleman's Marina	Private	Pool 6 – Rosston	Fuel, overnight mooring, restrooms, pump-out station
Kittanning Public Ramp	Public/ Municipal	Pool 6 – Kittanning	Shore fishing, launch ramp, dock, parking lot, park, restrooms
Kittanning Marina	Private	Pool 7 – Kittanning	Launch ramp, dock, parking lot, fuel, groceries, overnight mooring, fees
Cowanshannock Public Launch	Public/PFBC	Pool 7 – Cowanshannock	Shore fishing, launch ramp, parking lot, picnic area
Nautical Mile Marina Boat Launch		Pool 8 – Pine	
Templeton Public Launch	Public/PFBC	Pool 8 – Templeton	Shore fishing, launch ramp, dock, parking lot
The Spot Marina		Pool 8 – Washington	Public ramp, fuel, groceries, overnight mooring, parking
River's Edge Campground and Boat Launch	Private	Pool 8 – Washington	Launch ramp, dock, parking lot, groceries, overnight mooring, restrooms, fees
Butler Boat Club	Private	Pool 9 - Phillipston	Private club with ramp
Phillipston Yacht Club	Private	Pool 9 - Phillipston	
Waterfront Boatworks Marina	Private	East Brady	Fuel, overnight mooring, private club with ramp
Brady's Bend Public Launch	Public/PFBC	Brady's Bend	Shore fishing, launch ramp, dock, parking lot
Parker City Public Launch	Public/ Municipal	Parker City	Shore fishing, launch ramp, parking lot
Emlenton Public Launch	Public/ Municipal	Emlenton	
Source: PFBC, ACE			

2. Boating Registrations

The PFBC tracks and regulates all boat and fishing registrations and related activities. Boat traffic on the river may include commercial traffic (towboats and barges) and recreational traffic that is either motorized (pleasure boats or personal watercraft – see definition below) or non-motorized (canoes, kayaks, or sculls).

Recreational boat registrations by county for 2004:

Allegheny ……..27,100
Armstrong……3,782
Butler……..9,002
Clarion……1,921
Venango……..3,946
Westmoreland……..11,008

See the table at the end of this chapter “PA Boat Registrations by County” for registration comparisons by county since 1995.

3. Boating Safety

Conflicts among boaters do occur in this public space. The PFBC has established regulations and educational courses to deal with the conflicts. Most of the study corridor is within the Southwest Region PFBC Law Enforcement Headquarters (Allegheny, Armstrong, and Westmoreland Counties), which can be reached at 814-445-8974. The remaining corridor lies within the Northwest Region (Butler, Clarion, and Venango Counties); that number is 814-337-0444. A complete guide to boating regulations can be found at www.fish.state.pa.us. A summary of boating regulations can be found at the end of this chapter.

Some safety problems arise when pleasure boaters are not educated about the rules of the river or when alcohol is involved. To help alleviate this problem, mandatory boating safety education for operators of motor boats became effective in February 2003. The regulation requires people born after January 1, 1982, to complete a boating education course and obtain a certificate to operate an internal combustion motor greater than 25 horsepower or to operate a personal watercraft. The certification lasts for a lifetime, and there are exemptions for the owners of private ponds. More information is available from the Pennsylvania Fish and Boat Commission.

"Personal watercraft are often referred to by their trade names such as jet skis or skidoos, etc. PFBC regulations define "personal watercraft" as a boat less than 16 feet in length that uses an internal combustion motor powering a water jet pump as its primary means of propulsion and is operated by a person sitting, standing, or kneeling on the craft. Under proposed regulations, it is an unacceptable boating practice to:

- Cause a boat to become airborne while crossing the wake of another boat within 100 feet of the boat causing the wake.
- Weave through congested traffic.
- Follow too closely to another boat at other than slow, minimum height swell speed. For purposes of this regulation a boat is deemed to follow too close if within 100 feet of the rear of the boat or within 50 feet of the side of another boat (except in a narrow channel.)"[3]

E. FISHING

Fishing piers at Locks & Dams 5 and 6

1. Access

Informal fishing access points abound within the study corridor. However, since many good fishing spots are on private property, anglers must be aware of restrictions and respect the rules of property owners.

[3] www.fish.state.pa.us

There are public fishing piers at L&D 5 and 6 and in Cheswick, Arnold, and Tarentum (all handicapped accessible).

2. Fishing Registrations

See Table 4-4 for information on fish stocking and Chapter 3 for fish consumption advisories.

Fishing license sales report by county for 2004:

Allegheny……..63,872
Armstrong……...8,062
Butler……20,034
Clarion ……6,154
Venango……..5,100
Westmoreland ……32,558

See the table at the end of the chapter "2004 Fishing License and Trout/Salmon Stamp Sales" for information on fishing registration sales per county in 2004.

3. Restrictions

There are some fishing restrictions for Pool 3 of the Allegheny River, which is part of the PFBC's Big Bass Program. The purpose of this multi-year study is to limit the number and size of the fish to determine if this produces larger sport fish. After seven years, some change in fish size has been noted, but there are five more years left (through 2008) in the study.[4] The restrictions apply to largemouth, smallmouth, and spotted bass.

Fishing Pier in Arnold

Date	Restriction
Jan. 1- Apr. 16 and Oct. 1 – Dec. 31	Min. Size = 18 inches, daily limit = 2
Apr. 17 – June 11	No harvest, catch and immediate release No tournaments permitted
June 12 – Sept. 30	Min. Size = 15 inches, daily limit = 4

Additional restrictions occur on some of the tributaries within the corridor, which are approved trout waters. They meet the criteria qualifying them to be stocked with trout by the PFBC. Therefore, they are open to harvest during an extended season and closed to all fishing from March 1 to the opening day of trout season. The waters on the 2004 PFBC list are: Bull Creek, Buffalo Creek, Glade Run, Cowanshannock Creek, Pine Creek South Fork, Pine Creek North Fork, Huling Run, Richey Run, Redbank Creek, Tom's Run, and Bear Creek.

4. Fishing Tournaments

During the summer months there are many fishing tournaments in the region. Most are small club tournaments with no prizes or fees and are limited to a small number of boats. While all tournaments are required to get a permit from the PFBC, a single list of the tournaments for the region does not exist.

[4] Denny Tubbs, PA Fish and Boat Commission, personal communication, March 30, 2004.

Anglers need to watch for notices in the newspaper and search the Internet for tournament notices. The PFBC is exploring ways to create a comprehensive list.[5]

F. GAME LANDS

The Pennsylvania Game Commission has purchased land for inclusion in the State Game Lands system since 1920. Each State Game Lands has an individual management plan designed to improve wildlife habitat and provide recreational opportunities. Hunters, anglers, hikers, birdwatchers and other wildlife enthusiasts are welcome on State Game Lands.[6]

Table 5-2
State Game Lands in the Allegheny Corridor (See Map 5)

Municipality	SGL #	Location	Acreage	Species
Brady's Bend	105	Somerville	2613	deer, fox, grouse, muskrat, racoon
North Buffalo	247	Ford City/Kittanning	452	pheasent, rabbit, turkey
Pine	287	Templeton	1167	pheasent, rabbit, squirrel

Source: PA Atlas and Gazetteer, 2000 Ed.

G. COMMUNITY RECREATION PLANS

Many recreational developments are occurring in the study corridor; the following list comes from news articles or notification from municipalities.

- New Kensington and Arnold received a grant from DCNR to conduct a comprehensive study on their parks and recreation facilities. Tom Dunn, Arnold Community Development officer, and John Regoli Jr., New Kensington Councilman, indicated that riverfront development for recreational purposes was a possibility.[7]

- Freeport Borough is examining opportunities to get funding for public docks along the Allegheny River that they can then rent to recreational boaters. One possibility is from the Boating Infrastructure Grant from the USFWS. These grants are available to improve recreational fishing and boating as part of a larger recreation plan.[8]

- Kittanning Council approved matching funds for a 450ft. stretch of the Rails to Trails project from Chestnut St. to North Grant Ave. The total cost of the project is $180,000 but the Council will apply for a Community Revitalization Grant to pay for $20,000 in engineering fees.[9]

- Ford City received $30,000 to spend on a master plan for a 17 acre riverfront trail. DCNR provided a grant for $15,000 and the match was provided by the Greater Ford City Community Development Corporation. There will be a 12-member study committee of citizens who will review the plan, which will contain a trail design and estimates for construction and operation.[10]

[5] Personal interview with Dennis Tubbs, PA Fish and Boat Commission, 2003
[6] www.pgc.state.pa.us
[7] Valley News Dispatch, Oct. 26, 2003
[8] Valley News Dispatch, October, 28, 2003
[9] Kittanning Oks matching funds for tail, Valley News Dispatch, October 29, 2003
[10] Ford City receives $30,000 to spend on trail's plan, Leader Times, November 4, 2003

H. RECREATION AND ECONOMICS

Advocates for a healthy environment often point to the economic benefits that outdoor recreation can bring to a community. While there are no specific estimates available for this study area, there are national and state figures that illustrate the contribution of outdoor recreation to the local economy.

In a 2001 survey, the U.S. Fish and Wildlife Service calculated that 82 million Americans age 16 and older participated in a wildlife-related activity (fishing, hunting, photography, wildlife watching, etc.) and spent 110 billion dollars on these activities.[11] For Pennsylvania, the figures and their expenditures are broken down in Table 5-3.

