

ANALYSIS OF CONDITIONS

CHALFANT RUN WATERSHED

Chalfant Run (formerly known as Johnston's Run, as per plat book Eastern Vicinity of Pittsburgh, 1915 edition) is situated in the eastern part of Allegheny County. It is contiguous and east of the Borough of Wilksburg and includes the municipalities of Penn Hills Township, Churchill Borough, Wilksburg Borough and Wilks Township. The watershed has its headwaters bounded on the north by Frankstown Road at Graham Boulevard and runs directly southeasterly through Penn Hills Township, Churchill Borough and Wilks Township for approximately 19,000 ft to its intersection with Thompson Run at the former Village of Linhart.

Chalfant Run consists of an area of approximately 4.3 square miles and the elevations above mean sea level vary from 800 ft to 1260 ft.

The subdivisions throughout the watershed have their own separate storm and sanitary sewers and are not combined sewers similar to the old cities such as Pittsburgh, Philadelphia, etc. In general the streets are well storm sewered with an adequate number of inlets for quick discharge of storm water to the streams. Naturally, in this type of storm

sewer design any material in street cartways will be washed into the storm inlets and thence through the storm sewer system for deposition in the streams and the rivers.

Portions of the tributaries in the upper reaches have been enclosed with pipe, principally in the narrow corridors where commercial establishments exist.

This area is primarily residential except for a portion along Parkway East, William Penn Highway and Rodi Road, which is bounded by steep hillsides and the Churchill Country Club, located in the northwest portion of the Chalfant Run watershed. The tributaries of Chalfant Run are in valleys which vary from gentle terrain to extremely steep terrain. All the valleys are built up with the exception that further development can take place in the Duff Run Area (Rodi Road) and also the Lougeay Road Area, which is approximately 2500 ft. easterly and parallel to Rodi Road. Wilkinsburg Borough, Churchill Borough and Wilkins Township, for all practical purposes, are built up with the exception of some marginal land which will undoubtedly be developed to a limited extent in the future.

All the streams in the entire watershed are used only for drainage purposes; that is, runoff from streets and hillsides, spring drainage, mine water runoff, discharge of

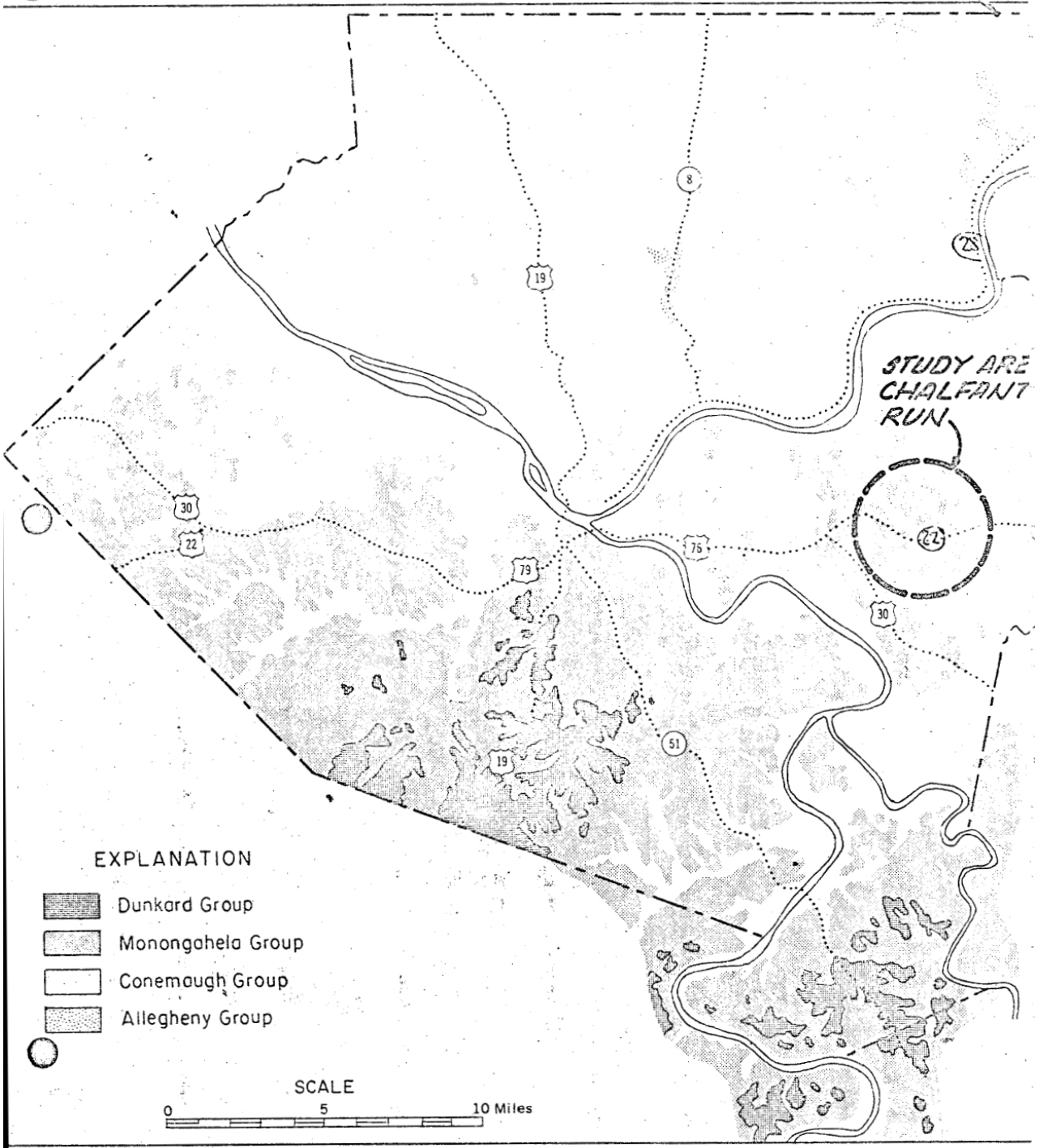
treated effluent from the Long Road Sewage Plant and emergency overflow from existing; sewage lift stations in the watershed. There is no known use of water from this watershed for drinking water purposes, industrial water use, swimming or any other known recreational use. The stream is not known to support aquatic or fish life due to the character of mine drainage in the area.

