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5/14/2002

BIG TUNA PROSPECT Twp. 16S, Rge. 35E Lea County, New Mexico

BEFORE THE OIL CONSERVATION COMMISSION Case No. 12816 Exhibit No. 15-A Submitted By: TMBR/Sharp Drilling Hearing Date: March 20, 2003



Louis J. Mazzullo Geological Consultant Albuquerque, NM 3/19/03

BIG TUNA PROSPECT Lea County, NM

BEFORE THE OIL CONSERVATION COMMISSION Case No. 12816 Exhibit No.15-6 Submitted By: TMBR/Sharp Drilling Hearing Date: March 20, 2003

GEOLOGIC HISTORY AND RESERVOIR DEVELOPMENT IN THE SHOEBAR FIELD AREA, LEA COUNTY, NEW MEXICO

Louis J. Mazzullo

Ameristate Exploration, LLC Albuquerque, New Mexico and Midland, Texas

ABSTRACT

Production in the Shoebar Field area comes from many different types of reservoirs in rocks ranging in age from the Silurian up through and including the Permian Abo Formation. A complex structural setting in this area created a Paleozoic stratigraphy that is difficult to interpret with seismic data alone. The section from the upper Mississippian Chester through the upper Atoka Formations is further complicated by inter- and intra-formational unconformities, and differential movement along major faults. Faults and unconformities were important to the development of reservoirs throughout the section because tectonic movement and exposure events associated with those surfaces affected reservoir distribution, quality, and locally, erosion.

Several formations in the area, including the Wristen, Chester, Atoka, Strawn and lower Wolfcamp, are key targets because of recent exploratory successes or because they offer new reserve development potential. Reservoirs in each of these formations were developed under unique depositional conditions, and prediction of ideal reservoir conditions in these rocks may be facilitated through coordinated lithologic correlations and seismic interpretation. Lithologic data are critical to understanding the abrupt changes that affect the stratigraphy in the area, and to preventing mis-correlations that could inhibit optimum evaluation of prospective targets in a well.

INTRODUCTION

The Shoebar Field area is located westsouthwest of Lovington in Lea County, New Mexico, and is situated on the east side of the Northwest Shelf at the junction of several other major structural elements of the Permian Basin: the Tatum Basin to the north, North Platform to the northeast, and Central Basin Platform to the southeast (Figure 1). In this setting, the Paleozoic section had undergone numerous episodes of tectonic activity, reactivation of older structures, and periodic exposure and erosion of parts of the section. This episodic tectonic activity had varying affects upon development of carbonate and siliciclastic reservoirs that occur in formations from the Wristen (Silurian) through the Abo (Permian). The purpose of this geologic note is to summarize the tectonic setting of the Shoebar area, the types of reservoirs that have developed as a result of the complicated history of the area, and characteristics of major oil and gas reservoirs in the area. The aim of this study was to apply an understanding of reservoir development mechanisms to broadening old plays and developing new ones in formations that have been producing in the area for years. Study in this area is a work in progress, as new drilling activity will no doubt continue to reveal useful details of the stratigraphy that will add to our exploration tools.

COMMISSION OIL CONSERVATION CASE NUMBER 4) Ocean EMERET 21



Figure 1. Location and tectonic setting of Shoebar Field study area in eastern Lea County, New Mexico.

GEOLOGIC SETTING

General

Detailed lithologic study of well cuttings from 19 wells in the area were used to evaluate the stratigraphy of the major producing horizons, identify and correlate formation contacts, and provide depositional models for each of the major target zones. Several high-resolution 2-D seismic lines were also used to identify fault locations and penetrations, and in some cases, to confirm the presence of reservoir facies. Figure 2 shows the stratigraphy of the area and the formations that produce there. Some of the formational contacts (e.g., between the lower Atoka shale and lower Atoka limestone) differ from colloquial use in the area, but are based on detailed lithologic correlation and faunal assemblages.



Figure 2. Silurian through Lower Permian stratigraphic section of the Shoebar area. Well symbols at left are sized in relative proportion to production from formations in the area. Dashed contacts represent major unconformities.