Table 5-3
Participation in Wildlife Activities in Pennsylvania
U.S. Fish and Wildlife Service 2001 Survey

Activity	Participants	Expenditures* (in thousands of dollars)
Fishing	1,266,000	$ 810,665
Hunting	1,000,000	$1,353,640
Wildlife Watching	3,371,000 (resident) 1,279,000 (non-resident)	$1,679,875

* Includes permits, licensing, food, lodging, trip related expenses, equipment, magazine subscriptions, land leasing, etc.

According to the PFBC, Pennsylvania residents age 12 and over spend $1.7 billion annually on boating, including an average expenditure per recreational boater of $274.[12]

In addition to these expenditures, wildlife activities generated worker earnings, state sales taxes, state income taxes, and federal income taxes.

Similarly, trails and greenways improve local economies through tourism and recreation-related spending. A 1998 study on the economic impacts of the Great Allegheny Passage, the trail that is under construction between Pittsburgh and Washington D.C., showed that trail users spent $14.1 million near six trail heads as well as between $8.9 and $12.2 million on bikes and biking equipment.[13] Businesses predict that the completion of the trail will have an extremely positive impact on them, and nearly half of the businesses plan to expand.

[11] 2001 Survey of Fishing, Hunting, and Wildlife Associated Recreation State Overview. June 2002. U.S. Fish and Wildlife Service.
[12] PA Fish and Boat Commission Fact Sheet, Economic Value of Fishing and Boating in Pennsylvania.
[13] www.atatrail.org/news/econ-study-99.htm

MANDATORY BOATING EDUCATION

MINIMUM AGE FOR OPERATING A BOAT

HP of Motor	*Restrictions of Use*
0 - 10	None
Greater than 10 hp	Persons 11 years of age or younger may NOT operate. Persons 12 through 15 years of age may NOT operate unless they have obtained and have in possession a Boating Safety Education Certificate, or unless at least one person 16 years of age or older is present on board.
Greater than 25 hp	Persons born on or after **January 1, 1982** may not operate unless they have obtained and have in possession a Boating Safety Education Certificate. *(Effective February 7, 2003)*

PERSONAL WATERCRAFT (PWC*):

• Persons 11 years of age or younger may NOT operate.

• Persons 12 through 15 years of age may NOT operate with any passengers on board 15 years of age or younger or rent a PWC.

• All PWC operators must obtain and have in their possession a Boating Safety Education Certificate.

**Also known as Jetski®, See-Doo®, WaveRunner®, TigerShark® and others.*

How can I get a Boating Safety Education Certificate?

To obtain a Boating Safety Education Certificate, boaters must successfully complete an approved boating course (a fee may be charged). Pennsylvania residents must have a certificate issued by the Commission. Approved courses include classroom courses offered by the Commission, the Coast Guard Auxiliary, the U.S. Power Squadrons, and the Commission's Boat Pennsylvania Internet and Video/Correspondence courses.

To find a boating course near you, contact one of the following resources:

• Fish & Boat Commission website: **www.fish.state.pa.us**

• Fish & Boat Commission Boating Course Hotline: **1-888-PAFISH-1 (1-888-723-4741).**

Boaters wanting to take a long-distance learning course from home can visit the Commission's Boating Courses page to access the Boat Pennsylvania Internet Course, OR call Boat Ed at **1-800-830-2268** to order the Boat Pennsylvania Video/ Correspondence Course.

REQUIRED EQUIPMENT

PERSONAL FLOTATION DEVICES (PFDS)

• A U.S. Coast Guard-approved wearable PFD (life jacket) is required for each person on board. In addition, one throwable PFD (seat cushion or ring buoy) is required on boats 16 feet in length or longer.

• Children 12 years of age and younger must wear an approved wearable PFD while underway on Commonwealth waters on any boat 20 feet or less in length and in all canoes and kayaks.

• All water skiers and anyone towed behind a boat, personal watercraft operators and passengers, and sailboarders must wear a life jacket. Inflatable PFDs are not acceptable for these activities.

• Wearable life jackets must be "readily accessible" or in the open where they can be easily reached. Throwable PFDs (cushions and ring buoys) must be immediately available or within arm's reach. A PFD stowed in a compartment or sealed in its original packing is not readily accessible or immediately available.

LIGHTS

• All boats must show required running lights between sunset and sunrise and during periods of restricted visibility. Check the *PA Boating Handbook* for details.

• All boats must display anchor lights when they are anchored on any boatable Commonwealth waters (except in special anchorage areas).

FIRE EXTINGUISHERS

• Coast Guard-approved fire extinguishers must be carried on all motorboats 26 feet or more in length. Motorboats less than 26 feet in length with gasoline engines are required to carry a fire extinguisher if they have one or more of the following: Closed compartments, permanently installed fuel tanks, double bottoms not sealed to the hull or completely filled with flotation materials, or closed living spaces. Note: Open boats such as johnboats where an after-market solid wood or metal floor is installed and is not completely sealed to the hull are **NOT** required to carry a fire extinguisher.

• Fire extinguishers must be installed so that they are immediately available within arm's reach of the operator or passengers on board.

• Fire extinguishers must be maintained and fully charged.

CARBURETOR BACKFIRE FLAME CONTROL

• Gasoline engines, except outboards, must have an approved (USCG, SAE or UL) backfire flame control on the carburetor to prevent ignition of gasoline vapors in case the engine backfires.

SOUND-PRODUCING DEVICES

• Motorboats less than 12 meters (39.4 feet) in length shall carry some mechanical means of making a sound signal. This device may be hand-, mouth- or power-operated. An athletic coach's whistle is an acceptable sound-producing device for small motorboats.

• Operators of unpowered boats are required to have some means of making an efficient oral or mechanical sound signal that can be heard by another boat operator in time to avoid a collision.

• Sound signaling devices must be readily accessible to the boat operator.

VISUAL DISTRESS SIGNALS (VDS)

• Visual distress signals are required for all boats operating on Lake Erie.

• Visual distress signals must be U.S. Coast Guard-approved, have legible approval numbers, be in serviceable condition, and be readily accessible. An expiration date must be stamped on flares.

MUFFLING DEVICES

• Boat motors must be equipped with an efficient muffling system or device in good working order. Cutout devices are prohibited.

• Boat exhaust systems may not be modified in any manner that reduces or eliminates the effectiveness of the muffler or muffler system.

MARINE SANITATION DEVICES (MSD)

• Marine sanitation devices must be installed on all vessels with installed toilet systems. They must be approved by the U.S. Coast Guard.

• Types I and II MSDs are approved for use on Lake Erie, the Delaware River, the Three Rivers area, and other flow-through waters. Type III holding tanks are required only on non-navigable waters. Discharge of untreated sewage in any Commonwealth water is prohibited.

OPERATIONAL REQUIREMENTS

It is illegal to:

• operate a boat at greater than slow no-wake when within 100 feet of the shoreline, floats, docks, ramps, swimmers, downed skiers, anchored, moored, or drifting boats, or areas marked with "slow, no-wake" buoys.

• operate faster than slow no-wake when within 100 feet to the rear or 50 feet to the side of another boat that is underway, unless in a narrow channel.

• operate within 100 feet of any person towed behind another boat.

• cause a boat to become airborne or to leave the water completely while crossing another boat's wake when within 100 feet of the boat creating the wake.

• operate a watercraft in a reckless, negligent or dangerous manner. Boats must be operated at a rate of speed that does not endanger the life or property of any person.

• fail to keep a proper lookout or fail to maintain a safe speed so that the boat operator cannot take proper and effective action to avoid a collision.

• weave through congested traffic.

• operate a motorboat less than 20 feet in length at greater than slow no-wake speed while a person is standing on or in the boat.

• operate a motorboat not equipped with railings or other safeguards at greater than slow no-wake while a person is riding on the bow decking, gunwales, transom or motor cover.

• tow more than one person at a time behind a PWC or tow anyone behind a PWC with a capacity of two persons or fewer.

• operate a pontoon boat while a person is riding outside the passenger-carrying area.

WATER-SKIING

(includes similar activities such as wakeboarding, towing inner tubes, etc.)

• **It is unlawful** to operate a motorboat at any speed with a person or persons sitting, riding or hanging on a swim platform *(teak surfing)* or swim ladder attached to the motorboat, except when launching, retrieving, docking or anchoring the motorboat.

• **It is unlawful** to operate a motorboat at any speed when towing a person on waterskis or other devices using a tow rope of 20 feet or less.

• Skiing is illegal between sunset and sunrise.

• In addition to the operator, a competent observer must be in the boat in a position to observe the towed person.

• Tow ropes may not exceed a length of 80 feet.

EQUIPMENT RECOMMENDED BUT NOT REQUIRED

• **Oars or paddles.** They are helpful to get back to shore if the boat's engine fails.

• **Anchor and line.** An appropriately sized anchor with good-quality nylon line is an essential piece of equipment for boaters. All boaters on rivers with locks should carry a mooring line at least 75 feet long.

• **Bailing device.** All boats should have on board some kind of bailer to remove water from the boat.

• **Marine radio.** There is no substitute for a marine radio in an emergency. A marine radio is an excellent addition to boats with a console. Operators of smaller boats should consider portable units.

• **Cell phone.** A cell phone is an excellent way to call for help if the operator knows the emergency numbers for the area in which he or she is boating.

• **Boating maps or charts.** These items are useful for planning outings. They can help boaters avoid problems.

• **Other useful items.** Sunscreen, flashlight, visual distress signals (required on Lake Erie), compass, throw (rescue) bag, extra gas can, first aid kit, boat fenders, tool kit, spare spark plugs, propeller pins, spare propeller and extra light bulbs and fuses.

HAZARDS TO BOATERS

Dams. Boats must stay clear of dams. Failure to do so often results in tragedy. Hazards exist both above and below the dam.

