

## I. PROJECT AREA CHARACTERISTICS

### A. LOCATION

The Crooked Creek watershed is situated within the Pittsburgh Low Plateau Section of the Appalachian Plateau (Pennsylvania Department of Conservation and Natural Resources [DCNR], 1999), and encompasses portions of Indiana and Armstrong Counties. The boundary of the study area consists of the portion of the Crooked Creek watershed from the confluence with Plum Creek in Armstrong County and upstream to the headwaters (Figure 1).

The headwaters of Crooked Creek's mainstem originate near the village of Onberg in Rayne Township, Indiana County, Pennsylvania. From this location, Crooked Creek flows northward approximately 4 miles to the National Register Listed Kintersburg Bridge before turning west-southwest to its confluence with the Allegheny River approximately 1 mile south of Ford City, Pennsylvania.

Crooked Creek's two largest tributaries, the North and South Branches of Plum Creek, are situated in the northern portion of the watershed in South Mahoning Township, Indiana County, Pennsylvania. Plum Creek North Branch originates near Plumville, while Plum Creek South Branch begins near Ambrose. Each follows a southwest course before joining to form the main stem of Plum Creek just north of Gastown, Plum Creek Township, Armstrong County, Pennsylvania.

### B. SIZE

The contributory drainage of the entire Crooked Creek watershed is approximately 292 square miles in area (186,880 acres) (Pennsylvania Department of Environmental Protection [PADEP], 1989). The study area for the Crooked Creek Watershed Conservation Plan covers the entire watershed in Indiana County and a small section of the Plum Creek watershed in Armstrong County; totaling 195 square miles (125,067 acres). This plan examines approximately 28 river miles (r.m.) along Crooked Creek, contains sections of 23 named tributaries, and encompasses portions of 15 municipalities in two counties (Figures 1 & 2, Table I-1).

### C. TOPOGRAPHY

The Crooked Creek basin exhibits a dendritic, or branch-like, drainage pattern, which is characteristic of streams within the Allegheny River watershed. Topography along Crooked Creek's main stem, although highly variable, is dominated by wide bottomland floodplains, extending up to approximately 2000 feet from the stream. As discussed under the Land Resources Section, many of these floodplain regions have been converted to agricultural use. The main stems of Plum Creek North and South Branch also exhibit similar characteristics, with bottomlands extending up to 1000 feet from the stream margin.

Indiana County	Armstrong County
<i>Townships</i>	
Armstrong	Cowanshannock
Cherry Hill	Plum Creek
East Mahoning	
Rayne	
South Mahoning	
Washington	
White	
<i>Boroughs</i>	
Creekside	Atwood
Marion Center	Elderton
Shelocta	Plumville

**Table I-1** Crooked Creek Watershed Municipalities

Along the main stems of Crooked and Plum Creek, numerous areas of steep, forested slopes are also present. These slopes occur more frequently within the headwaters and generally extend one-quarter to one-half mile outward from the stream margin before leveling to a plateau.

The highest point within the watershed is approximately 1720 feet above sea level and is located in the northeastern section of the watershed, adjacent to Rayne Run and just west of Marion Center, PA. The lowest elevation occurs at Plum Creek's confluence with Crooked Creek and is approximately 980 feet above sea level. This change in channel elevation yields a vertical drop of approximately 740 feet.

#### *D. LAND USE*

##### 1. Floodplain Management

There are both federal and state floodplain management regulations affecting development in Pennsylvania. The National Floodplain Insurance Program (NFIP) establishes the federal standards, while the Pennsylvania Floodplain Management Act (Act 166) establishes the state regulations.

For the residents of a municipality to be eligible to participate in the NFIP, it must enact an ordinance that meets the minimum requirements established by the Federal Emergency Management Agency (FEMA). A participating municipality must regulate all construction and development within those areas that have been identified by FEMA as being flood prone. The NFIP defines development as:

...Any manmade change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation, or drilling operations (Pennsylvania Department of Community and Economic Development [DCED], 1999).

