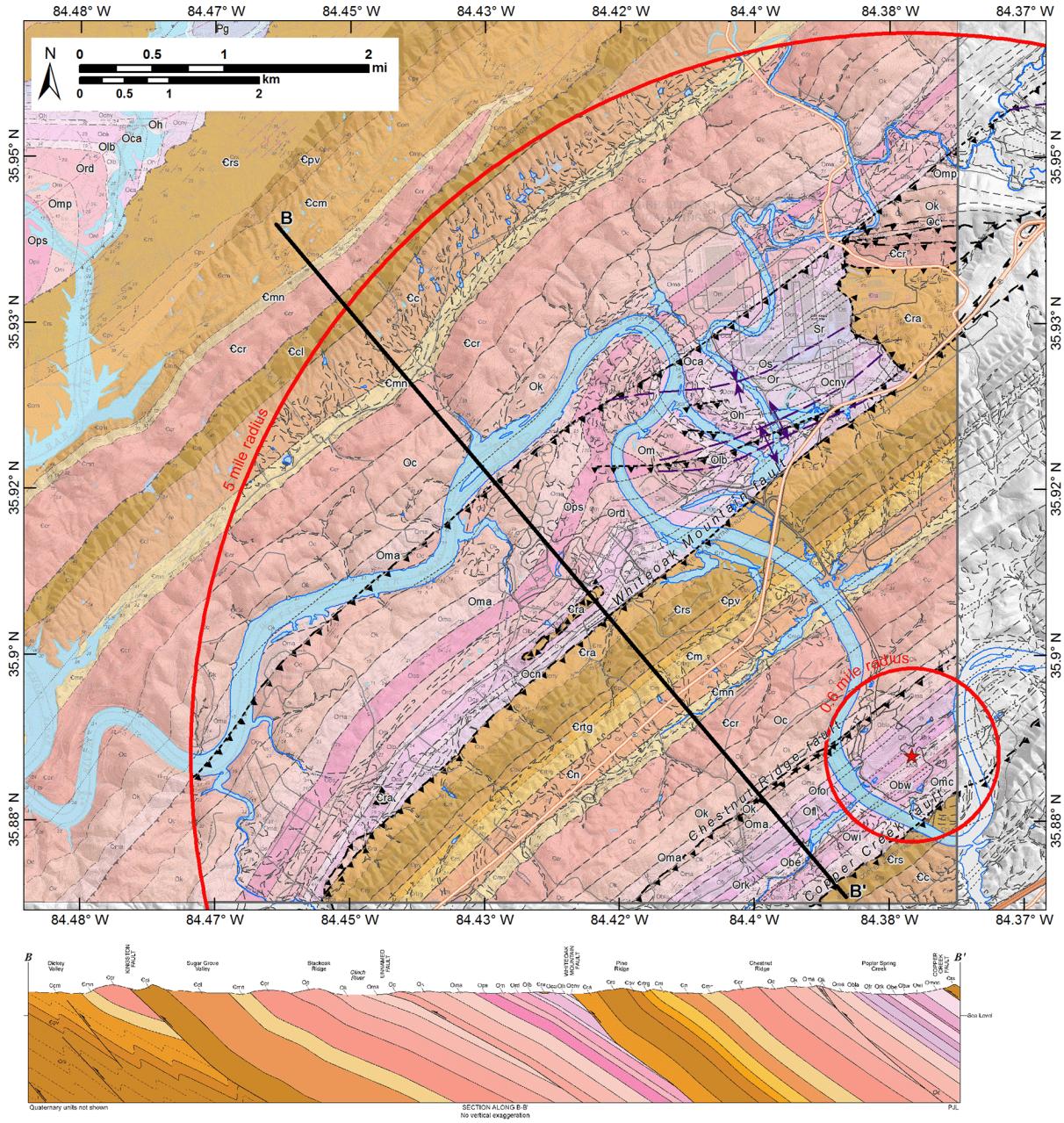
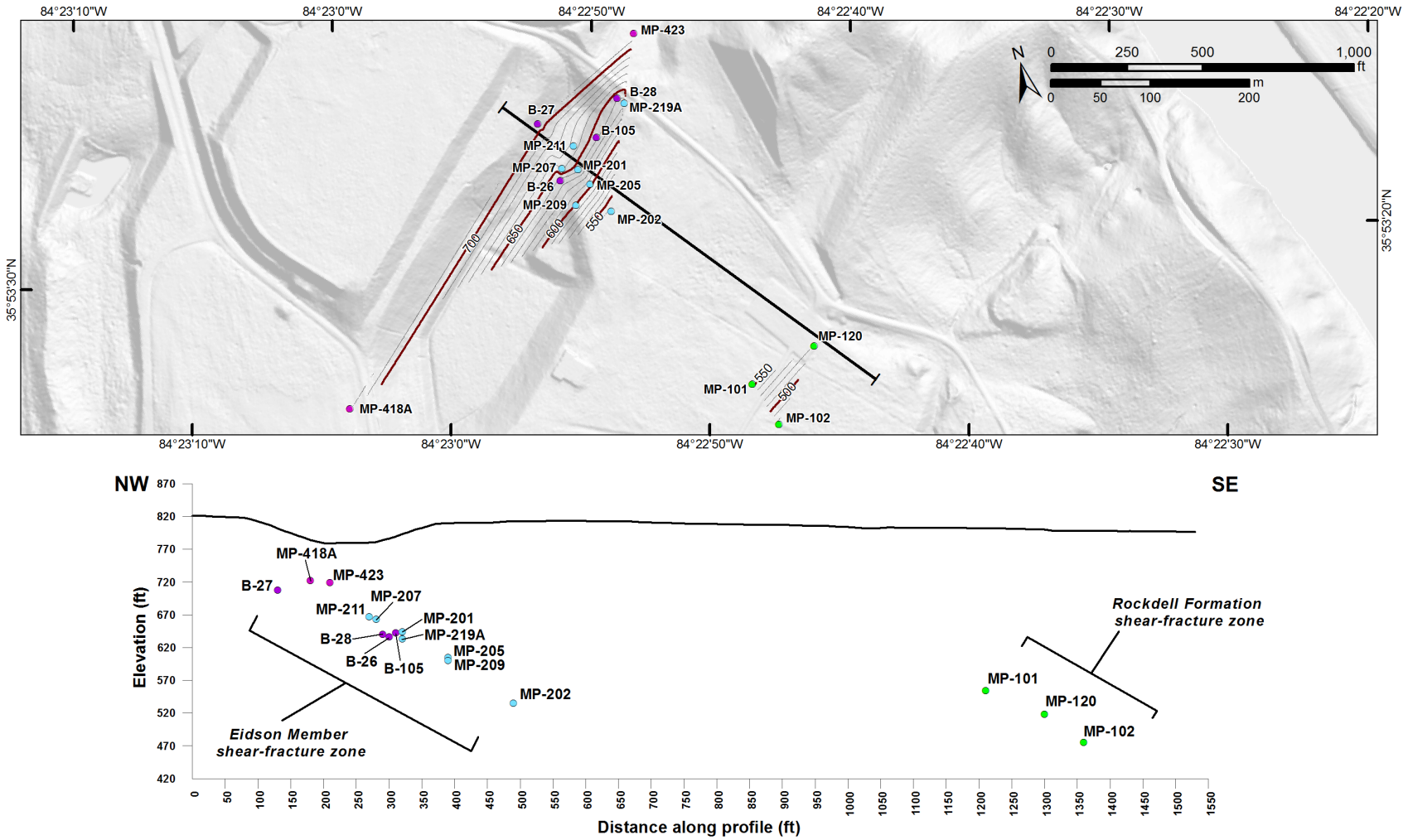


Source: Reference 2.5.1-282

Figure 2.5.1-64. Geologic Map and Cross Section B-B'



Notes:
See Table 2.5.1-17 for MP-Series boring data. B-series boring data from Reference 2.5.1-100.
Geometry of shear-fracture zones are shown on Figures 2.5.1-66 and 2.5.1-67.

Figure 2.5.1-65. (Sheet 1 of 2) Structure Contour Map of Shear Fracture Zones and Associated Profile

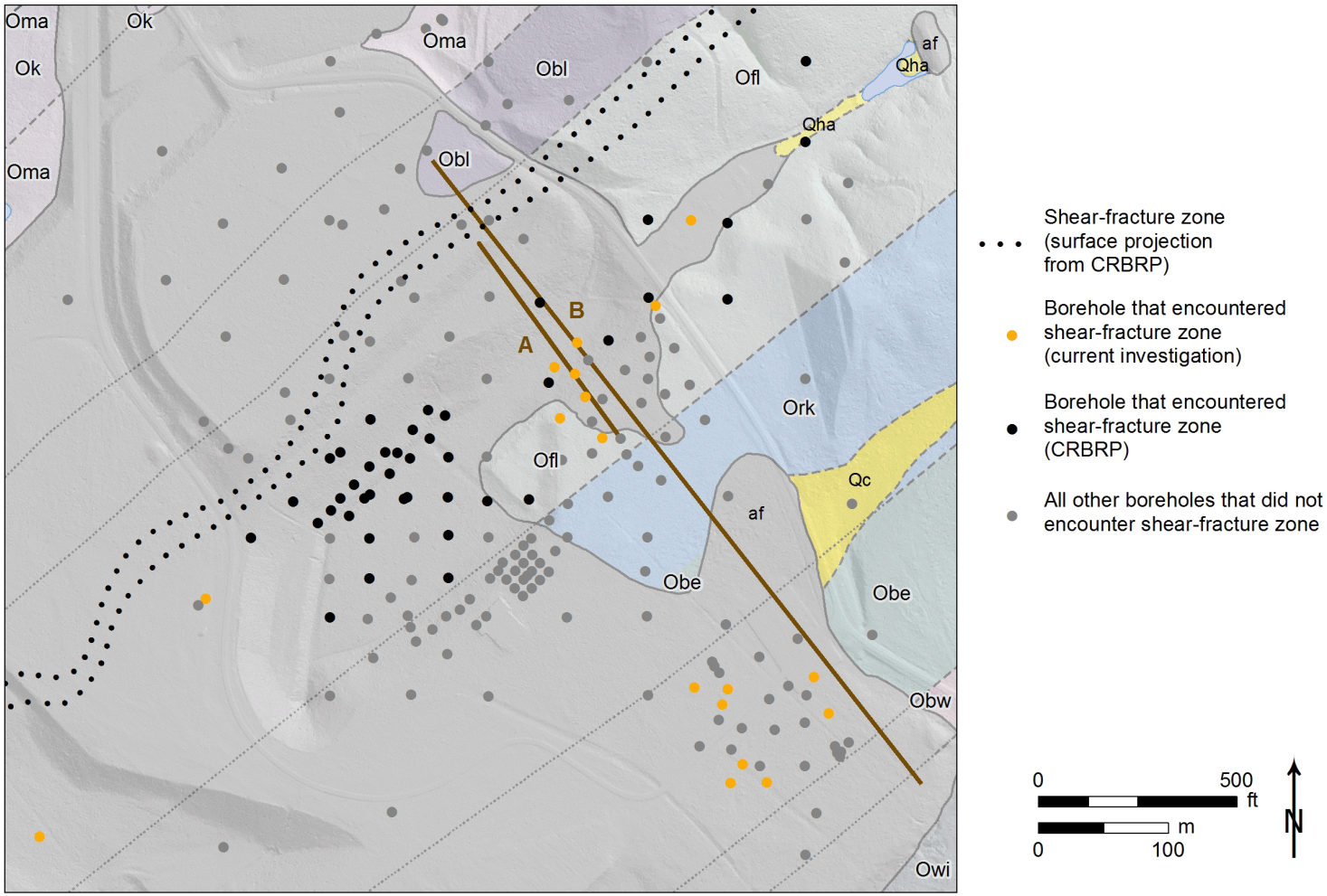


Figure 2.5.1-65. (Sheet 2 of 2) Map of Cross-Section Locations and Boreholes that Encountered Shear Fracture Zones

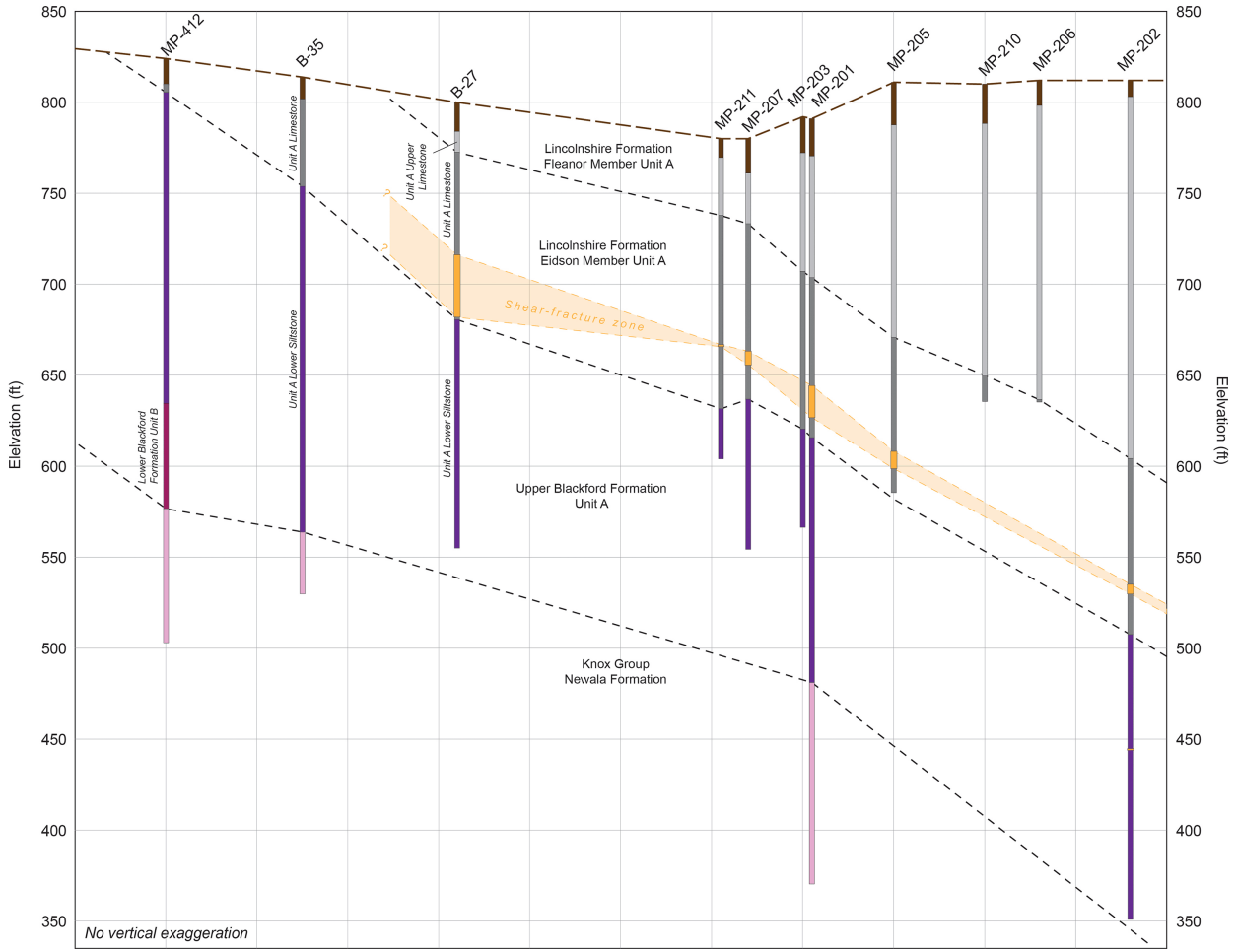


Figure 2.5.1-66. Cross-Section through the Shear-Fracture Zone within the Eidson Member of the Lincolnshire Formation (Cross Section Line A in Figure 2.5.1-65)

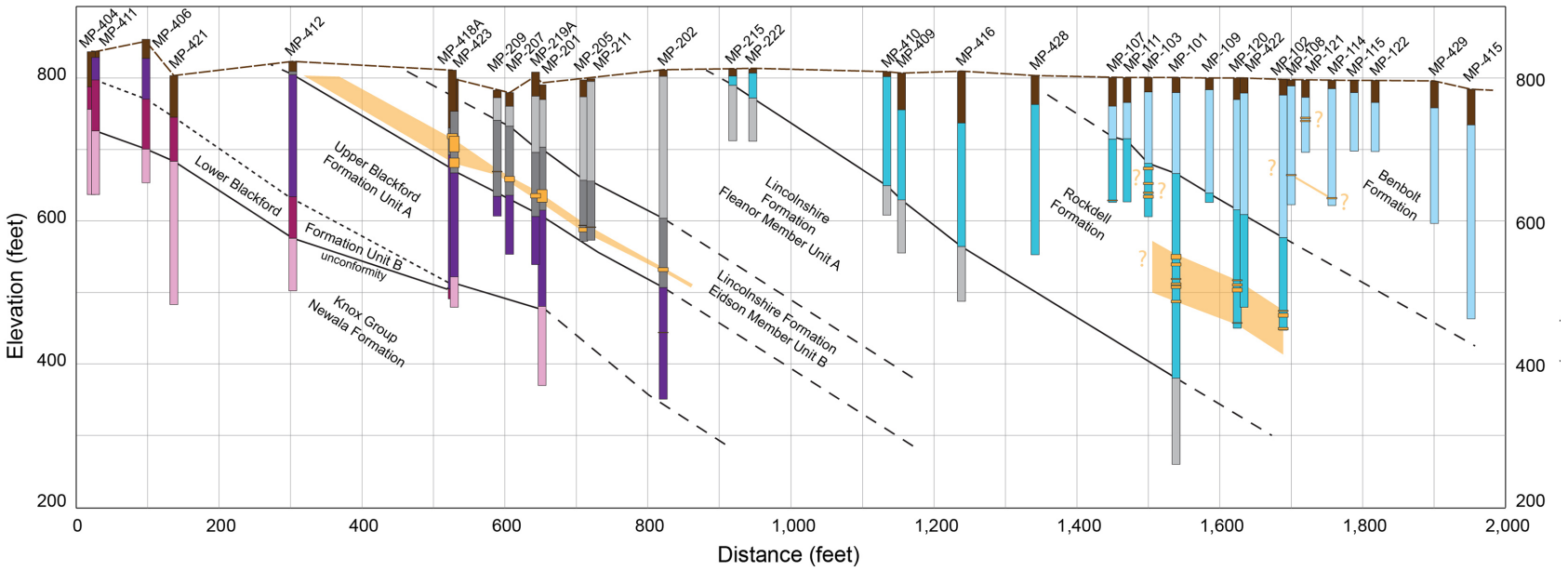


Figure 2.5.1-67. Cross-Section Through All Shear-Fracture Zone Features (Cross Section Line B in Figure 2.5.1-65)