State law now requires that many low-head dams in the Commonwealth be marked with signs and, when practical, buoys upstream and downstream. The signs detail restrictions for boating, swimming and wading, and hazards posed by the dam. These restrictions are enforced by Commission waterways conservation officers.

Strainers. A tree or tree limb is a typical strainer that can trap and flood boats. Water flows through these obstructions, but solid objects do not. Strainers can pin victims underwater.

Current. Never underestimate the power of moving water. A boater who is not sure if his or her boat or ability is up to the prevailing conditions should stay off the water.

Cold water. It kills! When boating on cold water, always wear a life jacket, dress in layers, and always tell someone where you are going.

Submerged objects. Rocks, stumps, logs and other objects can greatly damage a hull or motor. Keeping a sharp lookout and reducing speed in unfamiliar areas is a good idea.

Alcohol and boating. Alcohol use increases the chances of having an accident. Alcohol affects balance, coordination and judgment. It is illegal to operate a boat while under the influence of alcohol or a controlled substance. **Penalties include fines up to $7,500, two years imprisonment, and loss of boating privileges for up to one year.**

Other boaters. Steer clear of other boaters, stay alert, keep a sharp lookout, and report violations to a waterways conservation officer. Don't assume other operators are paying attention or that they know the rules.

BOATING ACCIDENTS

Boating accidents must be reported in writing by the boat operator or owner to the Fish & Boat Commission when:

• A person dies or disappears.

• A person is injured and requires advanced medical treatment beyond first aid.

• Damage to the boat and other property totals more than $2,000, or there is a complete loss of the vessel.

Boating accident reports can be downloaded from the Commission's web site, or one can be obtained from any Commission regional law enforcement office.

SPECIALLY REGULATED WATERS

Additional regulations such as speed limits and slow, no-wake areas affect boaters on specific waterways. Boaters should read all regulations posted on the bulletin boards at access areas.

REGISTRATION & TITLING

• Boats propelled by machinery must be registered, and they must properly display numbers and a boat registration validation decal. This includes all motorboats regardless of the boat's length and type of motor (includes electric motors).

• Unpowered boats using Commission lakes and access areas must be registered OR display a Commission use permit OR display a State Parks launch or mooring permit.

• Boat titles are issued when a boat is sold or when ownership is conveyed. Titles are required for motorboats with a model year of 1997 and newer, except for those that are powered by an outboard motor that are less than 14 feet in length. All 1997 or newer personal watercraft, are also subject to the titling requirement. Voluntary titling is available for any other boat.

PHONE NUMBERS

Fish & Boat Commission Boating Course Hotline:
1-888-PAFISH-1 (1-888-723-4741)

Bureau of Boating and Education: **717-705-7833**

Bureau of Law Enforcement: **717-705-7861**

Boat Registration Office:
TOLL-FREE 1-866-BOATREG (1-866-262-8734)

Regional Offices:

NW	**814-337-0444**	**SW**	**814-445-8974**
NC	**814-359-5250**	**SC**	**717-486-7087**
NE	**570-477-5717**	**SE**	**717-626-0228**

produced by the Bureau of Boating & Education
printed on recycled paper *rev12/04*

2005

BOATING REGULATION RECAP

A Supplement to the Boating Handbook
Information All Boaters Must Know

The following information includes highlights of laws and regulations that affect recreational boaters in Pennsylvania. This short summary is not intended to be a complete listing of all boating regulations. Consult the ***PA Boating Handbook*** for more detailed information on boating laws and regulations, or call the nearest Fish & Boat Commission regional law enforcement office.

The Fish & Boat Commission's web site is the place to go for a wealth of up-to-date information on Pennsylvania fishing and

Pennsylvania Boat Registrations By County

County	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
ADAMS	2,328	2,415	2,524	2,354	2,751	2,910	3,075	3,086	3,135	3,232
ALLEGHENY	29,936	29,955	29,485	25,531	29,194	29,358	28,989	28,476	27,932	27,100
ARMSTRONG	3,201	3,268	3,418	3,059	3,706	3,840	3,807	3,841	3,616	3,782
BEAVER	6,393	6,515	6,384	5,641	6,556	6,732	6,689	6,525	6,490	6,367
BEDFORD	1,634	1,635	1,683	1,510	1,832	1,944	1,950	1,970	1,977	1,943
BERKS	8,281	8,512	8,602	7,601	8,826	8,932	8,976	8,913	9,007	9,080
BLAIR	4,878	4,978	5,043	4,370	5,126	5,153	5,060	4,961	4,861	4,797
BRADFORD	2,795	2,861	2,876	2,475	2,960	2,993	3,044	2,999	2,950	2,959
BUCKS	15,849	16,061	16,000	13,875	16,478	16,806	16,675	16,444	16,332	16,320
BUTLER	7,905	8,211	8,386	7,518	8,766	9,125	9,217	9,082	9,055	9,002
CAMBRIA	4,979	5,033	5,128	4,500	5,120	5,267	5,305	5,242	5,292	5,278
CAMERON	242	233	242	224	249	234	235	221	206	200
CARBON	2,609	2,698	2,770	2,452	2,847	2,950	3,021	3,045	3,035	3,050
CENTRE	3,349	3,480	3,529	3,100	3,692	3,802	3,880	3,790	3,831	3,824
CHESTER	6,216	6,535	6,719	6,150	7,338	7,698	7,808	7,681	7,683	7,703
CLARION	1,939	1,956	2,007	1,741	2,026	2,036	2,012	1,952	1,953	1,921
CLEARFIELD	2,701	2,726	2,763	2,378	2,852	2,895	2,903	2,905	2,887	2,903
CLINTON	1,656	1,732	1,771	1,569	1,899	1,952	1,962	1,960	1,968	1,923
COLUMBIA	2,895	2,960	2,997	2,637	3,025	3,097	3,130	3,101	3,107	3,110
CRAWFORD	5,950	6,133	6,060	5,349	6,335	6,559	6,644	6,649	6,756	6,659
CUMBERLAND	7,035	7,095	7,284	6,590	7,667	8,041	8,158	8,044	8,083	8,149
DAUPHIN	8,842	9,045	8,959	7,726	9,081	9,280	9,284	9,120	8,937	8,755
DELAWARE	5,296	5,436	5,495	4,638	5,653	5,860	5,777	5,582	5,509	5,390
ELK	953	971	983	858	989	1,017	1,005	998	1,012	975
ERIE	10,440	10,713	10,765	9,475	11,382	11,715	11,834	11,744	11,715	11,590
FAYATTE	3,761	3,819	3,991	3,671	4,450	4,538	4,486	4,335	4,239	4,208
FOREST	394	427	457	406	503	528	572	637	701	706
FRANKLIN	3,230	3,318	3,383	3,107	3,584	3,727	3,791	3,739	3,661	3,732
FULTON	507	517	554	483	581	618	639	608	612	613
GREENE	928	932	977	874	1,153	1,113	1,111	1,090	1,080	1,084
HUNTINGDOM	2,215	2,299	2,318	2,044	2,330	2,468	2,612	2,665	2,632	2,607
INDIANA	2,336	2,374	2,425	2,188	2,601	2,698	2,759	2,797	2,794	2,810
JEFFERSON	1,521	1,565	1,571	1,372	1,623	1,580	1,540	1,546	1,571	1,547
JUNIATA	1,079	1,117	1,115	1,011	1,198	1,233	1,227	1,199	1,200	1,185
LACKAWANNA	7,914	7,929	7,828	6,765	7,726	7,662	7,588	7,498	7,362	7,228
LANCASTER	10,811	11,273	11,622	10,499	12,336	12,872	13,157	13,097	13,101	13,131
LAWRENCE	3,586	3,593	3,737	3,252	3,866	3,914	3,820	3,887	3,806	3,716
LEBANON	3,438	3,528	3,589	3,205	3,687	3,711	3,690	3,710	3,703	3,715
LEHIGH	7,884	8,113	8,623	8,014	9,279	9,543	9,691	9,683	9,687	9,661
LUZERNE	12,513	12,668	12,729	11,207	12,878	12,973	12,855	12,572	12,413	12,339
LYCOMING	5,730	5,854	5,883	5,184	6,114	6,254	6,375	6,205	6,133	6,102
McKEAN	1,861	1,922	1,884	1,607	1,967	1,950	1,916	1,825	1,810	1,746
MERCER	5,564	5,655	5,785	5,197	6,026	6,132	6,087	6,051	5,948	5,909

