Prospects for oil and gas in and near the Barker Creek Dome, Colorado and New Mexico. Uplifts in Parts of LaPlata County, Colorado and San Juan County, New Mexico.

Mapped by Government Geologists

by

U. S. G. S.

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PROSPECTS FOR OIL AND GAS IN AND NEAR THE BARKER CREEK DOME, COLORADO AND NEW MEXICO.

Uplifts in Parts of LaPlata County, Colorado, and San Juan County, New Mexico, Mapped by Government Geologists.

When the Midwest Refining Co. in October, 1921, drilled its first well on the Ute dome, which lies largely in T. 32 N., R. 14 W., New Mexico, and struck natural gas in large volumes, the discovery at once suggested that oil and gas might be found in the neighboring Barker Creek dome and other structural uplifts in the vicinity. This area, which had been visited in 1912 by Max Pishel, of the Geological Survey, Department of the Interior, was mapped in 1923 and 1924 by two other Government geologists, J. B. Reeside, jr., and W. W. Boyer, who obtained some of their information from representatives of the oil companies operating in the region.

Wells Already Drilled.

Two wells have been drilled on the Ute dome by the Midwest Refining Co. and one by the Producers & Refiners Oil Co., all near the corner common to secs. 1 and 2, T. 31 N., R. 14 W., and secs. 35 and 36, T. 32 N., R. 14 W. These wells together produce more than 125,000,000 cubic feet of natural gas a day. A fourth well was drilled in sec. 34, T. 33 N., R. 12 W., Colorado, by J. A. Leidecker and others. This well, which was carried to a depth of 3,603 feet, struck small quantities of oil and gas at the horizons shown in the accompanying table of geologic formations, but did not obtain gas or oil in paying quantities. Three wells are now being drilled in this area, one on the Barker Creek dome, by the Gypsy Oil Co., and two by the Leidecker interests, one of which is in sec. 3, T. 32 N., R. 12 W., Colorado, and the other on the east flank of the Ute dome. The location of these wells, except that last mentioned, is shown on the accompanying map.

Geologic Formations.

The general character and the thickness of the geologic formations in the vicinity of the Barker Creek dome that are of present interest to the driller are summarized in the following table:

Geologic formations in parts of San Juan County, New Mexico, and LaPlata County, Colorado, near the Barker Creek dome.

Subdivisions	Thickness (feet)	Character of rocks and possible oil and gas horizons recognizable in drilling.
Recent deposits	0-30	Stream gravels and alluvium.
Pleistocene terrace gravel	0-60	Widespread terrace gravels lying principally east of LaPlata River.
Upper Cretaceous: Fruitland formation	340+	Gray sandy shale, gray-white cross-bedded soft sandstone, brown indurated sandstone, carbonaceous shale and coal.
Pictured Cliffs sandstone	150-210	Buff to light-yellow and gray sandstone inte bedded with thin gray shales.
Lewis shale	1810	Gray to black marine shale, few concretions or sandy zones. Base marked by yellowish - brown calcareous sandstone, 1 to 3 feet thic exposed in Long Hollow and Government Draw.
Mesaverde group: Cliff House sandstone	292-350	An exceedingly variable series of gray-white to buff sandstone lenses, characteristically cross-bedded; lenses of gray shale and sandy shale. This member forms a prominent rim around Barker Creek and Ute domes and where fully exposed is a cliff-maker. Contains brackish water and marine shells.
Menefee formation	570-750	Gray shale and buff sandstone in about equal proportions, containing coal and carbonaceou shale beds, the most widespread of which occurs near the base of the formation. Yield ed show of gas at Leidecker No.1 well, 620 feet below top of the formation.
Point Lookout sandstone	190-250	Gray-white massive sandstone, 90 feet thick underlain by 50 to 90 feet of sandy shale, which in turn rests upon a massive sand mem- ber, 50 to 70 feet thick. The upper sand- stone is easily recognized in drilling. Yielded half enough gas to fire boiler and a show of oil from basal member at Leidecker No. 1 well.
Mancos shale	1938-1985	Gray to black marine shale, some sandy zone Sandy shale zone, 14 feet thick, 1,220 feet below top of formation, contained oil at Leidecker No. 1 well.
Dakota sandstone	220+	Gray sandstone and gray shale with a coal b or black shale 50 to 75 feet below top of formation. Contains oil at Hogback and Rattlesnake dom New Mexico, and gas at Ute dome, and yielde show of oil at the Leidecker No. 1 well.