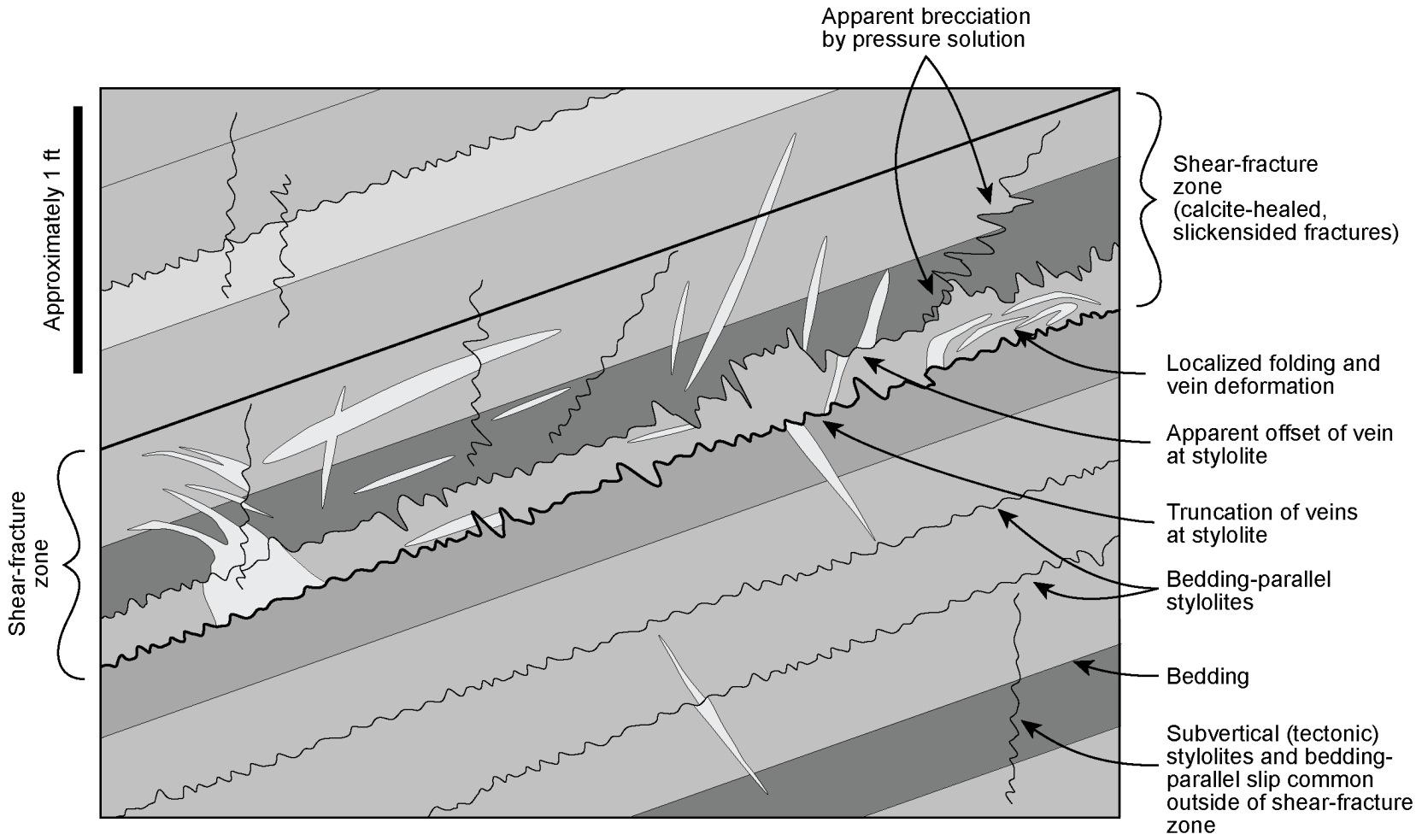
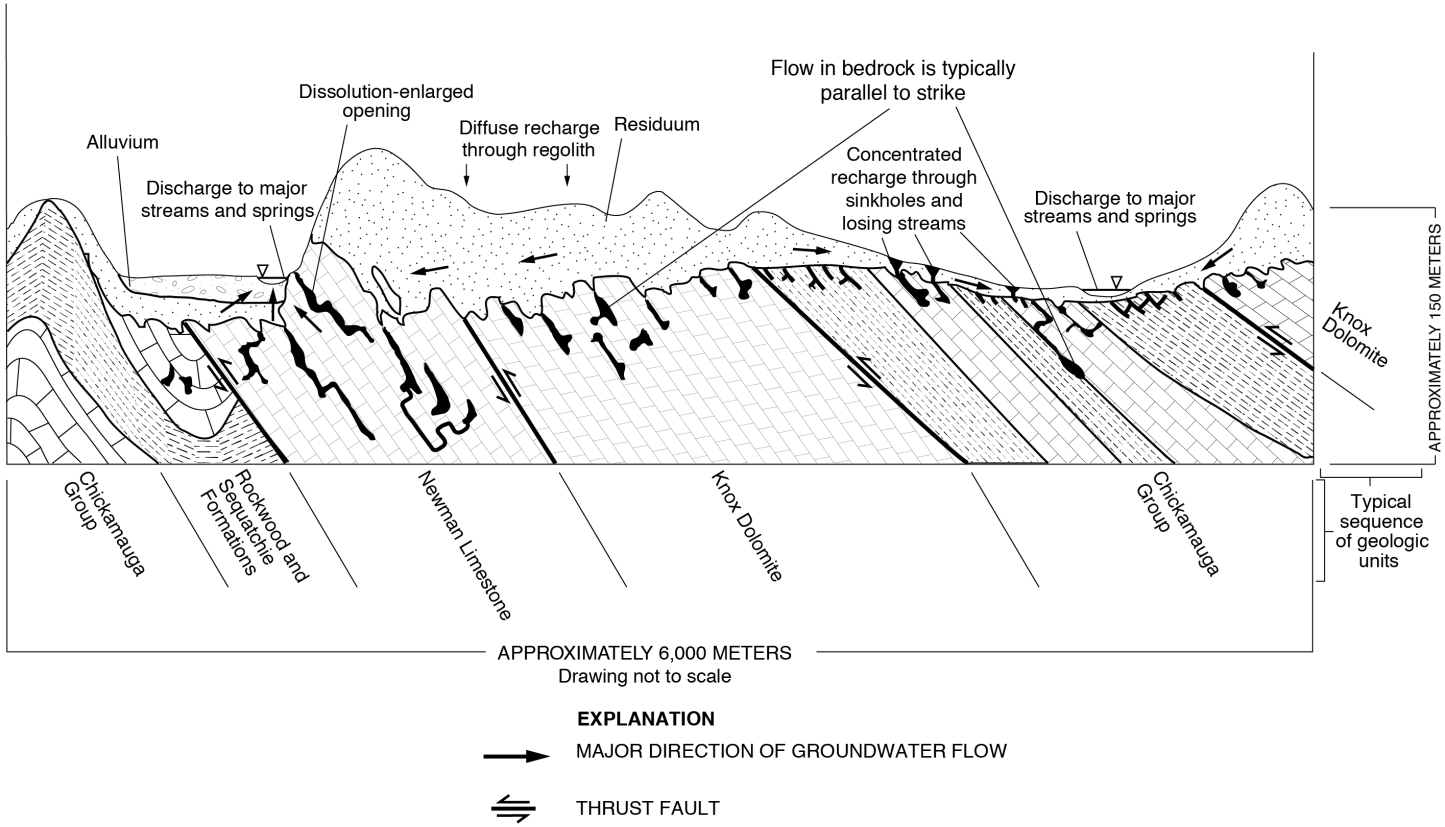
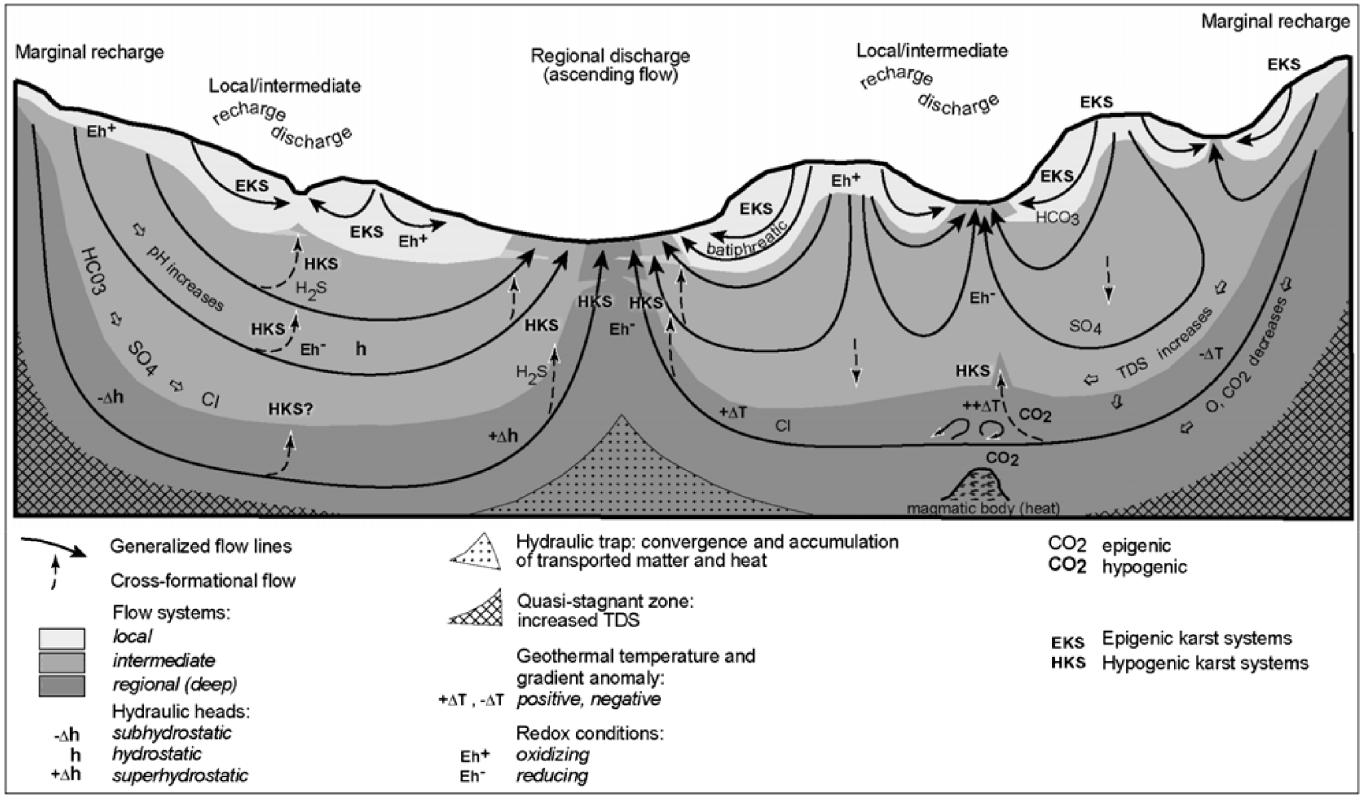


Figure 2.5.1-68. Schematic Diagram of the Crosscutting Relationships Between Bedding, Stylolites, and Shear-Fracture Zones



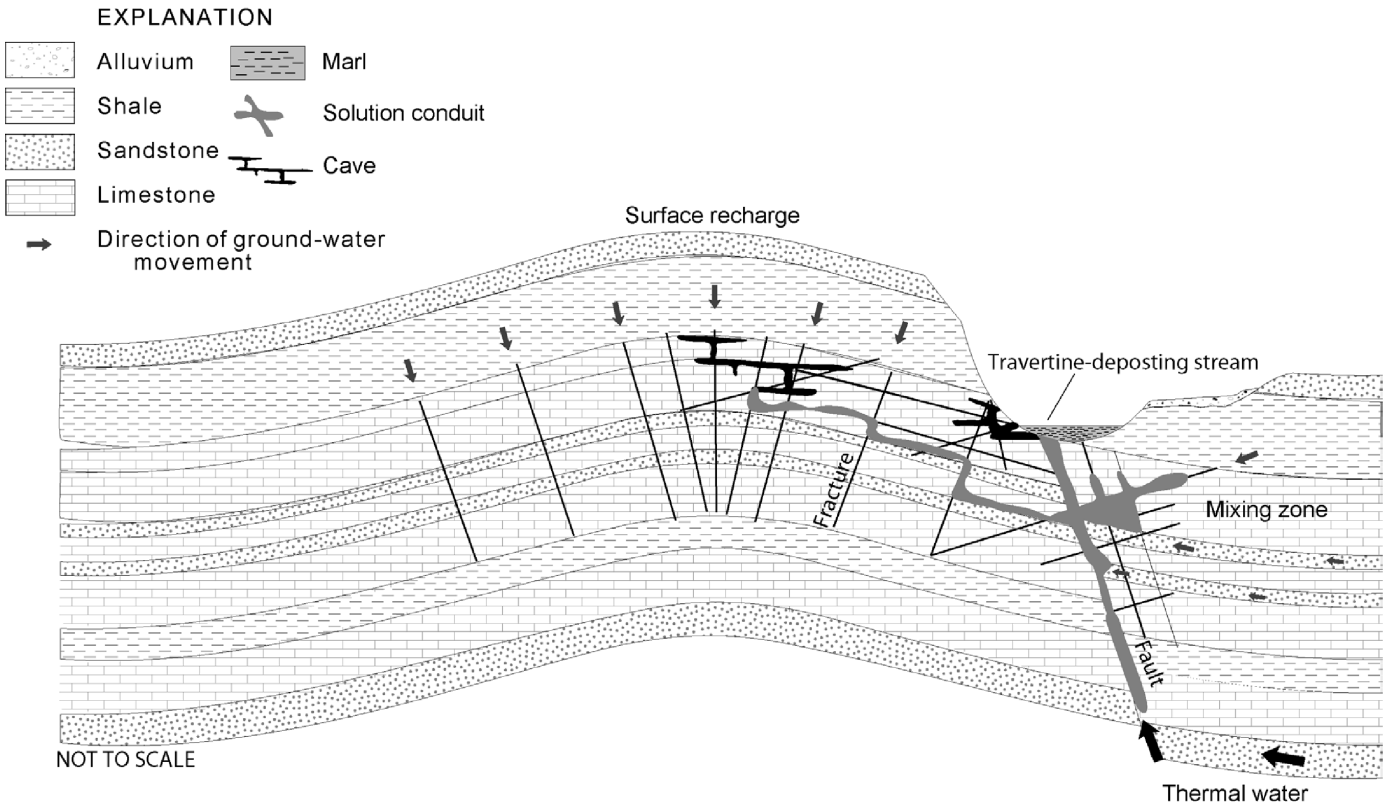
From Reference 2.5.1-292.