MIFFLIN	2,170	2,234	2,178	1,946	2,254	2,277	2,282	2,230	2,192	2,138
MONROE	4,627	4,784	4,926	4,379	5,235	5,443	5,678	5,624	5,606	5,623
MONTGOMERY	11,272	11,429	11,645	10,349	12,097	12,534	12,673	12,551	12,491	12,554
MONTOUR	776	806	797	674	798	836	872	856	845	849
NORTHAMPTON	8,327	8,495	8,289	7,191	8,160	8,215	8,069	7,962	7,919	7,816
NORTHUMBERLAND	3,230	3,196	3,189	2,728	3,194	3,237	3,255	3,252	3,267	3,204
PERRY	2,607	2,756	2,803	2,489	2,920	2,997	3,029	3,006	2,979	3,036
PHILADELPHIA	6,146	6,127	6,136	4,940	5,970	5,955	5,732	5,456	5,213	5,075
PIKE	3,302	3,498	3,528	3,080	3,679	3,737	3,831	3,790	3,841	3,885
POTTER	683	709	732	614	758	741	747	733	745	764
SCHUYLKILL	4,763	4,742	4,785	4,187	4,792	4,855	4,821	4,706	4,628	4,595
SNYDER	1,767	1,774	1,808	1,578	1,927	1,888	1,901	1,854	1,839	1,820
SOMERSET	2,777	2,825	2,846	2,526	3,107	3,116	3,192	3,254	3,259	3,274
SULLIVAN	300	299	316	286	335	339	350	339	337	346
SUSQUEHANNA	1,883	1,988	2,009	1,796	2,108	2,196	2,271	2,282	2,328	2,294
TIOGA	1,683	1,713	1,706	1,537	1,809	1,858	1,881	1,845	1,811	1,831
UNION	1,370	1,362	1,404	1,215	1,435	1,464	1,521	1,540	1,546	1,598
VENANGO	3,637	3,689	3,717	3,200	3,932	4,052	4,063	4,022	3,926	3,946
WARREN	2,085	2,168	2,206	1,962	2,383	2,437	2,426	2,412	2,380	2,329
WASHINGTON	6,376	6,525	6,579	5,754	6,805	7,001	6,896	6,868	6,913	6,843
WAYNE	4,119	4,250	4,477	4,066	4,856	5,138	5,293	5,313	5,388	5,475
WESTMORELAND	10,991	11,219	11,230	9,887	11,415	11,511	11,505	11,401	11,186	11,008
WYOMING	1,851	1,873	1,982	1,687	2,028	2,110	2,136	2,144	2,164	2,176
YORK	12,078	12,435	12,736	11,254	13,181	13,538	13,708	13,579	13,526	13,625
OUT OF STATE	8,046	8,245	8,269	7,601	8,801	9,176	9,594	9,000	9,139	9,307
OUT OF COUNTRY								235	15	16
TOTAL	**330,440**	**337,201**	**340,637**	**348,352**	**352,231**	**360,361**	**359,706**	**357,729**	**355,265**	**353,478**

Boating -- PFBC Home

Copyright 1997-2005 Commonwealth of Pennsylvania, Fish and Boat Commission. All rights reserved. Any reproduction or publication of any material found on any of the Fish and Boat Commission web pages or web site without the express written consent of the Pennsylvania Fish and Boat Commission is prohibited.

Commonwealth of Pennsylvania Web Privacy and Security Policies

2004 Fishing License & Trout/Salmon Stamp Sales

BY COUNTY

As of 1-6-05, approximately 40 agents have not closed their accounts for 2004.

County	Resident	Non-Resident	Sr. Resident	7-Day Tourist	3-Day Tourist	Lifetime	Free	Total	Trout/Salmon Stamp
Adams	3,177	402	78	12	190	141	4	4,004	2,962
Allegheny	59,491	1,129	1,676	72	875	613	16	63,872	47,631
Armstrong	7,509	123	99	15	104	208	4	8,062	6,351
Beaver	11,699	402	200	9	166	267	4	12,747	9,597
Bedford	6,663	952	163	34	581	92	3	8,488	5,734
Berks	23,487	493	596	26	316	226	13	25,157	18,704
Blair	14,330	238	195	28	239	206	0	15,236	12,305
Bradford	5,571	610	169	26	186	214	3	6,779	3,309
Bucks	27,626	796	754	22	396	348	12	29,954	20,047
Butler	18,710	268	328	33	364	321	10	20,034	13,470
Cambria	17,484	351	239	36	257	270	9	18,646	15,022
Cameron	453	69	3	5	75	16	0	621	574
Carbon	6,296	403	120	77	551	128	1	7,576	6,030
Centre	10,952	553	204	54	553	128	2	12,446	10,665
Chester	18,342	809	481	29	328	215	6	20,210	15,180
Clarion	5,365	292	97	23	272	105	0	6,154	4,258
Clearfield	12,505	418	283	56	501	196	5	13,964	11,917
Clinton	6,847	278	87	44	269	134	5	7,664	6,271
Columbia	7,372	165	103	26	221	129	0	8,016	6,524
Crawford	13,070	939	328	84	747	303	7	15,478	5,907
Cumberland	17,972	778	290	56	839	157	5	20,097	16,425
Dauphin	17,023	649	275	35	294	1,629	17	19,922	14,350
Delaware	10,379	474	337	6	102	120	8	11,426	9,093
Elk	4,905	237	27	27	258	82	0	5,536	5,307
Erie	29,437	4,193	551	266	4,560	362	8	39,377	27,418
Fayette	15,165	410	310	43	461	183	6	16,578	14,273
Forest	1,514	503	36	34	455	42	0	2,584	1,853
Franklin	13,842	920	276	39	452	163	1	15,693	13,161
Fulton	715	105	11	3	37	37	0	908	792
Greene	2,772	135	53	7	63	53	13	3,096	2,277
Huntingdon	5,790	469	97	93	1,076	112	1	7,638	4,389
Indiana	8,834	133	123	9	130	172	6	9,407	7,789
Jefferson	5,119	213	97	51	384	83	0	5,947	5,097
Juniata	1,424	31	21	3	33	47	0	1,559	1,230
Lackawanna	15,357	959	384	63	457	237	8	17,465	11,100
Lancaster	27,675	491	649	19	482	445	5	29,766	21,216
Lawrence	5,825	828	98	13	147	151	6	7,068	5,342
Lebanon	8,877	77	156	13	92	133	4	9,352	7,208
Lehigh	18,516	321	332	11	191	321	1	19,693	17,574
Luzerne	23,557	432	434	77	416	438	17	25,371	18,342
Lycoming	12,492	526	161	84	505	196	0	13,964	11,296
McKean	4,977	589	81	42	567	63	1	6,320	5,170
Mercer	14,069	1,336	276	25	449	237	2	16,394	7,458

Mifflin	7,071	141	70	17	134	117	2	7,552	5,632
Monroe	11,697	2,401	347	184	2,350	165	6	17,150	12,043
Montgomery	25,758	242	643	24	240	248	13	27,168	20,108
Montour	380	6	2	0	2	49	0	439	383
Northampton	14,717	461	329	9	207	230	6	15,959	13,940
Northumberland	6,307	81	125	10	75	145	3	6,746	5,829
Perry	3,216	298	49	5	433	73	0	4,074	2,501
Philadelphia	18,290	472	932	31	166	0	0	19,891	12,413
Pike	5,191	3,208	157	153	2,378	108	2	11,197	4,436
Potter	2,045	402	49	32	277	75	3	2,883	2,764
Schuylkill	9,228	118	133	24	129	193	7	9,832	8,743
Snyder	6,739	169	74	17	147	75	0	7,221	5,185
Somerset	8,409	421	184	38	306	198	4	9,560	7,781
Sullivan	1,035	157	24	19	132	43	0	1,410	1,076
Susquehanna	3,675	1,144	101	29	292	104	5	5,350	2,537
Tioga	6,051	1,025	132	31	523	123	2	7,887	6,160
Union	3,871	135	56	11	130	89	0	4,292	3,417
Venango	4,110	445	76	34	305	127	3	5,100	3,379
Warren	3,956	544	70	43	475	104	3	5,195	4,041
Washington	11,960	415	274	17	185	308	6	13,165	10,203
Wayne	7,888	3,684	324	312	2,693	172	2	15,075	6,322
Westmoreland	30,609	334	559	54	524	465	13	32,558	27,225
Wyoming	4,234	241	104	23	152	61	0	4,815	2,616
York	29,868	1,516	718	47	803	360	1	33,313	20,356
New Jersey	0	1,097	0	21	167	0	0	1,285	957
Ohio	0	2,452	0	12	399	0	0	2,863	2,023
Maryland	0	228	0	0	29	0	0	257	71
West Virginia	1	2	0	2	22	0	0	27	9
Internet Sales	15,600	4,371	308	370	3,368	0	0	24,017	15,863
TOTALS	**785,091**	**50,709**	**17,118**	**3,299**	**36,684**	**13,355**	**294**	**906,550**	**658,631**

License Sales Reports -- Fishing -- PFBC Home

Copyright 1997-2005 Commonwealth of Pennsylvania, Fish and Boat Commission. All rights reserved. Any reproduction or publication of any material found on any of the Fish and Boat Commission web pages or web site without the express written consent of the Pennsylvania Fish and Boat Commission is prohibited.

Commonwealth of Pennsylvania Web Privacy and Security Policies

A. REGIONAL HISTORY

The Allegheny River is likely named for the Allegawes, the native people who lived along its shores before the arrival of the Delaware tribes. Later, the Seneca tribe and the French trappers viewed the Allegheny and Ohio Rivers as one river, which they referred to as "the beautiful river" or "fair waters."

Despite the presence of these people, the area was not settled. It was home to abundant wildlife, including species that no longer inhabit Pennsylvania such as wolves, panthers, and buffalo. It was not until after the revolutionary war when much of the land in the Allegheny Valley was set aside as "depreciation lands" for soldiers that real settlement began. Development in the area came slowly, however, with the establishment of stations, small towns that popped up along the Allegheny River. Settlement was finally sparked by the establishment of the Pennsylvania Canal in the 1820s, which followed the Kiskiminetas River, to the Allegheny River to Pittsburgh. By the mid 1850s, the railroad was becoming established on the east bank of the Allegheny River, and soon surpassed the canal as the primary means of transportation. More and more people were now settling in the area, especially because of the vast supply of minerals and resources such as salt, coal, oil, and gas.

But what truly has defined the region are the variety of cultures and ethnicities that make the valley such an interesting place to live and visit. The building of the canal and railroads, and especially the coal mining caused the influx of Europeans to the area, each group recruited for specific jobs. Those European cultures have survived in clusters throughout the corridor.

