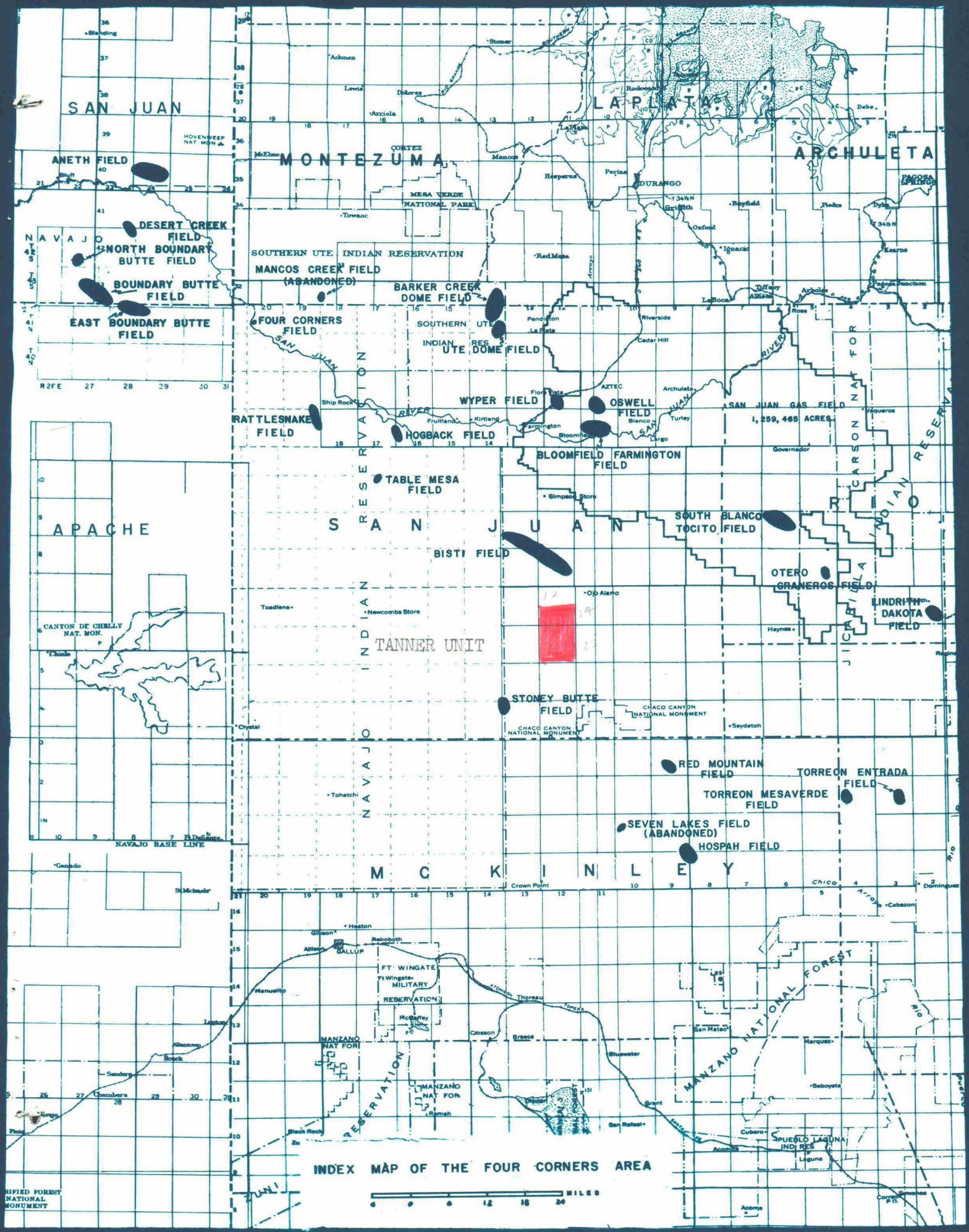
TO: DIRECTOR, UNITED STATES GEOLOGICAL SURVEY,
WASHINGTON, D. C.