Structure.

The Barker Creek and related domes are minor uplifts on the west rim of the great San Juan basin, as indicated by the contour lines on the accompanying sketch map, which shows the shapes of the Ute, Barker Creek, Dry Mesa, and Red Mesa domes and of the Long Hollow structural terrace, as well as the southeastward slope of the strata into the San Juan basin.

The Barker Creek dome and the Ute dome are both unsymmetrical, each having a relatively steep southeast flank and a gently sloping northwest flank. In contrast to the Ute dome, which has no pronounced axis of folding, the Barker Creek dome has a marked axis, which trends northeastward to a point not far from the State line, where it turns more nearly north, and which forks farther on, near the south line o T. 33 N., R. 13 W., Colorado. From the crest of this dome its axis plunges southwestward at the rate of about 100 feet to the mile, and toward the northeast it descends even more gently, so that the area of structural closure extends 6 miles into Colorado, the total closure of the dome amounting to about 300 feet.

The southern half of the Ute dome and of the syncline between the Ute and Barker Creek domes is cut by a series of faults, not shown on the map, whose genera trend is N. 70° W. These faults die out on the west on the flanks of the Barker dome and on the east either in the rim of Cliff House sandstone or in the overlying Lewis shale. The blocks defined by these faults appear to include several minor folds.

The Dry Mesa dome, in T. 33 N., R. 13 W., Colorado, is on a minor anticlinal axis that extends nearly at right angles to the axis of the Barker Creek dome, and its area of closure lies within the slight depression between the forks at the northern end of the Barker Creek axis. The Dry Mesa dome is indicated on the map by a 50-foot contour line. Its crest is near the corner common to secs. 21, 22, 27 and 28. The folding in this dome is very gentle, and its structural closure is about 15 feet.

The Red Mesa dome lies principally in sec. 32, T. 33 N., R. 12 W., Colorado. It is a narrow, elongate structure, the axis of which bisects sec. 32 from northeast to southwest. The high point of the dome is near the southwest corner of the NE¼ of NE¼ sec. 32, and its structural closure is about 20 feet.

The Long Hollow structural terrace is in the Long Hollow valley, in the southeastern part of T. 33 N., R. 12 W. The beds exposed at two places in the stream channel lie nearly horizontal, but beds of Lewis shale exposed near the south side of sec. 27 show southward dips of half a degree to a degree and a half.

Prospects of Obtaining Oil and Gas.

Gas and some oil have already been found within this area on the Ute dome and south of the Long Hollow structural terrace at the Leidecker No. 1 well. Other localities have not yet been fully tested.

Coal beds in the Menefee formation and in the Fruitland formation crop out in close proximity to this area, and their content of fixed carbon is not so high as to preclude the possibility that oil may be found here in commercial quantities.

Recommendations for Drilling.