GEOLOGY OF CHALFANT RUN





The rocks of Western Pennsylvania were formed during the Paleozoic Era. All the Systems of the Paleozoic Era are represented in the rocks of Penn Hills, but most are far below ground surface. Only 1100 to 1200 feet of Pennsylvanian and Permian rocks are exposed at the surface. The rest of the almost 16,000 feet of Paleozoic age rock is beneath us and can be reached only by drilling.

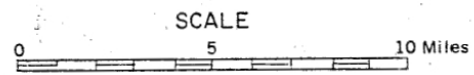
A typical cross section, in the Rodi Road area, shows the Upper Conemaugh formation which is composed of a layered system of sedimentary rocks. These are primarily horizontal bedded limestone, siltstone and claystone; and are typically hard to very hard.

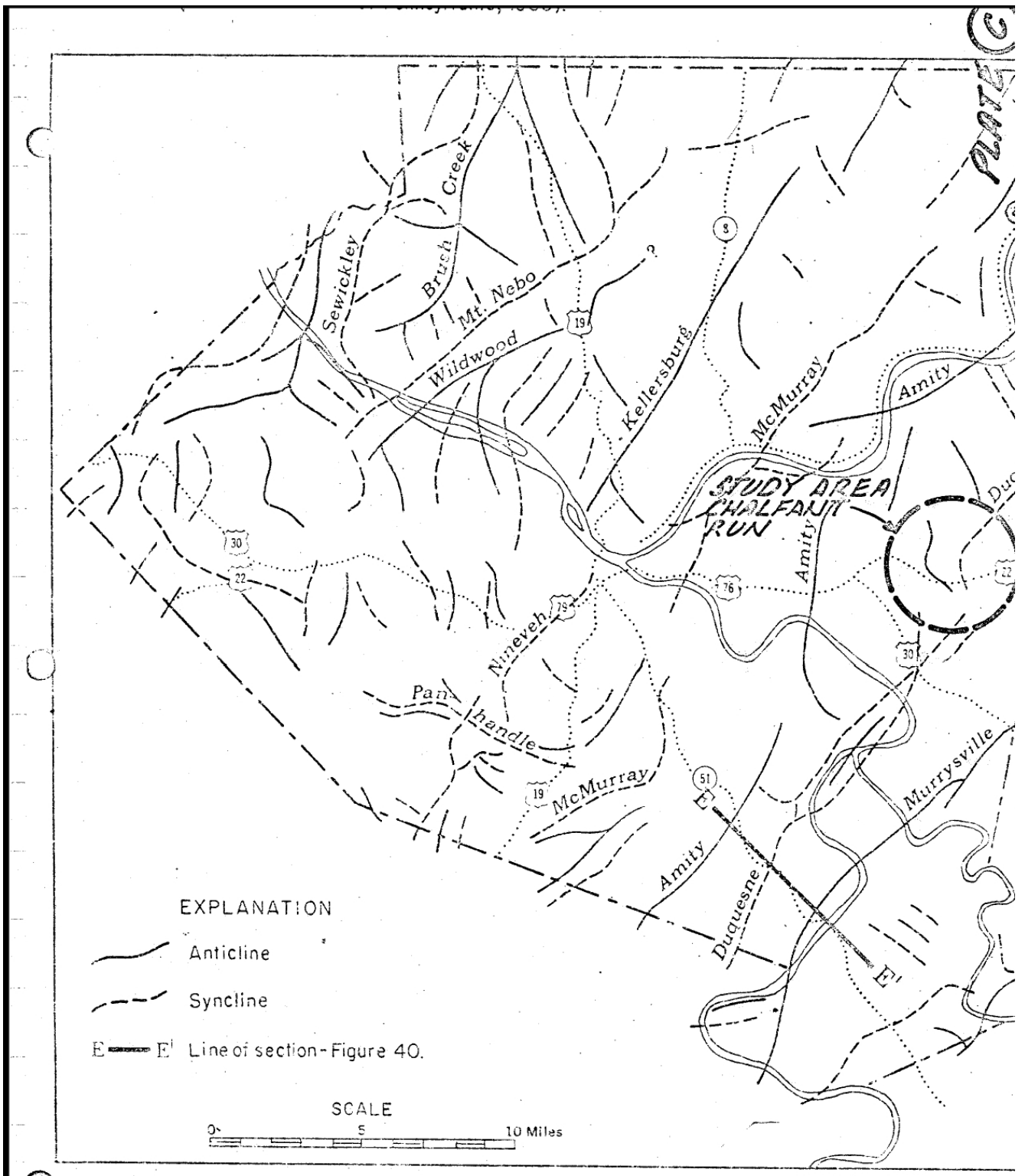
The upper reaches of the Conemaugh show signs of coal




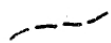

EXPLANATION

-  Dunkard Group
-  Monongahela Group
-  Conemaugh Group
-  Allegheny Group





EXPLANATION

-  Anticline
-  Syncline
-  E—E' Line of section—Figure 40.

SCALE

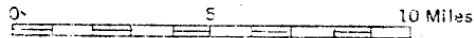
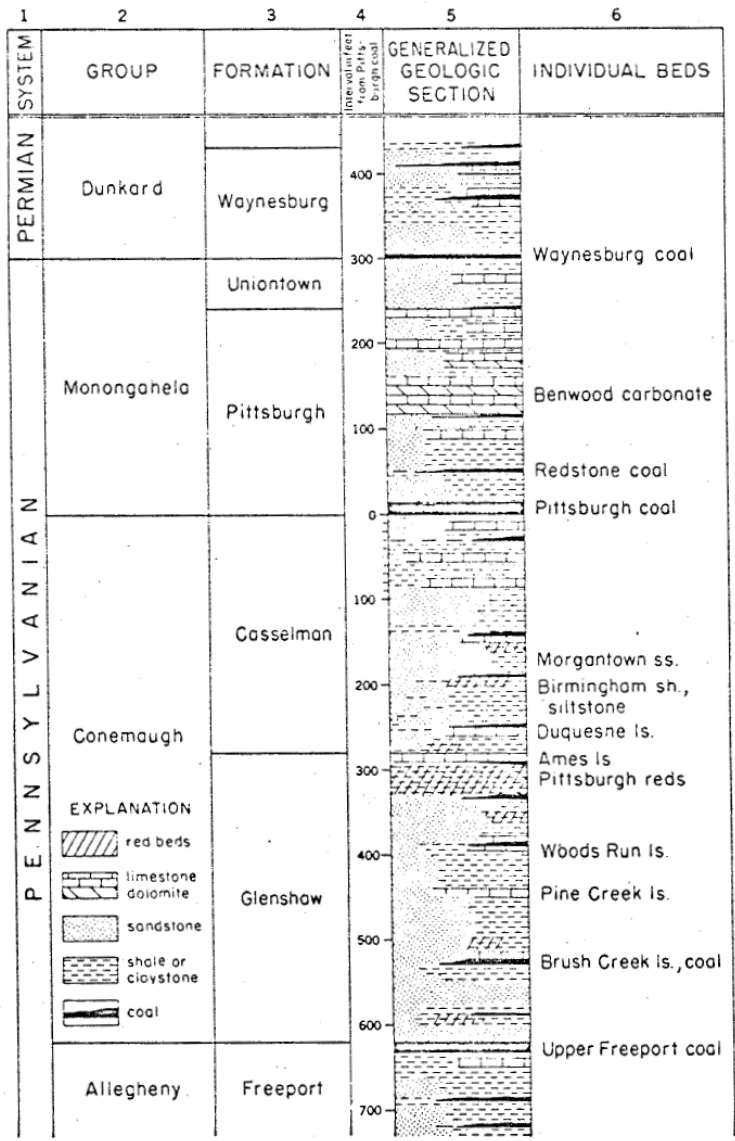


