

WALT CANYON UNIT

EDDY COUNTY, NEW MEXICO

INTRODUCTION

The following report is submitted in conjunction with a request for the formation of a working interest unit for the purpose of drilling a 10,500 foot Mississippian test on a location along the south lines of either Section 1 or 2, T-22-S, R-24-E, Eddy County, New Mexico. The topography is very rugged in this area, consequently, the ultimate location cannot be designated until such time as a qualified surveyor has had an opportunity to reconnoiter the area and determine which locations can be made readily accessible for the movement of heavy drilling equipment.

LOCATION

The proposed unit lies approximately 13 miles due west of the town of Carlsbad, New Mexico and is geographically centered about Section 11, T-22-S, R-24-E, Eddy County, New Mexico. Walt Canyon, a very prominent topographic feature after which the unit was named, trends in a north-south direction along the common line of Sections 2 and 3, T-22-S, R-24-E, and divides the unit into two equal segments.

The following acreage will be included within the geographic confines of the proposed Walt Canyon Unit.

Township 21 South, Range 24 East
All of Sections 34 and 35

Township 22 South, Range 24 East
All of Sections 1, 2, 3, 4, 9, 10, 11,
12, 13, 14 and 15
Section 5: E/2
Section 8: E/2

Township 22 South, Range 25 East
All of Sections 6, 7 and 18

GEOLOGY

STRUCTURE

The enclosed structural map, Plate I, contoured on the top of the Mississippian formation, indicates the unit area to be characterized by an east-west trending faulted anticlinal structure. The structural interpretation of the unit area as set forth in Plate I, is based on gravity meter surveys conducted by E. V. McCollum & Company of Tulsa, Oklahoma and surface geologic studies conducted by the consultant firm of Knox, Bergman and Shearer of Denver, Colorado. The outline of the anticlinal structure as it appears in the southern portion of T-21-S, R-24-E and in the northern portion of T-22-S, R-24-E, was taken directly from the gravity interpretation. All faults appearing on Plate I, with the exception of those in T-22-S, R-24-E, exhibit definite displacements at the surface. Those in T-22-S, R-24-E are recognizable on the surface as distinct topographic alignments and in the subsurface as additional sections on electrical logs.

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Electrical log correlations indicate that the Atoka-Morrow section in the Northern Natural Gas No. 1, McKittrick Hills, located in Section 23, T-22-S, R-24-E, is approximately 610' thicker than in the Lowe No. 1 Indian Hills or the Lowe No. 1 Staple, located in Sections 21 and 22, T-21-S, R-24-E. This additional accumulation of sediments may be attributed in part to regional thickening, however, the major portion is attributed to a thrust fault which occurs within the Atoka-Morrow Section. Seismic reconnaissance has indicated a probable fault crossing adjacent to the subject well. Unfortunately the rugged topography of the area prohibits the additional reconnaissance necessary to determine the actual strike of the indicated fault. It is apparent from the additional accumulation of sediments and the seismic data that the No. 1 McKittrick Hills did in fact encounter a thrust fault within the Atoka-Morrow section. However, lacking sufficient control to determine its actual strike, it must be assumed that the distinct topographic alignment which extends from the subject well in a northeasterly direction through the proposed unit is a surface trace of the fault.

Assuming the fault to be located as indicated on Plate I, Sections 1, 12 and 13, T-22-S, R-24-E, and Sections 6, 7 and 18, T-22-S, R-25-E are located on the down thrown side of the fault. These sections are located on a prominent surface anticlinal ridge known as the Range Springs Anticline. The Stanolind No. 1 Guadalupe Foothills and the Inman No. 1 Carnero Peak were both drilled on the aforementioned anticlinal ridge and conclusively proved it to be a surface expression of a deep seated structural feature. Since the true strike of the fault encountered in the No. 1 McKittrick Hills cannot be definitely established, it is requested that the forementioned acreage be included in the unit outline by virtue of its position relative to the Range Springs Anticline.