FROM: HUMBLE OIL & REFINING COMPANY, EXPLORATION DEPARTMENT,
ROSWELL, NEW MEXICO

SUBJECT: REPORT ON THE GEOLOGY OF THE TANNER AREA, SAN JUAN
COUNTY, NEW MEXICO

PURPOSE: THIS REPORT IS SUBMITTED TO SHOW THE SUBSURFACE GEOLOGY AND TO DEMONSTRATE THE NEED OF FORMING A FEDERAL EXPLORATION UNIT TO TEST THE TANNER AREA. IT IS BELIEVED THAT THE GEOLOGIC CONDITIONS ARE SUCH THAT THE ONLY REASONABLE METHOD OF EXPLORATION AND DEVELOPMENT IS BY MEANS OF AN APPROVED FEDERAL UNIT.

DATE: August, 1956


SAN JUAN
MONTEZUMA
LA PLATA
ARCHULETA
APACHE
NAVAJO
RIO ARRIBA
SANDOVAL
MCKINLEY
ANETH FIELD
DESERT CREEK FIELD
NORTH BOUNDARY BUTTE FIELD
BOUNDARY BUTTE FIELD
EAST BOUNDARY BUTTE FIELD
MANCOS CREEK FIELD (ABANDONED)
BARKER CREEK DOME FIELD
FOUR CORNERS FIELD
UTE DOME FIELD
WYPER FIELD
OSWELL FIELD
RATTLESNAKE FIELD
HOGBACK FIELD
SAN JUAN GAS FIELD
1,259,465 ACRES
BLOOMFIELD FARMINGTON FIELD
TABLE MESA FIELD
SOUTH BLANCO TOCITO FIELD
BISTI FIELD
OTERO GRANEROS FIELD
LINDRITH DAKOTA FIELD
TANNER UNIT
STONEY BUTTE FIELD
RED MOUNTAIN FIELD
TORREON ENTRADA FIELD
TORREON MESAVERDE FIELD
SEVEN LAKES FIELD (ABANDONED)
HOSPAH FIELD
SOUTHERN UTE INDIAN RESERVATION
SOUTHERN UTE INDIAN RES
NAVAJO INDIAN RESERVATION
JICARILLA INDIAN RESERVATION
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CANYON DE CHELLY NAT. MON.
PETRIFIED FOREST NATIONAL MONUMENT
CHACO CANYON NATIONAL MONUMENT
MESA VERDE NATIONAL PARK
NAVAJO BASE LINE
INDEX MAP OF THE FOUR CORNERS AREA
MILES
0 6 12 18 24

REPORT ON THE TANNER AREA, SAN JUAN COUNTY, NEW MEXICO

INTRODUCTION

The location of the Tanner area is in Township 23 and S/2 24 North, Range 12 West, San Juan County, New Mexico. It is proposed that one Federal Exploration Unit be established in these two townships for the purpose of exploration and development of oil and/or gas. This area is located on the south flank of the San Juan basin in the Bisti trend area (Exhibit "B"). Possible productive horizons are the Mesaverde, Gallup, Dakota, Entrada, Pennsylvanian, and Mississippian.

The approval of the requested unit will be in the interest of conservation and of scientific and orderly development of the oil and/or gas reservoirs that might be found within this unit.

RECOMMENDATIONS

It is recommended that the United States Geological Survey approve one Federal Exploration Unit in Township 23 and S/2 24 North, Range 12 West, San Juan County, New Mexico, with the Humble Oil and Refining Company as unit operators. It is further recommended that this unit will be called the Tanner Unit.

As unit operators, Humble will drill three (3) 5,500-foot Cretaceous Dakota tests to cure the unit. In the event of production, Humble will develop and produce the field in an orderly manner consistent with modern and scientific drilling and production practices.

SUBSURFACE STRATIGRAPHY

The Cretaceous sediments for the most part are alternating blanket and off-shore bar sands, marine dark shales, and coals. The generalized stratigraphy can best be described from the section encountered by the M.S.B. Company No. 1 F. W. Meyer located in Section 13, Township 23 North, Range 11 West, San Juan County, New Mexico. This well was plugged and abandoned at 5,272 feet on March 27, 1954.

JURASSIC

Morrison:	202 feet. (Base not penetrated). White to tan sandstone and green to purple shales.

CRETACEOUS

Dakota:	120 feet. Medium grained sandstone with gray shale.
Graneros:	35 feet. Gray shale.
Greenhorn:	50 feet. Limey shale to shaly limestone.
Mancos:	1,730 feet. Dark gray to black shale with a sandstone buildup in the middle of the section.