Pay Zones and Production

The greater Shoebar area is in one of the oldest producing areas of the Permian Basin, yet new and significant discoveries continue to be made there. The most prolific production to date has been from sandstones near the base of the Lower Pennsylvanian Atoka Formation (up to 30 billion cubic feet of gas per well), and from algal mound carbonates in the Middle Pennsylvanian Strawn Formation (up to 600,000 to 1,000,0000 barrels of oil equivalent (BOE) per well). Other significant production has been from (1) algal mounds of the Lower Permian Wolfcamp Formation (variously referred to as Permo-Penn or Wolfcamp), which produces dual-phase hydrocarbons (up to 775,000 BOE per well); (2) carbonates of the Silurian Wristen Formation (up to 650,000 barrels of oil per well); (3) Upper Pennsylvanian Cisco algal mounds (similar in reserves to the Wolfcamp); (4) foreshelf carbonates of the Permian Abo Formation (up to



100,000 barrels of oil per well); and (5) various sands in the Lower Pennsylvanian Morrow and upper Atoka shale sections (up to 2.5 billion cubic feet of gas per well). Depths to the various pay formations range from approximately 8,500 feet (Abo) to 13,000 feet (Silurian or Atoka-Morrow).

Tectonic Setting

Figures 2 and 3 show a number of interand intra-formational unconformities that have been recognized in the area. Figure 3 also shows that over relatively short distances, the Paleozoic section is cut by several faults of different ages.

The terminal tectonic event occurred in the Early Wolfcamp, but only affected a small part of the study area. Faults that penetrate only to the upper Atoka are more numerous, and in some areas, faulting terminates in the Silurian and does not extend any farther up section. The major unconformities are found at the top of the Silurian, Mississippian, Atoka, and lower Wolfcamp formations. Important intraformational unconformities are found within the Wristen, Morrow, Atoka, and lower Wolfcamp Formations. Faults and unconformities were important to hydrocarbon production in the area because tectonic movement and exposure events associated with those surfaces affected reservoir distribution and quality, hydrocarbon migration, and locally, reservoir erosion.

EXPLORATION PROBLEMS

Because of the structural complexity and resultant variable stratigraphy of the area, conventional 2-D seismic data has its limitations in exploring for and developing hydrocarbon reservoirs in the Shoebar area. 3-D seismic, which has been used a lot in the area over the last several years, has had mixed success because of the way the section and structure can change very abruptly over short lateral distances. For example, Figure 3 shows that on the highest fault blocks, part or all of the upper Mississippian, Morrow, and lower Atoka Formations can be stripped off, depending upon the timing of movement along each fault. It is not surprising, then, that seismic interpretations sometimes miss their mark because these abrupt changes in structure and stratigraphy are not always recognized or anticipated.

Another problem that arises from misunderstanding the stratigraphy is drilling short of potential pay zones. For example, the lower Atoka and upper Morrow limestones have been often mistaken for the Mississippian Chester or Meramec-Osage limestones, causing some operators to drill short of targets in the Morrow. The lithologies of the Atoka-Morrow and the Mississippian are distinguishable in samples, but log responses in these formations are often similar. Well logs are not a reliable means by which to correlate sections, especially when it comes to deciding on the final depth of a well.

MAJOR RESERVOIRS -

Table 1 lists the types of reservoirs found in the Shoebar study area. The more important reservoirs in terms of recent exploratory successes or potential new development are summarized below.

Silurian

The oldest rocks that produce in this immediate area are dolomitic carbonates that have been referred to as Devonian, but which are lithologically similar to the Upper Silurian Wristen Formation (e.g., Mazzullo, 1998). The Wristen Formation subcrops beneath a relatively thick section of dark Woodford Shale in this area. Production is from moderately-bedded porous dolomites that are interbedded with non-porous limestones. Although most of the production is on higher structural blocks, productive features are small and reserves not always commensurate with the amount of structural closure.

