

PROPOSED NORTH TEXAS HILL UNIT

EDDY COUNTY, NEW MEXICO

YATES PETROLEUM CORPORATION

ARTESIA, NEW MEXICO

Yates	4
6455	

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<p>El Paso Nat 7-1-78 6702</p> <p>7</p> <p>U.S.</p>	<p>El Paso Nat 7-1-78 6702</p> <p>8</p> <p>U.S.</p>	<p>El Paso Nat 7-1-78 6702</p> <p>M.M. Wilson Armstrong 1993 0-15-79</p> <p>9</p> <p>El Paso Nat 9-16-69 L-3533 625</p> <p>State</p>	<p>Stetco 69 Ltd. 1-1-75 8417</p> <p>10</p> <p>El Paso Nat. 3-1-79 9187</p> <p>U.S.</p>	<p>Exxon 3-1-78 27451</p> <p>11</p> <p>(El Paso Nat.) Yates 836</p> <p>U.S.</p>
<p>Sanford Starman 8-1-87 30410</p> <p>18</p> <p>Albert Gushner 4-1-84 20327</p> <p>J.J. Grynberg, 1/2</p> <p>U.S.</p>	<p>J.M. Huber Corp. 7-1-81 3968</p> <p>17</p> <p>U.S.</p>	<p>Stetco 69 Ltd. 3-18-79 L-2635 72</p> <p>16</p> <p>State</p>	<p>Yates Nat. (J.M. Huber Corp.) 1968</p> <p>15</p> <p>Yates Huber Fed. 108125</p> <p>U.S.</p>	<p>Yates (Stetco 69 Ltd.) -8417</p> <p>14</p> <p>Box Canyon</p> <p>MIDLAND MAP</p> <p>U.S.</p>
<p>King Res. 14-1-79 9187</p> <p>King Res. 12-28-79 92729</p> <p>19</p> <p>King Res. 4-1-79 9187</p> <p>U.S.</p>	<p>Albert Gushner 4-1-84 20327</p> <p>J.J. Grynberg, 1/2</p> <p>Stetco 69 Ltd. 1-1-75 8417</p> <p>20</p> <p>Stetco 69 Ltd. 3-18-79 L-2635 72</p> <p>U.S.</p>	<p>Pennzoil & Wainoco 9-1-77 3047</p> <p>21</p> <p>Mallard Expl. Fed. 108125 0-15-77</p> <p>U.S.</p>	<p>Texas O.G. 6-1-84 20325</p> <p>22</p> <p>U.S.</p>	<p>Yates etal 1-1-78 4010</p> <p>23</p> <p>Box Canyon</p> <p>U.S.</p>
<p>King Res. 1-1-80 10861</p> <p>30</p> <p>Scope Ind. 2-1-88 32160</p> <p>U.S.</p>	<p>Pennzoil & Wainoco 6-1-79 9529</p> <p>29</p> <p>Scope Ind. 2-1-88 32160</p> <p>U.S.</p>	<p>Stetco 69 Ltd. 1-1-75 8417</p> <p>Pennzoil & Wainoco 9-1-77 3047</p> <p>28</p> <p>Pennzoil & Wainoco 7-1-79 9799</p> <p>U.S.</p>	<p>Pennzoil & Wainoco 9-1-77 3047</p> <p>27</p> <p>Scope Ind. 2-1-88 32160</p> <p>U.S.</p>	<p>Cities Service 8-1-78 7032</p> <p>26</p> <p>Scope Ind. 2-1-88 32160</p> <p>U.S.</p>
<p>King Res. 1-1-80 10861</p> <p>31</p> <p>Armstrong & Armstrong</p> <p>U.S.</p>	<p>Stetco 69 Ltd. 3-18-79 L-2637 33</p> <p>32</p> <p>State</p>	<p>Scope Ind. 2-1-88 32160</p> <p>33</p> <p>U.S.</p>	<p>Pennzoil & Wainoco 7-1-79 9799</p> <p>34</p> <p>Pennzoil 10-1-79 10446</p> <p>U.S.</p>	<p>Pennzoil 8-1-79 9971</p> <p>35</p> <p>Scope Ind. 2-1-88 32160</p> <p>U.S.</p>

YATES PETROLEUM CORPORATION

EXHIBIT NO. 2

LAND PLAT

NORTH TEXAS HILL UNIT

EDDY COUNTY, NEW MEXICO



YATES BUILDING - 207 SOUTH 4TH ST.
ARTESIA, NEW MEXICO - 88210

S. P. YATES
PRESIDENT
MARTIN YATES, III
VICE PRESIDENT
JOHN A. YATES
VICE PRESIDENT
B. W. HARPER
SEC. - TREAS.

GEOLOGICAL REPORT
PROPOSED NORTH TEXAS HILL UNIT
EDDY COUNTY, NEW MEXICO

PURPOSE

The purpose of this report is to briefly summarize the geological reasons for forming an eight section Federal Unit. Development of the unit will begin with the re-entry of the Mallard-No. 1 Federal "21", Sec. 21-T21S-R21E and drilling it approximately 2000' deeper to a depth of 8200 feet which will test 200 feet of Upper Mississippian Limestone.

