GEOLOGY

Upon the organization of the 2nd Geological Survey of Pennsylvania in 1874, one of the first areas of a limited number of districts to be surveyed was the bituminous coal region of Jefferson and Clearfield Counties. Only a basic amount of geologic investigation has been done in the area comprising the Mahoning Creek Watershed.

This area lies in the Pittsburgh Plateaus Section of the Appalachia Plateaus Provence of the Appalachian Region. Historically, the region has passed through four epochs which have determined its present condition. From early Cambrial time to near the end of the Carboniferous era the area was a shallow sea. Near the end of the Carboniferous time mountain making forces shoved the sea deposits westward and folded the rocks. Erosion then took place and wore the folds down to about sea level. Then the Scholey peneplane began to rise and to be eroded in most instances to the sandstone layers of rock; the result is the present drainage pattern. The watershed lies outside the area affected by the great ice sheets.

The rocks exposed are of the Carboniferous Age and extend from about 40'0 feet above the base of the Conemaugh Group through the Allegheny and include about 100 feet of the Pottsville Group. The Conemaugh Series is eroded in most areas and is present only in a broad band a few miles wide from Punxsutawney to Sykesville. The Allegheny Group

has a greater aerial distribution in this vicinity and all of the coal production has come from the Allegheny Formation. A log of a well at Sykesville (Fig. 2) shows a thickness of 300 feet for the Allegheny Formation. These three groups consist of sandstones, shales, limestones, clays, and coal beds. The Vanport limestone which is quite persistent in this region is not present in the south-eastern portion of the watershed.

The rocks and structure of this area are folded in a regular succession of approximately parallel anticlines and synclines having a general north 40° east trend with the entire structure rising towards the north-east.