Figure 4 suggests the reason for lackluster production out of the Wristen. Unit A is a limestone reference horizon, identified with samples, that is used to show the relationship between pre-Woodford and post-Woodford structure. The changing structural attitude of unit A relative to the base of the Woodford reflects pre-Woodford folding and removal of the upper part of the section, which is a common occurrence in this part of the Lower Paleozoic (Mazzullo, 1990). The base of the Woodford Shale is an exposure surface. The section below this surface was folded prior to exposure and erosion and further modified by subsequent tectonic events in the Mississippian, Atoka, and early Wolfcamp. Consequently, porous reservoir facies (dolomites) could be eroded off or are not always ideally juxtaposed on the later structures, and are often reverse-structured from what is mapped on the base of the Woodford shale. With adequate TABLE 1

RESERVOIRS IN THE SHOEBAR AREA AND VICINITY

SILURIAN:	Restructured karsted carbonates; dolomites interbedded with limestones
MISSISSIPPIAN:	Weathered tripolitic limestones near top of the Chester
MORROW:	Primarily alluvial sandstones, absent on higher structures
ATOKA:	Fluvial/Transitional marine sandstones in lower part; Fluvial and marine sands in upper part
STRAWN:	Sandstones on top of upper Atoka unconformity; Algal mound carbonates on flanks of deeper structures
CISCO:	Algal mound carbonates; foreslope detrital carbonates
L. WOLFCAMP:	Tubiphytes/algal mounds along flanks of deeper highs
ABO:	Foreslope to shelf-edge carbonates

sample control, the Wristen can be zoned, and reservoir dolomites traced to areas where they might trap more favorably, even if these areas do not coincide directly with highest structures.

Mississippian

The Upper Mississippian Chester Limestone pays in a few wells in the area, although it is often mis-correlated as a Morrow pay zone. It is noted here because it may offer additional reserve opportunity that has generally gone unrecognized. Based on correlations of Mississippian lithologies from several wells, the pay zone is a reworked, tripolitic, carbonate sand that appears to form very close to major fault scarps that cut the Upper Mississippian section.

Figure 4 suggests how these carbonate sands may have formed. The top of the Mississippian is one of the major unconformities in the area. During the latest Mississippian, lowrelief uplift occurred along the faults and exposed cherty Chester limestones to erosion. Unit *B* was formed from erosion of the fault scarp, and deposition of debris in alluvial fans close to the base of the scarps. The carbonate debris was exposed and tripolitized, which created the outstanding porosity seen in these reservoirs. Since they were deposited so close to the source, they are limited in width and probably discontinuous along trend, which makes them hard to predict. To date, these reservoirs have been found to be up to 20 to 25 feet thick, and capable of delivering in excess of 1.0 billion cubic feet of gas per well.

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Atoka

Sandstones near the base of the lower Atoka shale (Figure 2) are the most sought after reservoirs in the area because of their potentially large gas reserves. These sandstones were



Figure 4. Structural cross-section through the Silurian and Chester sections in the Shoebar area. Unit A represents a limestone marker bed in the Wristen; Unit B is a tripolitic lime grainstone in the Chester.

deposited in fluvial environments over most of the area, but the net pay section is actually a composite of several individual channel units that locally stack into appreciable thicknesses of sand (Figure 5). These sandstones were deposited on a relatively gently-sloping alluvial plain. Because these sands are found on both high and low structural blocks, they appear to have been deposited in relatively low areas that were differentially uplifted after deposition, either in the late Early Atoka or Late Atoka.

Some basal Atoka sands terminate abruptly on parts of the higher fault blocks in the area (Figure 6). Because their grain size and lithology do not change closer to these highs, it is suspected that the lower Atoka section was uplifted shortly after deposition of the sands, and the sands were eroded off the highs. This event is marked by an intraformational unconformity that separates the lower Atoka shale and limestone from the upper Atoka section (Figures 2 and 3). On the highs, the Atoka thins by erosion of the basal part of the lower Atoka shale and the Atoka limestone sections. Lower permeability is also associated with these sands in close proximity to the highs, presumably due to early postdepositional occlusion of primary porosity in the meteoric environment.

