

REPORT
ON
WRAY DOME
YUMA COUNTY
COLORADO

By
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GOLDEN, COLORADO

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During the past week I made an investigation of the area near Wray, Colo. Mr. Paul H. Keating, who had some familiarity with the area, gained on a former trip, accompanied me.

Four wells have been drilled in the area. No's 1, 2 and 3 are located on the Black Wolf Anticline and No 4 on the Arikaree Anticline. I have determined to my own satisfaction that these two Anticlines exist. Whether there is also local doming I am not prepared to definitely state. I believe, however, that domes exist. This judgment is to a large extent influenced by the results of the several wells drilled. It is not possible to correlate a particular stratum from one point to another, - a map must necessarily be made up of local attitudes. The structures are gentle. They are similar to the Mid-continent type of structure. Since the Wray area is located 160 miles East of the Front Range. Mid-Continent structural conditions would perhaps be expected.

The Niobrara (Cretaceous) is exposed in the south and southeastern area, while the shales of Sections 8,9,10,11, 17 and 18 are probably Pierre. Undifferentiated tertiary. White River, occupies the high area removed from the stream; the outcroppings are thus quite limited and for the most part unsatisfactory. The best exposures were North of Arikaree Creek. South of the Creek were several southward attitudes, limited in their extent yet I feel that they show the southward flank of the Anticline. Westward attitudes seen in section 30 seemed satisfactory until I found an exposure apparently flat.

From No. 1, well in Section 14 westward thru sections 15 and 16, the attitudes seen were southward, while in sections 11 and 8 they were northward. In the vicinity of wells Nos 2 and 3 and westward, I could find no exposure of sufficient extent on which to satisfactorily take an attitude. I believe, however, that these wells are on the Black Wolf Structure, possibly on its south flank.

Several important fields of Colorado and Wyoming produce oil from the Nic-Benton and Muddy - Dakota sand series.

The oil and gas development of Wellington, Colorado, west along the mountain foothills was either within the Nic-Benton (Frontier) or the Muddy-Dakota series.

The new field of the Texas company at Hamilton Dome in Northwest Colorado obtained oil in the Dakota.

Both Rock River and Rex Domes, Ohio Oil Company, developments in Southeast Wyoming, obtain oil in the Muddy-Dakota series.

Lance Creek and Mule Creek, also in Southeast Wyoming are Dakota series producers.

Lost Soldier in South-central Wyoming is both Frontier and Dakota series producer.

Grass Creek, Elk Basin, Salt Creek and Big Muddy are Frontier producers. The latter three fields also are productive in the Dakota series.

Both Cat Creek in Montana, and Hog Back in New Mexico are Dakota producers. The Series involved at Wray are most important within the Rocky Mountain Region adjacent.

THE WELLS

Tabulated Analysis of Wells

Well No.	Surf Elev	Thin Lime	Elev. Same	Gas Sand	Elev. Same	Green horn lime	Elev. same	Muddy sand	Elev. same
1,	3570			1490 1590	2080	1985	1585	2530	1040
2,	3725			2050	2135	2100	1625	2636	1089
3,	3722	1351	2371	1593	2130				
4,	3670	1250	2420	1485	2185				

Differences

1 & 2		55	40	29
1 & 3		50		
1 & 4		105		
2 & 3		5		
2 & 4		50		
3 & 4	49	55		

Fortunate for the present investigator is the fact that the four wells have been drilled. One of these wells, No. 4 with respect to the No's 1, 2 and 3 is structurally high, - higher than No's 2 and 3 by 50 to 55 feet, and higher than No. 1 by 100 feet, No. 4 is the one well on the Arikaree anticline No's 2 and 3 are higher than No. 1 by 50 feet.

All the wells found gas in a sand probably the Mio-Benton. The sand has very unusual thickness, 460 feet in number 2. Mr. W. H. Ingersoll, who drilled the well, assured me that there was no break in this sand body, although it was variably hard and soft. A small amount of water was found 135 feet, below its top. It did not raise above the top of the gas sand itself.

