

**E** Map location number 52 SEYLER I ANDERSON API 40 019 05008 NW SE sec. 12, T. 8 N., R. 5 E., Butte County, South Dakota Kelly bushing elevation: 2,891 ft Ground surface elevation: 2,887 ft Log types shown: spontaneous potential and resistivity

Map location number 53 ENERGY RESERVES I STATE API 40 019 20023 NE SE sec. 36, T. 9 N., R. 6 E., Butte County, South Dakota Kelly bushing elevation: 2,814 ft Ground surface elevation: 2,804 ft Log types shown: spontaneous potential, resistivity, and conductivity

Map location number 54 MOBIL I MICKELSON API 40 019 05015 NE NE sec. 7, T. 9 N., R. 9 E., Butte County, South Dakota Kelly bushing elevation: 2,860 ft Ground surface elevation: 2,848 ft Log types shown: spontaneous potential, resistivity, and conductivity

Map location number 55 HERNDON I PRICE API 40 093 05035 SE SE sec. 15, T. 9 N., R. 1 D E., Meade County, South Dakota Kelly bushing elevation: 2,737 ft Ground surface elevation: 2,728 ft Log types shown: spontaneous potential, gamma ray, and resistivity

Map location number 56 CAMAC 27-1 NELSON API 40 093 20020 SE SE sec. 27, T. 10 N., R. 14 E., Meade County, South Dakota Kelly bushing elevation: 2,630 ft Ground surface elevation: 2,630 ft Log types shown: gamma ray, spontaneous potential, and resistivity

Map location number 57 HERNDON I OAKLAND API 40 093 05036 NE SE sec. 20, T. 10 N., R. 17 E., Meade County, South Dakota Kelly bushing elevation: 2,367 ft Ground surface elevation: 2,359 ft Log types shown: spontaneous potential and resistivity

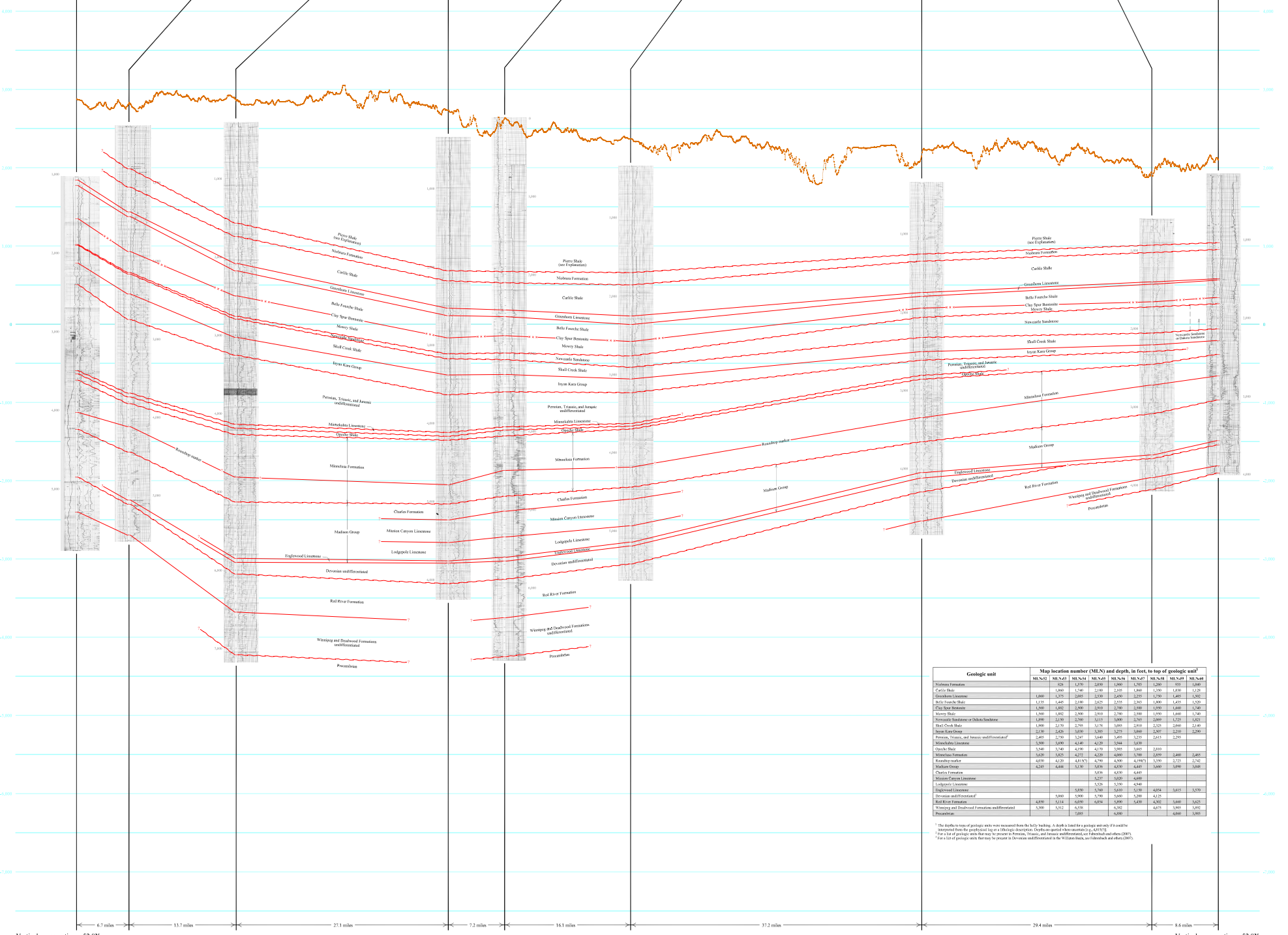
Map location number 58 TEXACO I STATE B API 40 055 20001 NW SE sec. 36, T. 6 N., R. 21 E., Haakon County, South Dakota Kelly bushing elevation: 2,158 ft Ground surface elevation: 2,147 ft Log types shown: spontaneous potential, resistivity, and conductivity