Local historical societies are excellent resources for learning more about the history of the region: Alle-Kiski Valley Historical Society (Tarentum), Kittanning Historical Society, and East Brady Historical Society.

B. LOCAL MUNICIPAL HISTORIES

Each municipality in this corridor has its own distinct history. Their stories are summarized in the Appendix at the end of the chapter. Other major historical facts about the corridor:

1) 1849, Natrona – Samuel Kier refined oil to a usable substance
2) 1883, Creighton – PPG (Pittsburgh Plate Glass) established
3) 1885, New Kensington – Charles Martin Hall invented a process to extract aluminum, thus establishing ALCOA (Aluminum Company of America)
4) 1907, Springdale – Birth of noted environmentalist Rachel Carson

C. UNIQUE CULTURAL FEATURES

1. River Towns - Heritage

The Alle-Kiski river towns are remembered for their industrial heritage – centers for making glass, aluminum, and steel. As such, the river valley lies within the Rivers of Steel National Heritage Area – a 3,000 square mile region in seven counties (Allegheny, Armstrong, Westmoreland, Washington, Beaver, Fayette, and Greene) that was created by Congress in 1996 to preserve, interpret, and manage the historical, cultural, and natural resources related to the Steel Industry. The Steel Industry Heritage Corporation (SIHC), a non-profit organization that coordinates the Heritage Area, offers a variety of interpretive programs. Information can be found on their website: www.riversofsteel.com.

The PA Heritage Parks Program, administered by the SIHC, has awarded grants to several river-related projects.[1] They are:

[1] Jeff Leber, SIHC, personal communication, December 2003

- Nine dedicated canoe access sites from Freeport to Pittsburgh (awarded to Friends of the Riverfront);
- The design and development of river landing heritage kiosks throughout the area;
- Allegheny River Water Trail heritage signs along the Allegheny River from the Kiskiminetas River to the Ohio River (awarded to Friends of the Riverfront); and
- Connecting Wood St. to boat access ramp for a canoe/kayak access; it will involve the purchase of racks, signs, and kiosks (awarded to Tarentum Borough).

2. Local Points of Interest

Historic Coke Ovens along Armstrong Trail

Historical Interpretive Kiosk along the river in Emlenton

- The A-K Valley Heritage Museum in Tarentum is a resource library and museum of artifacts of local significance. In particular, the museum houses glass artifacts from PPG's first plant in Tarentum and aluminum artifacts from the first aluminum plant in New Kensington. The museum itself is located in an art deco building from 1931 that was originally an American Legion Post. Blue cobalt glass and art glass donated by PPG, as well as art deco aluminum from Alcoa, was used to decorate the interior. The building also is decorated with murals depicting life during World War II. These murals need to be restored when funding or donated services are available. More information can be found at www.akvhs.org.
- Murphy's Bottom – Native American artifacts, Native American burial ground topped by settlers cemetery – west bank next to Donley Island
- Coke ovens – seen from trail on east bank across from Clinton
- Trilobite fossils – along riverbanks in Kittanning
- Glacial remnants – Armstrong County
- Stone used for Armstrong County Court House – can see areas where stone was taken
- Coal Tipple – coal loading tower along trail on east bank across from Watersonville
- Train Turntable – near trail entrance in Phillipston
- Petroglyphs – Rattle Snake Riffle, Parker, Emlenton
- Monticello Furnace – above Cowanshannock
- Carnegie Estate cove – across from Freeport
- Brick plant – along Butler-Freeport Trail one mile from Freeport
- Mickey's Mill in Freeport, along with many mills along Buffalo Creek
- Civil War cemeteries – Hillville
- French & Indian War battle site at Kittanning
- Rachel Carson Homestead – Springdale Borough
- Sarah Furnace Cave
- First US Golf Course – Foxburg

- Fort Crawford (now New Kensington)
- Bread oven – near Catfish Run
- Ironworks at Brady's Bend

D. THE NATIONAL REGISTER OF HISTORIC PLACES[2]

The PA Historical and Museum Commission (PHMC) manages the National Register of Historic Places for Pennsylvania. The program was established by the National Historic Preservation Act of 1966. Properties listed in the Register include districts, sites, buildings, structures, and objects that are significant in American history, architecture, archeology, engineering, and culture. National Register properties are distinguished by having been documented and evaluated according to uniform standards. These criteria recognize the accomplishments of all people who have contributed to the history and heritage of the United States and are designed to help state and local governments, federal agencies, and others identify significant historic and archeological properties worthy of preservation and of consideration in planning and development decisions. Listing in the National Register, however, does not interfere with a private property owner's right to alter, manage, or dispose of property. It often changes the way communities perceive their historic resources and gives credibility to efforts to preserve these resources as irreplaceable parts of the communities.

Listing in the National Register contributes to preserving historic properties in a number of ways:

- Recognition that a property is of significance to the nation, the state, or the community.
- Consideration in the planning for federal or federally assisted projects.
- Eligibility for federal tax benefits.
- Qualification for federal assistance for historic preservation, when funds are available.

The list of historic places in and near the corridor can be found at the end of this chapter.

E. THE HISTORICAL MARKER PROGRAM[3]

The historical marker program, established in 1946, is one of PHMC's oldest and most popular programs. The blue and gold markers located throughout the state highlight people, places, and events significant in state and national history. Presently, nearly 1,800 markers recognize Pennsylvania's history - from William Penn's country home, to the bloody Homestead Strike of 1892, to the Pennsylvania Turnpike, the nation's first long-distance superhighway.

See the list of historical markers at the end of this chapter.

[2] Supported and published by the Pennsylvania Historical and Museum Commission (PHMC) www.phmc.state.pa.us Summary taken from PHMC.
[3] Summary taken from PHMC

Chapter 6

Appendix

History of Riverfront Municipalities

Municipality	History
Allegheny County	
Brackenridge Borough	Founded in 1902. The community was named after the Brackenridge family who owned thousands of acres that now comprises Brackenridge, Harrison and part of Tarentum (www.PittsburghLive.com). Although the Henry Brackenridge family first settled here in 1827, commercial and industrial development began with his grandson in the latter part of the century. When the Borough of Brackenridge incorporated, native glass, coal, stone and brick industries were flourishing, and many residents worked at the nearby Allegheny Steel Company. Since then, the borough has seen these industries decline (1984 Community Profiles: A Descriptive Picture of Communities in Allegheny County).
Cheswick Borough	Founded in 1902. Cheswick, which was named for a town in England, developed native industries only after the railroad was completed in 1857. Before it incorporated, it formed a part of East Deer Township known as Acmetonia, possibly in reference to the Acme Tanning Co. located there (PittsburghLive.com). The resident population remained small in Cheswick until the establishment of streetcar lines through the borough in 1906 and power plants in nearby Springdale Borough and Springdale Township during the 1920's. Cheswick's population doubled during the 1950's (1984 Community Profiles: A Descriptive Picture of Communities in Allegheny County).
East Deer Township	After its incorporation in 1856, East Deer's early history was forged by some of the area's most notable industrial pioneers. During the mid to late Nineteenth Century, America's first oil refining and marketing enterprises were developed here by Lewis Peterson and Samuel Kier. East Deer was also the site for salt and coal-mining, brick-making, and most importantly, glassmaking. Prior to this period, East Deer had lost much of its land area to neighboring communities. The construction of new industries, a street railway, and worker housing boosted East Deer's growth from 1900 to 1930, when its population peaked. Since that period, the population has decreased to the point where more land acreage was used for industry than for housing. The construction of Route 28, further disrupted settlement in the area (1984 Community Profiles: A Descriptive Picture of Communities in Allegheny County).
Harmar Township	Founded in 1875, Harmar Township took its name from Harmar Denny, who served as a lawyer, businessman, congressman and civic leader during the early Nineteenth Century. The village of Harmarville functioned first as a canal town and later in 1866 as a

	railroad town. The railroad attracted several industries, including coal-mining operations. During the early 1900's groups of small cottages called "camps" were established on Twelve Mile Island, making this location a popular resort until the post-WWII period (1984 Community Profiles: A Descriptive Picture of Communities in Allegheny County).
Harrison Township	Founded in 1900. John Harrison, for whom it is believed the township was named, lived in the area in 1839. While gentlemen farmers established themselves in the hills away from the Allegheny River, the shoreline canal was home to oil, gas and coal industries and later the railroad. In 1850, the Penn Salt Manufacturing Co. set up oil refining and soap making operations in the town of Natrona, which became a major employer and built company housing (www.PittsburghLive.com).
Plum Borough	Founded in 1956. Plum Borough was founded as Plum Township in 1788 and was one of Allegheny County's first seven townships. It was reorganized as a borough in 1956. The historic development of Plum Borough was closely tied to the industries that developed here including coal mining, aluminum powder manufacturing and gas and oil production. Plum further developed as a bedroom community for Pittsburgh (www.PittsburghLive.com).
Springdale Borough	Founded in 1906. Around 1820, this village was named Springdale because of the local abundance of springs. In 1906, the borough separated from Springdale Township (originally created from Pitt Township in 1874 and included Cheswick, Springdale and the villages of Colfax and Bouquet.)(www.PittsburghLive.com).
Springdale Township	Founded in 1921. Named for underground springs, Springdale Township was once a larger area, encompassing what is now Springdale Borough. While the riverfront developed rail and industrial facilities, the northwestern section was devoted to Allegheny Coal Company's Harwick Mine. This enterprise ended in a tragic explosion in 1900, leaving only a small village of miners' housing as a reminder. In 1906, the riverfront community split from the township and incorporated as Springdale Borough. Township residents have largely depended upon this municipality for their commercial, educational, and religious services (1984 Community Profiles: A Descriptive Picture of Communities in Allegheny County).
Tarentum Borough	Founded in 1842. Tarentum's development began when Felix Negley arrived here from Germany in 1796, and built a dam on Bull Creek, a saw mill, and a grist mill. In 1828 the Pennsylvania Canal came through. In 1842, Tarentum incorporated as a borough. In subsequent years, the discovery of gas and oil, as well as the arrival of the railroad, attracted a number of glass industries, including PPG, to this riverfront town. The commercial district and most of the residential structures were completed by 1939. (1984 Community Profiles: A Descriptive Picture of Communities in Allegheny County).