To regulate development within flood-prone areas, the municipality must enact an ordinance requiring a building permit before construction or development takes place. This ensures that the municipality has a chance to review all proposed activities for compliance with applicable floodplain management regulations.

Under this definition, almost any new structures would require a permit. Exceptions to the permit request would include activities that have no direct bearing on increasing flood damage or aggravating flooding conditions.

All of the municipalities within the study area have adopted floodplain management ordinances. Several types of ordinances can be adopted based on the municipality's goals and the other types of regulations (zoning, subdivision and land development, etc.) in the community. The state provides model ordinances based on the municipality's needs, which are updated to meet the newest regulations. Because none of the municipalities within the study area have a zoning ordinance or subdivision and land development ordinance, each municipality should, at the very least, review their current floodplain ordinance and update it accordingly. A model floodplain ordinance, which is dated April 1998 and represents the most current state regulations, has been included in Appendix B. By reviewing and updating these ordinances, municipalities will be completing the first step toward developing a more comprehensive zoning or subdivision and land development plan.

**E. MUNICIPALITIES**

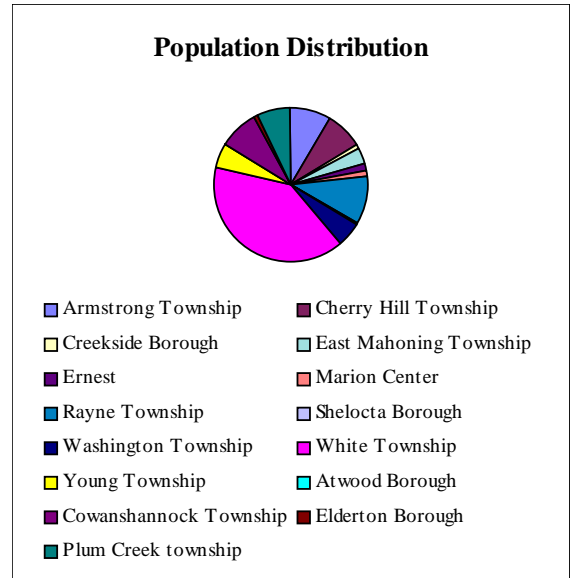
**1. Population Centers**

According to 2000 Census figures, the total population for the municipalities located within the Upper Crooked Creek watershed study area accounted for 21.3 percent of total population of Indiana County and Armstrong County combined (US Department of Commerce, 2000). Indiana County municipalities made up the majority of the 34,865 persons residing in the study area (Charts I-1, I-2, and I-3).

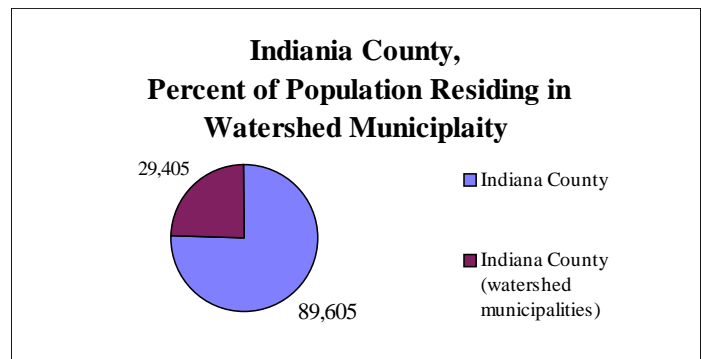
Population density within the watershed varied greatly among the boroughs and the townships. In 2000, the population density for Indiana County was 108 people per square mile while Armstrong County’s population density was 112 people per square mile. The average population density for municipalities within the watershed (100 people per square mile) was lower than the county averages. The population per square mile of the ten municipalities within Indiana County was 103 people per square mile, while the average of the four municipalities within Armstrong County was only 63 people per square mile.