Map location number 59 SHAMROCK 3 BARRICK API 40 117 05007 SW SW sec. 23, T. 7 N., R. 23 E., Stanley County, South Dakota Kelly bushing elevation: 1,945 ft Ground surface elevation: 1,936 ft Log types shown: spontaneous potential and resistivity

Map location number 60 CITIES SERVICES I BARRICK API 40 117 05008 SW NE sec. 18, T. 7 N., R. 28 E., Stanley County, South Dakota Kelly bushing elevation: 2,082 ft Ground surface elevation: 2,070 ft Log types shown: gamma ray, resistivity, and conductivity

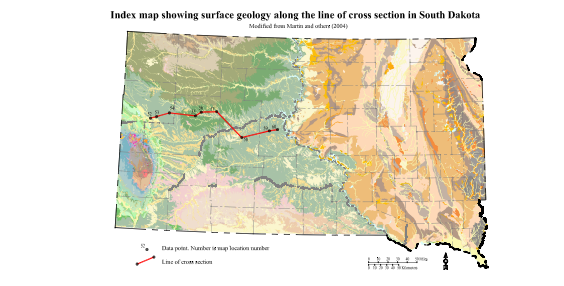
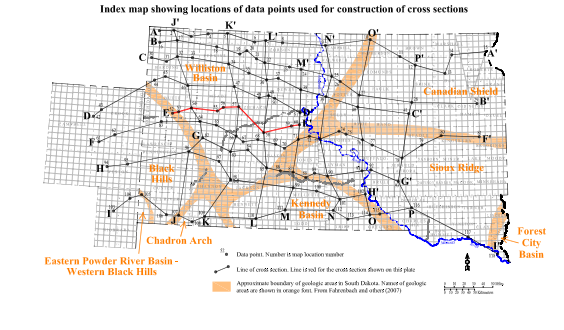
**Cross Sections Showing Geophysical Logs of Phanerozoic Rocks in South Dakota**  
**Plate 5. Structural Cross Section E-E'**  
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Prepared in cooperation with the Department of Geology and Geological Engineering, South Dakota School of Mines and Technology



**Explanation**

- Correlation line at a conformable geologic contact. Interpreted from a geophysical log or lithologic description. Oriented where uncertain.
- Correlation line at an unconformable geologic contact. Interpreted from a geophysical log or lithologic description. Oriented where uncertain.
- Profile of land surface derived from U.S. Geological Survey digital elevation models.
- Boundary of nonstratigraphic change. Boundary shown in orange on index map below. Boundary and nomenclature generally outside with Fahrenback and others (2007).
- Correlation lines are not intended to show detailed structure or actual elevation of a geologic unit between data points. Correlation lines are not projected to land surface near the Black Hills even though some geologic units crop out. The generalized nature of the cross section does not lend itself to illustration of these outcrop areas.
- Depth of well, or first below-kelly bushing.
- Mean sea level elevation on the
- Marker for a geologic contact
- Horizontal and vertical scale of cross section
- Vertical exaggeration = 52.8X