Figure 2.5.1-69. Karst Hydrogeologic Model for the Valley and Ridge Region, Tennessee



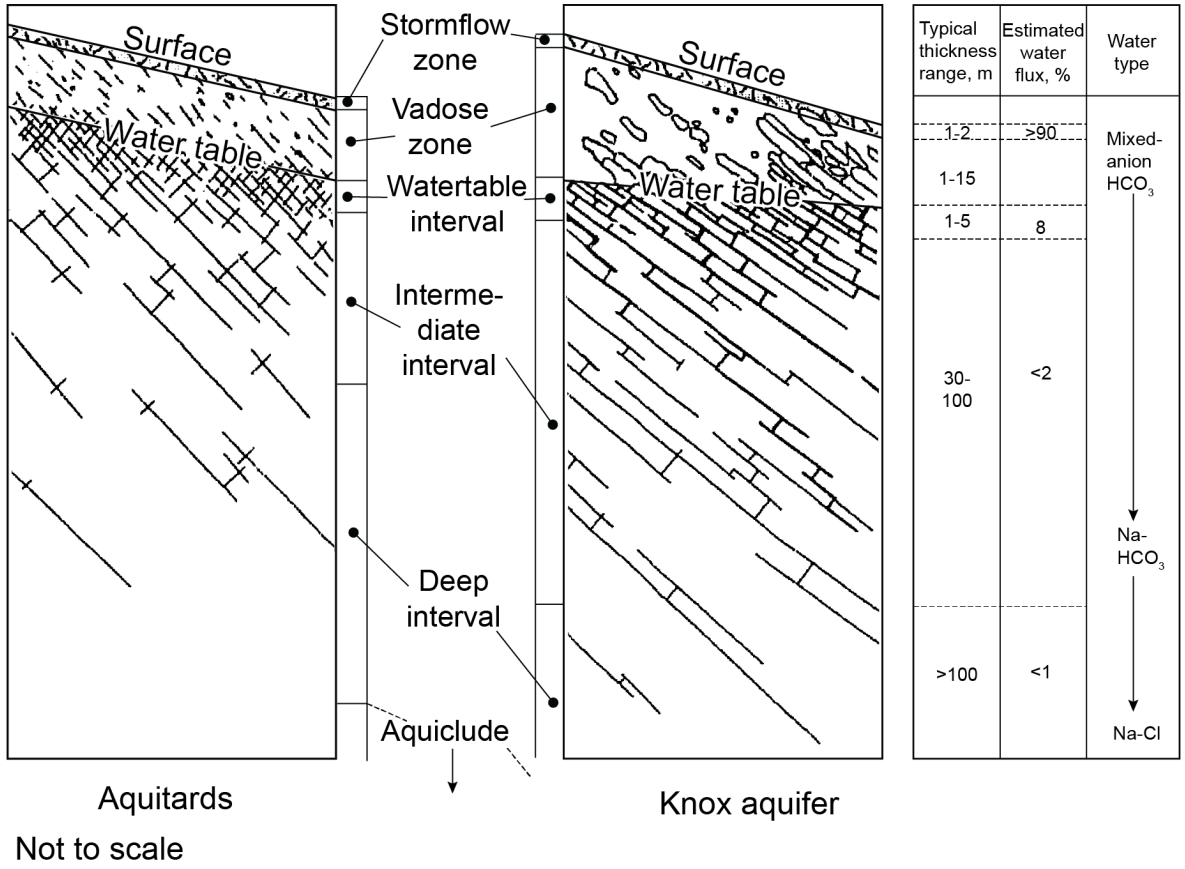
Epigenic and hypogenic karst in the context of basinal groundwater flow. The figure shows mainly gravity-driven flow in an idealized homogenous basin. In reality, most sedimentary sequences are highly heterogeneous, and gravity-driven flow interacts with other flow mechanisms. From Reference 2.5.1-289.

Figure 2.5.1-70. Epigenetic and Hypogenetic Karst in Basinal Groundwater Flow



Schematic illustration of isolated phreatic maze cave development within a mixing zone localized near to a fault. Rising water along the fault intersects the shallow karst aquifer, and creates cavernous porosity in the mixing zone. If rising fluids were initially hydrothermal, alteration of the bedrock along fractures may result in slightly more resistance to weathering, and result in a cave located within a hill on the land surface. From Reference 2.5.1-296.

Figure 2.5.1-71. Isolated Phreatic Maze Cave Development in an Anticline Near a Fault



Schematic vertical relationships of flow zones of the ORR, estimated thicknesses, water flow, and water types. From Hatcher et al. (Reference 2.5.1-9), Chapter 7

Figure 2.5.1-72. Schematic Vertical Relationships of Groundwater Flow Zones in the ORR

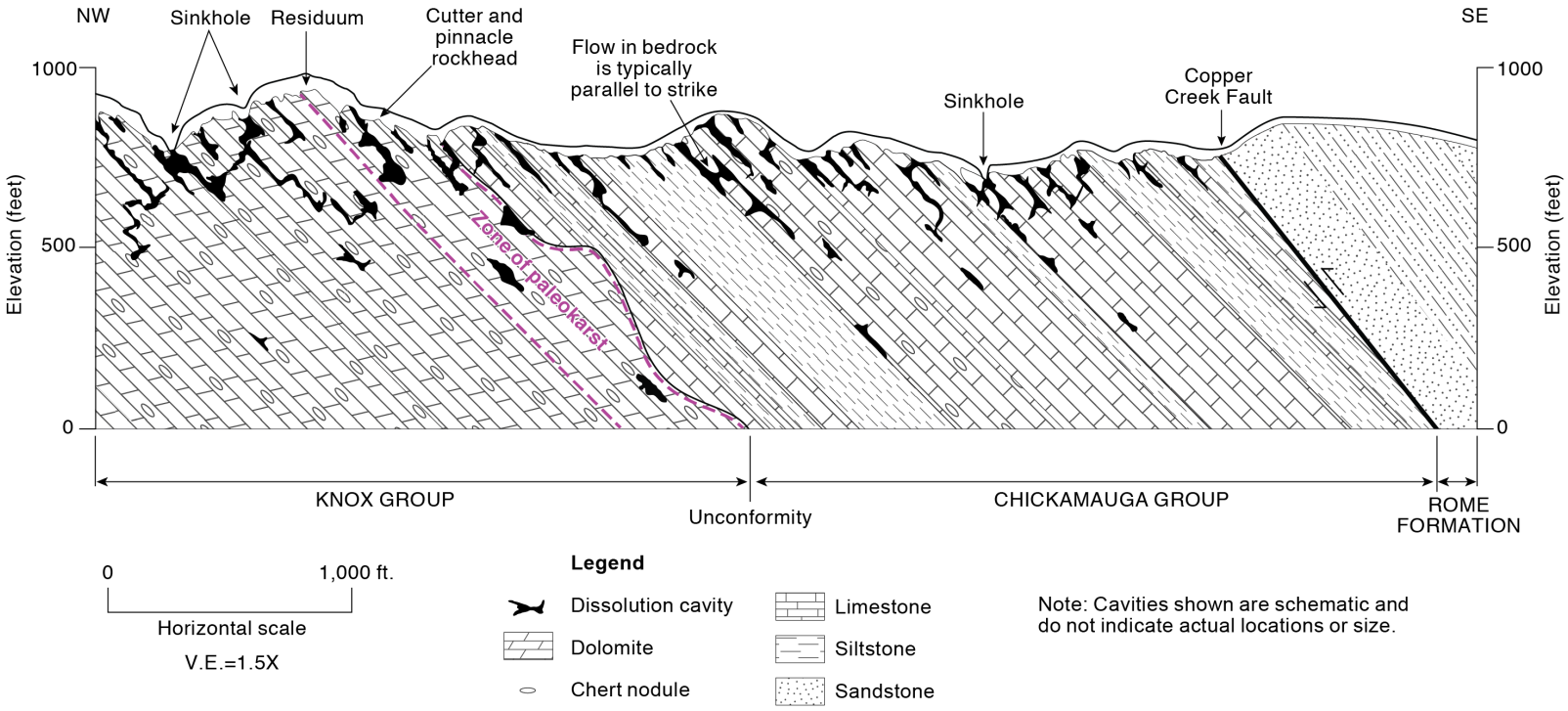
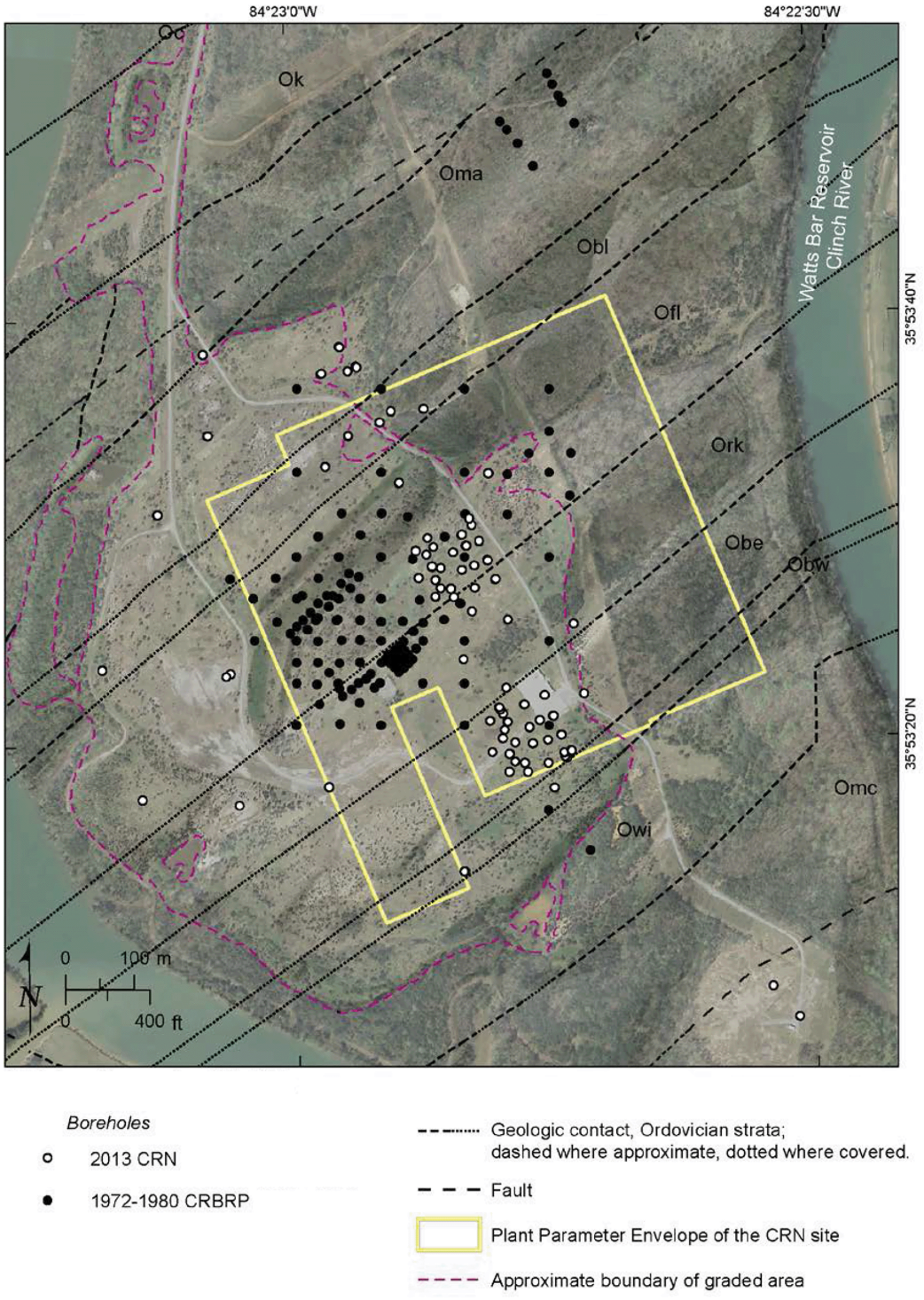
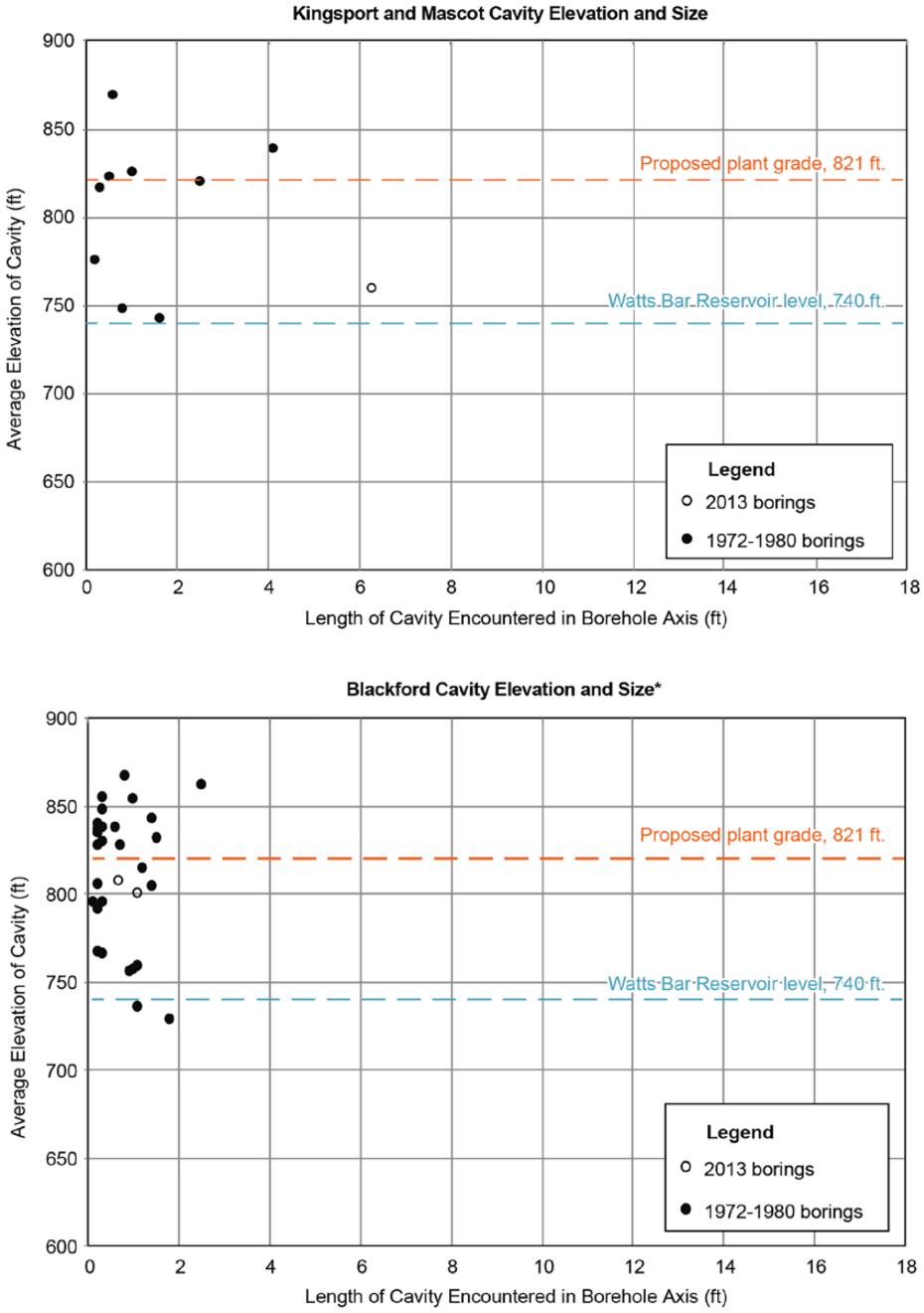


Figure 2.5.1-73. Karst Model of the CRN Site



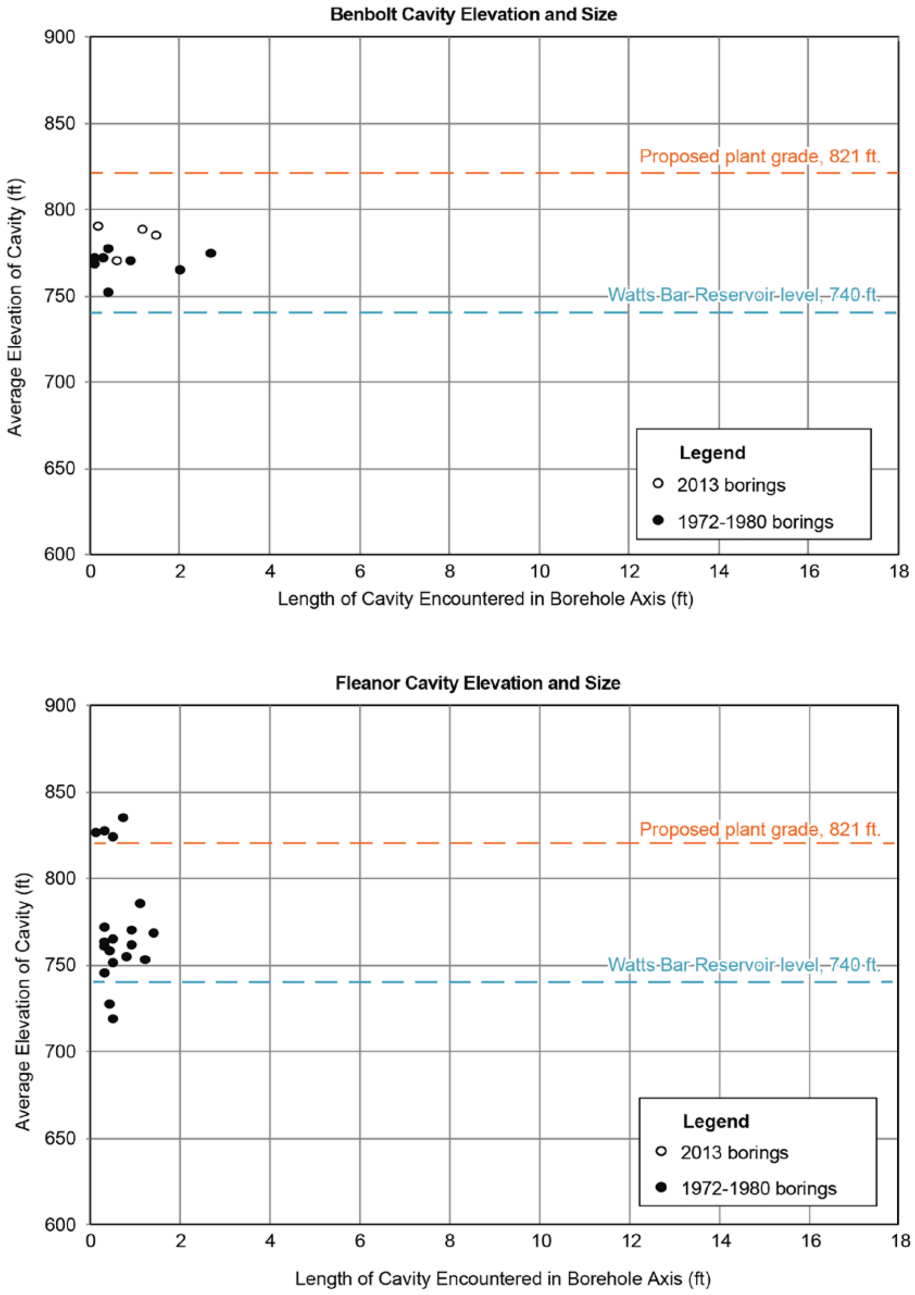
Note: See Figure 2.5.1-79 for explanation of geologic units
1972–1980 CRBRP borehole data from Reference 2.5.1-100