Population centers are locales where the population density is greater than 500 people per square mile. Within the watershed, population centers included Creekside, Marion Center, Plumville, and Shelocta in Indiana County; and Atwood and Elderton in Armstrong County (Figure 3). An additional high-density area was located in the portion of White Township near Indiana Borough, which consists of newer housing developments and small commercial areas.

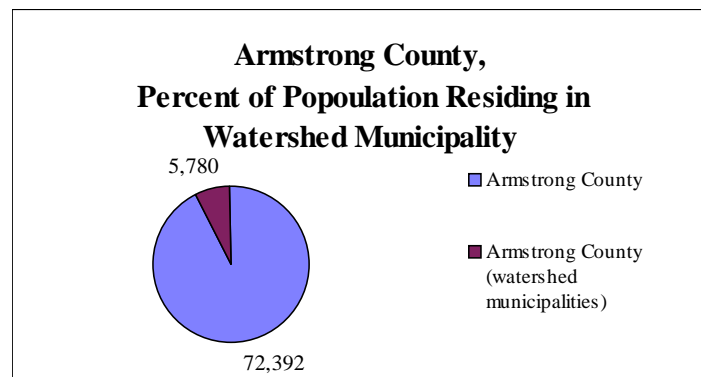
An analysis of the population characteristics of the study area was completed to identify which communities and segments of the population could be impacted by policies regarding future development (Table I-2). The age cohort breakdown is important to consider because of the specialized needs and demands exerted upon various municipal and county services by the different age groups. The “wage-earners” group (ages 18-64) is the portion of the population that is usually considered techni-



**Chart I-1 - Population Distribution**



**Chart I-2 - Percent of Population**



**Chart I-3 - Percent of Population**

Population Distribution, 1990-2000								
	Total Population		Percent of Population >18		Percent of Population 18-64		Percent of Population 64+	
	1990	2000	1990	2000	1990	2000	1990	2000
<b>Pennsylvania</b>	<b>11,881,643</b>		<b>23.5</b>		<b>61.1</b>		<b>15.4</b>	
<b>Indiana County</b>	<b>89,994</b>	<b>89,605</b>	<b>23.3</b>	<b>21.1</b>	<b>62.9</b>	<b>64.0</b>	<b>13.8</b>	<b>14.9</b>
Armstrong Township	3,048	3,090	31.0	25.6	60.3	64.0	8.7	10.4
Cherryhill Township	2,764	2,842	27.0	24.2	60.9	64.1	12.3	11.7
Creekside Borough	337	323	21.4	19.5	63.5	61.0	15.1	19.5
East Mahoning Township	1,140	1,196	33.7	29.2	55.1	59.9	11.1	10.9
Ernest	492	501	23.4	26.9	52.1	56.1	24.6	17.0
Marion Center	476	451	28.6	26.8	55.9	58.6	15.5	14.6
Rayne Township	3,339	3,292	29.6	22.1	60.5	64.5	9.9	13.4
Shelocta Borough	108	127	29.6	26.0	53.7	56.7	16.7	17.3
Washington Township	1,861	1,805	30.9	25.5	59.9	65.1	9.2	9.4
White Township	13,788	14,034	22.3	20.0	62.0	60.2	15.7	19.8
Young Township	1,805	1,744	25.4	26.7	57.0	56.2	17.6	17.1
Municipalities within Study Area (Indiana Co.)	29,158	29,405	27.5	24.8	58.3	60.6	14.2	14.6
<b>Armstrong County</b>	<b>73,478</b>	<b>72,392</b>	<b>24</b>	<b>22.9</b>	<b>58.4</b>	<b>66.6</b>	<b>17.6</b>	<b>10.5</b>
Atwood Borough	121	112	34	25.0	54	62.5	12.0	12.5
Cowanshannock Township	2,813	3,006	26	27.1	57	56.8	17.0	16.1
Elderton Borough	373	358	23	22.3	53	57.0	24.0	20.7
Plumcreek township	2,400	2,304	27	22.0	60	61.9	13.0	16.1
Municipalities within Study Area (Armstrong Co.)	5,707	5,780	27.2	24.0	57.6	60.7	15.2	15.2