The structural and stratigraphic aspects of the proposed Walt Canyon Unit have been graphically demonstrated by the enclosed North-South Cross-section, Plate II, through the unit area.

STRATIGRAPHY

There are in excess of 13,000' of Paleozoic sediments underlying the unit area. The established sedimentary column ranges from the Ordovician System through the Permian System. The Seven Rivers formation of the Whitehorse Group, Permian System, comprises the surface rock in the immediate area.

Permian System The Permian System is represented by approximately 7300' of sediments being: 3500' of Guadalupe Series, 3500' of Leonard Series and 300' of Wolfcamp Series. The lithological units are the formations of the Whitehorse and Delaware Mountain Groups of the Guadalupe Series; the Bone Springs formation of the Leonard Series, and the Wolfcamp formation of the Wolfcamp Series.

Pennsylvanian System The Pennsylvanian System will consist of approximately 2100' of sediments representing the Cisco, Canyon, Strawn, Atoka and Morrow Series. The Cisco-Canyon Series will be approximately 1100' thick. The upper 650' will be a carbonate section, considered by many stratigraphers to be of organic origin; the lower 450' will be alternating zones of limestone and shale. The Strawn Series will be represented by approximately 280' of limestone with interbedded sand and shale. The upper portion of the Strawn, in some instances, is both dolomitic and cherty. The Atoka-Morrow Series will be characterized by approximately 700' of alternating sand, shale and lime. The

reservoir development in the Morrow Series usually occurs in the Basal Sand. It is anticipated that this sand will be approximately 60' thick in the Unit Area.

Mississippian System The Mississippian System consists of approximately 760' of sediments of the Chester, Meramec, Osage and Kinderhook Series. The Chester Series, the Upper Mississippian Lime and Barnett Shale, will be approximately 330' thick, the upper 280' will be predominately limestone and shaley lime; the lower 50' will comprise the Barnett shale. The Meramec and Osage Series 'Mississippian Lime' will be represented by approximately 390' of cherty limestone. The Kinderhook Series will be represented by approximately 40' of Woodford Shale.

PROSPECTIVE RESERVOIRS

Potential reservoirs within the proposed unit have been determined by correlation and evaluation of the electric logs on adjacent wells. The characteristics of favorable reservoir development with regards to porosity, gross interval and net pay thickness, estimated productive acres and recovery factor have been considered in determining the prospective reservoirs to be anticipated within the proposed unit.

PENNSYLVANIAN: The Cisco-Canyon and Atoka-Morrow Series of the Pennsylvanian System are the primary objectives of the initial test to be drilled on the proposed unit. The Cisco-Canyon section is productive within two and one-quarter miles of the northern boundary of the proposed unit. The Lowe No. 1 Indian Hills was recently completed for a Calculated Absolute Open Flow of 21.5 MMCFPD from the Cisco-Canyon Section. The 650' of reef development in this well is the most encountered to date.

There are five wells currently completed in the Cisco-Canyon reef in the Indian Basin area which lies approximately five miles to the northwest of the proposed unit in T-21-S, R-23-E. A sixth well tested 10 MMCFPD from the Cisco-Canyon reef and is presently drilling ahead to test the Atoka-Morrow section.

Four of the five wells in the Indian Basin area are dualed with the Morrow. There are several sand zones within the Atoka-Morrow section, any of which could become prolific gas-distillate reservoirs in the proposed unit area.

CONCLUSIONS AND RECOMMENDATIONS

The structural and stratigraphic interpretation based on gravity meter surveys, surface geology and electric log correlations, indicate the presence of an east-west trending faulted anticlinal structure within the outline of the proposed Walt Canyon Unit. The prospects of obtaining commercial quantities of gas and/or gas and distillate from the Cisco-Canyon and Atoka-Morrow Series of the Pennsylvanian System are very good and would economically justify the drilling of a test well.

It is recommended that a test well be drilled to a depth of 10,500 feet or to the top of the Mississippian formation, whichever occurs at the lesser depth, on a location along the south lines of either Section 1 or 2, T-22-S, R-24-E, Eddy County, New Mexico.

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