Strawn

The Shoebar area is south of (i.e., basinward of) the main Lovington Strawn trend. The Lovington trend is characterized by a few

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hundred feet of Strawn carbonate that is comprised of multiple, stacked carbonate algal mound sequences. In the Shoebar area, the Strawn is only 50 to 150 feet thick. It locally contains isolated algal mound sequences (Figure 7) in the northern part of the study area, but grades to basinal, muddy limestones in the southern part. The mounds are commonly found on the flanks of underlying structural highs rather than on the crests. These highs provided paleo-topographic substrates on the sea floor on which mounds grew. However, the wave-intolerant phylloid algae that are common to these mounds favored the slightly lower-energy environments around the flanks of the highs.

Lower Wolfcamp

The lower Wolfcamp produces from algal mounds similar to those in the Strawn (Figure 7), but are dominated by *Tubiphytes* algae, red algae, and bryozoans. These species were more resistant to wave energy than those in the Strawn, and grew both on the flanks and near the crests of substrate highs. The lower Wolfcamp is often miscorrelated as the upper Cisco because it has been generally thought that the southernmost extent of *Tubiphytes* mound development in the Wolfcamp was to the north along the Eidson-Townsend trend. A high-relief Early Wolfcamp reverse fault block, however, provided the substrate for more basinward development of these mounds in the Shoebar area.

The lower Wolfcamp mounds developed in carbonate facies tracts that shifted depositional sites laterally through time in response to changes in relative sea level. As a result, mounds were able to grow on the higher structural blocks in the area several miles seaward of the main Eidson-Townsend shelf-edge trend to the north. At Shoebar, lower Wolfcamp reservoirs occur as discrete mound sequences of less than 30 feet thickness, or locally develop over 300 feet of stacked, composite sequences.

CONCLUSIONS

The Shoebar area is an exploration and development play in a mature hydrocarbon

producing region because of the number of potential reservoir zones in the section, many of which have not been developed to their full potential. Part of the reason why reservoirs are underdeveloped or overlooked is the stratigraphic complexity that arises from the unique tectonic setting of the area. It is understandable that miscorrelations have limited development in some areas because it is difficult to sort out the section without detailed lithologic correlations.

Seismic evaluation of the area should not be conducted without coordinated lithologic study. The examples cited in this report have shown how critical lithologic and faunal correlation can be to correctly placing reservoirs in the section, and how abrupt changes in section may not be easily recognized. Log correlations are not reliable for gross stratigraphic correlation here because logs cannot characterize facies and faunal assemblages, and different formations often show similar log signatures. In areas where well control is adequate, it should possible to enhance chances for a successful well and finding new reserves from old producers by applying reservoir models based on lithologic study to the location of new well sites and interpretation of 3-D seismic.

REFERENCES CITED

- Mazzullo, L. J., 1990, Implications of sub-Woodford geologic variations in the exploration for Silurian-Devonian reservoirs in the Permian Basin; West Texas Geological Society, Publ. 90-86, p.29-42.
- Mazzullo, L. J., 1998, Exploration model of nonconventional Siluro-Devonian reservoirs in the Permian Basin (abstract); Frontier and Underdeveloped Basins of New Mexico, Albuquerque: Petroleum Technology Transfer Council Symposium.

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214 West Texas Suite 400, (Zip 79701) P.O. Box 2071 Midland, Texas 79702	DAVID H. ARRINGTON OIL & GAS, INC.	Phone: (915) 682-6685 Fax: (915) 682-4139
Ministry Teers 19702	·	

September 10, 2001

Mr. Derold Maney Ocean Energy, Inc. 1001 Fammin, Suite 1600 Houston, TX 77992

> Re: Assignment Of Rights In And To Certain Farmout Agreements Concerning The SW/4 Of Section 25, T165, R35E, Lea County, New Mexico South Payday "25" Prospect

Gentleman:

When executed by the parties hereto, this lener agreement (this "Agreement") shall set forth the agreement between Ocean Energy, Inc. a Louisiana corporation ('Ocean") and David H. Arrington Oil & Gas, Inc. ("Arrington") concerning the assignment of thirty percent (30%) of Ocean's right in and to those certain farmout agreements covering the SW/4 of Section 25, T16S, R35E, Lea County, New Mexico, more particularly described on Schedule 1 hereto (such agreement, as may be amended, supplemented, restated or otherwise modified from time to time, a "Farmout Agreement", and collectively, the "Farmout Agreements"). For good and valuable consideration, the sufficiency of which is hereby acknowledged, the parties do hereby agree as follows:

1. On or before July 1, 2002, but not earlier than January 10, 2002, time being of the essence, Arrington shall commence actual drilling of a test well (the "Test Well") to be located in the NW/4 of Section 25, T16S, R35E, Lea County, New Mexico, referred to as the Triple Hackle Dragon 25 #1 Well, and shall thereafter prosecute drilling of the Test Well to penetrate and test the lower Mississippian Lime formation (as hereinafter defined) or to a depth of approximately thirteen thousand two hundred feet (13,200"), whichever is the lesser depth (the "Contract Depth") and shall complete the Test Well as capable of producing oil and/or gas in paying quantities or plug and abandon the same. Ocean shall participate in the drilling of this Test Well for its proportionate share. The Lower Mississippian Lime formation is defined as that certain gas and condensate bearing zone encountered at the stratigraphic equivalent depth of twelve thousand four hundred and four feet (12,404"), as shown on that certain compensated neutron three detector density log measurement in the Mayfly "14" State Com # 1 Well, located in Section 14, Township 16 South, Range 35 East, Lea County, New Mexico.

ARRINGTON OIL & GAS, INC. BEFORE THE COMMISSION NMOCD CASE NO. 12731 & 12744 DATE: 03/26/02 EXHIBIT NO.

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. . Mr. Derold Maney Ocean Energy, Inc. September 10, 2001 Page 2 of 6

> In the event that the drilling till opinion rendered by a law firm licensed to do business in the State of New Mexico shall contain title requirements such that Arington or Ocean as a reasonable and prudent operator is unable to commence drilling operations on the Test Well prior to July 1, 2002, Arrington or Ocean shall no later than January 5, 2002, indiate force pooling proceeding for a 320 arre unit comprised of the W/2 of Section 25, T165, R35E, Lea County, New Mexico. Arriagion or Ocean shall diligently and expeditiously pool such lands in order to cure such title requirements so that the Test Well may be drilled prior to July 1, 2002.

> Should Arrington or Ocean fuil to successfully cure such title defects through force pooling proceeding or otherwise and fail to timely commence drilling operations on the Test Well by July 1, 2002, then Ocean shall have the right, but not the obligation, to become the designated Operator under the Operating Agreement for the drilling of the Test Well through the point of first production; subsequently, Ocean shall relinquish operations under said Test Well to Arrington, and Arrington shall be the designated Operator under the Operating Agreement. Notwithstanding anything contained in this Agreement to the contrary Ocean shall not be obligated to participate in the drilling of the Test Well for a share of costs greater than thirty-five percent (35%) and Ocean is statisfied in its sole discretion that the remainder of the costs for the Test Well will be paid, either by Arrington or another third party with title to the leasehold interest in the lands contained within the pooling order issued by the New Mexico Oil Conservation Division.

- 2. In the event any well is lost for any reason prior to being dulled to Contract Depth or Arrington has encountered, during the drilling of any well, mechanical difficulty or a formation or condition which would render further drilling impracticable or impossible, Arrington may plug and abandon that well and may continue its rights under this agreement by commencing a substitute well (or wells) ("Substitute Well(9)") for any such well which has been lost or abandoned within sixty (60) days from the date the drilling rig is removed from the location of the prior well. Any Substitute Well drilled shall be drilled subject to the same terms and conditions and to the same depth as provided for the well so lost or abandoned. Any reference in this agreement to the Test Well shall be deemed to be a reference to any well or wells, which may be drilled as a Substitute Well. In the event that either party elects to drill a Substitute Well as provided herein, the other party must participate in same, or forfieir to the participating party any interest which it would have otherwise carned by virtue of its participation in such Substitute Well.
- 3. Contemporaneously herewith, Arrington and Ocean shall have entered into that certain Operating Agreement attached hereto as Exhibit A (the "Operating Agreement"), covering the W/2 of Section 25, T165, R35E, Lea County, New Mexico (the "Contract Area"). Exhibit "A" to the Operating Agreement shall be completed based apon the results of the drillsite title opinion being prepared covering the W/2 of said Section 25.
- 4. Subject to the terms and conditions (1) of this agreement, (11) each Farmout Agreement and (111) the Joint Operating Agreement, Ocean hereby assigns unto Arrington, an undivided