Armstrong	
Applewold Borough	Founded in 1900. From the Applewold Land Co. Applewold is a Scottish term meaning "apple valley." (www.PittsburghLive.com)
Bethel Township	Founded in 1878. This community takes its name from one of the oldest Lutheran churches in this part of Pennsylvania. Bethel and the townships of Parks and Gilpin, were formed at the same time in 1878 out of the old Allegheny Township. The area was known for its grist mills on Crooked Creek (www.pa-roots.com).
Boggs Township	Founded in 1878. Boggs Township was originally part of Pine Township. Wilkins & Bell erected a sawmill here in 1872, working almost exclusively for the Pennsylvania Railroad Company. A glass works was started here shortly after the opening of the gas wells in this vicinity, but it was not profitable and was destroyed by fire in 1890 (www.pa-roots.com).
Brady's Bend Township	Founded in 1845. The name of this township is derived from the immense serpentine loop of the Allegheny, which forms the township's eastern boundary and causes the line of the Pennsylvania railroad to almost double upon itself as it travels the inner part of the great bend. The naming of the bend, the township and the formerly populous town is attributed to a desire of the early settlers and their descendants to perpetuate the memory of Capt. Samuel Brady, a famous Indian fighter (www.pa-roots.com).
Cadogan Township	Founded in 1922.
East Franklin Township	Founded in 1868. East Franklin is the result of the separation from West Franklin in 1868, and both were named after Benjamin Franklin. Log gristmills and sawmills were built here throughout the late 1700s and 1800s. The old Allegheny furnace was erected in 1827 on the run across the river from Kittanning. It was similar to most of these old structures, being operated with charcoal. It went out of blast in 1837. Upon its site now is the new mining town of Furnace Run (pa-roots.com).
Ford City	Founded in 1889. Capt. John B. Ford selected this site for his immense plate glass works because of its abundant natural resources. In 1888 he visited the portion of Manor Township south of Kittanning and took steps to purchase the land on which Ford City now stands. With his partners, Ford started the Ford Plate Glass Company (later known as PPG) (www.pa-roots.com).
Freeport Borough	Originally called Todd's Town, it was thought to be a French Encampment after the destruction of Fort Duquesne in 1758. In 1812, the small town was known as a 'watering place' and some of its land was declared free to lot owners, and rivercraft was free of fees.

	Therefore, the town became known as Freeport and was officially established in 1833. Two of the largest industries were the Gluckenheimer Brothers Distillery and the Freeport Planing Mill Company. Freeport is also famous for the legendary story of Massa Harbison, who was captured by, and later escaped from, Native Americans.
Gilpin Township	Founded in 1748. Gilpin was originally part of old Allegheny Township. Probably the earliest industries of this township were sawmills. The township's location at the junction of the Kiskiminetas and Allegheny rivers offered great potential for manufacturing sites. In 1856, an oil works was erected by the North American Oil company, which made oil from cannel coal, a vein of which is found under the Freeport bituminous stratum in this area. The discovery of petroleum eventually put them out of business. In 1865, the Penn Oil Works was established on the Allegheny (www.pa-roots.com).
Hovey Township	Founded in 1870. This tiny strip of land is the northernmost projection of Armstrong County, and is the smallest township in the county. It was taken from the territory of Perry in 1870, and its dimensions were further reduced during the formation of Parker City. Dr. Simeon Hovey, from whom the township acquired its name, was one of the pioneer settlers of this section, coming here in 1797 (www.pa-roots.com).
Kittanning Borough	Founded in 1821. The area was originally settled by Native Americans who migrated here from eastern PA along the Kittanning Path. Delaware and Shawnee warriors used Kittanning as a staging point for raids against the British living in central PA during the French and Indian War. Colonel John Armstrong destroyed the settlement in 1756. Kittanning later became an important trading center and major city in Armstrong County, eventually becoming the county seat.
Madison Township	Founded in 1837. This Township was named after James Madison, fourth president of the United States, and was formed from parts of Toby and Red Bank townships. In 1851 it lost land in the formation of Mahoning Township. The old Red Bank Furnace was built along Red Bank Creek in 1841. The second Red Bank Furnace was erected about 300 yards above the mouth of Red Bank, in Clarion county, just below the neck of Brady's Bend. It was the first coke furnace near the Allegheny River. The proprietors met with some difficulty in finding a ready market on this side of the mountains for their coke-made iron. The American furnace was built on the site of the present town of Rimerton in 1846. It was changed to coke burning, but never became a paying investment (www.pa-roots.com).
Manor Township	Founded in 1849 from the western portion of Kittanning Township.

	Its name originated from one of the proprietary manors, which was a part of the territory within what are now its boundaries (www.pa-roots.com).
Manorville Borough	Founded in 1866. Industrial town that housed a tannery, mills, and oil refinery. Firebrick was manufactured here (www.pa-roots.com).
North Buffalo Township	Founded in 1847. The remnant that was left of Buffalo Township after Franklin had been taken from it was further divided in 1847 into North and South Buffalo. Sawmills and gristmills were of great importance to the settlers of North Buffalo (www.pa-roots.com).
Parker City	Founded in 1873. Parker City is situated on the western bank of the Allegheny River, eighty-two miles above Pittsburgh. It was named after the Hon. John Parker, who originally owned nearly all the land now included within its limits and was the first settler in the area. Parker and his brother were surveyors who surveyed much of northern Armstrong and Butler Counties. At the time of the survey, the "flat" on which now stands the main portion of the first ward of Parker was occupied by an Indian village. The surveyors did not take any account of this flat area because they considered it worthless, and instead focused their surveys only to the top of the bluff. The first oil discovered in Armstrong County was struck in 1865 at the Clarion well, No. 1, one mile north of Parker City. A dozen other wells soon followed down the hill near Parker. Parker became an important point as a base of operations for producers and operators in the oil industry (www.pa-roots.com).
Perry Township	Founded in 1845. Perry Township was formerly a part of Sugar Creek Township. In 1870, that portion lying north of Bear Creek was removed to form Hovey Township. Because of the rugged and hilly character of this region, the lands lying west of the Allegheny in the northern part of Armstrong county were settled later than neighboring townships. It was a favorite hunting ground for settlers and native peoples. The oil developments in this township from 1870 produced many changes. Many old residents disposed of their farms and moved away. Others remained and received more income than their farms could ever have produced (www.pa-roots.com).
Pine Township	Founded in 1836. This community is named after Pine Creek, which flows along the northern border of the township. It was originally named “Pine Creek Township,” but at the time of the separation of Boggs Township from its territory, the name was changed to the present one (www.pa-roots.com).
Rayburn Township	Founded in 1890. This was the last township to be formed in

	Armstrong County and was created from Valley Township. It was named after Judge Calvin Rayburn. Numerous grist mills and saw mills existed throughout the community as well as the first brickyard in the county. Salt works were operated here in 1838 by William Burns. The Cowanshannock furnace, which was of the type adopted in those early days of iron making was built here and operated until 1853. The Monticello furnace, similar to all the rest of its class, was erected on the bank of the Allegheny River, near Guthrie's run. It operated until 1875. The first limekiln in the county was built of stone just above the northeast corner of the borough of Kittanning in 1866. (www.pa-roots.com).
South Buffalo Township	Founded in 1847. The division of the old township of Buffalo into two parts left a small portion of the territory to South Buffalo. Sawmills and gristmills were common throughout. One of the more well-known settlers to the area was Massey Harbison, who in the 1700s survived an Indian raid and capture that killed some of her children. Many of the owners of the lands in this township held them for speculation, and in several cases the property was repeatedly sold at different periods before actual settlement was made. One of these landowners was Benjamin Franklin, who in 1787, while in Philadelphia, purchased ten depreciation lots all in the northern part of this township, adjoining Butler county. He later sold these lands for a profit (www.pa-roots.com).
Sugar Creek Township	Founded in 1806. The town of Franklin developed where the township touches the Allegheny River. By 1854, the town was home to sawmills, a factory, a furnace, and a distillery. The sawmills provided much of the timber for the Pennsylvania Railroad's tunnel through Brady's Bend (www.pa-roots.com).
Washington Township	Founded in 1858. This township was formed from part of Sugar Creek Township. In the early 1800s the area's first blacksmith shop opened. Numerous sawmills and gristmills could be found as well (www.pa-roots.com).
West Kittanning Borough	Incorporated in 1900. This township was located on a ridge opposite of Kittanning and was settled by the mid 1800's. Travelers came to this site because it was the terminus of the chain ferry and for its tavern. The West Kittanning Lumber