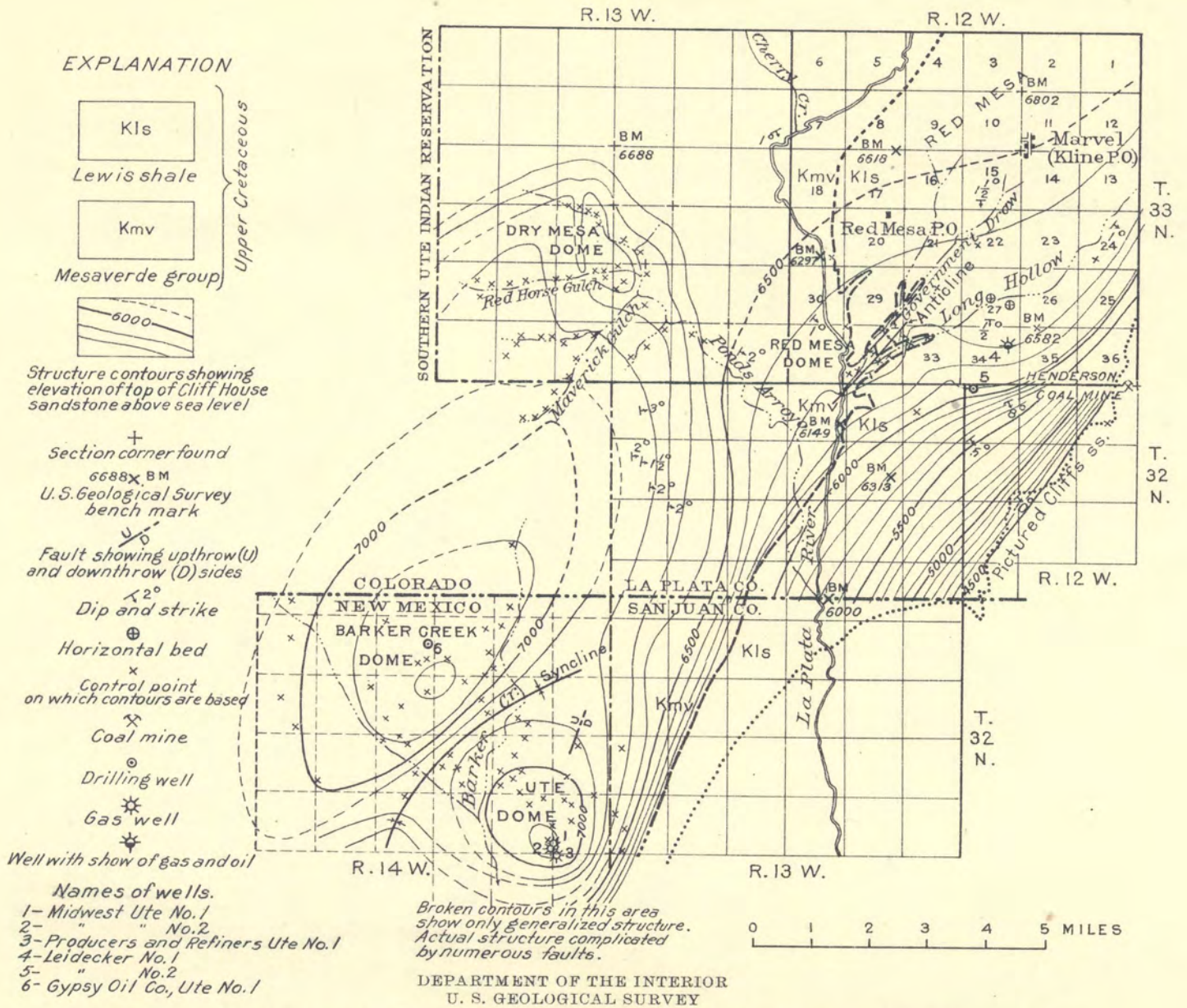
If the test well now being drilled on the Barker Creek dome by the Gypsy Oil Co. encounters a large flow of gas in the Dakota sandstone there, as at Ute dome, wells drilled lower on the flanks of the Barker Creek dome, around the margin of the gas pool, may possibly strike oil.

The Dry Mesa and Red Mesa domes are believed to merit testing, though their structural closures are very small as compared with that of the Barker Creek dome. A test well on the Dry Mesa dome should be started near the corner common to secs. 21, 22, 27 and 28, and should be carried to a depth of at least 3,300 feet unless oil or gas is encountered at less depth. A well on the Red Mesa dome should be started near the center of the NE¼ sec. 32, and should be carried to a depth of at least 3,500 feet.

Accessibility and Operating Conditions.

The nearest railroad point is Durango, which is connected by a good automobile road with the town of Marvel, in T. 33 N., R. 12 W. From Marvel numerous branch roads lead west to Dry Mesa and south to Long Hollow and the LaPlata River. A good road follows LaPlata River down to LaPlata postoffice, whence a branch road leads to the Midwest Refining Co's camp on the Ute dome. The Gypsy Oil Co. has constructed a road from the river to their camp on the Barker dome.

On the Barker and Dry Mesa domes drilling will be hindered by lack of water, which must be hauled or piped from LaPlata River. Elsewhere water may be obtained at little additional expense. Fuel for drilling on Barker dome is obtained from the gas well on Ute dome. Coal of good quality can be obtained from coal mines in the vicinity, or wood for fuel can be cut from the numerous thickets of juniper an scrub pine.



DEPARTMENT OF THE INTERIOR
U. S. GEOLOGICAL SURVEY

MAP SHOWING LOCATION OF BARKER CREEK, DRY MESA, RED MESA, AND UTE DOMES, COLO.-N. MEX.

Compiled from surveys by Max Pishel, 1912, J. B. Reeside, Jr., 1923, and W. W. Boyer, 1924

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