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NOTES ON THE BUFFALO BASIN OIL STRUCTURE

SWEETWATER COUNTY, WYOMING

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The Buffalo Basin structure is located on the northern edge of the Red Desert, in Sweetwater County, in the central and southwestern parts of T. 25 N., Range 96 West.

No complete examination of the structure was made. Two groups of sediments are involved, those of Upper Cretaceous age and those of Basal Eocene age. There is a profound erosional unconformity and a marked angular discordance between these two formations. Along the eastern end of the structure the Niobrara and Steele formations of Upper Cretaceous age dip gently to the east and northeast at an angle of approximately  $10^{\circ}$ . Along the southeastern part of the structure the Steele formation stands vertically, is overturned in some places and there is some evidence of faulting. The Fort Union formation of Basal Eocene age rests unconformably on the Steele with dips ranging from  $10^{\circ}$  to  $60^{\circ}$ . The Steele formation consists mainly of soft gray shales with a few thin soft gray sandstones in the upper part of the succession. The Fort Union formation consists of a varying sequence of conglomerates, sandstones and variegated shales. At the base are numerous beds of well consolidated conglomerates with the roundstones varying in size up to eight inches. Higher in the succession the conglomerates become finer and grade into sandstone beds, between which are carbonaceous shales, thin coal seams and variegated shales.

It is evident that there were two distinct periods of folding separated by a long interval of erosion in this region. The first came at or near the close of Upper Cretaceous time and the second came at or near the close of Basal Eocene time. The folds resulting from these two periods of diastrophism did not follow the same structural lines. From the evidence available it seems a dome was formed in the Fort Union sediments during the second period of folding but this fact does not necessarily mean there is any closure on the oil-bearing strata beneath this dome, as the older formations had been previously folded along entirely different structural lines.

The Fort Union sediments conceal the underlying structure on the northwest, south and southeast sides of the area. The dips are gentler on the north, west and southwest sides of the structure, the highest recorded one being about  $25^{\circ}$ . Several wells have been drilled in this vicinity. No definite data was obtained concerning their depth, the horizons they struck, or the gas, oil, or water they encountered. According to reports one well encountered a large flow of gas and another one a very small flow of oil. All drilling operations were suspended a number of years ago.

It is recommended that a careful survey be made before attempting any subsurface exploration work, as the structures are not conformable, are obscured by overlying sediments and are faulted along the southeastern side. In addition to this it would be well to make a careful study of the sediments lying to the northwest of Buffalo Basin, as there appears to have been some extensive faulting, and one of these places, if it should extend beneath the Buffalo Basin structure might eliminate the possibility of any commercial production of oil or gas.

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