**Table I-2 - 1990 and 2000 Population Distribution**

cally able to provide for and makes up the labor force of the municipality. This age group utilizes many community facilities and services, but also supports them through income and property taxes. Other age groups, such as those over the age of 65 are of retirement age and usually require additional medical services and specialized housing needs as they become older. The age group, which includes those residents under the age of 18, also requires specialized services. Infants and toddlers of working parents may require specialized childcare services such as day care. As these children get older they will enroll in the public education or private education system. It is important that government leaders are aware of the current population trends. This will enable them to properly plan for the future including additional schools or assisted living facilities.

The communities within the watershed study area had an average age of 35.8 years in 2000, which was slightly higher than the average age of Indiana County (35.5 years) and slightly lower than Armstrong County average (38.6 years).

On a county-wide basis, between 2000 and 1990, Armstrong County decreased its over 65 population by 1.1 percent, while the under 65 population increased by approximately 7.1 percent. Indiana County's over 65 population increased by 1.1 percent while their under 65 population decreased by 1.1 percent.

Historical census data indicated that Armstrong County had lost 0.1 percent of its population between 1950 and 1990. From 1990 to 2000, it was estimated that the county's population decreased by less than 1.5 percent. The figures for Indiana County showed that the population had increased by 14.3 percent between 1950 and 1990. The largest increase occurred during the 1970s when the county had a total population of 92,281 people. Recent estimates revealed a reverse in this trend, with the county losing less than 0.5 percent of its population between 1990 and 2000. During the forty year period from 1950 to 2000 Pennsylvania saw its population grow by over 12 percent.

## 2. Zoning

The Upper Crooked Creek Watershed study area includes all, or portions of, fifteen municipalities. Eleven of these are located in Indiana County, while four are located in Armstrong County. During the preparation of this plan, none of the municipalities within the study area had adopted a zoning ordinance.

Indiana County has enacted a Special Recreation and Conservation Zoning Ordinance which has jurisdiction over the portion of any public or private property surrounding the county parks of Blue Spruce Park, Pine Ridge Park, and Hemlock Lake Park; as well as Yellow Creek State Park (Indiana County, 1973, as amended). These parks cover portions of Cherryhill, Rayne, and Washington Townships in the study area.

The Indiana County Special Recreation and Conservation Ordinance establishes two zones, a Buffer Zone and a Conservation Zone. According to the ordinance, the intent of the Buffer Zone is to strictly control the type, density, and quality of development in the areas immediately adjacent to the parks. This zone is designed to protect the parks against immediate encroachment by uses that are, or have a potential to be, detrimental to the park operations or facilities, or which may detract from the recreational atmosphere of the park. The intent of the Conservation Zone is to protect against the development of detrimental land uses within close proximity of the parks, particularly within and immediately beyond the identified drainage basins serving the parks. As the lakes and streams are the focal points of each park, the primary concerns of the regulatory provisions are to ensure adequate protection for the quantity and quality of the park waters, and to prohibit any use that poses a potential to degrade the park waters.

None of the municipalities in the study area have enacted a Subdivision and Land Development Ordinance. However, these municipalities are covered under the Indiana County Subdivision Ordinance or the Armstrong County Subdivision and Land Development Ordinance.

During the development of this plan, State Correctional Institution-Pine Grove was being constructed in White Township. This facility, which opened in January 2001, has a maximum capacity of 500 inmates and provides 250 full-time jobs. After it is constructed, the prison is forecasted to generate 750 spin-off jobs. While the prison facility itself is located outside of the watershed, the sewage line to service the facility bisects the study area. Access to this sewage line will dramatically increase the amount of land available for development. As mentioned above, the only land use controls for any of the municipalities in the watershed are the Indiana County Subdivision Ordinance and the Armstrong County Subdivision and Land Development Ordinance. Not only could this have a negative impact on the watershed, but also on the roads, the landscape, and the way of life in the area.