LOCATION AND LAND

The propose North Texas Hill Unit is 36 miles west of Carlsbad, New Mexico and immediately southwest of the Little Box Canyon Gas Field (Exhibit No. 1). It has a semi-arid climate with drainage to the east and northeast. The area is accessible by county and lease-ranch roads.

The proposed unit contains eight sections. It includes Sections 16, 17, 20, 21, 28, 29, 32 and 33 in T21S, R22E (Exhibit No. 1 and 2).

GENERAL GEOLOGICAL DISCUSSION

The North Texas Hill Unit is located on the North-western Shelf of the greater Permian Basin of West Texas and Southeastern New Mexico. Approximately 7600 feet of Permian and Pennsylvanian sedimentary rocks are present and will be tested. A wildcat well drilled to a depth of 8200 feet will penetrate the principally prospective Lower Pennsylvanian Morrow Series and bottom in the Mississippian Limestone. Expected tops are as follows:

San Andres	Surface
Glorieta	825 (?)
Abo	3122
Wolfcamp	4144
Cisco	5440
Lower Canyon	6269
Strawn	6505
Atoka	6919
Morrow Clastics	7272
Chester	7590
Mississippian	7740

Exhibit No. 3 shows the structural configuration of the proposed North Texas Hill Unit and surrounding area. The Huapache Fault Zone cuts across the southwest corner of the unit. Structural contours are drawn on top of

the Morrow Clastics on the down thrown block and they are drawn on top of the Abo Formation on the up thrown block. Lower Pennsylvanian rocks are not present on the up thrown block this far north. In the proposed North Texas Hill Unit, a structural closure exists with the -2400 contour cutting each of the sections included in the unit.

The primary objective is the Lower Pennsylvanian Morrow Clastics. Secondary objectives include Atoka, Strawn, Canyon, Cisco and Lower Abo-Upper Wolfcamp. All of these horizons are productive in the surrounding area except the Basal Abo. Morrow production has been established in the Little Box Canyon Field to the north-east, in the Rocky Arroyo Field to the southeast (Exhibit No. 1) and other scattered production as seen on Exhibit No. 3.

Production from Atoka and Strawn sands is present in the area but are sporadic and lack continuity. Wolfcamp, Ciso and Canyon carbonate reservoirs produce in the Little Box Canyon and Rocky Arroyo areas. These reservoirs are in carbonate buildups along the shelf margin with one exception, the Yates - No. 2 Huber "IA", Section 15 in T21S, R21E, which produces from a thin shelf carbonate.

All production in the area is primarily caused by stratigraphic trapping, including the Morrow Clastics,

the primary objective. The stratigraphy of the Morrow Clastics in the proposed unit is similar to that of the Little Box Canyon Area. On Exhibit No. 3 the dashed contours represent isolith contours of total sand in the Upper Morrow Clastics. The interval which has been isolithed is shown on the Stratigraphic Cross Section AA' (Exhibit No. 4). These isolith contours represent the areal extent of a complex shoreline strike sand deposit (beach-bar sands) which can be traced from CatClaw Draw (see Exhibit No. 1) to Little Box Canyon and through the North Texas Hill Unit. Exhibit No. 4 shows some of the key wells with good sand development in this Upper Morrow interval. Moving west along A' to A on Exhibits 3 and 4 structure is regionally up dip. Moving from well to well in the same direction along A' to A wells alternate from producing wells to water wet wells in the Upper Morrow until the Yates - No. 2 - Huber "IA", Section 15, in T21S, R21E. The last two wells on the west are within the unit. Both of these wells, the Mallard - No. 1 - Federal "21" and the Pennzoil - No. 1 - Federal "28" are up dip from the Yates - No. 2 - Huber "IA" which has an excellent sand in the Upper Morrow with good reservoirs qualities but drill stem tested water. The Mallard - No. 1 - Federal "21" is substantially up dip. It was only drilled to 6200 feet and did not penetrate the Morrow. The location of the Mallard - No. 1 - Federal "21"

is in optimum position for penetrating this high quality reservoir. A sand at this same level was penetrated in Pennzoil - No. 1 - Federal "28" which is probably not reservoir connected to the Huber "IA" well but is also highly prospective in this interval and will be discussed in detail later.