Mr. Derold Maney Cocan Evergy, Inc. September 10, 2001 Page 3 of 6

> thirty percent (30%) of Ocean's right in and to each Fannoot Agreement. In the event that any Farmout Agreement comming a requirement that the Farmor (as defined in such Farmout Agreement) thereunder consent to any such assignment. Ocean shall use its best efforts to obtain such consent, <u>provided however</u>, that in the event that Ocean is unable to acquire such Farmor's consent to assign, then Ocean shall assign additional interest(s) from such other of the Farmout Agreements as Ocean may elect in its discretion such that the aggregate of Artington's right to earn rights under all Farmout Agreements will entitle Artington to an assignment of Ocean's interest in the Contract Area equal to an undivided thirty percent (30%), proportionately reduced to Ocean's interest in the Contract Area. The terms and conditions of this letter agreement shall apply to any extensions or renewals of each Farmout Agreement acquired by either Artington or Ocean within 180 days of the expiration of the farmout agreement.

- 5. Arrington has acquired proprietary 3D seismic data across certain lands, including, without limitation; T16S, RJSE, Les County, New Mexico (i) Section 23; E/2E/2; (ii) Section 24: All that Arrington has in the SW/4; (iii) Section 25: W/2, W/2E/2; (iv) Section 26: E/2E/2; (v) Soction 35: NE/4NE/4; and (vi) Section 36: N/2NW/4, NW/4NE/4 (such 3D seismic data, colloctively, the "Arrington 3D Data"). Arrington agrees (and represents to Ocean that Arrington has the right to so agree) that Ocean shall (1) have access to the Arrington 3D Data in Arrington's offices during normal business bours, in order to work and interpret the Arrington 3D Data and (ii) have access to and copies of, Arrington's interpretations of the Arrington 3D Data (the Arrington 3D Data together with such interpretations thereof, the "Arrington Evaluation Material"). Arrington shall rotain full ownership rights to the Arrington 3D Data, and no ownership or license to the Arrington 3D Data shall be conveyed to Occan. Except as provided for in this Paragraph 5, Arrington makes no representations or warranties to Ocean (i) as to the Arrington 3D Data (ii) or in respect of Ocean's reliance upon the Arrington Evaluation Material. Ocean shall keep the Arrington Evaluation Material confidential; provided however, that such obligation of confidentiality shall not apply to information which (i) was or becomes available to the public other than as a result of a disclosure by Occan, (ii) was or becomes available to Occan on a non-confidential basis from a source other than Arrington, provided that such source is not known by Ocean to be bound by a confidentiality agreement with Arrington or otherwise prohibited from transmitting the information by a contractual, legal or fiduciary obligation, (iii) was within Ocean's possession prior to its being furnished by Arrington, (iv) is developed or derived without the aid, application or use of the Arrington Evaluation Material, (v) is disclosed following receipt of the written consent of Arrington to such disclosure being made, or (vi) is disclosed pursuant to Paragraph 6 bereof.
- 6. In the event that Ocean is requested or required (by oral questions, interrogatories, requests for information or documents, subpoena civil investigative demand or other process) to disclose any of the Arrington Evaluation Material, Ocean agrees that it will provide Arrington with prempt notice of any such request or requirement (written if practical) so that Arrington may seek an appropriate protective order or waive compliance with the provisions of this Agreement. If, failing the entry of a protective order or the receipt of a waiver hereunder prior to the time such disclosure is required to be made, Ocean may disclose that

Mr. Derold Maney Occan Euergy, Inc. September 10, 2001 Page 4 of 5

> portion of the Arrington Evaluation Material which Ocean's counsel advises that it is compelled to disclose and will exercise reasonable efforts to obtain assurance that confidential treatment will be accorded to that portion of the Arrington Evaluation Material which is being disclosed. Arrington agrees that Ocean shall have no liability hereunder for any disclosure of the Arrington Evaluation Material made in compliance with this Paragraph 6.