Another issue that should be addressed because of its potential impacts on the watershed is that of logging. Currently, forestry (logging, lumbering, pulpwood extraction, and other practices of forestry) is a Special Exception use in both the Buffer Zone and the Conservation Zone. This means that logging is permitted only after permission is given by the Zoning Hearing Board, and when the request meets the following requirements:

1. The proposed timbering operation must be clearly demonstrated to be within the best management practices for the land and timber stand.

2. Logging plans must be prepared by a qualified forester.
3. The forestry practices of age management is strongly recommended. Plans may be prepared and reviewed for an age management operation which will be conducted over a number of years.
4. Plans for the timbering operation shall be reviewed and approved by the Indiana County Conservation District, and any other regulatory agency (Indiana County, 1973, as amended).

According to the Indiana County Office of Planning and Development (B. Baronack, personal communication, July 2000), there are two problems associated with the existing regulations. Enforcement of the ordinance is difficult because of the number of operations, and the logging roads are not being properly re-seeded allowing sediment to wash into the streams and negatively impact the watershed.

### 3. Government Structure

Indiana County, Pennsylvania, is classified as a sixth class county based on its 1990 population according to the Pennsylvania County Code. The governmental structure and services provided varies according to the classification of the county. Indiana utilizes the governmental structure outlined below.

**Elected Governing Officials—Board of Commissioners**, which are elected every four years. The Board of Commissioners is chaired by the majority party and is elected by the board itself. Indiana County has three commissioners.

**Row Offices—**Nine row offices must be filled according to sixth class county classification mandates. These include:

- Sheriff
- Coroner
- Recorder of Deeds
- Register of Wills and Clerk of Orphans Courts
- Prothonotary and Clerk of Courts
- Treasurer
- District Attorney
- Jury Commissioners
- County Auditors

Indiana County has a total of 38 municipalities (14 boroughs and 24 second-class townships.) The individual municipalities are responsible for the maintenance of local roads, code enforcement, ordinance administration, issuance of permits and licensing of businesses, and tax collection. In addition, municipalities may provide additional services that could include items such as recreational amenities, public libraries, emergency services, water, sewage and garbage services. One function of local government is to decide when to enact local planning and zoning ordinances. The Indiana County Office of Planning and Development currently administers ordinances for those municipalities who have not adopted land use ordinances.

Indiana County boroughs are of the weak Mayor form of government. This type of government structure utilizes Borough Council as the governing body and the Borough Council President as the Chief Governing Official, instead of the Mayor. Other elected officials include the tax collector, tax assessor, and auditor.

Every township in Indiana County is classified as a second-class township and elects three Township Supervisors as the governing body. The supervisors are elected on a staggered basis for six year terms with one of the supervisors serving as the chairperson. Townships also elect a tax collector and tax assessor, plus three auditors to assist in the management of the township. In addition to traditional road maintenance, the supervisors are responsible for enforcement of local ordinances, building codes, and the collection of taxes. Some townships will also provide water and sewage services and issue building permits.

Within the study area, there are six boroughs and nine townships (Cherryhill and Young Townships were not included in statistical calculations because of their limited contribution to population and land acreage statistics).

In order to ascertain the type of services provided and land use or building ordinances adopted, a municipal survey was developed and mailed to the municipalities located within the study area. A total of thirteen responses were received.

Of those replying, six have prepared a PA Act 537 plan in accordance with Pennsylvania Department of Environmental Protection (PADEP) regulations. Only two municipalities had adopted comprehensive plans and subdivision and land development ordinances, and none of the respondents indicated that they had a zoning ordinance. Three of the communities had dangerous structures, salvage restriction, and garbage ordinances. Public water was available in six of municipalities, and the availability of public sewage was slightly less for the municipalities who responded to the survey. Only three of the municipalities indicated that they are experiencing growth.

#### *F. TRANSPORTATION FACILITIES*

The vitality of a community is often dictated by the mobility and access afforded by the local and regional transportation system. The roads, bridges, parking lots, traffic signals, and public transportation system, which make up the transportation infrastructure, augment the revitalization of commercial areas and improve the quality of life. To determine if the study area has an adequate transportation infrastructure in place to serve its residents, a thorough examination of the existing transportation network must occur.