Figure 2.5.1-74. Borehole Plan for CRBRP and CRN Investigations



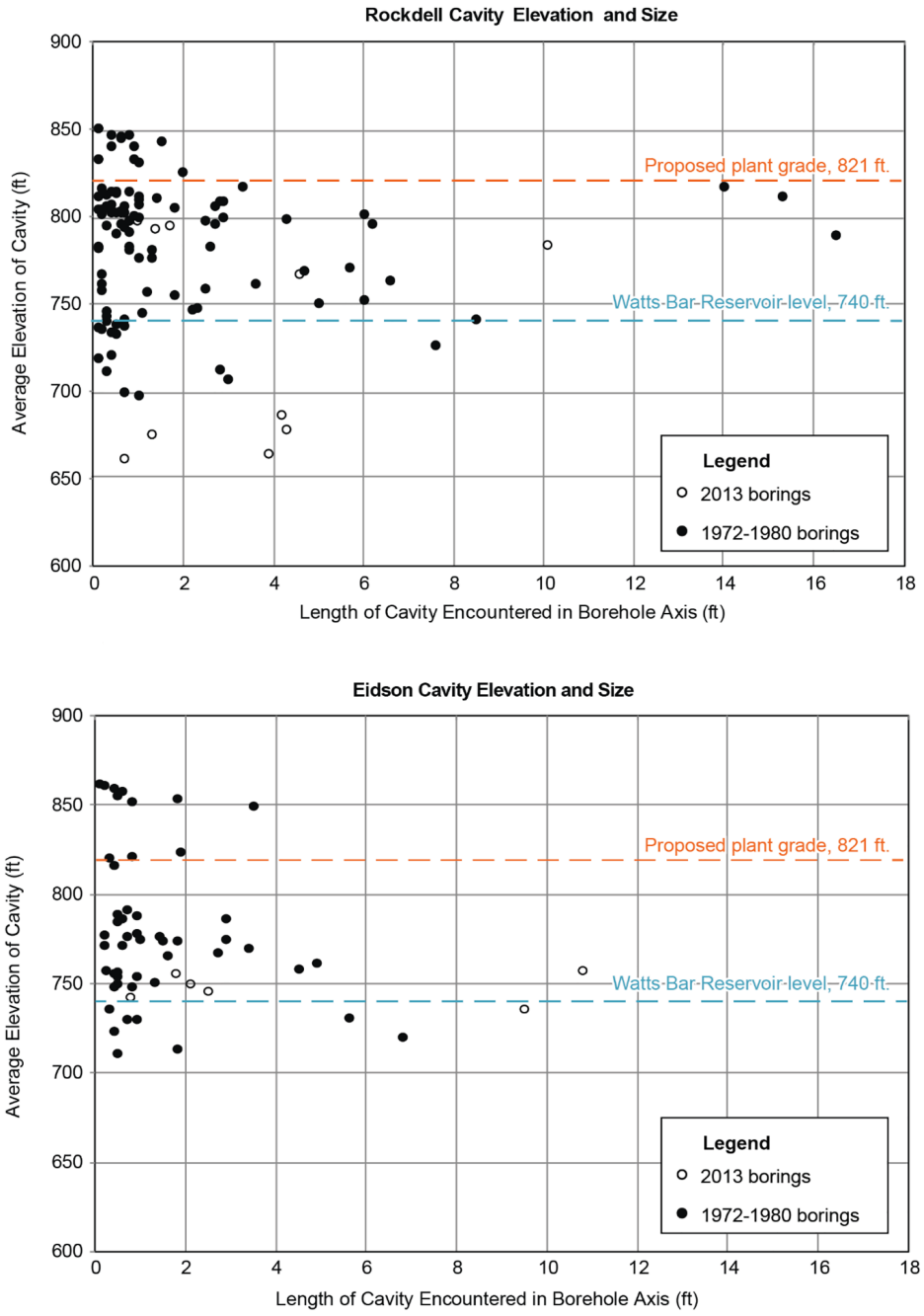
Note: Data from References 2.5.1-100 and 2.5.1-214
*Does not include the Eidson member.

Figure 2.5.1-75. Cavity Size and Elevation: Kingsport, Mascot, and Blackford Formations



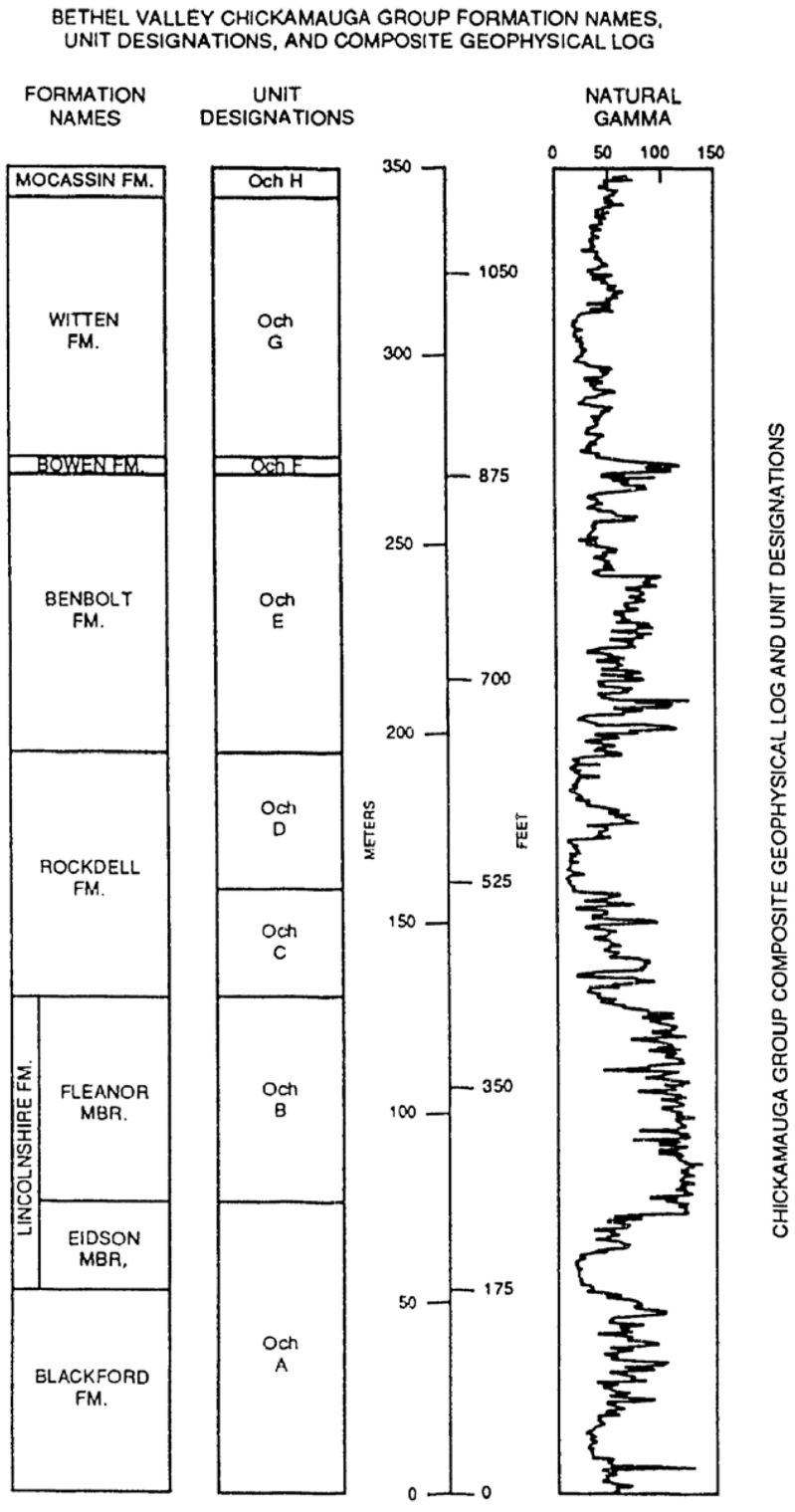
Note: Data from References 2.5.1-100 and 2.5.1-214

Figure 2.5.1-76. Cavity Size and Elevation: Benbolt Formation and Fleanor Member



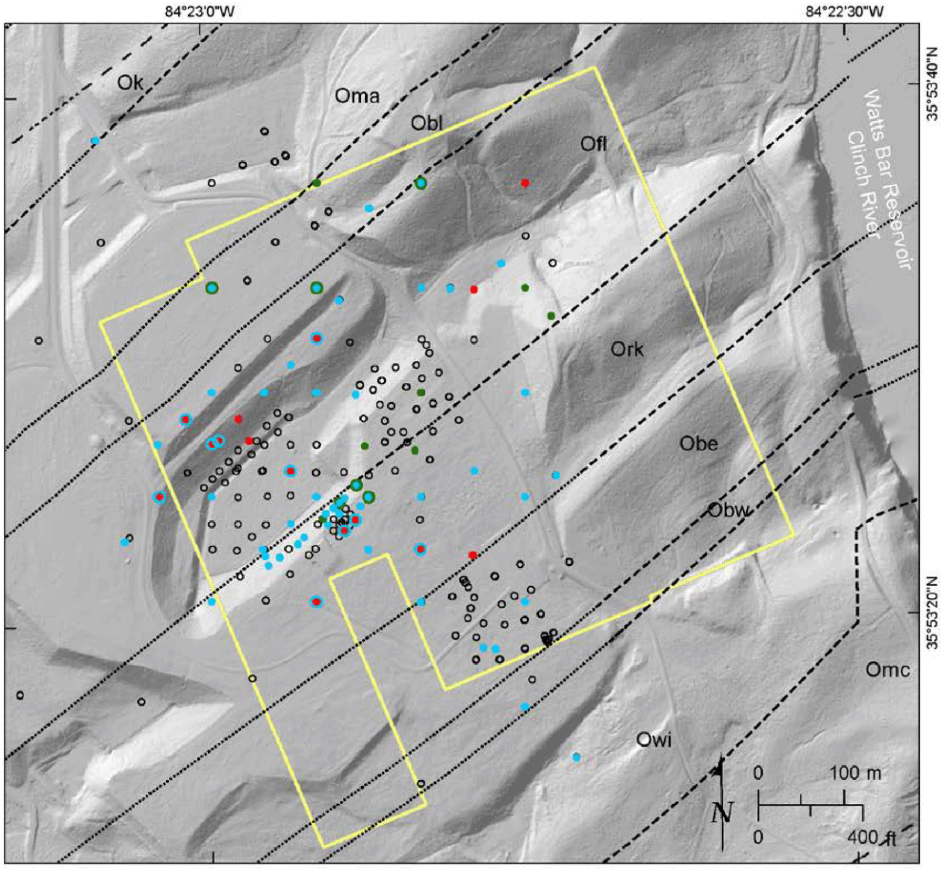
Note: Data from References 2.5.1-100 and 2.5.1-214

Figure 2.5.1-77. Cavity Size and Elevation: Rockdell Formation and Eidson Member



Note: From Reference 2.5.1-9

Figure 2.5.1-78. Chickamauga Group Stratigraphic Column



Geologic Units

Chickamauga Group

- Omc Moccasin Formation
- Owi Witten Formation
- Obw Bowen Formation
- Obe Benbolt Formation
- Ork Rockdell Formation
- Ofl Fleanor Shale (mbr. of the Lincolnshire Fm.)
- Obl Blackford Formation Eidson Member

Knox Group

- Oma Mascot Dolomite
- Ok Kingsport Formation
- Olv Longview Dolomite
- Oc Chepultepec Dolomite

Conasauga Group

- Cr Rome Formation

Boreholes (1972-2013)

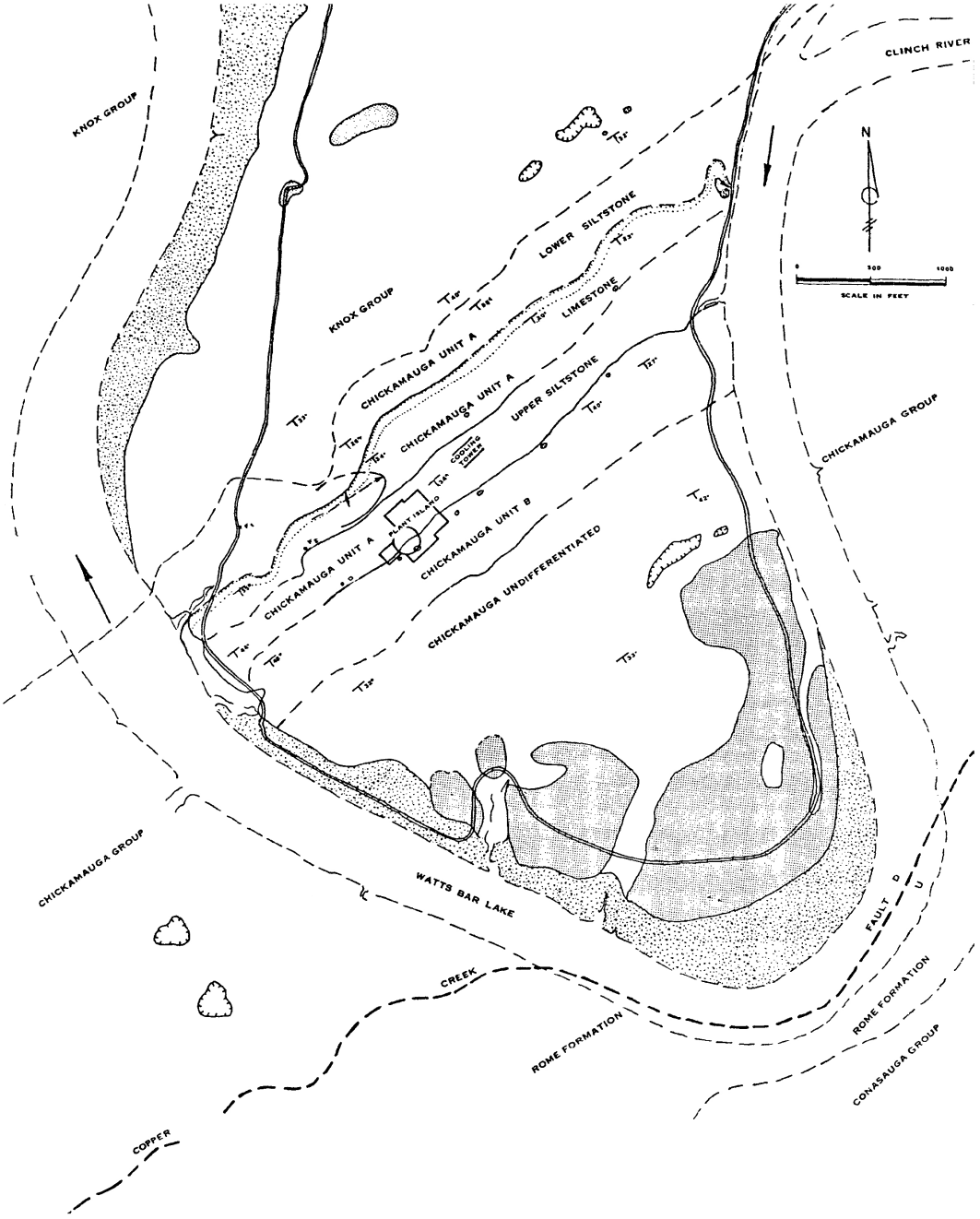
- Cavity present at 650-740 ft elevation
- Cavity present at 740-821 ft elevation
- Cavity present at >821 ft elevation
- No cavity

Geologic contact, Ordovician strata; dashed where approximate, dotted where covered.