Figure C. Structural axes of Allegheny County. (Adapted from reports preceded by asterisks in Appendix 3).



Generalized columnar section of the exposed rocks in Allegheny County.

PLATE **E** TAKEN FROM PENNSYLVANIA GEOLOGICAL SURVEY - GENERAL GEOLOGY REPORT G 59. GEOLOGY OF THE PITTSBURGH AREA 1970 EDITION.

at or in the lower Monongahela grouping (Pittsburgh Formation). The Penn Hills portion of the County of Allegheny has sufficient elevation to include the Monongahela grouping (Pittsburgh Formation).

There are more than twenty separate coal seams exposed in Allegheny County. They range in thickness from a fraction of an inch to more than nine feet. The Pittsburgh Seam, which occurs primarily south of the Ohio River and east of the Allegheny River, is the world's most famous coal seam because it is mined over an extensive area of 6,000 square miles. The Pittsburgh Seam may be examined in outcrop at the junction of the Parkway East and Ardmore Boulevard.

The primary coal mined in Penn Hills was the Pittsburgh Seam and currently the Upper Freeport Seam. Upper Freeport Coal is not being mined in the Chalfant Run Watershed. Both seams of coal are mined primarily for their coking qualities and for the production of iron and steel. By elevation and data from publications, it is assumed that there are traces of the Redstone Coal Seam at a higher elevation.

The Pittsburgh Seam, in the Penn Hills area, is dipping from The Amity Anticline in the northwest area towards The Duquesne Syncline in the southeast corner of Penn Hills Township. Coal elevations drop uniformly about 120 ft. between

the anticline and syncline.

The Pittsburgh Seam has a thickness varying from 42" to 108"; and is overlain by roof coal separated by claystone 3 ft. thick. In the Chalfant Run area Pittsburgh coal is at an elevation from 1080 ft to 1160 ft. above mean sea level.

The Upper Freeport Coal consists of a single coal bed about 42" thick overlain by a 5" to 10" thick high ash layer, and above that an upper coal of variable thickness ranging from 30" to 40". The level of the Upper Freeport seam is approximately 600 to about 630 ft. below the level of the Pittsburgh Coal.

During World War II strip mining commenced in the area to provide sufficient coal for power production. This practice was continued until recently to provide cheap strip coal for power production. The Penn Hills Township Commissioners, in permitting' stripping in their area by ordinance, required a \$1000 bond per acre to be posted for the following type of restoration:

- (a) Complete contour regrading of the land.
- (b) Seeding and vegetation.

Consequently with the aforementioned program, evidence of strip mining, particularly in Penn Hills Township, is not visible.

Early stripping in Penn Hills Township was done by Carr Coal Company. Later stripping, from 1946 to date, was done by subdividers, such as Sampson Bros., Russell P. Miller and others in the development of subdivisions, consisting of hundreds of new homes. The dislocation of the natural topography in the development of streets, storm sewers and homes, in our opinion, has increased the acid mine pollution load in Chalfant Run.

In grading the subdivisions and excavating for the homes, mine water was exposed and presented a problem. Developers disposed of the mine water by systems of french drains, pipings and ditchings; all to the nearest storm sewer system or nearest creek.