The Upper Crooked Creek watershed has a well-maintained and well-established transportation network. The project area has several major roadways and is also inter-connected with numerous arterial roadways (Figure 3). In addition, the project area has an industrial rail system with freight rail systems serving nine customers moving goods and mining resources across the region. Air transport is available in both counties.

In the Upper Crooked Creek watershed there are 461 miles of roads that provide residents with the means to travel efficiently from home to work and to access services (Figure 3, Table I-3). According to the Pennsylvania Department of Transportation (Pennsylvania Department of Transportation [PENNDOT], 1995), the number of local roads far outweighs the number of major roads within the study area.

<b>Major Roads</b>	
US Highways	26 miles
<b>Total Miles for Major Roads = 26 miles</b>	
State Routes	133 miles
Township and Other Roads	302 miles
<b>Total Miles for Local Roads = 435 miles</b>	

**Table I-3** Miles of Road by PENNDOT Classification

A freeway may be classified as a principal arterial.

*Expressway:* A divided arterial highway for through traffic with partial control of access and with grade separation at major intersections.

*Arterial Streets:* Highways that provide inter-county or inter-municipal traffic of substantial volumes. These highways should accommodate speeds up to 55 miles per hour (mph). These traffic routes may be classified as principal or minor arterials.

*Collector Streets:* Traffic routes that connect minor streets to arterial highways and generally serve inter-county and inter-municipal traffic. They may serve as traffic corridors connecting residential areas with industrial, shopping, and other residential areas and usually accommodate operating speeds at 35 to 45 mph.

*Minor Streets:* Roads that provide direct access to abutting land and connections to higher classes of roadways. Traffic volumes are usually low and travel short distances. These streets and roads should be designed for operating speeds of 25 mph.

The road network within the study area is comprised of US routes and township roads. Two US routes are located within the watershed, US Route 119 and US Route 422. Other traffic routes located within the watershed are classified as minor arterial and collector roads.

## 2. Major Through-Ways

US Route 119 travels north and south, bisecting Indiana County. US Route 119 can be considered both an expressway and an arterial street depending upon its function at various locations. Entering the watershed north of Indiana Borough in White Township, US Route 119 begins its path into the watershed as an expressway. As it crosses the Rayne Township border, the roadway is classified as an arterial street. US Route 119 is a major through traffic route to Marion Center, which is one of the largest employment centers in the study area.

US Route 422 travels east and west and enters the watershed after serving as a bypass around Indiana Borough. Similar to US Route 119, US Route 422 also acts as both an expressway and an arterial street. Entering the watershed in Indiana County at the border of Armstrong Township, it is a major through traffic route to Shelocta. US Route 422 continues east into Armstrong County where access is provided to population centers such as Kittanning.

## 1. Roadway Inventory

Based on function, roads within the watershed can be classified into one of the following categories.

*Freeway:* A multilane divided highway having a minimum of two lanes for exclusive use of traffic in each direction and full control of access and egress.

### 3. Other Traffic Routes

The remaining roads within the watershed provide a network of vehicular traffic corridors to access the sites and communities found in Indiana and Armstrong County.

#### a) Rail

Complementing the extensive network of roads within the study area is a freight rail system. Freight rail systems have historically moved large amounts of goods and also have served to transport travelers. Freight rail systems can also be used as a tourist related resource as sightseeing trips are becoming increasingly popular.

The major rail lines in Indiana County are the Buffalo & Pittsburgh Railroad, Inc., Norfolk Southern, and the National Railroad Passenger Corporation (Amtrak). Two private rail facilities, Pennsylvania Electric and R.J. Corman Railroad Company, are located in Indiana County. In addition, a new Norfolk Southern line will serve Keystone Power Plant located in Plum Creek Township, Armstrong County.