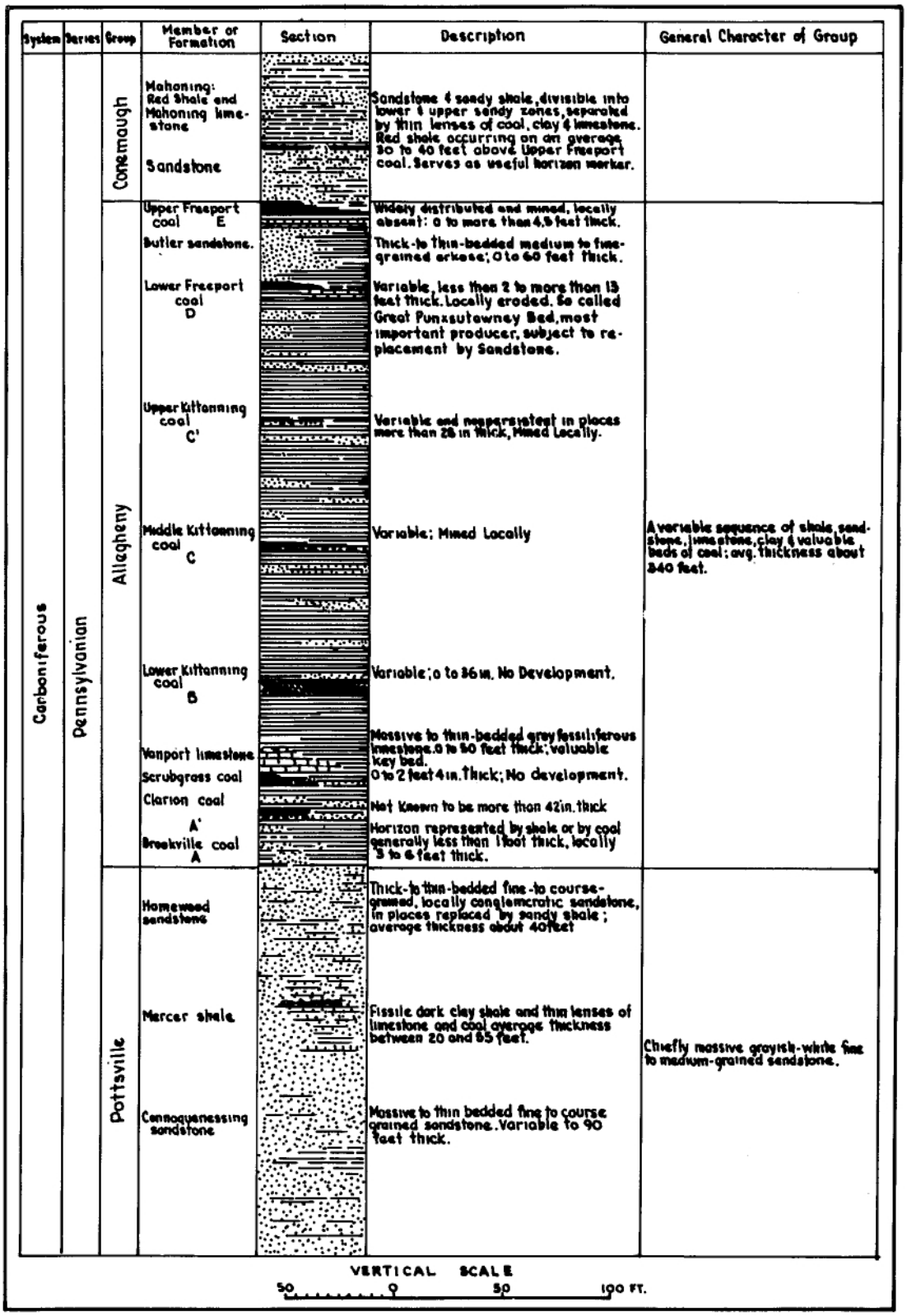

FIGURE 1 - Generalized stratigraphic column for the Pennsylvanian rocks of Mahoning Creek Watershed

JEFFERSON COUNTY

Log of well of Buffalo & Sesquehanna Coal & Coke Co.
Sykesville (well 496)

	Ft.	In.		Ft.	In.
Gravel and soft clay	33		Sandstone, gray, limy at top	9	
Shale, dark bluish	8		Shale, sandy, dark	17	
Shale, red and green	9	6	Coal, bony	3	
Shale, greenish	5		Fire clay	6	
Shale, sandy, greenish	10		Shale, sandy, dark gray	8	
Shale, dark	3	6	Shale, black	3	
Shale, black	7	7	Shale, sandy, dark	5	
Coal	1	9	Sandstone, gray, limy at base	7	
Fire clay	7	8	Shale, sandy, dark	7	
Shale, light	15		Shale, black	14	
Shale, sandy, bluish	7		Coal		3
Sandstone, shaly	4		Shale, sandy, and sandstone, dark	10	9
Shale, sandy, dark	8		Shale, dark	5	4
Shale, sandy, black	14		Coal, bony	1	8
Sandstone, light gray	19		Fire clay	2	6
Shale, black	5	9	Sandstone, white	23	6
Coal (Lower Freeport)	4	9	Fire clay, sandy	7	
Fire clay	1	6	Sandstone, gray	3	
Shale, light bluish	3		Shale, dark	1	
Linestone	6		Limestone	4	
Sandstone, bluish	8		Shale, black, and bone	2	
Shale, sandy, bluish	3		Sandstone, clayey	3	
Shale, bluish	3	6	Shale, sandy, dark	15	
Coal	1	6	Shale, dark	8	3
Fire clay	5		Coal	1	6
Sandstone, shaly	14		Shale, sandy, and sandstone, dark	14	3
Shale, black	4		Shale, black, and bone	1	6
Coal		9	Fire clay	2	
Fire clay	2	3	Sandstone, white (Homewood)	31	6
Sandstone, shaly	9				
Shale, dark	14		Total Depth	456	

Figure 2

MINING HISTORY

That portion of the Mahoning Creek Watershed covered by the study area has been extensively mined by both strip and deep mine methods. The Lower Freeport seam of coal in particular has been heavily mined by large deep mines due to the height of the bed and the excellent quality of the coal.

