U. S. DEPARTMENT OF INTERIOR

GEOLOGICAL SURVEY

Stratigraphic Cross Sections Within the Homer City, Pa., Dedicated Coal Reserve Area.

By R. W. Stanton and C. B. Cecil

Open-File Report 83-81

This report is preliminary and has not been reviewed for conformity with USGS editorial standards and stratigraphic nomenclature.

1983

Cross-sections were constructed from driller's logs of core as a part of a more inclusive study of the Upper Freeport coal bed (commonly referred to as "E Seam" in company records) and associated rocks located near Homer City, Pennsylvania (fig. 1). Data and interpretations from the first part of this study are contained in Cecil and others (1981). Figure 2 shows the lines of cross-section constructed across part of the coal reserve area dedicated for use in the Homer City Power Generation Station. Stratigraphic cross-sections are presented in figures 3 - 7.

Noteworthy in these cross sections is the presence of a horizon of calcareous shale or limestone which commonly occurs 10-30 feet below the Upper Freeport coal bed and which laterally grades into underclay (see especially figs. 3 and 4). In surface mines and outcrop, this calcareous shale/limestone is brecciated and irregularly fractured, and commonly contains wavy or uneven laminations or coloration. Megascopically, the brecciation was observed to occur as three general types: A) zones of small clasts approximately less than 20 mm each; B) zones of large, angular, laminar bedded, fragments (20 - 100 mm) which are rotated from normal bedding. Among these large fragments occur a matrix of smaller clasts (generally less than 20 mm). This type can also occur as a well developed flint clay which upon breaking, displays concoidal fracture; and C) zones of nonlaminated veined breccia. The veins are filled with dark, noncalcareous, translucent minerals.

This horizon below the Upper Freeport coal bed is interpreted to have initially formed as a lime and clay/lime mud that was subsequently subareally exposed permitting dissolution and the formation of solution and/or collapse breccia. Alteration of some of the calcareous-rich soil was, in some cases, severe enough so as to totally remove carbonate minerals.

The ancestral Upper Freeport peat developed on a stable, uniform topography formed by the weathering and partial inundation of this calcareous/clay-rich surface. A detailed interpretation of the formation of the Upper Freeport coal bed is discussed in Cecil and others (1981).

Peat formation was terminated by the deposition of organic-rich mud which is now present as a carbonaceus shale that overlies the Upper Freeport coal bed. In some areas, this mud was subsequently eroded by prograding streams that deposited silt (sandy shale) and sand.

Based on the cross sections and descriptions and observations of surface exposures and surface mine highwalls, the sandstones contained in the interval overlying the Upper Freeport coal bed are interpreted as having been deposited in a braided steam environment (expansion of this interpretation is given in Cecil and others, 1981). This interpretation is favored over other types of sand depositional systems based on the folowing observations noted in outcrop: 1) internal sedimentary structures such as large scale cross-stratification, small scale cross-stratification, horizontal stratification and parallel

stratification typical of a braided stream environment; 2) absence of evidence to suggest deposition as barrier bars or tidal channels typical of a coastal marine environment; 3) lack of features typical of meandering strems such as point bars, cut and fill channel features, crevasse splays, or levee deposits; and 4) absence of features typical of distributary channels systems of a lower delta plain environment. Furthermore, the overall geometry of the sandstones in this interval is consistent with the expected geometry expected from a migrating braided stream system or systems. The braided stream interpretation is preliminary in nature and data on a regional scale are currently being compiled.

Acknowledgments

The authors thank the following:

- Pennsylvania Electric Co., Rochester and Pittsburgh Coal Co., North American Coal Co. and Pennsylvania Geolgical Survey for drill hole data and access to mines;
- Environmental Protection Agency for their encouragement and cooperation in this phase of the study;
- Walter Craig, Howard Korn and Timothy Moore, U.S. Geological Survey for their technical assistance in the compilation of the data

References

Cecil, C.B., Stanton, R.W., and Dulong, F.T., 1981, Geology of contaminants in coal: phase I report of investigations: U. S. Geological Survey Open File Report 81-953A, 92 p.