It has been observed through the years that new mine seepage can appear perhaps one to five years after homes have been constructed, causing a further problem. Areas within the watershed experiencing this problem are Blackridge and Churchill Valley. Sources of water were blocked by home construction and eventually found new routes over a period

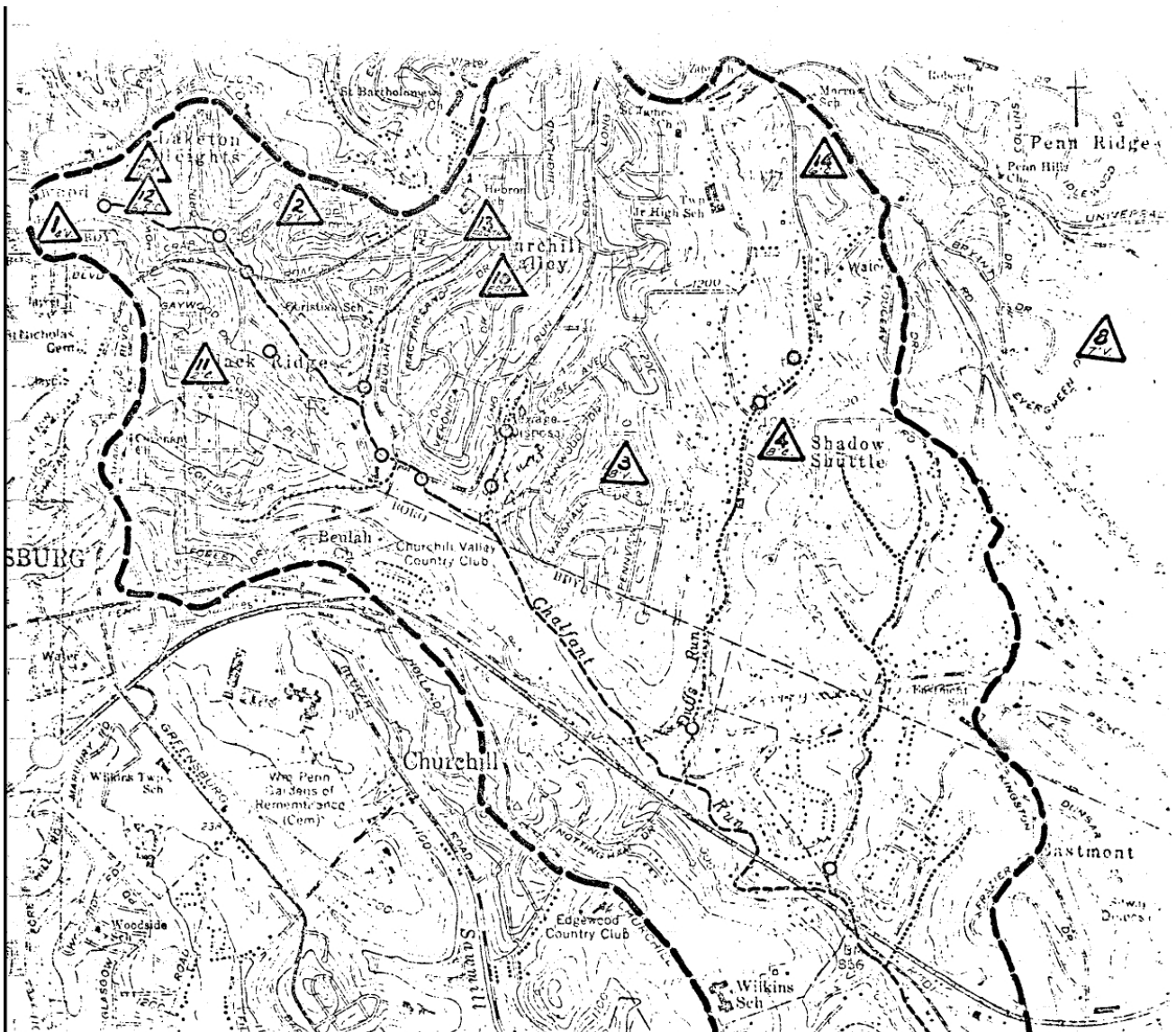
of years as new water levels were established.

The Department of Environmental Resources of the Commonwealth of Pennsylvania has been active the last several years in piping mine water in the rear yard areas, although this has been on a very limited basis. The properties that were remedied consisted of extremely saturated back yards and hillsides which were unusable for the owners of the property since the mine water was extremely acid in quality.

EXPLORATORY DRILLING PROGRAM

The Ebensburg District Office of the Department of Environmental Resources conducted, in January, 1974, an exploratory drilling program in Penn Hills Township, Allegheny County, under Project No. B-236 (ER-77). This program consisted of drill holes at fifteen (15) different locations throughout the municipality. Of these drill holes, the ten (10) in the Chalfant Run watershed will be reviewed. (See Plate D and Plate 500).