Fault

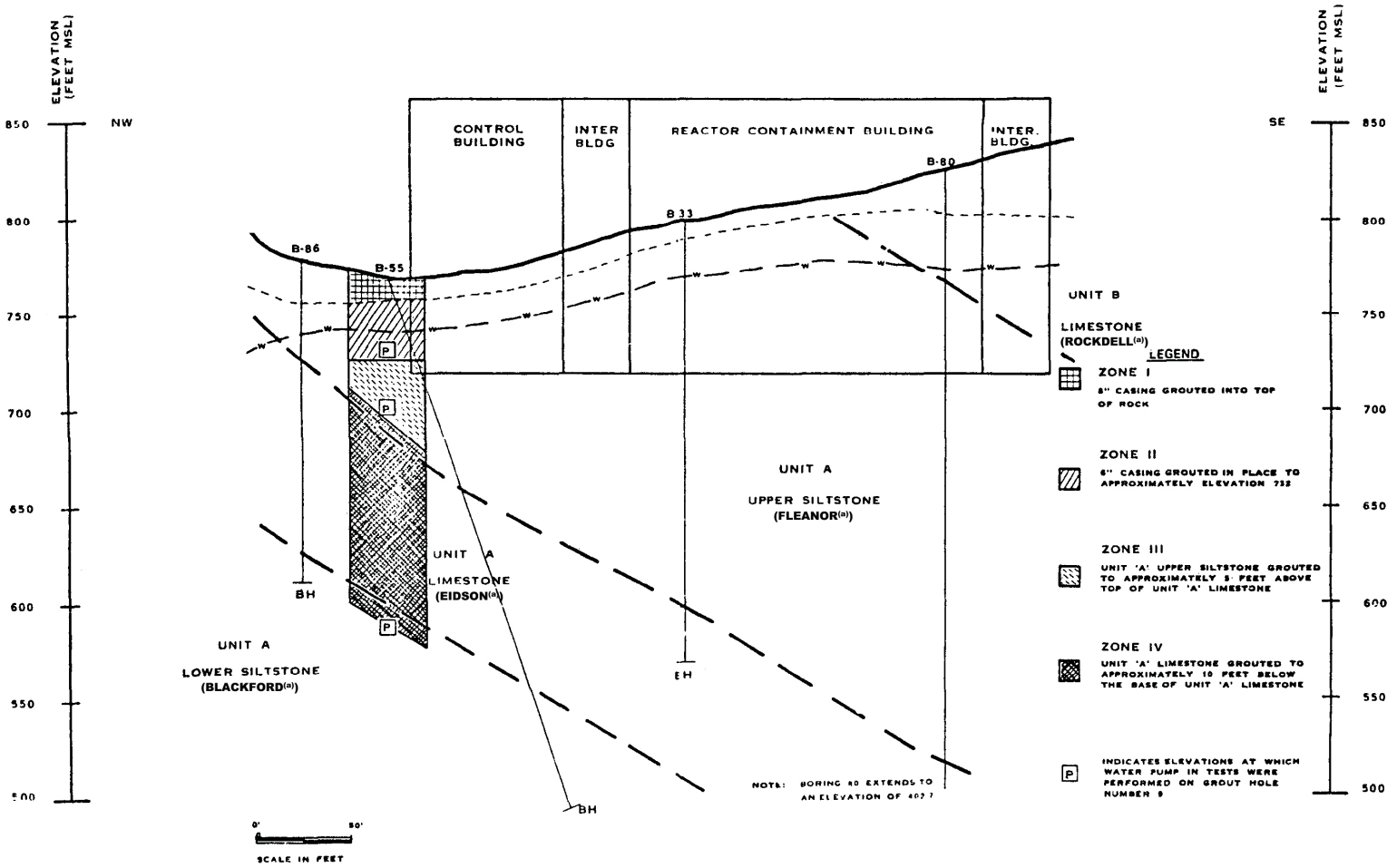
Plant Parameter Envelope of the CRN site

Figure 2.5.1-79. Map Distribution of Cavities in Rock Core



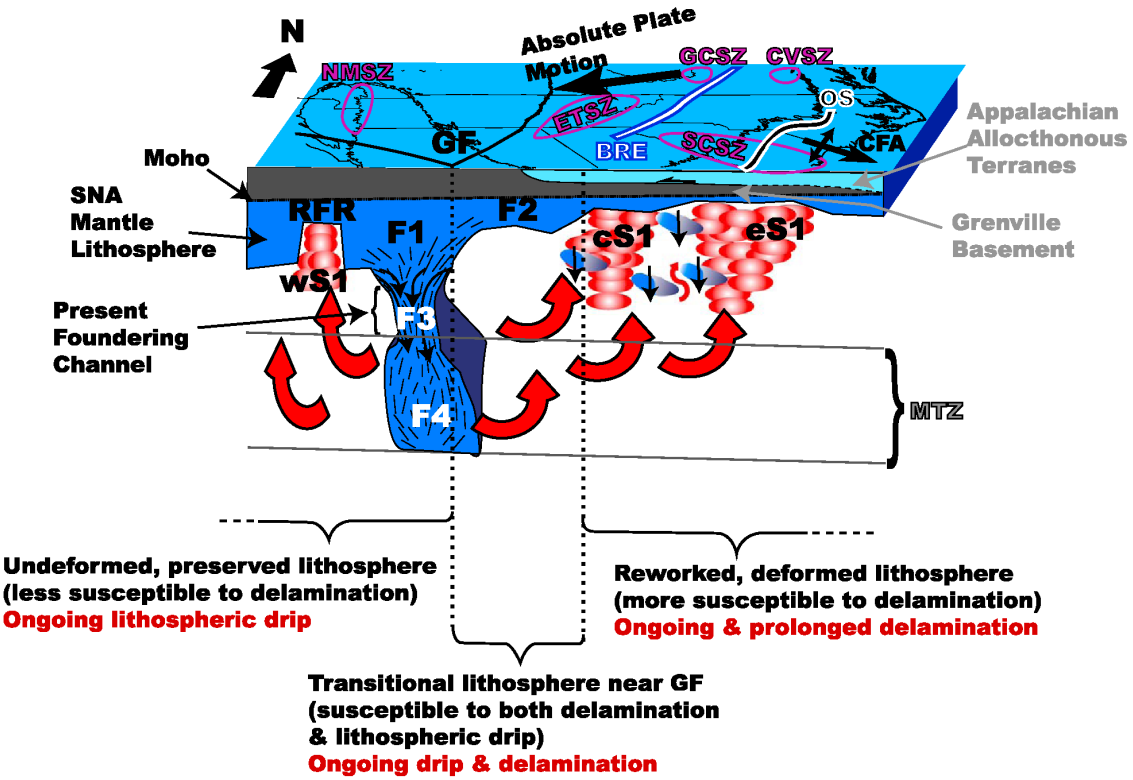
Reference 2.5.1-238

Figure 2.5.1-80. CRBRP Site Geologic Map



From Reference 2.5.1-238
Note:
(a) Description added to facilitate comparison with Figure 2.5.1-30

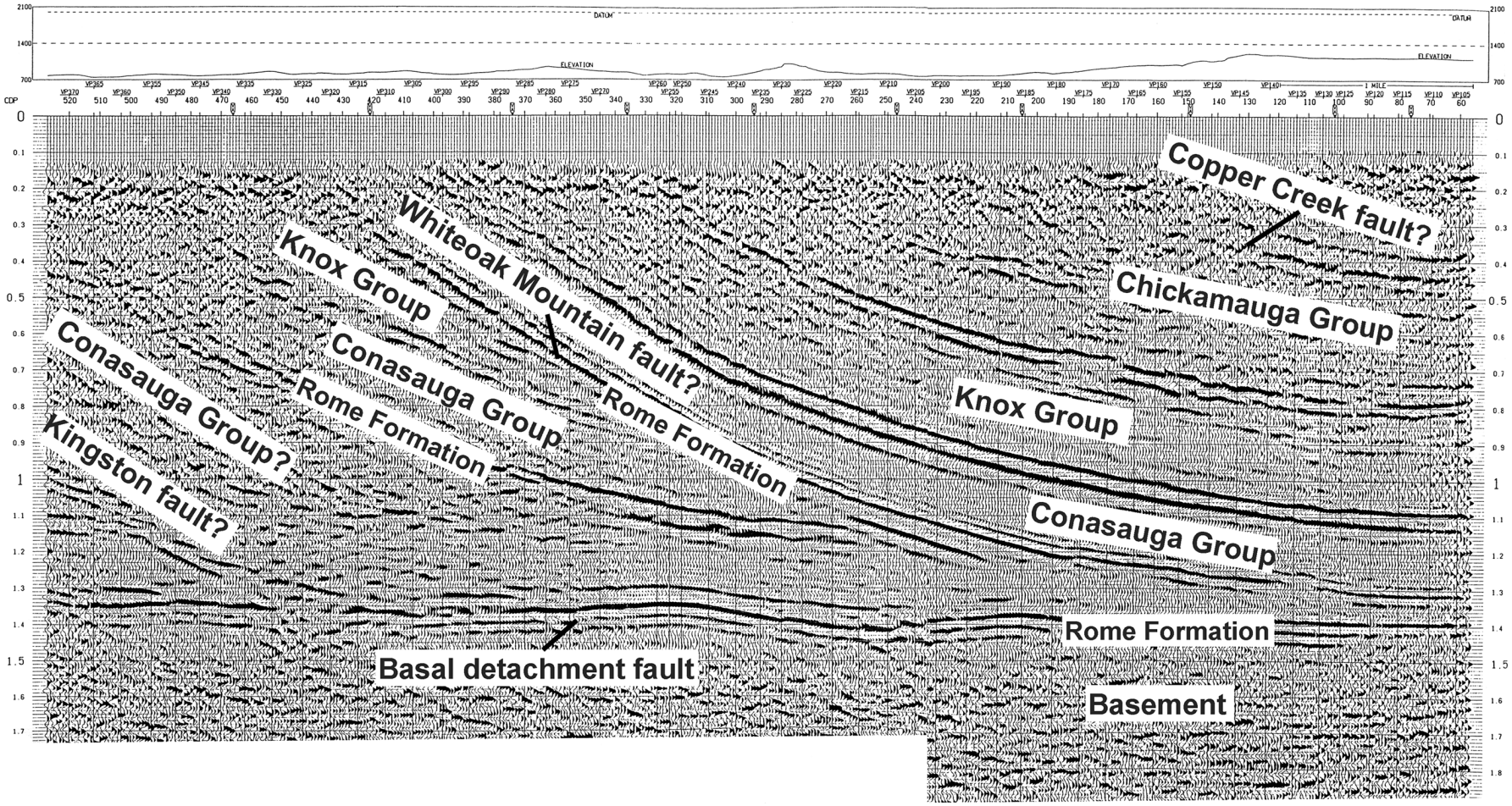
Figure 2.5.1-81. CRBRP Site Geologic Cross Section



Notes:
BRE – Blue Ridge escarpment; CFA – Cape Fear arch; GF – Grenville front; OS – Orangeburg scarp; RFR – Reelfoot rift; CVSZ – Central Virginia seismic zone; ETSZ – East Tennessee seismic zone; GCSZ – Giles County seismic zone; SCSZ – South Carolina seismic zone; NMSZ – New Madrid seismic zone; SNA – Stable North America.
F1, F2, F3, F4, cS1, eS1, and wS1 correspond to geophysical anomalies.

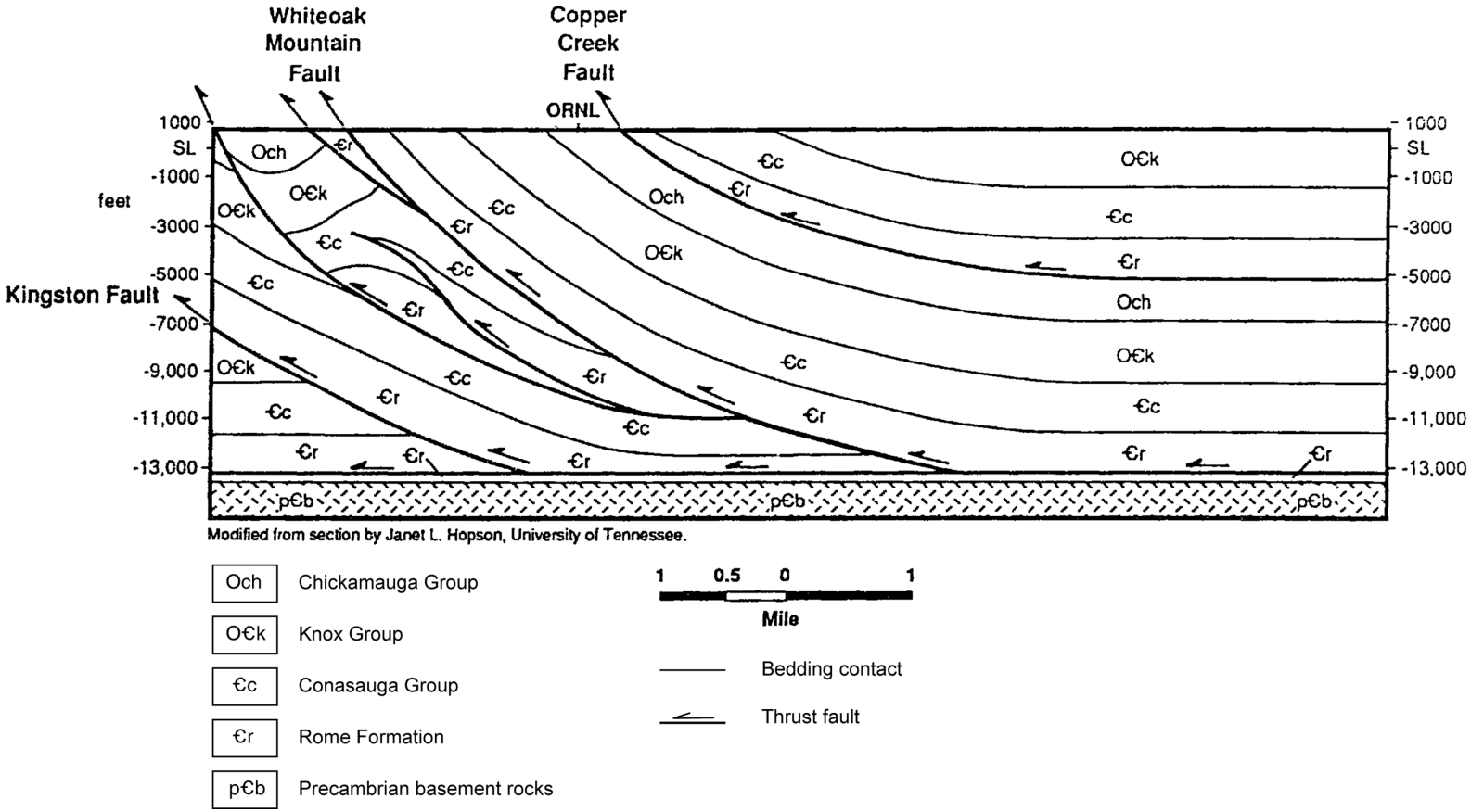
Source: Reference 2.5.1-313

Figure 2.5.1-82. Conceptual Model of Upper Mantle Structure Beneath the Southeastern U.S.



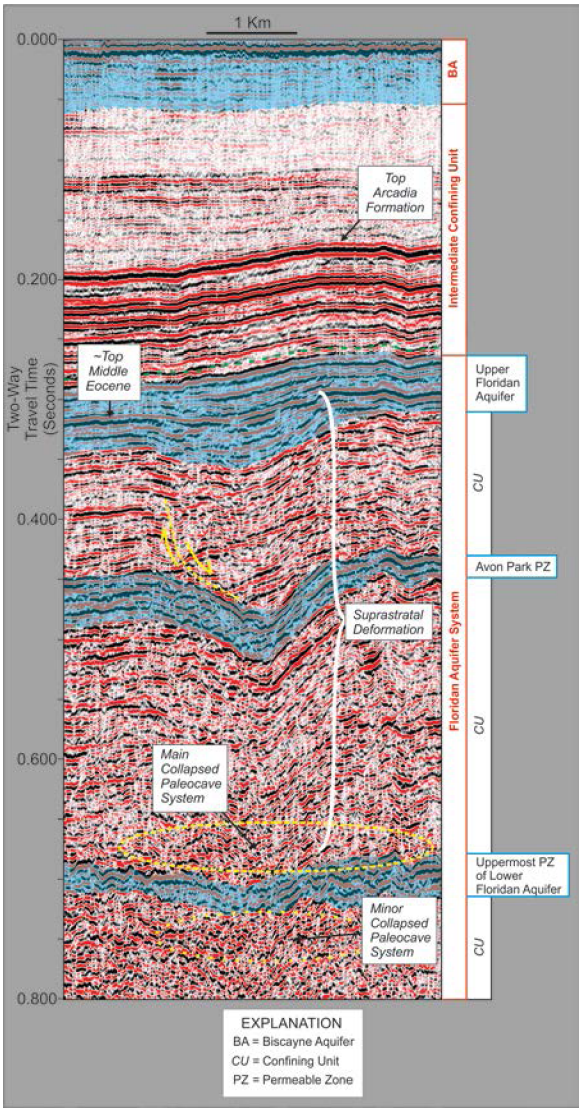
Note: Vertical axis is two-way travel time (seconds)

Figure 2.5.1-83. (Sheet 1 of 2) Interpreted Seismic Reflection Profile from Tennessee Highway 95



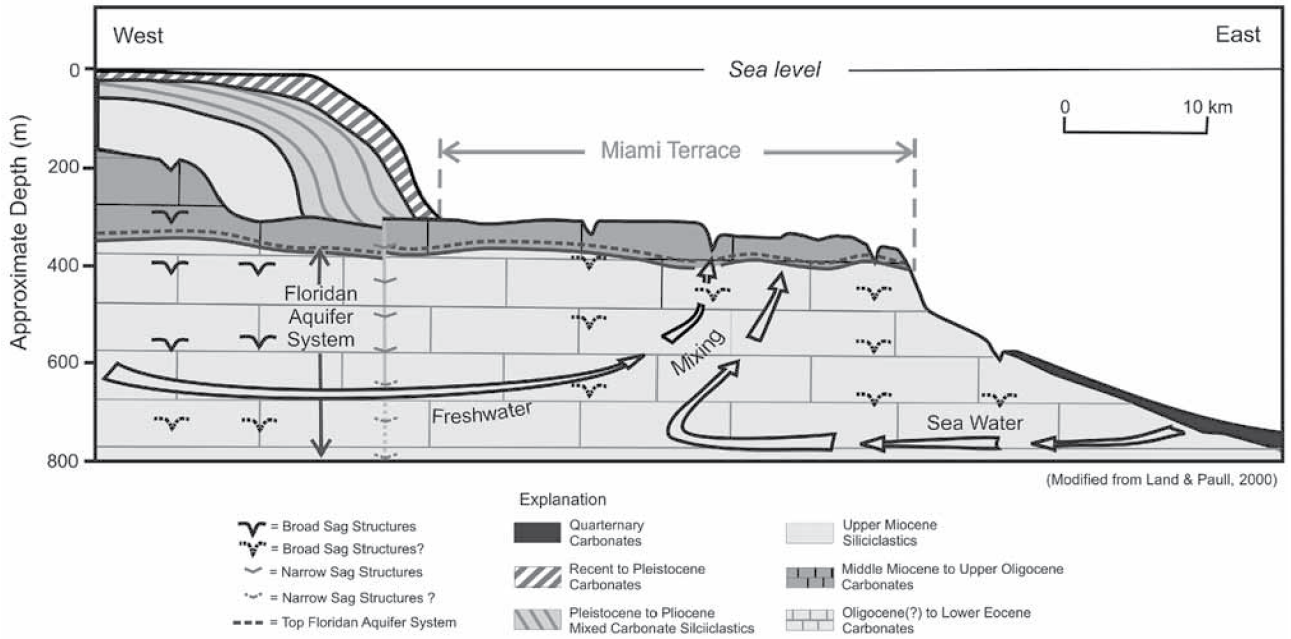
Source: Reference 2.5.1-9

Figure 2.5.1-83. (Sheet 2 of 2) Geologic Cross Section Based on Seismic Reflection Profile from Tennessee Highway 95



