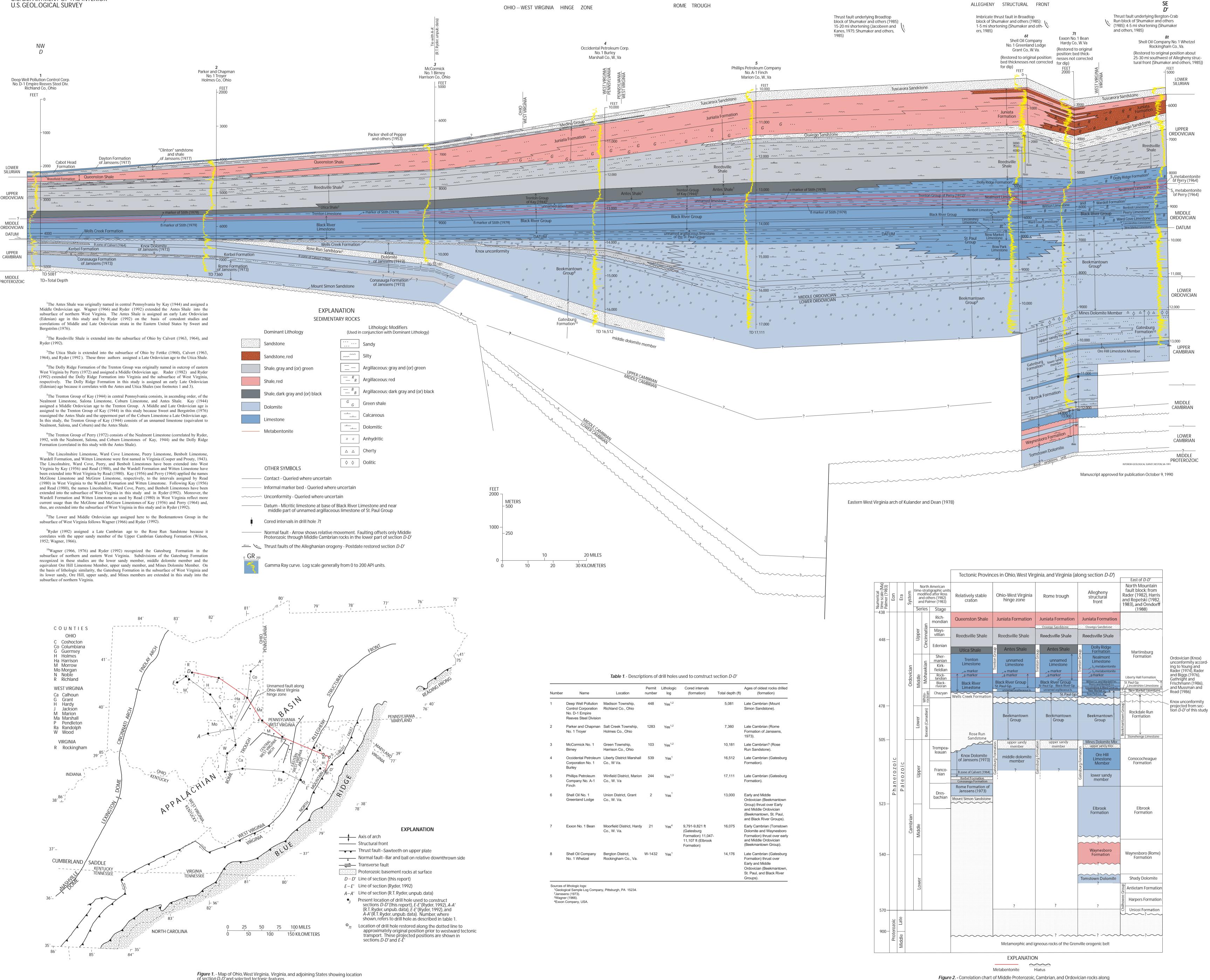
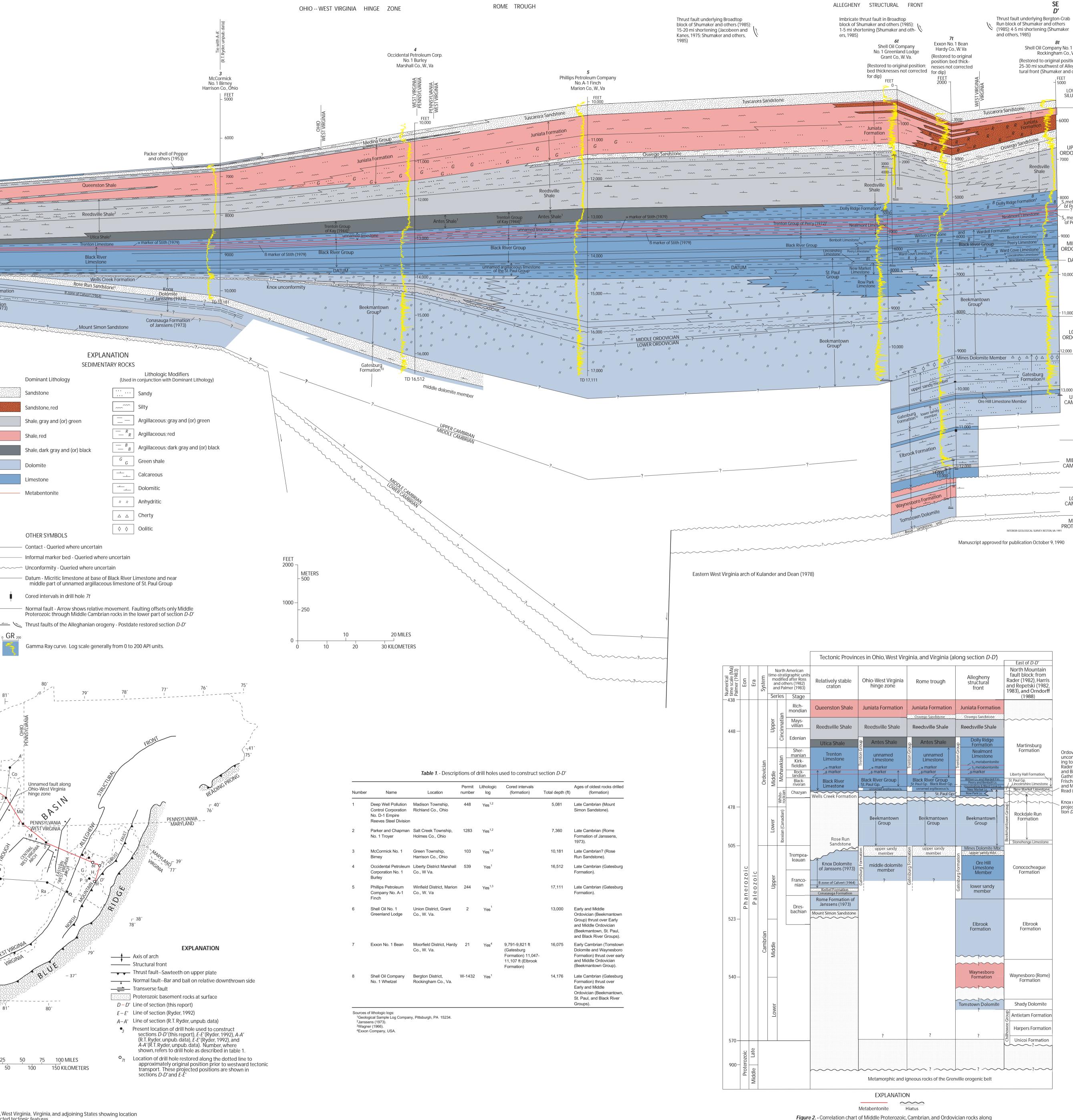
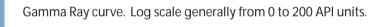
# U.S. DEPARTMENT OF THE INTERIOR