The earliest coal mined in this area was used by blacksmiths. The first shipment to foreign markets from Clearfield County was sent by barge down the Susquehanna River in 1804. The first person to mine coal in Jefferson County for manufacturing purposes was John Fuller in Winslow Township about 1825. In 1864 J. P. Leslie, a geologist, made a geological survey of the region for a group of men interested in bringing attention to the possible coal deposits in this area. His report on the Great Punxsutawney Coal Bed (Lower Freeport seam) resulted in the purchase of large tracts of land by moneyed interests in the area underlain by this bed of coal. With the possibility of large tonnages of coal becoming available, the railroads extended their lines through the region. The Bennett Branch R. R, was constructed in 1873 opening up the coal fields in the vicinity of Reynoldsville. In April 1874, the first shipment by railroad from Jefferson County was sent from Dubois. The B, R. & P. Railroad was completed to Punxsutawney on September 1, 1883.

The Rochester & Pittsburgh Coal & Iron Company was organized in 1882 and in 1896 absorbed Bell, Lewis and Yates, one of the first companies to purchase large tracts of land. The Punxsutawney Traction Co., organized in 1892, had lines running to Adrian, Elanora, Reynoldsville, and Sykesville by 1904. Since large acreages of the land were controlled by a few companies such as The Rochester & Pittsburgh Coal & Iron Co., The Berwind White Mining Co., and the Northwest Mining Exchange, the Lower Freeport seam of coal, ranging from four feet up to thirteen feet in height, was mined by large operations. Mining in this seam was relatively easy except for areas where rock rolls and clay veins interfered with the operation of the mines. Entries were usually driven about ten feet wide and the rooms were eighteen to twenty feet wide with eighteen to twenty foot pillars. By 1900 some of the largest mines in the United States were located in this area; several operations loading from 750,000 to 1,000,000 tons per year. Consequently, by this time Jefferson and Clearfield Counties were each loading 5,000,000 tons annually.

In the early 1900's, the largest coal consumers were the coke ovens which were constructed near many of these mines. Nineteen twenty-six marks the end of the beehive ovens because of the high sulphur and phosphorous content of the coke being manufactured. Then the railroads became the largest customers of the coal being produced in this area. By 1950 with the advent of the diesel engines, this market had

also disappeared. By this time the Lower Freeport seam had become depleted and, as shown by the accompanying 2000' map, the area between Punxsutawney and Dubois known as the Great Punxsutawney Bed had been worked out by these large mines. With exception of the Kramer Mine of the Northwest Mining Exchange, where the barrier pillars were left intact, these large deep mines are interconnected, allowing the water to flow freely through the mine workings. At the present time the coal being produced in the watershed solely by strip mine operations is going to the utilities for the generation of electrical power.

There are no deep mines operating in the area of the Watershed under study at this time. Strip mining is being conducted at three locations in this area and several strip mining operations are being conducted immediately over the divide.

Extensive deposits of coal remain in the watershed. The Upper Freeport seam which overlies the Lower Freeport seam at an interval of 38-45 feet had a thickness of about 40 inches N. E, of Punxsutawney, and had been mined by small deep mines at several locations and strip mined near the eastern boundary. Future mining of this bed will depend upon the extent to which the mining in the Lower Freeport had disturbed it. The coal beds below the Lower Freeport seam have not been mined except in the area near Luthersburg and other scattered locations where there have been some small deep mines and considerable stripping in the Kittanning seams. These beds, except for

strip mines probabilities in the eastern portion of the watershed, are below drainage and little is known of their thickness and character. They are probably not commercially attractive at the present time but may be prospected in the future for such purposes as coal gasification.

The acid mine drainage pollution in the Mahoning Creek Watershed is coming from the abandoned deep and strip mines (and their associated refuse piles) which were operated before the regulation of the mining industry. Effective implementation and enforcement of the present mining laws should control pollution from active and future mining operations.