	Company was located here (www.pa-roots.com).
Butler	
Allegheny Township	Founded in 1854. This Township in northeastern Butler County was formed from sections of Venango and Parker Townships. The area is not suited to farming as that of other townships in the county, so it was sparsely settled for many years. The discovery of oil, however, drew attention to it and resulted in a rapid and large increase in population (www.rootsweb.com).
Buffalo Township	Founded before 1803. Buffalo Township was one of the four townships into which Butler County was divided prior to 1803. Up to 1854, when the last re-subdivision of the county took place, it was one of the largest townships in the county. In that year its area was reduced to its present limits (www.rootsweb.com).
Clarion	
Brady Township	The Township was named after Captain Brady, who is associated with the battles that took place with local Indian tribes. Brady Township was originally a part of Madison Township. In 1866, the new township of Brady was formed (History of Clarion County, PA, 1997).
East Brady	Founded in 1869. East Brady is situated on the east side of the Brady's Bend section of the Allegheny River, at a point opposite to what was formerly known as "The Great Western." The main portion of the town lies in a valley, but a number of houses are built on the surrounding hills. Some of the most picturesque scenery of the Allegheny may be viewed from the town. It is the half-way point between Pittsburgh and Oil City, which contributed to East Brady's past importance as a railroad station. It is also the starting point of the trains of the Low Grade division of the Allegheny Valley Railroad. The town was built in this area to house the employees of the Brady's Bend Iron Company and the Allegheny Railroad (History of Clarion County, PA, 1997).
Foxburg	Founded in 1930. In 1785, this land was purchased by a member of the Colonial Assembly from Philadelphia. Foxburg lies in the scenic rural valleys of the Allegheny and Clarion Rivers. The area is rich in natural resources including lumber, oil, and natural gas. These resources were shipped to towns along the Allegheny River in route to Pittsburgh (www.csonline.net/foxburglibrary/local_history3.htm).
Madison Township	Founded in the 1800s. Madison was originally part of Toby Township, and before the formation of Clarion County, it extended into Armstrong County as far as the mouth of Mahoning Creek. The township is above several beds of bituminous coal and the limestone is largely exposed in the bluffs along Redbank Creek and its tributaries. The limestone was largely quarried throughout the township. (History of Clarion County, PA, 1997).
Perry Township	Founded in the 1800s. Perry Township was originally a part of

	Armstrong County. The industries in the past were varied: the southern part was principally the site of coal mining, the north for oil drilling, and other portions of the township were farming communities. Along with the industries, several saw and grist mills were established in Perry Township (History of Clarion County, PA, 1997).
Richland Township	Founded in 1806. This community lies in the great oil belt of Clarion County, and producing wells dot its surface from one end to the other. Oil producing and farming are the chief occupations of its inhabitants (www.pa-roots.com).
Toby Township	Founded in 1797. Toby Township was one of the first townships organized in what is now Clarion County. The township is abundantly supplied with coal, limestone and iron ore. (www.pa-roots.com)
Venango	
Emlenton Borough	Founded in 1859. The owners of the land at the time it was surveyed were Joseph B. Fox and Andrew McCaslin. Fox owned a large tract of land and founded the town of Foxburg, four miles below Emlenton. The town of Emlenton was named in honor of Fox's wife Hannah Emlen. (History of Venango County, Pennsylvania, 1984).
Scrubgrass Township	Founded in 1806. Originally included part of Clinton Township. Various industries were active during Scrubgrass's past. Saw mills were built along the area's waterways. Coal extraction, oil drilling, and farming were also practiced throughout the township (History of Venango County, Pennsylvania, 1984).
Westmoreland	
Allegheny Township	Founded in 1796. Allegheny Township was named for the river that formed its northwestern boundary. The northern part of the township is underlain with coal from the Pittsburgh seam and the upper and lower Freeport seams. Railroads were a large part of this area as they moved coal from the area. The township is well suited for agricultural purposes. (www.pa-roots.com).
City of Arnold	The community of Arnold was settled in 1852 by Major Andrew Arnold. It was at one time part of New Kensington. It was not until January 14, 1896, that it was incorporated as a borough. Arnold was a peaceful community until the establishment of the Chambers Glass Company in 1891, when the quiet little village began its transformation into a thriving industrial town (www.arnoldpa.org/arnmain.shtml).
City of Lower Burrell	Founded in 1958. Judge Jeremiah Murry Burrell, presiding as a judge of the Westmoreland County Court in 1852, responded to the petition of citizens of Allegheny Township requesting the establishment of a new township within the boundaries of Allegheny Township, as it then existed. The newly formed township was given the name of Burrell Township in honor of Judge Burrell.

	Continuing efforts to establish a more efficient government directly involving more citizens, a new petition was presented to the Court of Westmoreland County in 1878 requesting the further division of Burrell Township into two parts. This was granted and the township was divided into Upper Burrell and Lower Burrell Townships. The Official Charter declaring the City of Lower Burrell as a Third Class City in the Commonwealth of Pennsylvania was signed by the governor in 1959. Today, the City of Lower Burrell is still one of the youngest Third Class Cities in the State of Pennsylvania. (www.cityoflowerburrell.com).
City of New Kensington	New Kensington was founded in 1891. In 1890 the Burrell Improvement Company considered the advantages of the level land south of Lower Burrell, and deemed it a prime location for a city. They named the area "Kensington" (which was later changed to New Kensington). Once the land was surveyed, a public sale was held on June 10th 1891. Thousands of people flooded the area and investors brought industry with them. The first large company was the Pittsburgh Reduction Company (known later as ALCOA), which bought riverfront property. Additional companies built in the area as late as the early twentieth century (www.newkensington.org).

Sites Listed as National Historic Landmarks					
Historic Name	**Partial Address**	**County**	**Municipality**	**Status**	**Date Listed**
Oregon Hunting and Fishing Club	304-306 Cherry St.	Allegheny	Brackenridge Borough	Eligible	8/12/1996
Allegheny River Lock & Dam No. 3	Allegheny River P.O. Box 4208, Parnassus Station	Allegheny	Harmar Township	Listed	4/21/2000
Allegheny River Lock & Dam No. 4	1 River Ave.	Allegheny	Harrison Township	Listed	4/21/2000
Burtner Stone House	Burtner Rd. Natrona Heights	Allegheny	Harrison Township	Listed	1/13/1972
Harback Highschool	Argonne Dr. at Broadview Blvd.	Allegheny	Harrison Township	Eligible	1/5/2001
Pennsalt Historic District	Federal, Greenwich, Wood, Center, Penn, Pond, Phila.	Allegheny	Harrison Township	Listed	7/18/1985
Wood Street School	Wood St.	Allegheny	Harrison Township	Eligible	3/22/1990
Allegheny River Lock & Dam No. 3	Allegheny River P.O. Box 4208, Parnassus Station	Allegheny	Plum Borough	Listed	4/21/2000
Dickenson Farm	741 Center Rd.	Allegheny	Plum Borough	Eligible	6/26/1995
Lockkeepers' Dwelling, Allegheny Lock and Dam N	301 Barking Rd.	Allegheny	Plum Borough	Eligible	8/13/1998
Logans Ferry Aluminum Powder Plant	Barking Rd., Logans Ferry	Allegheny	Plum Borough	Listed	5/7/1997

McJunkin Site 36AL0017	No Data Available	Allegheny	Plum Borough	Eligible	NA
Oakmont Country Club Historic District	Hulton Rd.	Allegheny	Plum Borough	NHL	6/30/1987
Plum Creek Bridge No.16	Stotler Rd.	Allegheny	Plum Borough	Eligible	7/31/1990
Carson, Rachel, House	613 Marion Ave.	Allegheny	Springdale Borough	Listed	10/22/1976
?	143 E 7th Ave.	Allegheny	Tarentum Borough	Eligible	9/19/1990
Highview Pres. Church	312 7th Ave.	Allegheny	Tarentum Borough	Eligible	4/7/1992
Second Ward Public School	2nd Ave. 400 Block	Allegheny	Tarentum Borough	Eligible	9/20/1990
Allegheny River Lock & Dam No. 6	1258 River Rd.	Armstrong	Bethel Township	Listed	4/21/2000
Lockkeepers' Dwellings, Allegheny Lock and Dam	300 Feet South of Allegheny River Lock and Dam 8	Armstrong	Boggs Township	Eligible	8/13/1998
Bradys Bend Iron Company Furnaces	Rte. 68	Armstrong	Bradys Bend Township	Listed	8/11/1980
Saint Stephen's Church	Church St. Pa. 68	Armstrong	Bradys Bend Township	Listed	6/30/1980

Cadogan Tipple	Off PA Rte. 128 along Allegheny River near Cadogan	Armstrong	Cadogan Township	Eligible	3/22/1985
Allegheny River Lock & Dam No. 7	Along PA 4023, 0.6 Miles North of Kittanning Br.	Armstrong	East Franklin Township	Listed	4/21/2000
Ford City Armory	301 Tenth St.	Armstrong	Ford City Borough	Listed	12/22/1989
Ford City Historic District	1st St. to 16th St.	Armstrong	Ford City Borough	Eligible	2/11/1998
Allegheny River Lock & Dam No. 5	830 River Rd.	Armstrong	Freeport Borough	Listed	4/21/2000
Laneville Grist Mill	Old Mill Rd.	Armstrong	Freeport Borough	Eligible	5/8/1996
Allegheny River Lock & Dam No. 7	Along PA 4023, 0.6 Miles North of Kittanning Br.	Armstrong	Kittanning Borough	Listed	4/21/2000
Allegheny/Penn Central Railroad Station	N Grant Ave. and Reynolds St.	Armstrong	Kittanning Borough	Eligible	11/29/1995
Armstrong County Courthouse & Jail	Market & Jefferson Sts.	Armstrong	Kittanning Borough	Listed	11/1/1981
Hose Company No. 1	S Jefferson Sts.	Armstrong	Kittanning Borough	Eligible	11/00/1982
Kittanning Historic District	Roughly Bounded by Oak Ave., Jacob St., Water St.	Armstrong	Kittanning Borough	Eligible	2/11/1998
Mohney House	325 Arch St.	Armstrong	Kittanning Borough	Eligible	11/18/1991