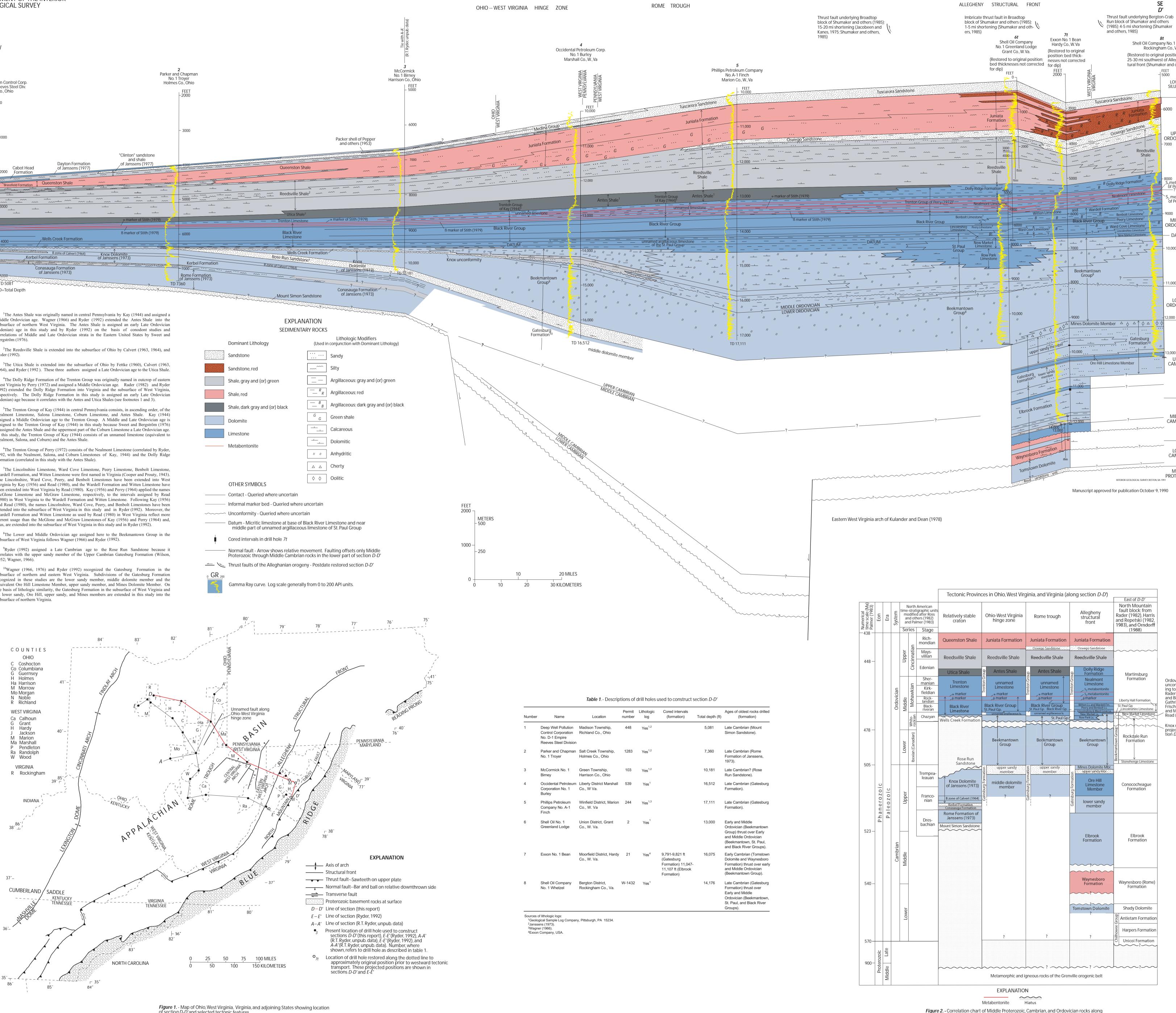




MIDDH PROTEROZOIC







of section D-D'and selected tectonic features.