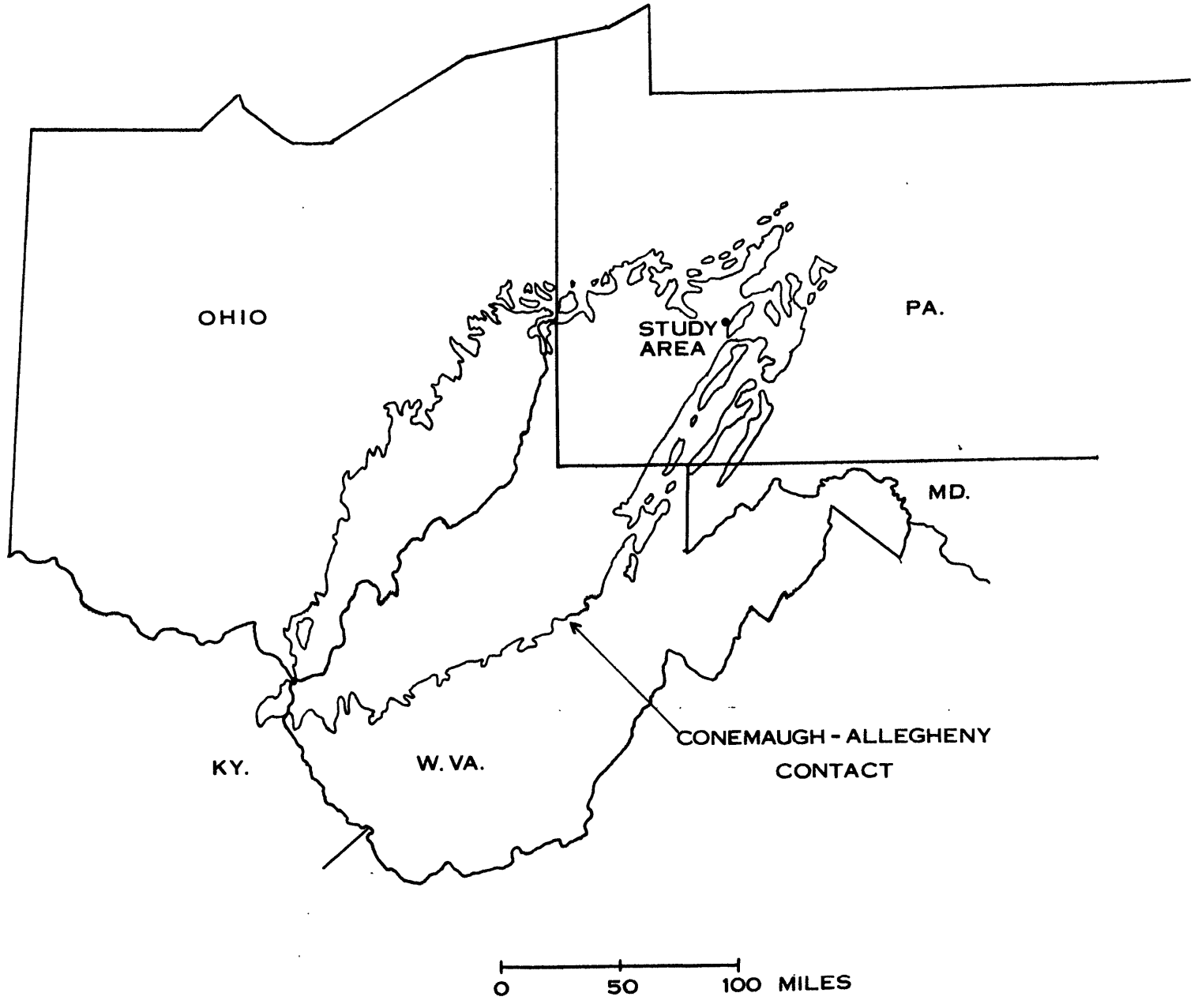

FIGURE 1 - INDEX MAP OF HOMER CITY, PA. STUDY AREA AND CONEMAUGH-ALLEGHANY CONTACT.