#### b) Air

The availability of air travel is essential to the movement of people and goods into and out of the region. Serving as a convenient and faster way to move items from one area to another, air travel is also used for medical emergencies and military transport. Indiana County has one air facility, the Indiana County/Jimmy Stewart Airport that has a runway length of 4,000 feet and a runway surface of bituminous asphalt. Armstrong County has one air facility, McVillie Field, which is located in South Buffalo Township. This facility has a 2,268 foot-long turf runway. Both of these air facilities are located outside of the study area.

### **G. MAJOR EMPLOYERS**

In the last decade, both Armstrong and Indiana County have experienced varying levels of growth in employment; however, both have unemployment rates three to four points higher than the state average.

Data for this section was acquired from second quarter unemployment compensation tax reports filed by employers and published in the following documents: Pennsylvania County Industry Trends 1994-1998, (Penn State Data Center, 1999); the 1999 Indiana County Data Book, (Penn State Data Center, 1999); and the 1990 US Census (U.S. Department of Commerce, 1991).

Workforce and employment figures show that the study area is located in an area that is typical of the western Pennsylvania region when considering economic conditions and employment opportunities. These economic statistics show a region in transition, with a higher than average unemployment rate and generally low industrial growth rates.

#### 1. Armstrong County

According to the 1990 Census (U.S. Department of Commerce, 1991), Armstrong County had a total of 31,171 persons in the civilian labor force and an unemployment rate of 8.2 percent for 1990. In January of 2000, the estimated number of persons in the Armstrong County's civilian labor force had decreased to 30,900 persons. The unemployment rate also fell to 7.9 percent over this ten-year period.

From 1994-98, Armstrong County experienced growth in the number of establishments for the following industries: agriculture, forestry and fishing; construction; transportation; retail trade; finance, insurance, real estate; and services sectors.

Although the county experienced a less than 21.8 percent decrease in mining, this sector remains one of the primary industries in the county. Mining in Armstrong County is classified into three types: coal mining, oil/gas extraction, and mining and quarrying. In 1994 there were 54 establishments that employed 1,282 persons, with the majority in coal mining.

## 2. Indiana County

According to the U.S. Department of Commerce (1991), Indiana County had 38,602 persons listed in the civilian labor force and an unemployment rate of 8.8 percent. During the ten-year period between 1990 and 2000, unemployment levels for Indiana County remained above the state average. In 1997, while the state unemployment rate was 5.2 percent, Indiana County was experiencing an unemployment rate that was almost three points higher (8.1 percent). In January 2000, the estimated number of persons in the labor force in Indiana County declined as compared to 1990 statistics, listing 35,600 persons available to work.

According to the 1999 Indiana County State Data Book (Penn State Data Center, 1999), the majority of Indiana County workers (75.7 percent) were employed in the private sector; 16.1 percent were employed in local, state, or federal government; and 7.4 percent were listed as self-employed. The primary industry in Indiana County was manufacturing.

According to the Pennsylvania County Industry Trends 1994-1994, (Penn State Data Center, 1999), the industrial base of the county experienced growth in the number of establishments in the following sectors: agriculture, forestry, and fishing; construction; manufacturing; and services. The wholesale trade sector experienced an 11.8 percent decrease in the number of establishments operating within Indiana County. In 1994, Indiana County had 119 wholesale trade establishments and by 1998 this number had fallen to 105 wholesale establishments.

According to the Indiana County Office of Planning and Development (B. Baronak, personal communication, June 1999), the largest employer in the county is Indiana University of Pennsylvania. The Indiana Hospital, Indiana School District, and state and local governments all rank in the top ten employers located within Indiana County. In addition, GPU Energy, Specialty Tires of America, and Westinghouse Specialty Metals are all listed in the top ten major employers for the county.

Marion Center is the primary employment center within the study area with one major employer (>100 employees), the Marion Center Area School District, which has 220 workers.

## ***H. OUTSTANDING OR UNIQUE FEATURES***

No outstanding or unique features were identified within the project study area.