



Mapped, edited, and published by the Geological Survey  
 Control by USGS and USC&GS  
 Topography by photogrammetric methods from aerial photographs taken 1967. Field checked 1969.  
 Polyconic projection. 1927 North American datum.  
 10,000-foot grids based on Pennsylvania coordinate system, north and south zones.  
 1000-meter Universal Transverse Mercator grid ticks, zone 17, shown in blue.

Scale: 1:24,000  
 Contour Interval: 20 Feet  
 Datum: Mean Sea Level

ROAD CLASSIFICATION  
 Primary highway, hard surface: Light duty road, hard or improved surface  
 Secondary highway, hard surface: Unimproved road  
 Interstate Route: U.S. Route: State Route

NEW BETHLEHEM, PA.  
 SE 1/4 CLARION 15' QUADRANGLE  
 N4100-W7915/7.5  
 1969

### LANDSLIDES AND RELATED FEATURES

OF THE NEW BETHLEHEM, PA. QUADRANGLE

by John S. Pomeroy 1981  
 U.S. Geological Survey  
 OPEN FILE MAP 81-238 A-G

NOTE  
 General guide to ground conditions as of the date of field check. Additional landslides and rockfalls should be anticipated in all map units. The map unit depicts the dominant condition in the area delineated and variations in slope stability may occur at any point in the unit. This map is suitable for general planning purposes and as a supplement to more detailed studies for site selection. The map cannot be used as a substitute for detailed geologic and engineering investigations to establish design and construction criteria of specific sites. Some symbols may not appear on this map because the description is applicable to a series of maps.

MAN-MADE FEATURES  
 Strip mines (combination of letter symbols indicates complex formed of more than one type of strip mine)  
 sh bench with high wall  
 sf furrowed with high wall  
 sd multiple furrows and multiple benches  
 ss hilltop removed  
 srg reclaimed by grading  
 sru reclaimed by secondary use  
 sh/r regraded in part, high wall remains  
 Coal refuse banks  
 r identified on aerial photographs; not classified in field check  
 rb not burnt nor on fire  
 rbb burnt  
 rbd burning  
 rbs sludge  
 Quarries  
 q quarry site  
 qub spoil bank, quarry waste  
 Gravel pits  
 g site of gravel pit  
 Slides in man-made features  
 af earth flow in fill  
 a/s earth flow in strip castings  
 a/r earth flow in coal refuse

ACTIVE OR RECENTLY ACTIVE LANDSLIDE  
 Complex landslide composed of earthflow, debris slide, earth and rock slump. Identified from historical records, and from scars, debris and other field evidence. Ground extremely unstable; sliding accelerated by excavation, loading and changes in drainage conditions. May include areas with several active slides too small to be shown separately. Questioned where doubtful. May be shown with symbol (A) where difficult to discern.

OLD LANDSLIDE  
 Area of extensive hummocky ground caused by earthflow and earth and rock slump. Lacks clear evidence of active sliding. Relatively stable in natural, undisturbed state, generally not affected by small structures properly sited in areas away from the edge of the toe; can be reactivated by extensive, rapid excavation, loading, and changes in ground water and surface water conditions. Area of old landslide probably includes recent ones not identified from field evidence or otherwise documented. Upslope boundary of landslide generally defined by modified scarp, but downslope (toe) may be gradational and not well defined. Questioned where doubtful.

COLLUVIAL SLOPE  
 Valley wall along major streams with slope as steep as 40° (85%); stony, clayey silt soil up to 50 ft. (15 m) thick; commonly buttressed by a terrace or bench at the toe of the slope; very susceptible to sliding by cutting of toe area, removal of terrace or bench, and overloading; slide commonly activated without apparent cause.

AREAS SUSCEPTIBLE TO DEBRIS FLOWS AND DEBRIS AVALANCHES  
 Primarily shallow, narrow ravines and chutes with accumulation of stony colluvium generally 10 ft. (3 m) or less in thickness; susceptible to rapid movement during intense rainfall. Most ravines and chutes designated show evidence of former debris flows and avalanches. Symbol (A) designates historical debris flow or debris avalanche.

AREAS SUSCEPTIBLE TO ROCKFALL  
 Steep, locally vertical, natural and man-made slopes and cliffs, 15 ft. (4.5 m) or more high; formed dominantly of sandstone, limestone, sandy shale, mudstone and claystone. Interbedded mudstone, claystone and shale weather rapidly leaving sandstone and limestone rock faces unsupported.

SOIL AND ROCK SUSCEPTIBLE TO LANDSLIDING  
 Soil and rock similar to that involved in landslides elsewhere in map area; primarily areas underlain by claystone, mudstone and shale associated with other rock types. Rock weathers rapidly on exposure forming clayey soil highly susceptible to sliding. Includes coves (U-shaped, shallow valleys) containing thick layers of clayey soil that are very susceptible to sliding where excavation breaks continuity of slope and where overladen by artificial fill.

AREAS LEAST PRONE TO LANDSLIDES  
 Map areas in which no patterns or symbols are shown; primarily valley floors, ridge tops and broad benches; modification by excavation and fill may lead to local landslides.  
 Includes slopes where landslides are sparse.

The first five digits of the open file number designate the specific 1:250,000 scale map sheet of which this quadrangle is a part. The last two digits designate the position of the quadrangle in a subdivision of the 1:250,000 scale map based on rows and tiers shown in the diagram to the right. The location of this quadrangle is shown by the black square.

WARREN 1° X 2° SHEET  
 80° 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 78°  
 G  
 F  
 E  
 D  
 C  
 B  
 A  
 Quadrangle does not contain landslides or related features.