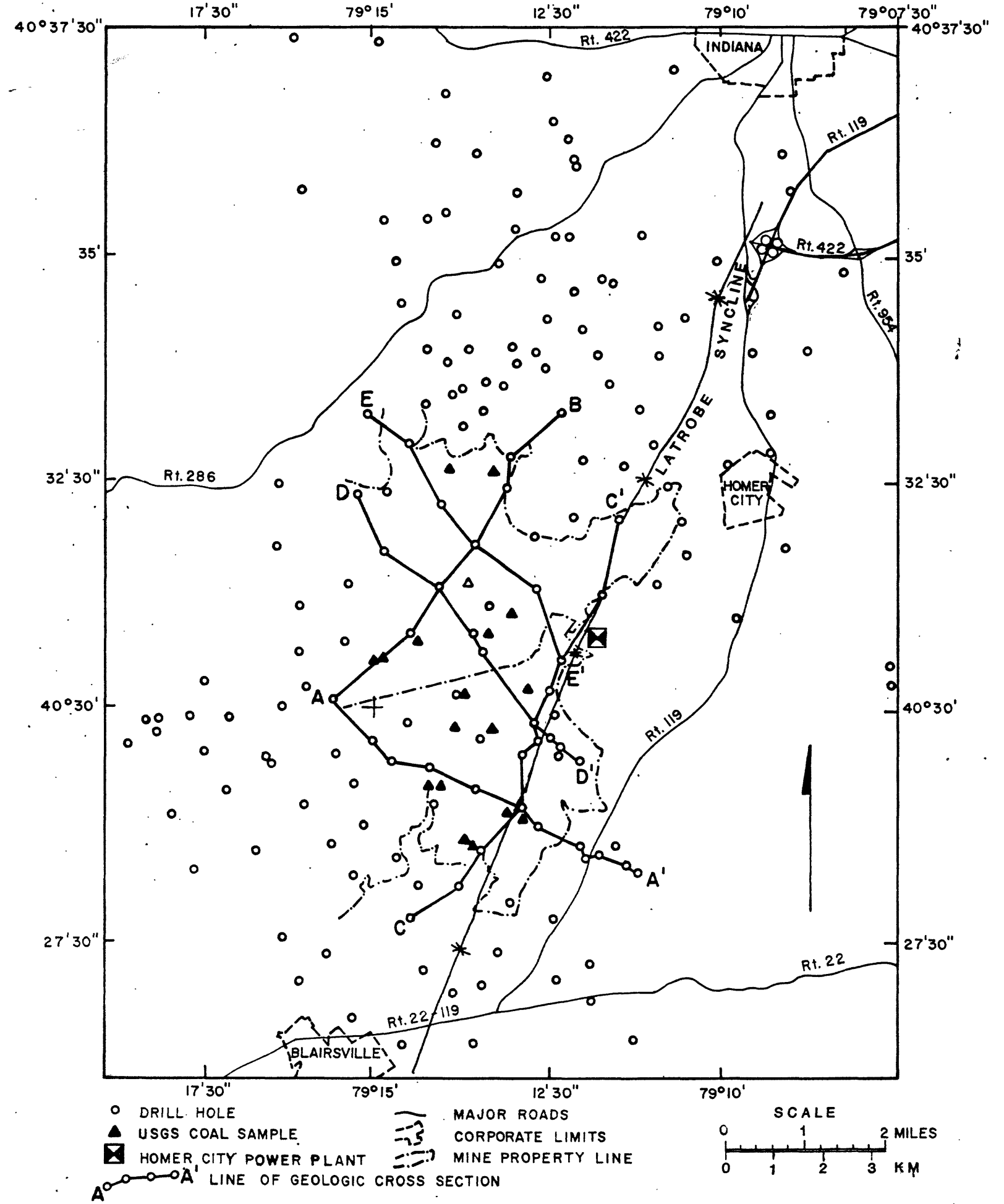

FIGURE 2 - LINES OF CROSS SECTIONS AND LOCATIONS OF DATA POINTS