PART II

Stop Descriptions

INTRODUCTION

The following descriptions are of rock outcrops that were judged by the authors to represent the best exposures in the field-trip area of all three Springer Formations Members, as well as of the Primrose Member of the Golf Course Formation. These outcrops exemplify important depositional environments.

At outcrops that contain a substantial portion of a representative Member (including overlying and/or underlying strata), detailed gamma-ray (GR) measurements were made of entire sections in order to plot GR responses for the various lithologies. The GR responses are different for shales and sandstones because minerals containing radioactive isotopes (potassium and thorium) tend to concentrate in clays and shales. Sandstones generally have smaller amounts of isotopic minerals. The surface GR profiles can be compared to well logs to correlate sandstone and shale sequences of surface Springer units with subsurface Springer strata penetrated in nearby wells. Surface GR profiles also can support the practice of interpreting lithology and depositional environments based only on well logs. This is possible because of the striking similarities between the GR responses for Springer units at the surface and those for subsurface units as shown on well logs. Through the use of such surface analogies, the character of subsurface sandstone beds can be accurately interpreted from modern well logs.

For this field trip, surface GR profiles were made using a Scintrex GRS-500 gamma-ray spectrometer/scintillometer. For statistical clarity, a 10-second time constant measuring total radiation (uranium plus thorium plus potassium) above 400keV was used for all outcrop GR measurements. GR measurements were made every 2 ft vertically except in diversified strata consisting of thick, discrete, alternating beds of sandstone and shale. In such lithology, measurements were made every vertical foot. In covered areas, GR measurements were made at larger intervals, often of several vertical feet where vegetation and/or soil was minimal.

Cuttings from the Springer Formation and some of the underlying strata from two wells in the study area were examined for comparison to outcrop rocks. Descriptions of cuttings from the Beach & Talbot No. 1 Pruitt BB well are presented in Appendix 2; those from the Goldsmith & Perkins No. 1 Herman Smith well are presented in Appendix 3. These wells were selected because of their location on the north flank of the Caddo anticline and their proximity to Stops 2, 5, 6A, and 6B.

In petroleum exploration and field development, it is very important to be able to interpret basic depositional environments, facies, and lithology from well logs. Working knowledge of this technique enables the geologist to predict reservoir quality and depositional orientation of sand bodies. It also aids in predicting the occurrence of certain types of deposits (both sandstone and nonreservoir deposits) and provides a good basis for predicting areal extent, thickness, and lateral variability of certain deposits.

Locations in this guidebook use standard section-township-range abbreviations. Rock-color terms are those shown on the rock-color chart (Rock-Color Chart Committee, 1991).

STOP 1

ROD CLUB (?) SANDSTONE MEMBER OF THE SPRINGER FORMATION (Overbrook Measured Section)

Location: SW¼SE¼SW¼ sec. 31, T. 5 S., R. 2 E., Carter County, and N½NE¼NW¼ sec. 6, T. 6 S., R. 2 E., Love County (Overbrook 7.5′ quadrangle)

Directions: From U.S. Highway 70, at the south edge of Ardmore, drive ~5 mi south on either Interstate Highway 35 or U.S. Highway 77 to the intersection with State Highway 77S; turn east and cross the Burlington-Northern-Santa Fe railroad tracks. The outcrop is on both sides of the road, ~250 yds east of the railroad tracks.

The sandstone exposed in the cuts on either side of S.H. 77S (Fig. 5) was named the "Overbrook" by Roth (1928). (Note that the sandstone called "Overbrook" on the Caddo anticline [see Stop 2, this guidebook] is not the same lithostratigraphic unit as the one here at its type locality [Straka, 1969].) Lang (1966) identified the sandstone that crops out near Overbrook, Oklahoma, as a Goddard sandstone, based on surface and subsurface studies. However, based on stratigraphic position, lithologic similarities, and interpretations of its depositional environment, we tentatively correlate the sandstone that crops out at Stop 1 with the lowest member of the Springer Formation—the Rod Club.

The thickness of the sandstone at this exposure is difficult to measure because of structural deformation. What appears to be an asymmetrical anticline with a steeply dipping east limb and a more gently dipping west limb can be observed in the road cuts (Fig. 5). Unit 2 (Fig. 6), a