In No 2 the Greenhorn lime seems to have been found at 2100 to 2153, while the Muddy-Dakota group was encountered between 2680 and 2815, - three sands of 40 feet each. A show of green oil is reported at 2700 - 2740, and water at 2780. The water arose within 300 feet of the surface. The oil is important; it suggests that there are oil possibilities at higher structural elevations. The gas of all three wells, according to Ingersoll, had pressure of 400 pounds plus by boiler gauge. No gas pressure gauge was used. The initial gas volume of No. 4 was, in Ingersoll's estimation, 1,500,000 although no measurements have been made. The well was brought in during August 1923. The steam gauges on No's 2, 3 and 4 now show 200 plus, 117 and 400 pounds respectively.

No. 1 well was carried, it is said, to a total depth of 3,650 feet. Unfortunately no log below 2530 feet is available. Sand pumpings, however, show that "Red Beds" were penetrated. It is not improbable that the Pennsylvanian series may assume Mid-Continent character in this area, removed as it is from the Mountain making influences.

For several years past the Nee-No-Shee well, located in section 18, township 20 south, Range 46 West, Kiowa County, Colorado, has been in process of drilling at 1,107 feet. They reached the base of the Dakota series, At 2628, drilling Red Beds, they encountered a lime and red shale series, at 3425 feet the limestone changed from gray to black. The well has reported several showings of oil and had reached a depth of 3664 when last reported. It is said not to be on structure. It is also interesting to note that more than one sand containing water is reported. Some of these sands may contain oil at proper location.

I include the Gove County, Kansas, well, located near Scott City, S E $\frac{1}{4}$, S W $\frac{1}{4}$, Section 27, Township 15 South, Range 31 West, and drilled by the Mutual Oil Company. The well apparently left the cretaceous at 1510. It seems to have reached the Red rock - limestone series - at 2460 and to have reached the black slate and lime series at 3095 feet. Total depth was 3840 feet. This well also found several sands containing water in the lower part.

The M. M. Valorious Oil and Gas Company, during 1923, drilling on Section 8-12-15 Russell County, Kansas, obtained oil at 2945 feet. The base of the Dakota was reported at 400 feet. The lime - shale series at 1515 feet and the dark limes and shales at 2875 feet. It is interesting to note that the interval between the Dakota series and the Black line & shale series, in the three wells, is closely related, - 2318, 2585, 2475 feet in the order discussed. It was within the black lime series that the Russell County well obtained oil. The well at Wray should reach the black lime and shale series at approximately 5000 feet. One drilling at Wray will have available natural gas for fuel and water from the two streams, Arikaree and Black Wolf. The latter stream is the more persistent during the year.

CONCLUSION

I find that two gentle anticlines exist; that each appears to have local doming. I base my judgment on the fact that measureable volumes of gas, under considerable pressure have been encountered. I judge that the south, or Arikaree anticline is the larger, and that the next test should be located on it.

I feel that the thick Nio-Benton sand is very interesting for this and other structural developments that may be found in the region. The Muddy-Dakota series offers the most interesting prospects in the area. Three sands each 40 feet thick are reported. It is interesting to know that No. 2 well on the Black Wolf Anticline found a show of oil in one sand of this series. I have also spoken of the deeper prospects as suggested by a well drilled in south east Colorado and two wells in Western Kansas. Considering the fact that the three wells are by no means close together, sedimentation in that region, shows a very remarkable uniformity. Such a test, perhaps will not be justified until the crest, at least, of the Arikaree structure, is definitely found by drilling.

My judgment is that one is dealing at Wray, with a gentle plains country structure, of Mid-Continent type. It is my judgment that a Dakota series test on the Arikaree structure is justified by known conditions. Such tests should be located south - southeast from well No. 4, I suggest that it be placed in the north-west corner of Section 28, Town 2 South, Range 43 West.

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