The results of the exploratory drilling did not indicate that large areas of abandoned mine workings beneath Penn Hills Township were inundated. Drill holes Nos. 1, 3, 4 and



**PLAN SHOWING
DRILL HOLE
LOCATIONS**

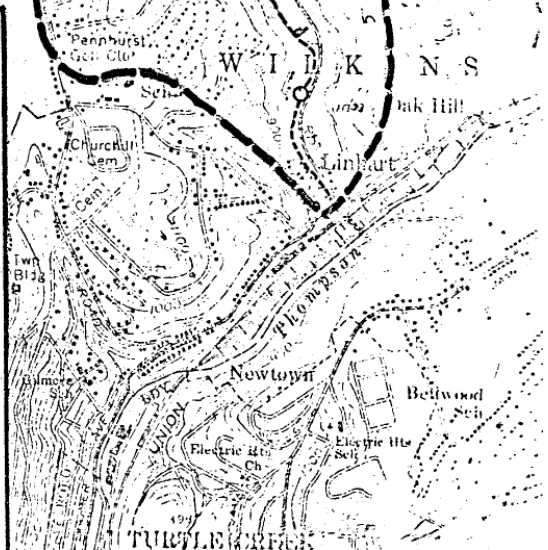
**CHALFANT RUN
PENN HILLS TOWNSHIP
CHURCHILL BOROUGH
WILKINSBURG BOROUGH
WILKINS TOWNSHIP**

SCALE: 1" = 2000'

JUNE 1974

NO. 15078

PLATE NO. **(D)**
PAGE AC-11



12A show water (drill hole numbers correspond to those in the D.E.R. Report). Four (4) holes, Nos. 4, 11, 12 & 14 show coal and four (4) drill holes, Nos. 1, 2, 3 & 12A show voids. Drill holes Nos. 10 & 13 do not show any of the aforementioned characteristics of coal, voids or water. Hole No. 10 was apparently not deep enough and Hole No. 13 appears to have been located outside of the outcrop.

Discharge D-22 (49SF) could be the result of a build-up of water in the adjacent deep mine, as shown by Holes Nos. 1 & 12A. Discharges D-3, D-4, D-9 and D-10 could be caused by the pool shown at Hole No. 3. With the exception of the above noted areas, and the block of coal around Hole No. 14 from which no discharges were located, pooling within the mine complexes in Chalfant Run does not seem to be present.

According to the above mentioned report certain conclusions were drawn regarding acid mine discharges throughout the Chalfant Run watershed, after the drilling program was completed. Because of the built-up portion of this area, it is impossible to predict what effect sealing of the mine complexes may have. An effective sealing program in one area may cause water to surface in other areas with even more hazardous conditions resulting. It is impossible to conclude

from the drilling program to what extent the sealing program could be put into effect.

The Blackridge area, Discharge D-12 (40S), and Park or Southern Avenue, Discharge D-19 (45SF), have a large volume of water discharging continuously throughout the year, regardless of the dry or wet weather periods. This would indicate that the source of in-flow to the mine workings in these two areas must be large; however, Hole No. 11 did not encounter any pooling in this area. It would not appear to be practical to conclude where to reduce the in-flow. In certain instances where there are small quantities of acid mine drainage, there is no way to define where in-flow may occur. Drilling operations for gas and oil may be a source of water from the surface into the mine complexes. The locations of oil and gas wells (active and abandoned) are shown on Plate 501. This information was furnished by Peoples Natural Gas Company, showing their system and other systems

Surface water may be entering the mines through natural percolation of precipitation. The acreage of coal affecting the Chalfant Run Watershed is 2150, and this includes the area to the northwest of the actual watershed. Applying an

annual rainfall of 36 inches on the average for Allegheny County, 10% percolation results in a 400 g.p.m. average rate of ground water recharge. Since little variation of acid mine flow is observed during wet and dry weather periods, immediate percolation appears to have little influence on the major discharges in this area.

Flushing of the mine complexes would be possible, however, extensive studies of the underground mines would be essential in order to determine the scope and estimated cost of such a project. A detailed investigation would also be required to develop whether breaching of in-mine barriers or construction of box-cuts within the mine would alter the inmine flow patterns. Box-cuts would be impractical, however, due to the extensive development in the watershed. Neither could be established without further mining information.

The recommendations of. treatment for the appreciable quantities of acid mine water discharging to Chalfant Run could incorporate a program of collection of additional AND discharges beyond these limits; however, detailed engineering studies would be necessary to develop adequate plans and specifications in this regard.