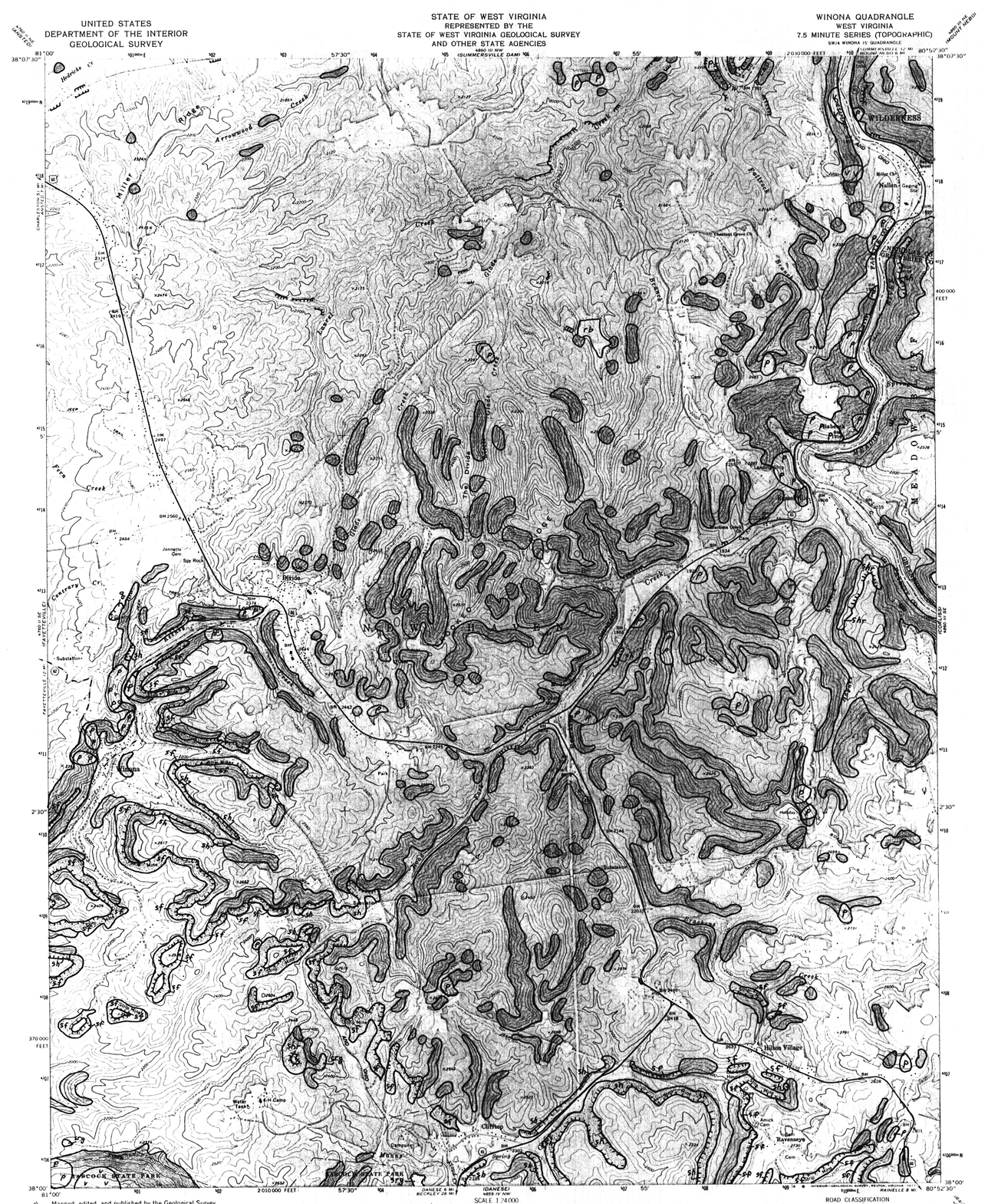
UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

STATE OF WEST VIRGINIA
REPRESENTED BY THE
STATE OF WEST VIRGINIA GEOLOGICAL SURVEY
AND OTHER STATE AGENCIES

WINONA QUADRANGLE
WEST VIRGINIA
7.5 MINUTE SERIES (TOPOGRAPHIC)



Mapped, edited, and published by the Geological Survey

Control by USGS and USC&GS

Topography by photogrammetric methods from aerial photographs taken 1960. Field checked 1969

Polyconic projection. 1927 North American datum
10,000 foot grid based on West Virginia coordinate system, south zone
1000-meter Universal Transverse Mercator grid ticks, shown in blue

SCALE 1:24 000

CONTOUR INTERVAL 40 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

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

UTM GRID AND 1976 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

QUADRANGLE LOCATION

WINONA, W. VA.
SW/4 WINONA 15' QUADRANGLE
N3800—W8052.5/7.5

LANDSLIDES AND RELATED FEATURES

OF THE WINONA, W.VA. QUADRANGLE

by

GREGORY C. OHLMACHER

U.S. Geological Survey

OPEN FILE MAP 83-80 (A-9)

Landslides and related features interpreted from aerial photographs:
1:60,000 SCALE BLACK AND WHITE 1960
1:125,000 SCALE COLOR INFRARED 1973
1:80,000 SCALE BLACK AND WHITE 1976

Photointerpretation and field check 1981. This map has not been edited or reviewed for conformity with Geological Survey standards and nomenclature.

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 fresh 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.

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.

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 overloaded 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.

NOTE
Information shown is intended as a general guide to ground conditions as of the date of field check. Additional landslides and rocktalls 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.

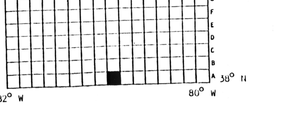
MAN-MADE FEATURES
Strip mines (combination of letter symbols indicates complex formed or more than one type of strip mine)
- sh — bench with high wall
- sf — furrowed with high wall
- sd — multiple furrows and multiple benches
- ss — hilltop removed
- srg — reclaimed by grading
- sru — reclaimed by secondary use
- shr — 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

Gravel pits
- g — site of gravel pit

Slides in man-made features
- af — earth flow in fill
- as — earth flow in strip castings
- ar — earth flow in coal refuse

The first **four** 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.

CHARLESTON 1° × 2° MAP SHEET