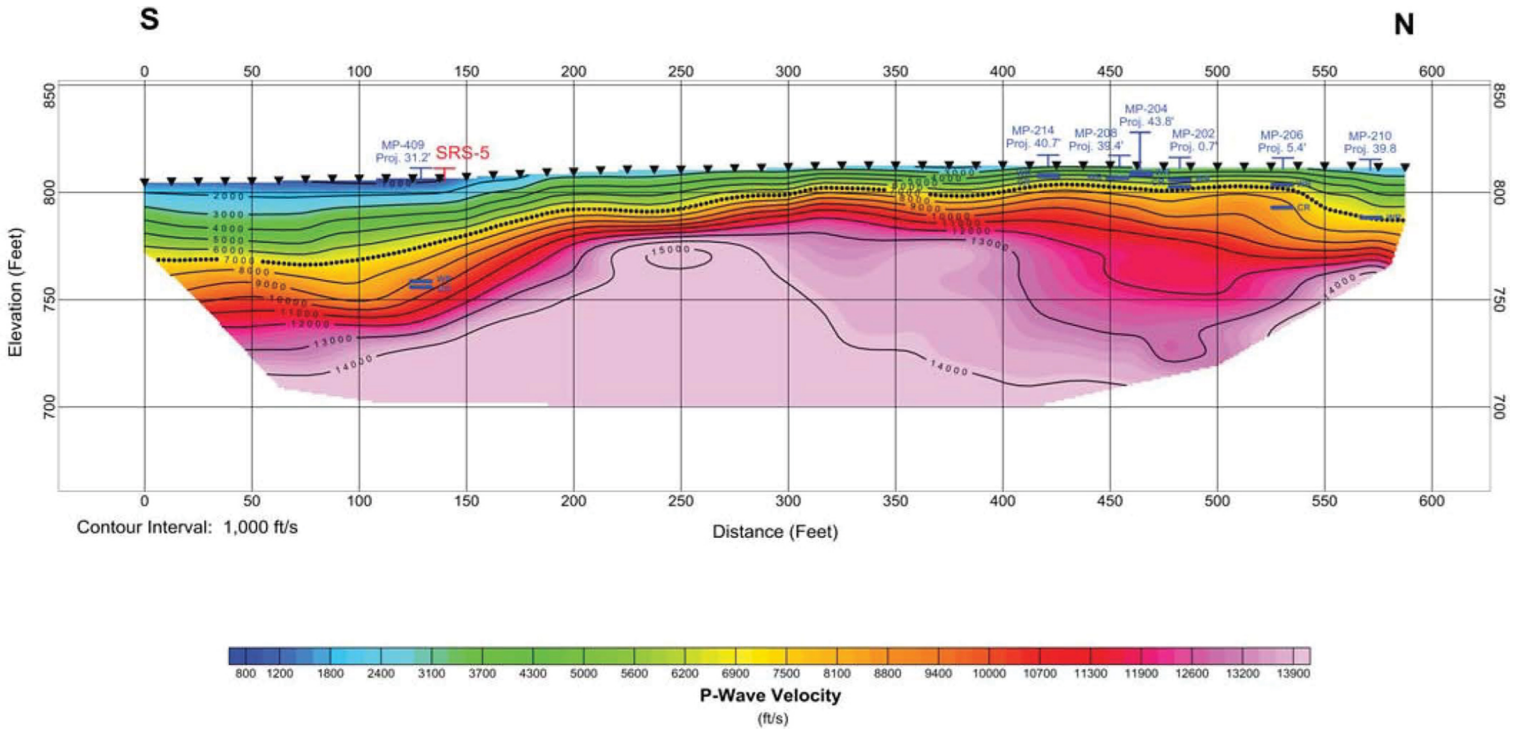
Source: Reference 2.5.1-318

Figure 2.5.1-84. Seismic Reflection Profile from Biscayne Bay, Florida, Showing Large Scale Sag Features Attributed to Hypogene Dissolution



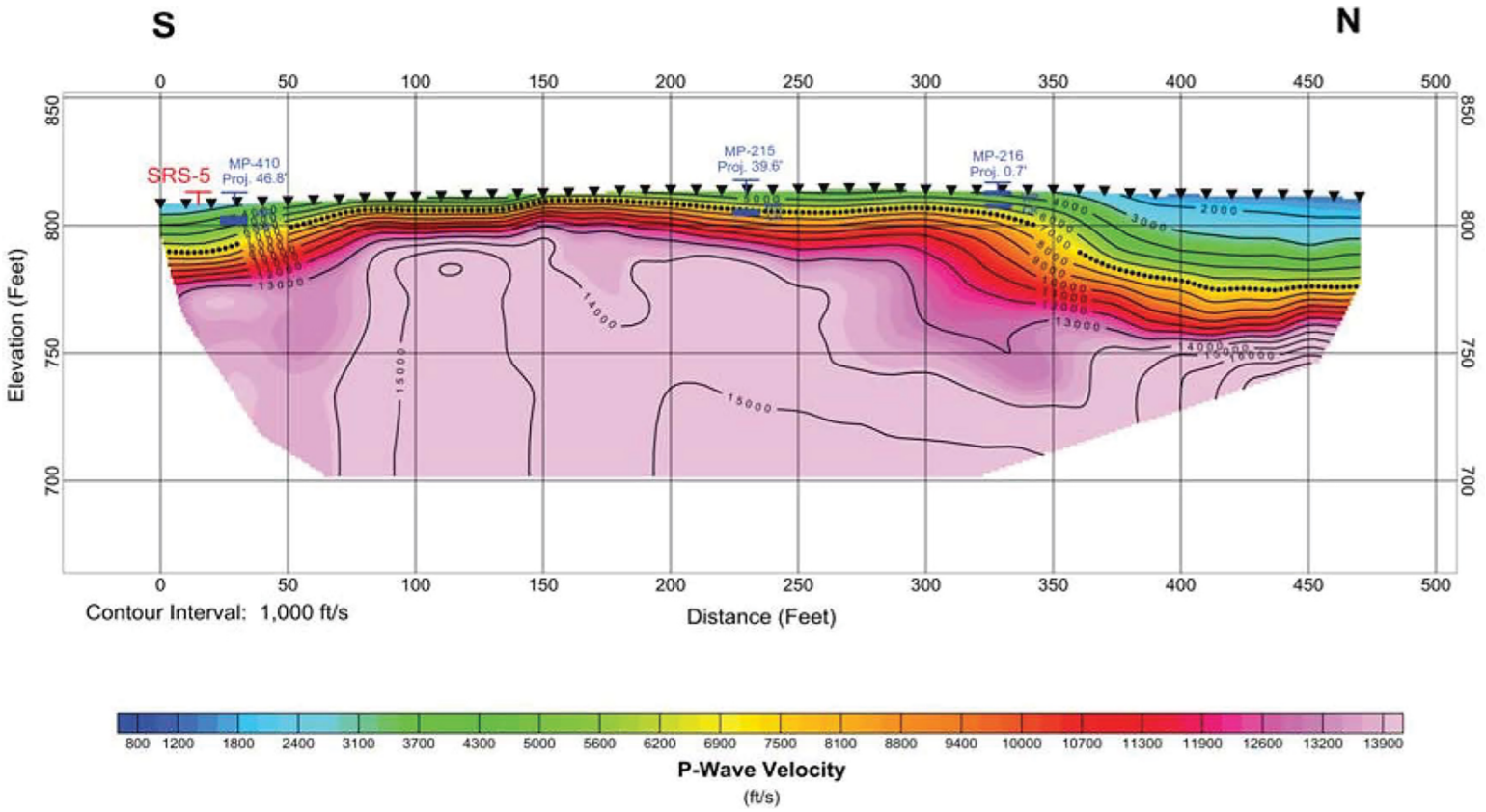
Source: Reference 2.5.1-41

Figure 2.5.1-85. Schematic Cross Section of Biscayne Bay Showing a Possible Model for Hypogene Dissolution



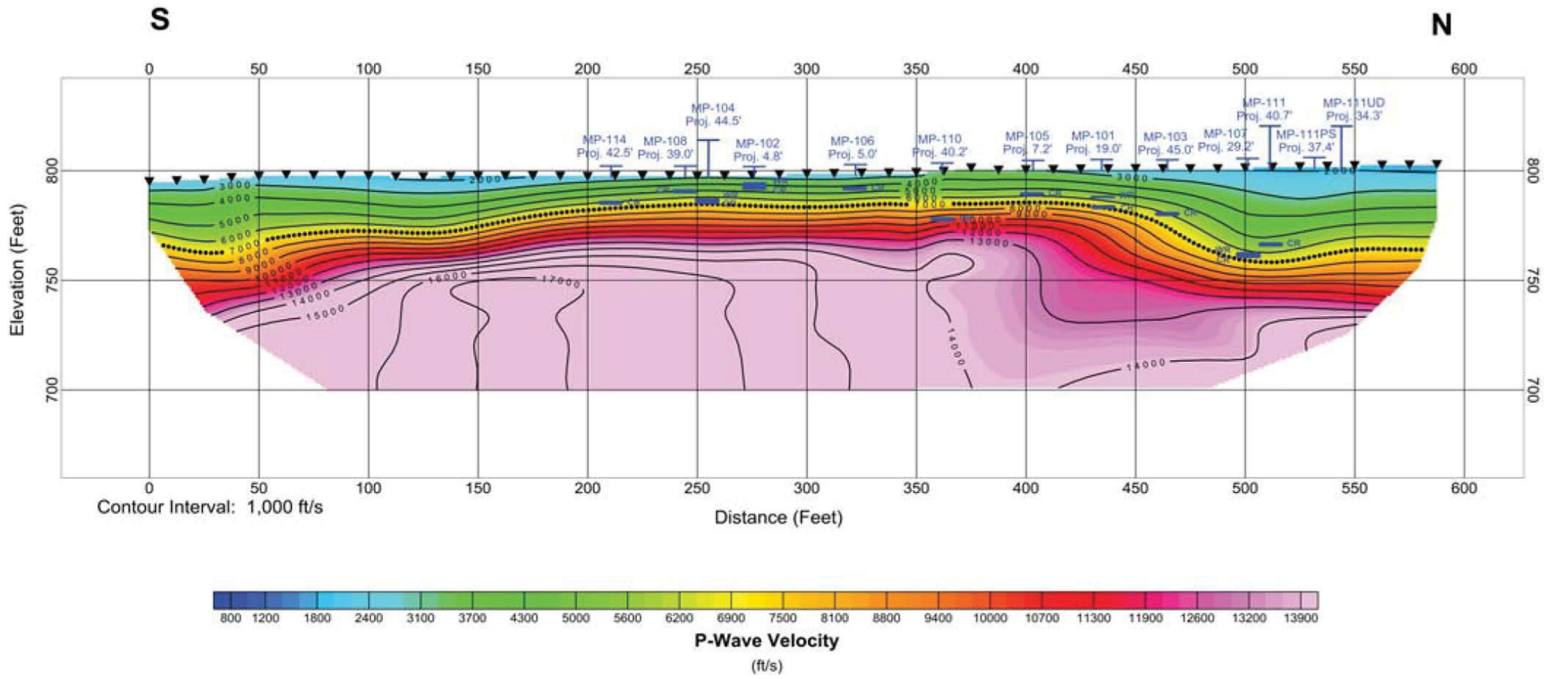
Source: Reference 2.5.1-214
See explanation on Sheet 7.

Figure 2.5.1-86. (Sheet 1 of 7) Seismic Tomography Model SRS-1



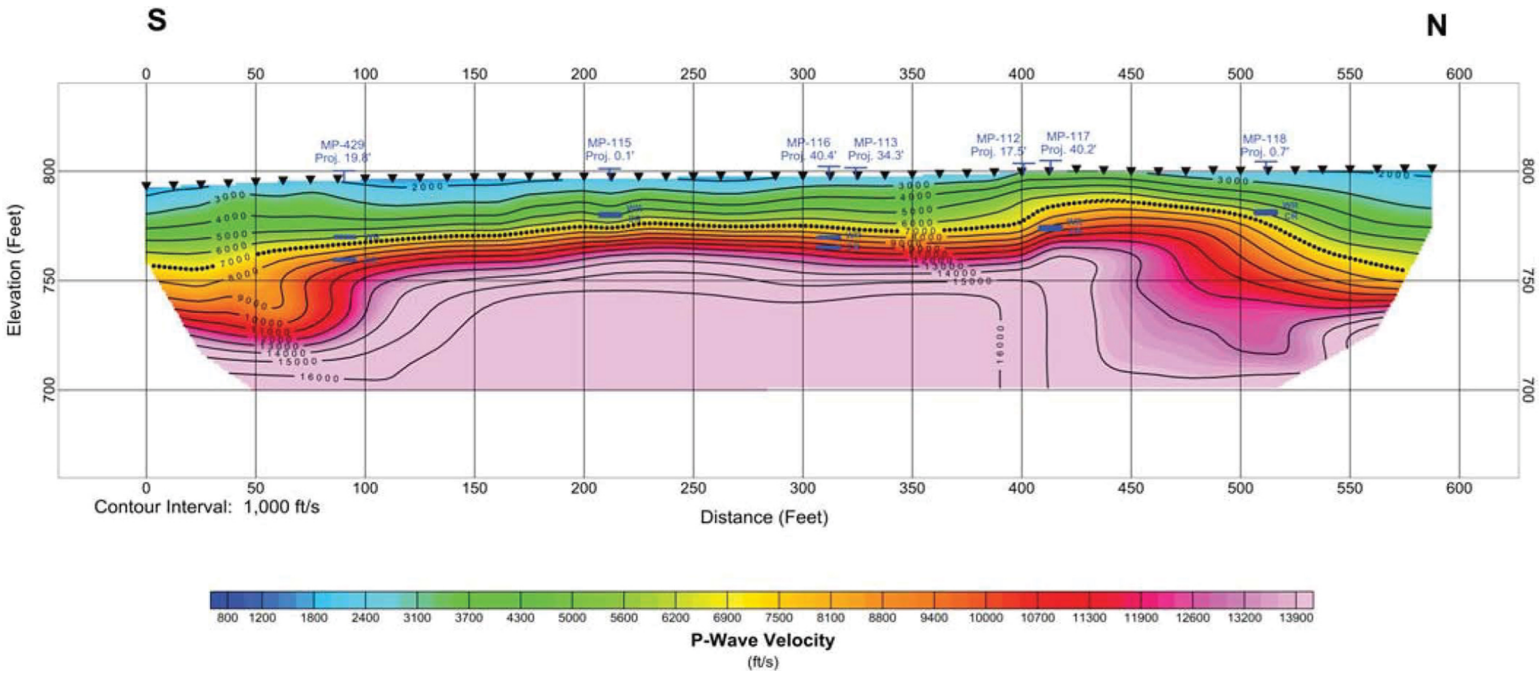
Source: Reference 2.5.1-214
See explanation on Sheet 7.

Figure 2.5.1-86. (Sheet 2 of 7) Seismic Tomography Model SRS-2



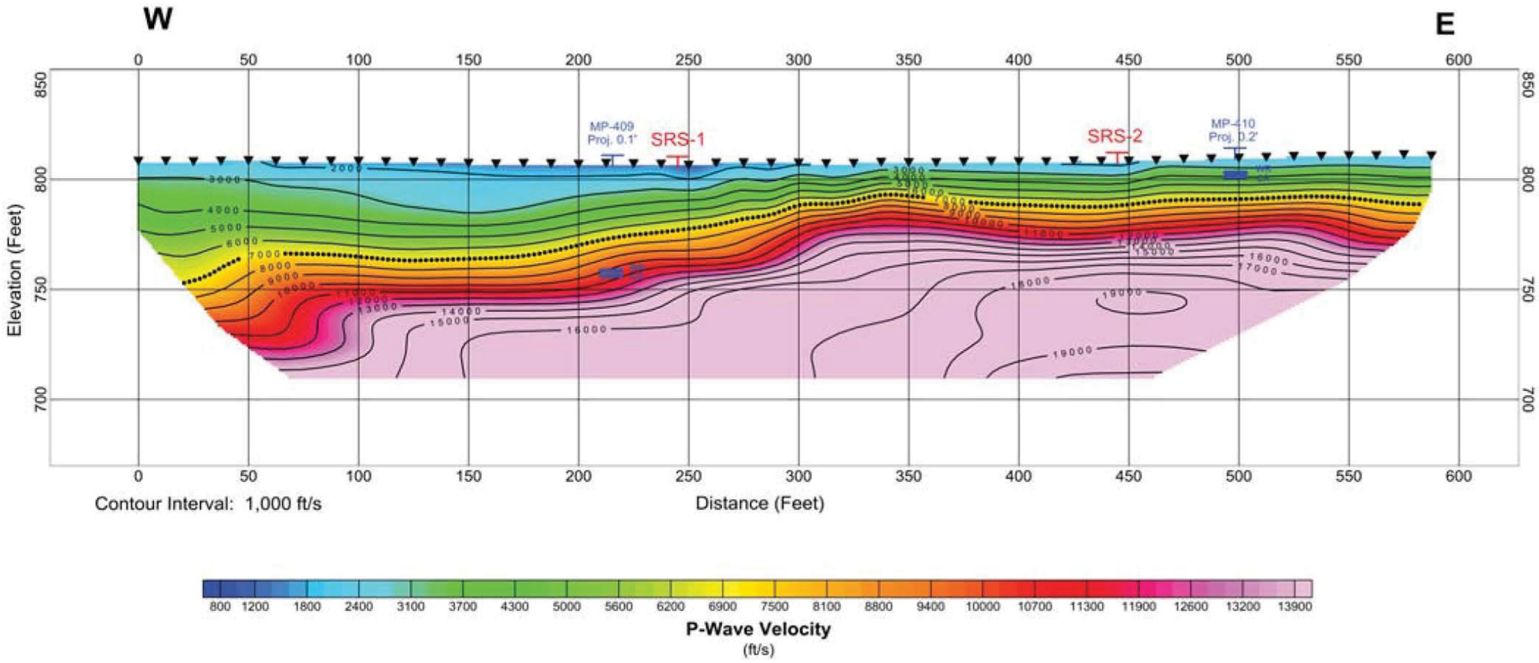
Source: Reference 2.5.1-214
See explanation on Sheet 7.