STRATIGRAPHIC FRAMEWORK OF CAMBRIAN AND ORDOVICIAN ROCKS IN THE CENTRAL APPALACHIAN BASIN FROM RICHLAND COUNTY, OHIO, TO ROCKINGHAM COUNTY, VIRGINIA

> Robert T. Ryder 1991 Revised and Digitized By Robert D. Crangle, Jr. 2002

section *D-D* and in the adjoining North Mountain fault block of northern Virginia.

# DISCUSSION

## INTRODUCTION

Cross section *D*-*D*' featured in this map is the second in a series of restored stratigraphic cross sections drawn by the author to show the stratigraphic framework of Cambrian and Ordovician rocks across the Appalachian basin from Pennsylvania to Tennessee. A second reason for drawing these cross sections is to better define the structure of the block-faulted Proterozoic basement rocks in the Appalachian basin. The first cross section in the series, section E-E' (Ryder, 1992), is situated 10 to 90 mi (16-144 km) south of section D-D' (see fig. 1). Section D-D' is about 215 mi (344 km) long, and eight drill holes, 10 to 52 mi (16-83 km) apart and 5,081 to 17,111 ft (1,549 5,215 m) deep, constitute the control (see fig. 1 and table 1). None of the eight drill holes bottomed in crystalline basement rocks of Proterozoic age. Drill holes 6, 7, and 8, located at or east of the Allegheny structural front, were restored from 5 to 30 mi (8-48 km) southeastward (fig. 1) to account for tectonic transport along underlying thrust faults (Jacobeen and Kanes, 1975; Shumaker

### BASEMENT STRUCTURE

and others, 1985).

78, 80, 82, 84,

97-116.

A18.

Details of the block-faulted Proterozoic basement rocks underlying cross section D-D' are only beginning to be understood. The basement-involved normal faults and adjoining fault blocks shown on section D-D' are projected northward from cross section E-E' (fig. 1) where basement structure was interpreted from drill holes that bottomed in Proterozoic basement rocks (Cardwell, 1977) and from magnetic data (King and Zietz, 1978; Kulander and Dean, 1978). Because the basement faults underlying section D-D' are conjectural, they are shown as 25- to 75-mi- (40- to 120-km-) long, incomplete segments on figure 1. From northwest to southeast, section D-D' is interpreted here to cross the following basement-involved structures: (1) the relatively stable craton in eastern Ohio, (2) the Ohio-West Virginia hinge line, (3) the Rome trough, an extensive graben system first identified by Woodward (1961) and McGuire and Howell (1963), and (4) the Eastern West Virginia arch of Kulander and Dean (1978) (see fig. 1). Moreover, the northern end of the Central West Virginia arch (horst) of Kulander and Dean (1978) is interpreted here to terminate within several miles of section D-D'.

METHODOLOGY AND STRATIGRAPHIC NOMENCLATURE

Stratigraphic correlations between drill holes are based primarily on geophysical logs whereas lithofacies patterns between drill holes are based primarily on lithologic logs described by the Geological Sample Log Company (Pittsburgh, Pa.). Section D-D' has been restored to a horizonta datum located in the middle of the Middle Ordovician unnamed argillaceous limestone of the St. Paul Group in West Virginia. At the western end of section D-D' in Richland County, Ohio, the datum is located at the base of the Middle Ordovician Black River Limestone or, using local oil industry terminology, the base of the Gull River Formation. Most of the stratigraphic nomenclature used in section D-D' follows the nomenclature used by Ryder (1992) in section E-E' (fig. 1). Existing nomenclature is preferred but in certain places modifications and additions are recommended. The following stratigraphic investigations of the Cambrian and (or) Ordovician System(s) were particularly applicable to this investigation: (1 Calvert (1962, 1963, 1965), Janssens (1973), Stith (1979), and Wickstrom and Gray (1988) in Ohio and (2) Wagner (1966, 1976) in West Virginia. The correlation chart (fig. 2) shows the specific time-stratigraphic position of the units identified in selected tectonic provinces along section D-L and summarizes the nomenclature assigned to them. Moreover, for comparison, this chart shows the nomenclature and time-stratigraphic position of Cambrian and Ordovician units in the adjoining North Mountain fault block in northern Virginia.

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