Nulton, Barclay, House	427- 429 Market St.	Armstrong	Kittanning Borough	Eligible	8/12/1993
Safe Deposit Title and Guaranty Company Building	Market St. and McKean St.	Armstrong	Kittanning Borough	Eligible	5/1/1981
Allegheny River Lock & Dam No. 9	Allegheny River P.O. Box 161	Armstrong	Madison Township	Listed	4/21/2000
Bridge between Madison & Mahoning Townships	L.R. 03178	Armstrong	Madison Township	Listed	6/22/1988
Bellwood Garden School	No Data Available	Armstrong	Manor Township	Listed	7/10/2001
Crooked Creek Dam	1 Mile East of S.R. 66	Armstrong	Manor Township	Eligible	10/20/2000
Damtenders' Dwellings, Crooked Creek Dam	1 Mile East of S.R. 66, Appx 600 feet West of Crooked Creek Dam	Armstrong	Manor Township	Eligible	8/13/1998
Manorville Public School	Water St.	Armstrong	Manorville Borough	Eligible	6/14/1993
Allegheny River Lock & Dam No. 6	1258 River Rd.	Armstrong	South Buffalo Township	Listed	4/21/2000
Saint Patrick's Roman Catholic Church	Intersection of L.R. 03130 & T-324	Armstrong	Sugarcreek Township	Listed	3/21/1978
Allegheny River Lock & Dam No. 8	R.D. 1	Armstrong	Washington Township	Listed	4/21/2000

Allegheny River Lock & Dam No. 9	Allegheny River P.O. Box 161	Armstrong	Washington Township	Listed	4/21/2000
Buffalo Township Elementary School	500 Sarver Rd.	Butler	Buffalo Township	Eligible	11/15/2000
East Brady Boro Historic District	Roughly Bounded by Spring, E 2nd, Robinson, 1st Ave.	Clarion	East Brady Borough	Eligible	1/31/1996
Foxburg Country Club	Harvey Rd.	Clarion	Foxburg Borough	Eligible	9/26/2002
Foxburg Historic District	Main St.	Clarion	Foxburg Borough	Eligible	2/23/1995
Emlenton Historic District	Bounded by Allegheny River, the boro limits, Kerr Ave., Hicko	Venango	Emlenton Borough	Listed	11/10/1997
Anderson, James, House	T-400	Venango	Scrubgrass Township	Eligible	2/6/1987
Arnold Historic District	3rd Ave., from the New Kensington-Arnold Boundary	Westmoreland	Arnold City	Eligible	9/7/1994
New Kensington Production Works Historic District	Schreiber Industrial Park, 12th St.	Westmoreland	Arnold City	Listed	5/7/1998
Zillman Hotel	1701 5th Ave. and 17th St.	Westmoreland	Arnold City	Eligible	9/12/1985
Arnold Homestead	3990 Wilks Dr.	Westmoreland	Lower Burrell City	Eligible	12/14/1999
Allegheny Valley Railroad	No Data Available	Westmoreland	New Kensington City	Eligible	2/4/2002

Aluminum City Terrace Historic District	Terrace St.	Westmoreland	New Kensington City	Eligible	9/7/1994
Aluminum Club	Freeport Rd. East Side, at Elizabeth St.	Westmoreland	New Kensington City	Eligible	NA
Aluminum Research Laboratories	Freeport Rd.	Westmoreland	New Kensington City	Eligible	9/7/1994
Building 242	Schreiber Industrial Park, 12th St.	Westmoreland	New Kensington City	Eligible	9/7/1994
Mt. Saint Peter Roman Catholic Church	100 Freeport Rd.	Westmoreland	New Kensington City	Listed	5/5/1998
New Kensington Downtown Historic District	900-1091 3rd Ave. 302-324 10th St., 201-319 9th	Westmoreland	New Kensington City	Listed	7/23/1998
New Kensington Production Works Historic District	Schreiber Industrial Park, 12th St.	Westmoreland	New Kensington City	Listed	5/7/1998
Parnassus Pres. Church	730 Church St.	Westmoreland	New Kensington City	Eligible	2/4/2002
U.S. Post Office, New Kensington	1100 5th Ave.	Westmoreland	New Kensington City	Eligible	12/6/1983

Pennsylvania Historic Markers

Marker Name: Chartier's Town
County: Allegheny
Date Dedicated: 1946/12/19
Marker Type: City
Location: PA 28 at Tarentum
Category:
Marker Text: Early Shawnee Indian town located at site of present Tarentum. Named for Peter Chartier who built a fur post here. The nearby river crossing marked course of the Allegheny Path east.

Marker Name: Rachel Carson
County: Allegheny
Date Dedicated: 1988/5/20
Marker Type: City
Location: Pittsburg St. (SR 1001, old PA 28) & Colfax St. in Springdale
Category: Women, AWP, Environment
Marker Text: Scientist, naturalist and writer. Born 1907 at 613 Marion Avenue; died 1964. Her 1951 book "The Sea Around Us" was followed in 1962 by "Silent Spring." This book focused the nation's attention on the dangers of pesticides and helped launch the environmental movement.

Marker Name: Fanny Sellins
County: Westmoreland
Date Dedicated: 1989/9/3
Marker Type: Roadside
Location: Front of Union Cemetery, PA 366, Arnold
Category: Women, Labor
Marker Text: An organizer for the United Mine Workers, Fannie Sellins was brutally gunned down in Brackenridge on the eve of a nationwide steel strike, on August 26, 1919. Her devotion to the workers' cause made her an important symbolic figure. Both she and Joseph Starzelski, a miner who was also killed that same day, lie buried here in Union Cemetery where a monument to the pair was erected.

Marker Name: Armstrong County
County: Armstrong
Date Dedicated: 1982/10/15
Marker Type: City
Location: Courthouse, N end Market St., Kittanning
Category: Government & Politics, Military, Native American
Marker Text: Formed March 12, 1800 out of Westmoreland, Allegheny, and Lycoming counties. Named for Gen. John Armstrong, who had destroyed the Indian Village at Kittanning, 1756. Here, county seat was laid out, 1803, and "Daugherty Visible" typewriter invented in 1881.

Marker Name: Brady's Bend Works
County: Armstrong
Date Dedicated: 1946/11/28
Marker Type: Roadside
Location: PA 68 Brady's Bend, at Allegheny River Bridge
Category: Business & Industry, Transportation
Marker Text: Located near this point, 1839-73. Organized as the Great Western and later known as the Brady's Bend Iron Company. One of that era's largest iron works, and first to make iron rails west of the Alleghenies.

Marker Name: Fort Armstrong
County: Armstrong
Date Dedicated: 1946/11/28
Marker Type: Roadside
Location: PA 66, 1.8 miles S of Kittanning
Category: military
Marker Text: Located on the nearby river bank, this outpost was built in June, 1779, and abandoned that autumn. It served the Brodhead expedition against the Senecas and was named for Maj. Gen. John Armstrong.

Marker Name: Kittanning
County: Armstrong
Date Dedicated: 1946/11/28
Marker Type: Roadside
Location: At Highway garage on US 422 (South Water Street) in Kittanning
Category: Native American
Marker Text: The most notable Delaware Indian village west of the Alleghenies, was situated here from about 1730 until destroyed by Armstrong's expedition in 1756. Its name means "great river", applying to the Ohio-Allegheny.

Marker Name: Kittanning
County: Armstrong
Date Dedicated: 1946/11/28
Marker Type: Roadside
Location: S. Water St. & W end Market St. Bridge, Kittanning
Category: Native Americans
Marker Text: The most important Delaware Indian village west of the Alleghenies, from about 1730 until its destruction by the Armstrong expedition in 1756, was located here. The Indian name meaning "great river" was applied to the Ohio-Allegheny.

Marker Name: Brady's Bend
County: Clarion
Date Dedicated: 1946/11/28
Marker Type: Roadside
Location: PA 68, 1.3 miles E of Brady's Bend at Lookout

Category: Military, Native American
Marker Text: Named for Capt. Samuel Brady (1756-1795), famed frontier scout and the subject of many legends. Near here in June 1779 -- in what was then Seneca territory -- he led a force seeking to redress the killing of a settler and her four children, and the taking of two children as prisoners. The force surrounded a party of seven Indians -- apparently both Seneca and Munsee -- killing their leader (a Munsee warrior) and freeing the two children.

Marker Name: Foxburg Golf Course
County: Clarion
Date Dedicated: 1955/6
Marker Type: Roadside
Location: PA 58 at NE end of Foxburg
Category: Sports
Marker Text: Oldest golf course in continuous use in the U.S. In 1887, land was made available to the newly formed Foxburg Golf Club by Joseph M. Fox, its first president. Course was enlarged from five to nine holes in 1888. The Foxburg Country Club purchased, in 1924, the original land which it had been leasing.

Marker Name: Rural Electrification
County: Clarion
Date Dedicated: 1987/7/11
Marker Type: Roadside
Location: PA 368, 1 mile E of Parker
Category: Business & Industry
Marker Text: In 1936 seventy-five percent of Pennsylvania farms had no electric service. During the next five years, with Federal support, 14 consumer-owned cooperatives were formed in this State. Serving users in seven counties of western Pennsylvania, Central Electric Cooperative at Parker was incorporated July 12, 1937.