Figure 2.5.1-86. (Sheet 3 of 7) Seismic Tomography Model SRS-3



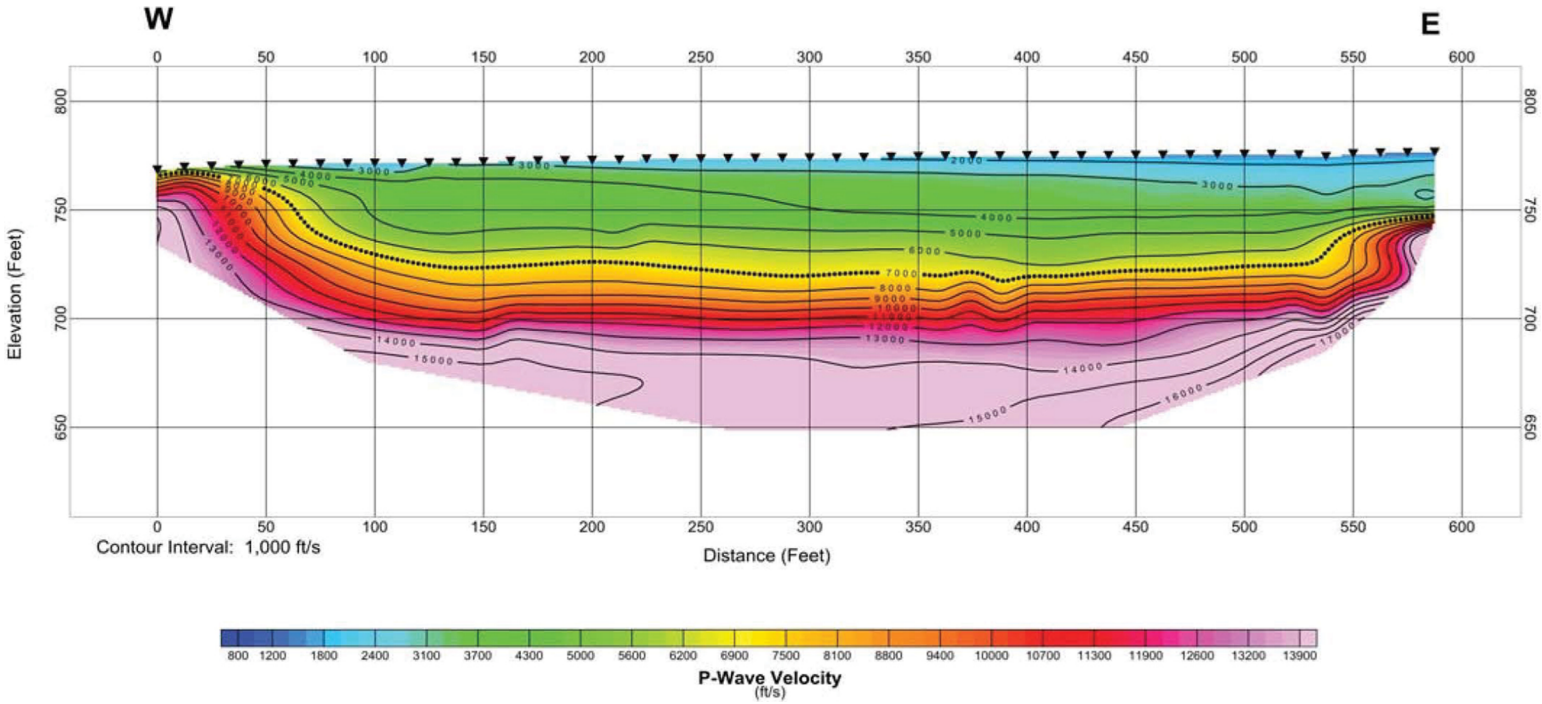
Source: Reference 2.5.1-214
See explanation on Sheet 7.

Figure 2.5.1-86. (Sheet 4 of 7) Seismic Tomography Model SRS-4



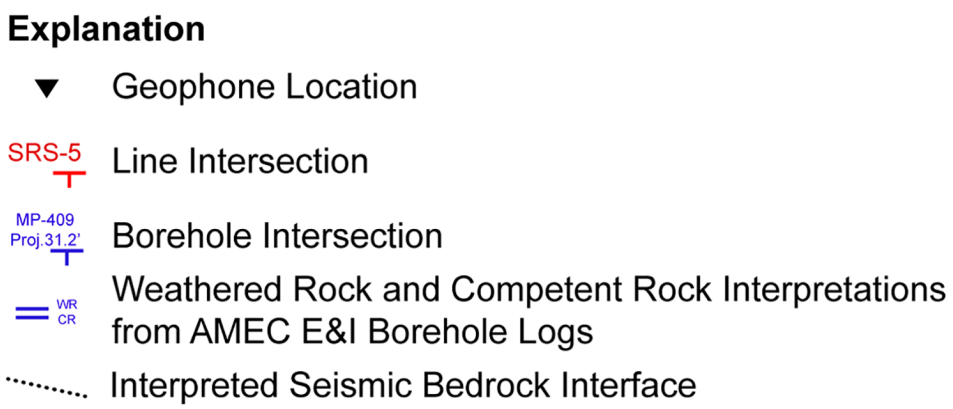
Source: Reference 2.5.1-214
See explanation on Sheet 7.

Figure 2.5.1-86. (Sheet 5 of 7) Seismic Tomography Model SRS-5



Source: Reference 2.5.1-214
See explanation on Sheet 7.

Figure 2.5.1-86. (Sheet 6 of 7) Seismic Tomography Model SRS-6

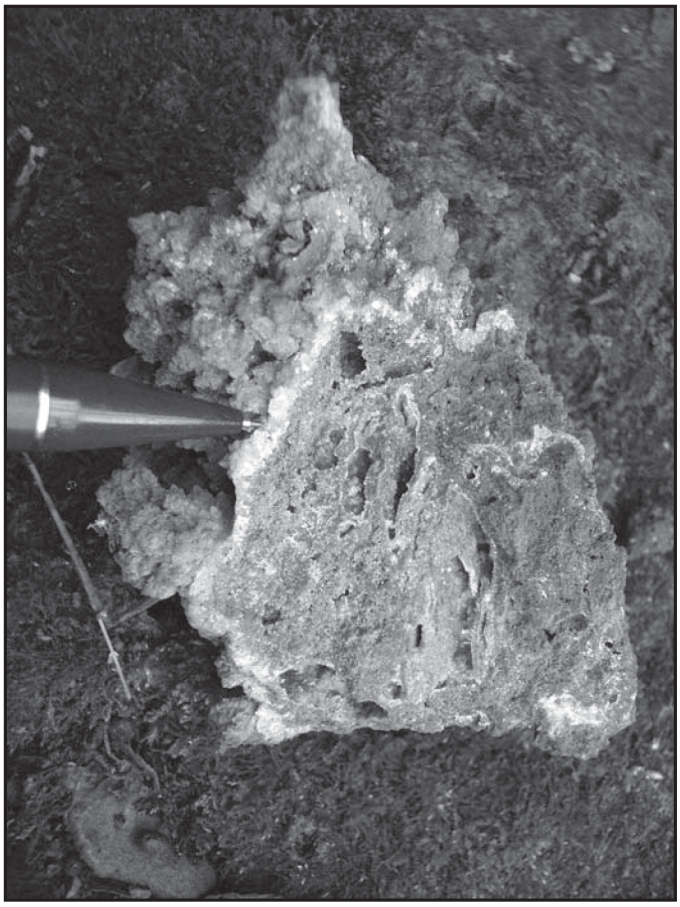


Source: Reference 2.5.1-214
See Sheets 1-6.

Figure 2.5.1-86. (Sheet 7 of 7) Explanation for Seismic Tomography Models

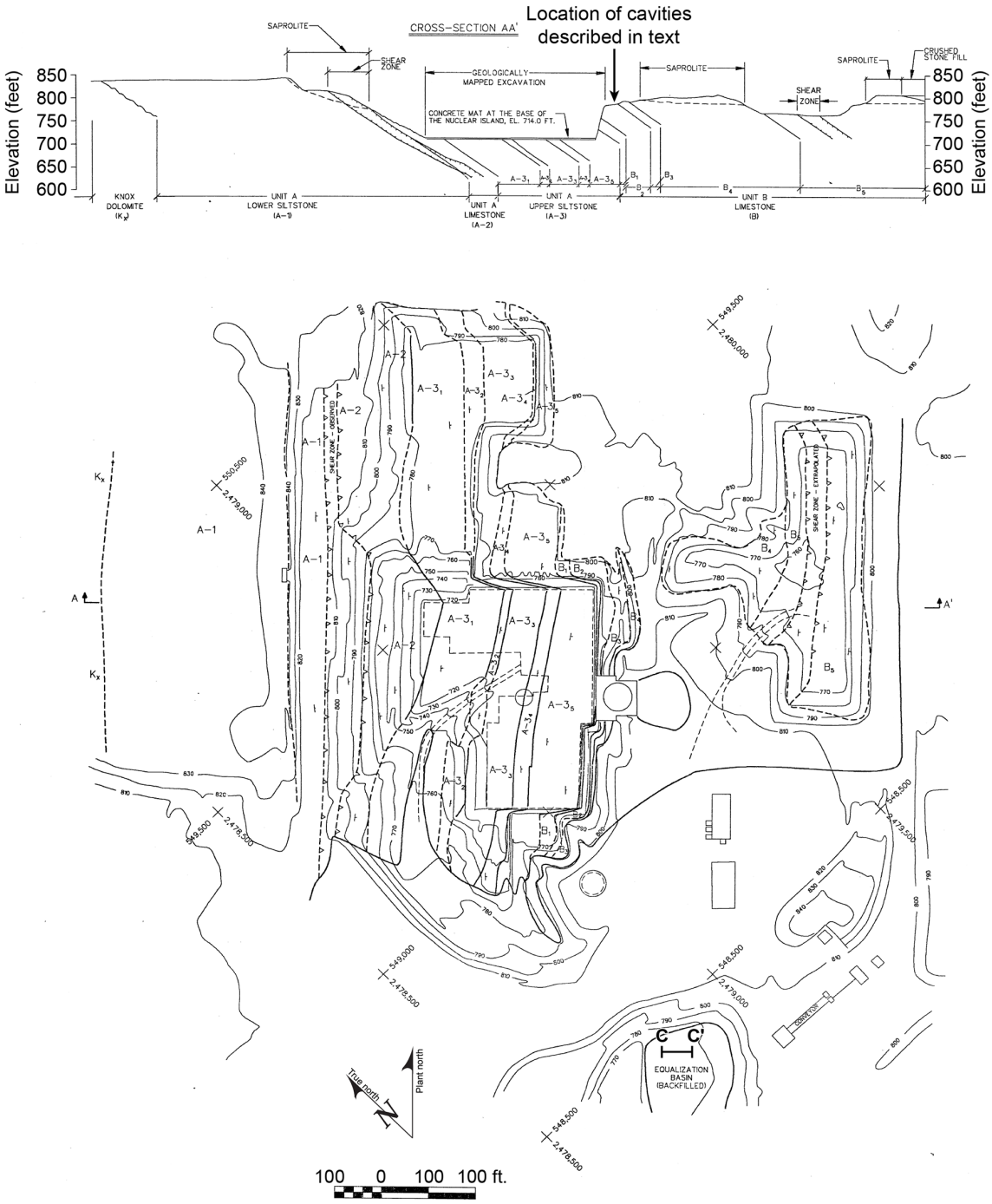
A)

B)



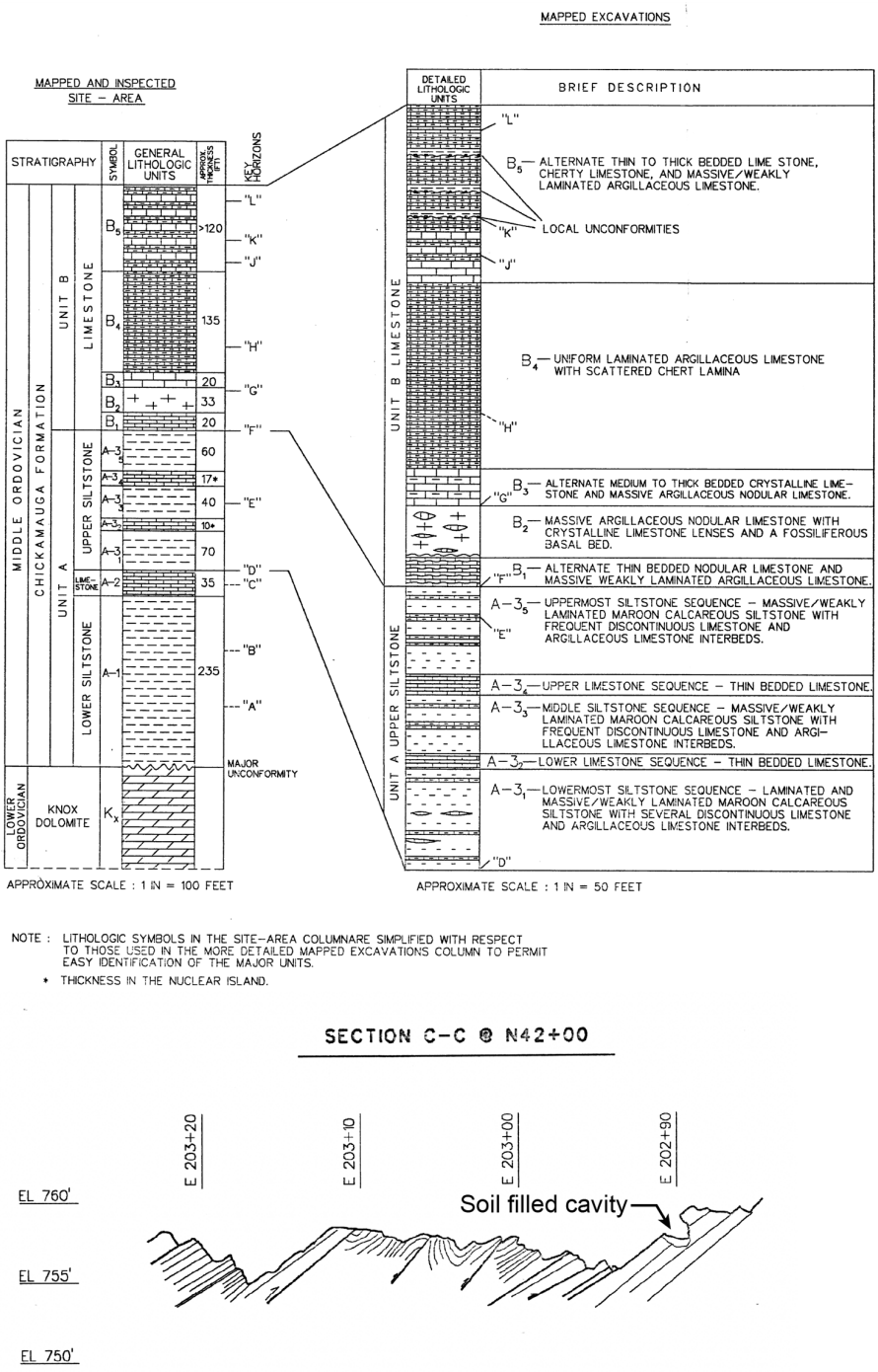
Source: Reference 2.5.1-319

Figure 2.5.1-87. Crystalline Calcite Deposits Indicating a Hypogene Origin in Caves of Shenandoah Valley, Virginia



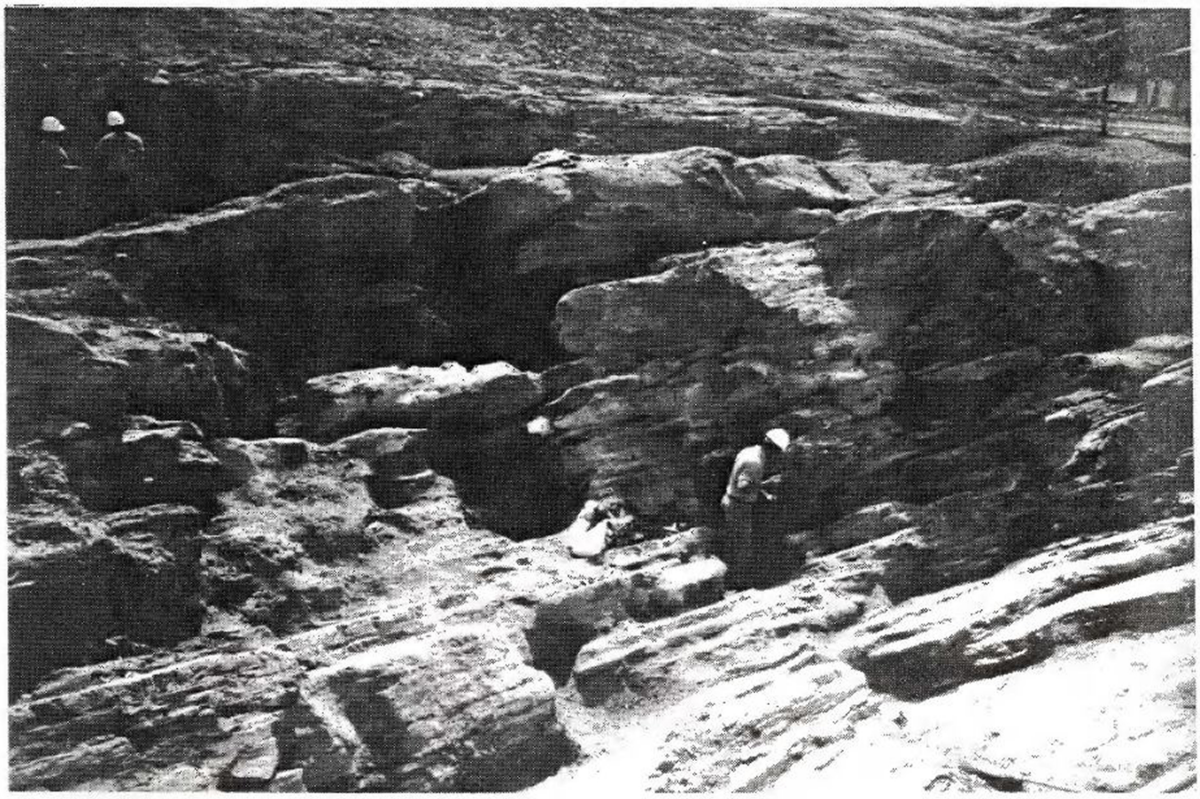
Source: Reference 2.5.1-303

Figure 2.5.1-88. (Sheet 1 of 2) Geologic Map of the 1983 CRBRP Excavations



Source: Reference 2.5.1-303.