An upper interval is also shown on Exhibit No. 4. This section is the Basal Abo and Upper Wolfcamp. A reef facies is present in the Yates - No. 1-Y - Hilliard "BF" Federal. In the other wells on the cross section this interval is a shelf facies. The wells of major significance are the last three wells on the west. These three wells show porosity streaks in the Lower Abo and Upper Wolfcamp. This interval does not produce in the immediate area but does farther north. The Yates - No. 2 - Huber "IA", Section 15 in T21S, R21E, was perforated in this interval and treated. After the load was recovered, additional swab testing produced a very small show of gas and condensate with fluid level at 1500 feet. This same interval in the Mallard - No. 1 - Federal "21", Section 21 in T21S, R21E, is 196 feet structurally higher, and from the mud log this interval had drilling breaks, gas kicks, sample porosity and oil fluorescence with cut. There is also fair to good porosity on the CNL-FDC log (Exhibit No. 4) where these shows occurred. This well was plugged and abandoned with these shows not tested. The Pennzoil - No. 1 - Federal "28",

Section 28 in T21S, R21E is 147 feet higher than the Mallard - No. 1 - Federal "21" at the Basal Abo level and on the BHC log has very good porosity in the interval. This zone was not tested before the Federal "28" was plugged and abandoned. Both of these wells have very good potential to produce oil and gas from the Basal Abo.

Exhibit No. 5 shows portions of the Pennzoil - No. 1 - Federal "28" which have high possibility to be productive gas zones which have not been tested. The bottom zone is a thin porosity zone in the Mississippian Limestone. Very few wells produce from the Mississippian on the Northwestern shelf. On the structural closure in the North Texas Hill Unit the Mississippian Limestone is a very viable objective.

The Morrow zone shown on the Federal "28" on Exhibit No. 5 is the same Upper Morrow sand described previously. Morrow sands at this level in other wells have tremendous permeability and an example of this is displayed on Exhibit No. 5 beside the Morrow in the Federal "28" in the Yates - No. 1-Y - Hilliard "BF" Federal. Both of these wells have a low Rt on their respective electric logs (both below 20 ohms). The Federal "28" shows separation on the Minilog (Micro-Il1) and the Hilliard "BF" shows separation between the Rxo and LLS on the DLL-Micro SFL log. This separation on both logs indicate filter cake build up in the bore hole. This filter cake is also seen on the

Caliper log in both wells by hole rugosity. Filter cake indicates fluid loss into the formation. In the Hilliard "BF" this drilling fluid invasion flushed back into the formation far enough to effect the LL_D reading and indicate a false Rt. From log calculation this sand should have been water wet but the sand was perforated and has produced over one billion cubic feet of gas and still steadily produces three million cubic feet of gas/day. The similarity of the Federal "28" and Federal "21", the structural position of the Federal "28", and the lack of interest in Morrow gas production when the Federal "28" was drilled indicates that this Upper Morrow sand in the Federal "28" could be a by passed prolific gas producing zone.

The Upper zone shown on Exhibit No. 5 of the Federal "28" is a carbonate zone of Canyon (NMOCC Strawn) age which has very good porosity, minilog separation and good Sw calculations. The bottom portion of this zone was drill stem tested with a recovery of 164 feet of slightly gas cut mud and shut in pressures of 1922 psi and 2103 psi. On Exhibit No. 5 across from this zone are the logs from the Yates - Griffin "JJ" Com #1 (formerly operated by AMOCO). Yates took over operations on this well when AMOCO planned to plug and abandon it. The interval shown is Upper Pennsylvanian in age and has porosity development in a carbonate zone. The drill stem test of this interval is very similar to the Federal "28", it recovered GTS TSTM,

200 feet mud with shut in pressures of 1889 psi and 2003 psi. Yates perforated the Griffin as shown and completed the well for one million cubic feet of gas/day. The Federal "28" in this zone of discussion has as much potential as the Griffin because of its' structural position.

SUMMARY AND CONCLUSION

A structure and isolith map was constructed from subsurface data available from the North Texas Hill area. The structure map shows a closure exists which is within the unit area with the -2400 contour cutting each of the sections in the proposed unit. Two wells have been drilled on the unit, the Mallard - No. 1 - Federal "21" and the Pennzoil - No. 1 - Federal "28". The Federal "21" did not drill deep enough to penetrate the Morrow Clastics, the primary objective in the area and did not test other shows which were penetrated. The Federal "28" penetrated the Morrow but did not adequately test reservoir quality rocks and still has a high potential of being a producing well. Reservoir potential in the rest of the unit is very high with high quality reservoirs in the Lower Pennsylvanian Morrow. Secondary objectives exist in shelf carbonate in the Basal Abo, Cisco, Canyon, and Strawn horizons. With the reservoir potential in the North Texas Hill Unit present and a favorable structural position demonstrated,

the unit has the potential of being a very prolific gas producing area.

In conclusion the eight sections, as outlined, appear to be properly located by geologic reasons that give cause and justification for the formation of the North Texas Hill Unit.