Gallup: 250 feet. This sandstone buildup is referred to as the Gallup sandstone and is the oil producing zone in the Bisti area. This fine to medium grained sandstone is an off-shore bar sand which had a fluctuating shore line that covered the entire southern flank of the San Juan basin. The productive trend of the Gallup appears to depend more on stratigraphy than structure. In areas where the permeability is low, gas production is found, as in the El Paso No. 1 Nelson (Section 8, Township 26 North, Range 12 West). Southwestward or shoreward the permeability increases due to the nearness to the source area. These sand buildups in the Mancos had a depositional trend of northwest-southeast over the entire south flank of the San Juan basin. A core taken from this same Gallup sandstone in the Meyer well exhibited seven feet of good oil show from 4,193 feet to 4,200 feet.

Mesaverde:	Point Lookout: 150 feet. Dominate sandstone section with alternating shales. Oil has been recovered on drill stem test from the Point Lookout in the Shell No. 1 Carson which is located in Section 24, Township 25 North, Range 12 West.
	Menefee: 1,850 feet. Alternating shales, coals, and sandstones.
	Cliff House: 85 feet. Tan to white quartz sandstone.
Lewis:	660 feet. Dark gray shale.
Pictured Cliffs:	140 feet. Medium grained white sandstone with gray shale stringers. This formation produces gas to the north and northeast in the 1,250,000 acre San Juan gas field.
Fruitland-Kirtland:	600 feet. Gray shales, coal stringers, and sandstones, undifferentiated.

SUBSURFACE STRUCTURE

On top of the Cretaceous Hospah sandstone which is about 100 feet above the Gallup, the regional dip in the area is about 120 feet to the mile in a northeast by north direction (Exhibit "B"). Well control is so sparse that no local structural dips can be postulated from subsurface information.

ECONOMIC POSSIBILITIES

Those zones in the proposed Tanner unit outline area that will have the best possibilities for production of oil and/or gas are as follows:

(1) The interval from 4,900 feet to 5,100 feet (Dakota sandstone) carries hydrocarbons throughout the San Juan basin and could produce gas or oil from either a structural or stratigraphic trap.

(2) The Gallup sand buildup from 4,100 feet to 4,350 feet affords excellent reservoir condition. Production is present in the Bisti field some 6 miles to the north from this blanket sand. Excellent shows of oil have been reported from the M.S.B. No. 1 Meyer and production has been established in the Chaco Unit.

Production from the Gallup does not depend upon structure, but upon permeability and porosity. Subsurface and core information indicate that the Gallup is more permeable toward the southwest. This would also be true for the Mesaverde, Dakota, and other sands in the Mancos that have low permeabilities further north in the basin.

Only one well has been drilled in the unit outline area. This is the D & N Oil and Mining Company No. 1 Hall (Section 8, Township 23 North, Range 12 West). This well was drilled to a total depth of 220 feet and plugged and abandoned on November 18, 1955.

(3) The Point Lookout has recently yielded oil on a drill stem test in the Shell No. 1 Carson (Section 24, Township 25 North, Range 12 West).

PROJECTED DEPTHS

A projected depth of 5,500 feet will test the Cretaceous Dakota throughout the proposed unit outline. The following is a list of projected tops that could be expected:

CRETACEOUS	Pictured Cliffs	600 feet
	Cliff House	1,350
	Menefee	1,450
	Point Lookout	3,000
	Mancos	3,150
	Hospah	4,000
	Gallup	4,100
	Lower Mancos	4,350
	Greenhorn	4,900
	Graneros	4,950
	Dakota	4,980
JURASSIC	Morrison	5,100

PROPOSED DEVELOPMENT

If the Tanner Unit is approved, and unitization progresses to completion, the Humble Oil and Refining Company will drill three (3) wells to 5,500 feet or to the base of the Cretaceous Dakota, whichever is the shallower and thoroughly test all oil and gas shows encountered.

All locations will be made subject to the approval of the State and United States Geological Survey.

If production is established, Humble will develop and produce the field in an orderly manner consistent with modern and scientific drilling and production techniques.

In the event of three initial dry holes, Humble will continue with additional exploration work, using information derived from the tests. This work will consist of further geological studies and/or geophysical surveying, and if the results of these studies indicate it is justified, an additional exploratory well or wells will be drilled.

Respectfully submitted,

B. A. Belknap

BAB:jj

August, 1956

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