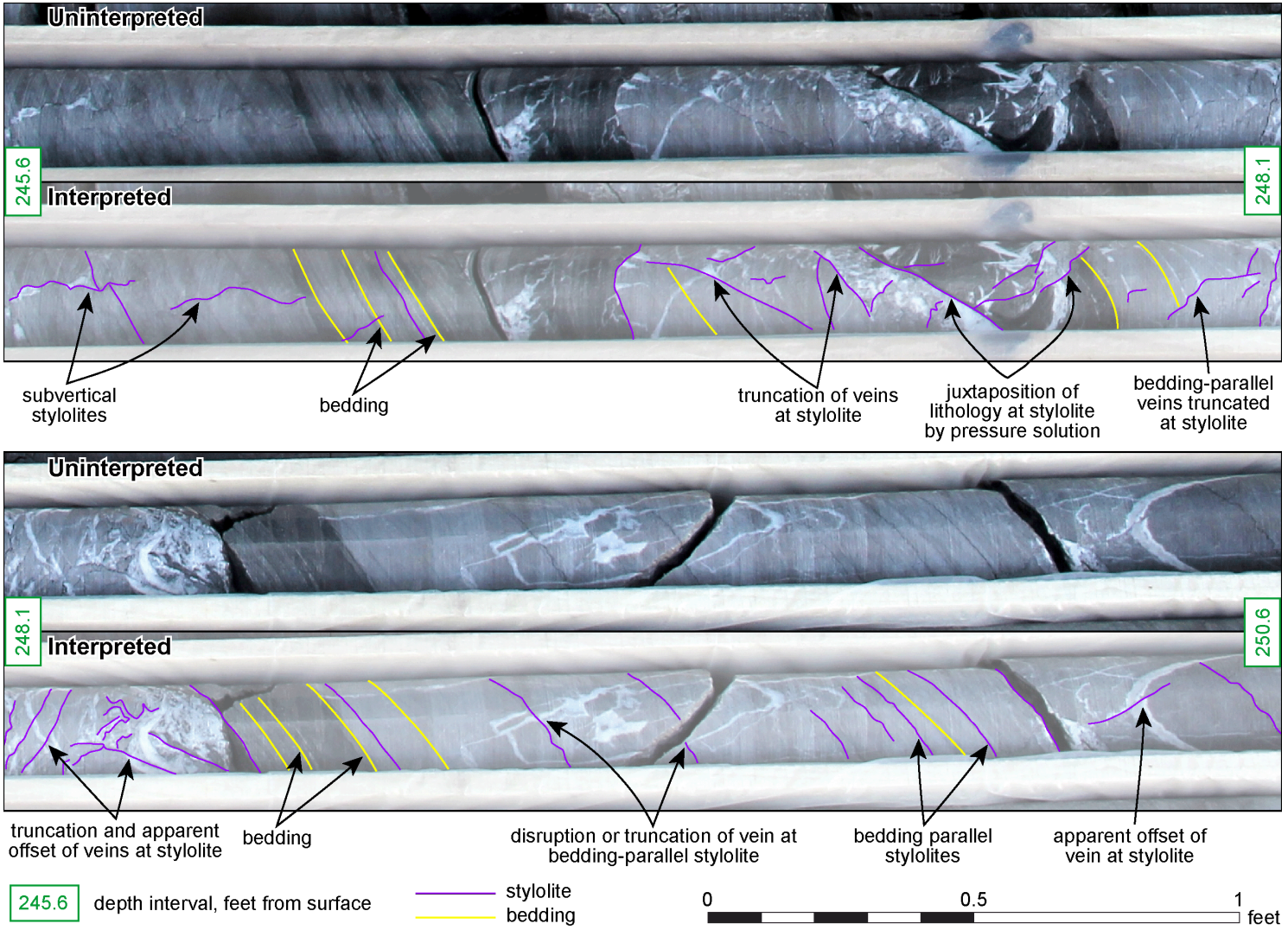
Figure 2.5.1-88. (Sheet 2 of 2) Geologic Column and Cross Section of the 1983 CRBRP Excavations



PHOTOGRAPH 26
SOLUTION CAVITIES ALONG BEDDING AND STRIKE-JOINTS ON THE BENCH (EL. 780 FT) ABOVE FACE IV (UPPER), AND KARSTIFIED LIMESTONE IN THE EQUALIZATION BASIN, WITH NUMEROUS CAVITIES

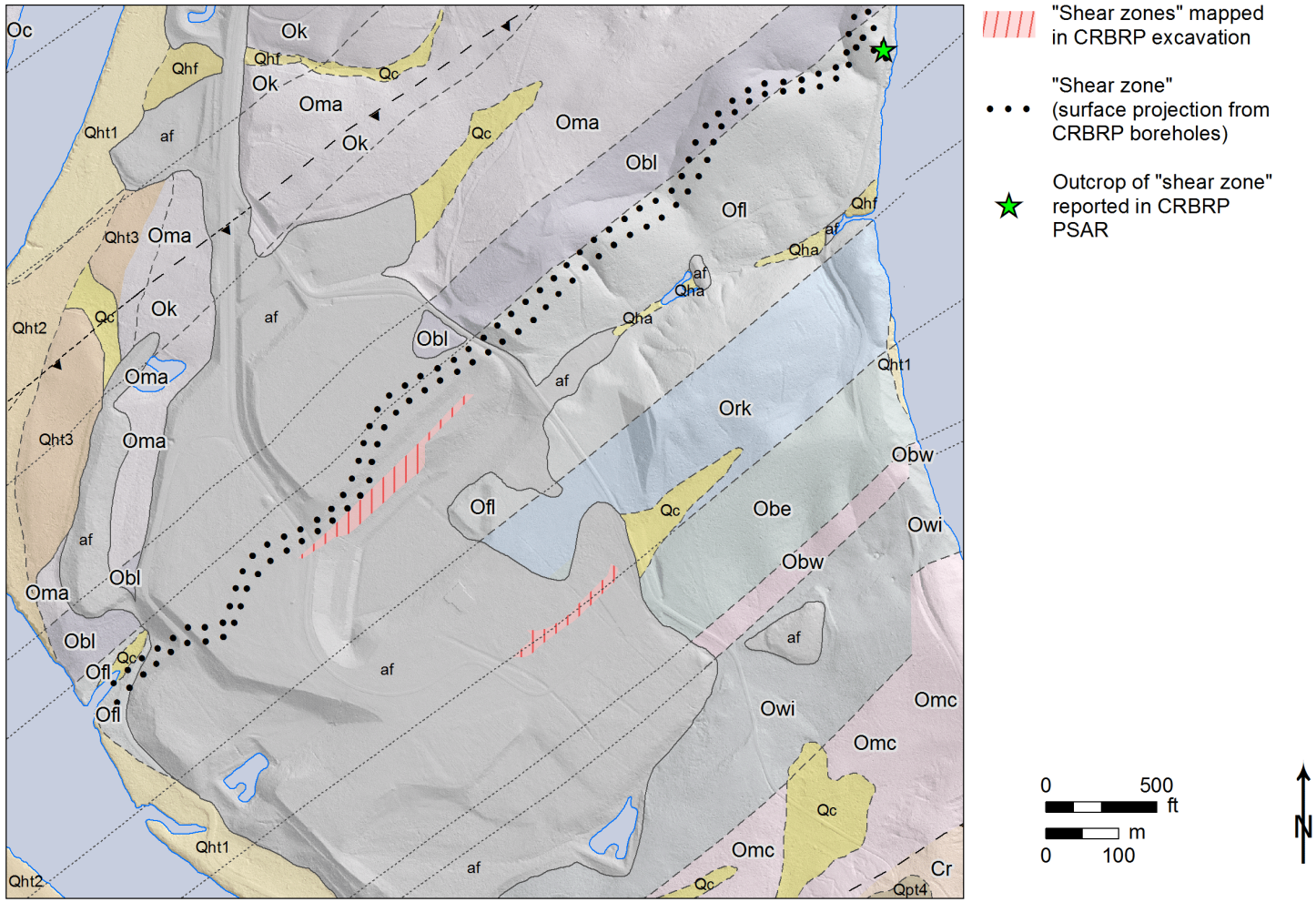
Source: Reference 2.5.1-303

Figure 2.5.1-89. Cavities in the Rockdell Formation Exposed in the 1983 CRBRP Excavations



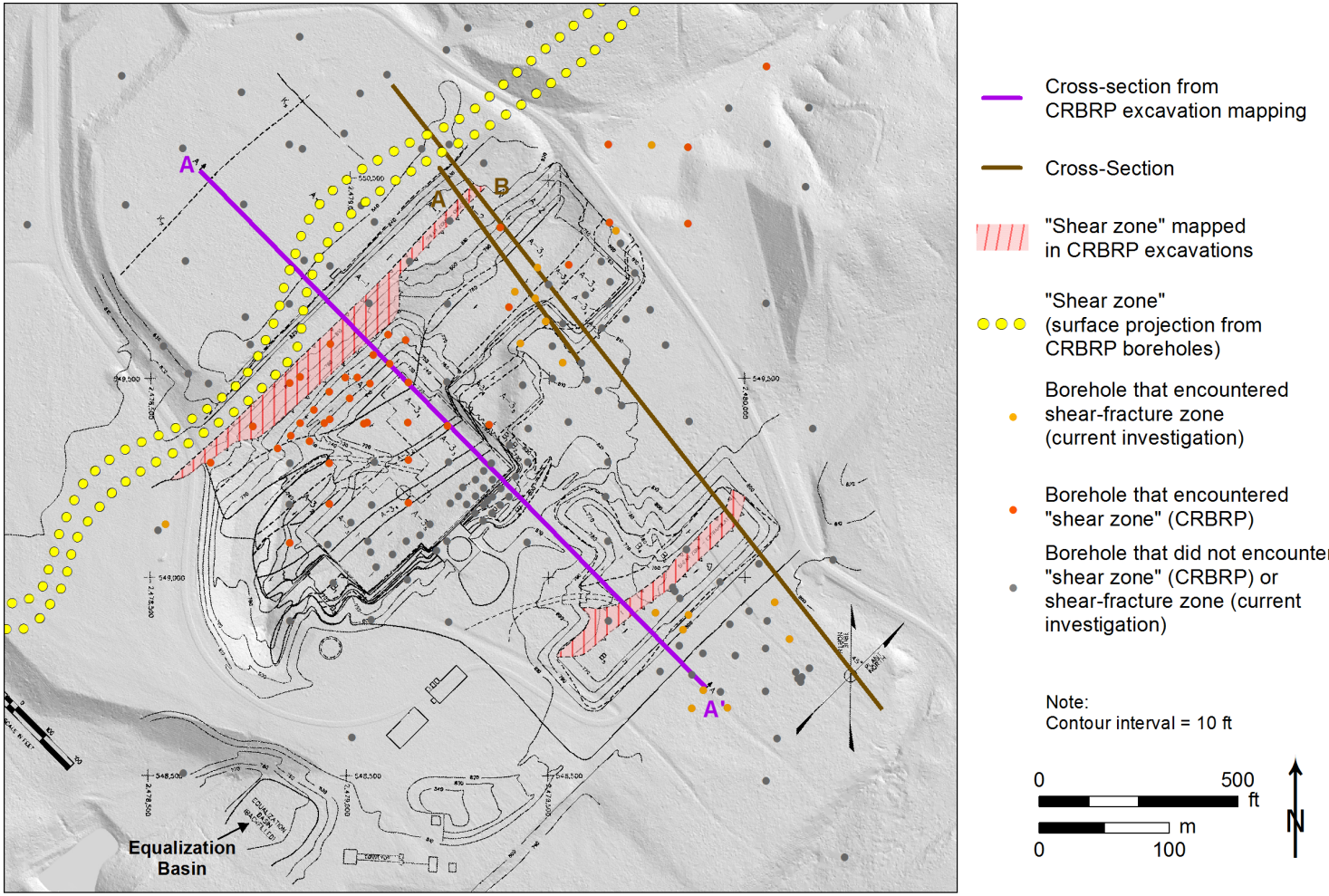
Note: Core photo from Reference 2.5.1-214

Figure 2.5.1-90. Interpreted Core Photo of Borehole MP-101 Demonstrating Shear-Fracture Zone Attributes



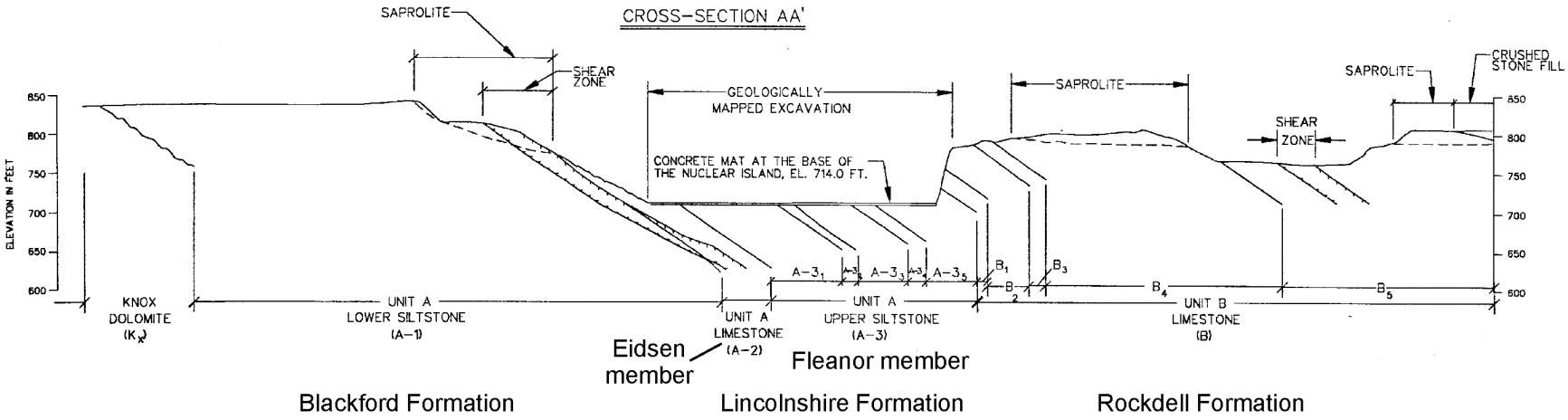
Note: Geologic unit symbols are defined in Figure 2.5.1-29 (Sheet 2 of 2). The “shear zone” identified in the CRBRP PSAR is referred to as shear-fracture zone in the current investigation.
Sources: References 2.5.1-303 (Plate 2, mapped “shear zone”) and Reference 2.5.1-238 (Illustration 7, surface projection of “shear zone” and outcrop location)

Figure 2.5.1-91. (Sheet 1 of 3) Site Geologic Map Showing Mapped “Shear Zones”



Note: The “shear zone” identified in the CRBRP PSAR is referred to as shear-fracture zone in the current investigation.
Source: Reference 2.5.1-238 (Illustration 7, surface projection of “shear zone”) and Reference 2.5.1-303 (Plate 2, excavation map, with mapped “shear zones” and section line A-A’)

Figure 2.5.1-91. (Sheet 2 of 3) Site Geologic Map Showing Excavation, Mapped “Shear Zones,” and Site Borings



Note: Profile line location shown on Sheet 2 of 3
Source: Reference 2.5.1-303

Figure 2.5.1-91. (Sheet 3 of 3) Cross Section of CRBRP Excavation Mapping

Source: Reference 2.5.1-303

Figure 2.5.1-92. Apparent Fault Propagation Fold Exposed in CRBRP Excavation