Geologic unit	Map location number (MLN) and depth, in feet, to top of geologic unit <sup>1</sup>									
	MLN-52	MLN-53	MLN-54	MLN-54	MLN-54	MLN-57	MLN-58	MLN-59	MLN-60	MLN-60
Pierre Shale	1,945	1,970	2,000	2,000	2,000	1,936	1,936	1,936	1,936	1,936
Carbonate	1,945	1,970	2,000	2,000	2,000	1,936	1,936	1,936	1,936	1,936
Greenhorn Limestone	1,945	1,970	2,000	2,000	2,000	1,936	1,936	1,936	1,936	1,936
Black Hills Shale	1,945	1,970	2,000	2,000	2,000	1,936	1,936	1,936	1,936	1,936
Clay Spur Sandstone	1,945	1,970	2,000	2,000	2,000	1,936	1,936	1,936	1,936	1,936
Neogene Sandstone	1,945	1,970	2,000	2,000	2,000	1,936	1,936	1,936	1,936	1,936
Shall Creek Shale	1,945	1,970	2,000	2,000	2,000	1,936	1,936	1,936	1,936	1,936
Iron River Group	1,945	1,970	2,000	2,000	2,000	1,936	1,936	1,936	1,936	1,936
Perrine, Triassic, and Jurassic andiferous <sup>2</sup>	1,945	1,970	2,000	2,000	2,000	1,936	1,936	1,936	1,936	1,936
Meadow Limestone	1,945	1,970	2,000	2,000	2,000	1,936	1,936	1,936	1,936	1,936
Niobrara Formation	1,945	1,970	2,000	2,000	2,000	1,936	1,936	1,936	1,936	1,936
Madison Group	1,945	1,970	2,000	2,000	2,000	1,936	1,936	1,936	1,936	1,936
Charles Formation	1,945	1,970	2,000	2,000	2,000	1,936	1,936	1,936	1,936	1,936
Missoua Canyon Limestone	1,945	1,970	2,000	2,000	2,000	1,936	1,936	1,936	1,936	1,936
Lodgepole Limestone	1,945	1,970	2,000	2,000	2,000	1,936	1,936	1,936	1,936	1,936
Devonian andiferous <sup>2</sup>	1,945	1,970	2,000	2,000	2,000	1,936	1,936	1,936	1,936	1,936
Roll River Formation	1,945	1,970	2,000	2,000	2,000	1,936	1,936	1,936	1,936	1,936
Williston and Chadron Formations andiferous <sup>2</sup>	1,945	1,970	2,000	2,000	2,000	1,936	1,936	1,936	1,936	1,936
Precambrian	1,945	1,970	2,000	2,000	2,000	1,936	1,936	1,936	1,936	1,936

<sup>1</sup> The depths to tops of geologic units were measured from the Kelly bushing. A depth is listed for a geologic unit only if it could be interpreted from the geophysical logs as a lithologic description. Depth is given in feet below Kelly bushing (KB).

<sup>2</sup> This is a list of geologic units that may be present in Perrine, Triassic, and Jurassic andiferous units, see Fahrenback and others (2007).

<sup>3</sup> This is a list of geologic units that may be present in Devonian andiferous units, see Fahrenback and others (2007).

Map location number	Surface geologic unit
52	Pierre Shale
53	Carbonate
54	Greenhorn Limestone
55	Black Hills Shale
56	Clay Spur Sandstone
57	Neogene Sandstone
58	Shall Creek Shale
59	Iron River Group
60	Perrine Shale

**References**

Fahrenback, M.D., Stoes, F.V., Sauer, J.F., McCormick, K.A., McMillen, G.L., Scholz, L.D., and Rodden, J.A., 2007. South Dakota stratigraphic correlation chart. South Dakota Geological Survey Oil and Gas Investigation 1.

Martin, J.L., Sauer, J.F., Fahrenback, M.D., Tombray, D.W., and Scholz, L.D., 2004. Geologic map of South Dakota. South Dakota Geological Survey General Map 10, scale 1:500,000.