- 7. Ocean has acquired proprietary 3D seismic data across certain lands, including, without limitation, T15S, R35E, Lea County, New Mexico (i) Section 7: W/2, W/2NE/4, W/2SE/4, SE/4SE/4; (ii) Section 17: W/2NW/4, NW/4SW/4; and (iii) Section 18: N/2, N/2S/2 (such 3D seismic data, collectively, the "Occan 3D Data"). Occan agrees (and represents to Arrington that Ocean has the right to so agree) that Arrington shall (i) have access to the Ocean 3D Data in Ocean's offices during termal business hours, in order to work and interpret the Ocean 3D Data and (ii) have access to and copies of, Ocean's interpretations of the Ocean 3D Data (the Ocean 3D Data together with such interpretations thereof, the "Ocean Evaluation Material"). Ocean shall retain full ownership rights to the Ocean 3D Data, and no ownership or license to the Ocean 3D Data shall be conveyed to Arrington. Except as provided for in this Paragraph 7, Ocean makes no representations or warranties to Arrington (1) as to the Ocean 3D Data (11) or in respect of Arrington's reliance upon the Ocean Evaluation Material. Arrington shall keep the Ocean Evaluation Material confidential; provided however, that such obligation of confidentiality shall not apply to shall not apply to information which (i) was or becomes available to the public other than as a result of a disclosure by Arrington, (ii) was or becomes available to Arrington on a nonconfidencial basis from a source other than Ocean, provided that such source is not known by Arrington to be bound by a confidentiality agreement with Ocean or otherwise prohibited from transmitting the information by a contractual, legal or fiduciary obligation, (iii) was within Arrington's possession prior to its being furnished by Ocean, (iv) is developed or derived without the aid, application or use of the Ocean Evaluation Material. (v) is disclosed following receipt of the written consent of Ocean to such disclosure being made, or (vi) is disclosed pursuant to Paragraph 8 hereof.
- 8. In the event that Arrington is requested or required (by oral questions, interrogatories, requests for information or documents, subpoent civil investigative demand or other process) to disclose any of the Ocean Evaluation Material, Arrington agrees that it will provide Ocean with prompt notice of any such request or requirement (written if practical) so that Ocean may seek an appropriate protective order or waive compliance with the provisions of this Agreement. If, failing the entry of a protective order or the receipt of a waiver hereunder prior to the time such disclosure is required to be made, Arrington may disclose that portion of the Ocean Evaluation Material which Arrington's counsel advises that it is compelled to disclose and will exercise reasonable efforts to obtain assurance that confidential treatment will be accorded to that portion of the Ocean Evaluation Material which is being disclosed. Ocean agrees that Arrington shall have no liability hercunder for any disclosure of the Ocean Evaluation Material made in compliance with this Paragraph 3.

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Mr. Derold Maney Ocean Energy, Inc. September 10, 2001 Page 5 of 6

- 9. It is not the intention of the parties to create a partnership, nor shall this agreement be construed as creating a mining or other partnership, joint venture, agency relationship or other association, or to render the parties liable as parmers, co-venturers or principals. Unless provided for to the contrary in the Operating Agreement, (i) the liability of the parties shall be several, not joint or collective and (ii) each party shall be responsible only for its obligations, and shall be liable only for its proportionate share of the costs, if any, to be incurred hereunder. No party shall have any liability hereunder to third parties to satisfy the default of any other party in the payment of any expense or obligation.
- 10. This Agroement and all matters pertaining hereto, including, but not limited to, matters of performance, non-performance, breach, remodies, procedures, rights, duties and interpretation or construction, shall be governed and determined by the law of the State of Texas. THE PARTIES HEREBY CONSENT TO THE EXCLUSIVE VENUE OF THE PROPER STATE OR FEDERAL COURT LOCATED IN MIDLAND COUNTY, TEXAS, AND HEREBY WAIVE ALL OTHER VENUES.
- 11. This Agreement, the Exhibits and Schedules hereto and the Operating Agreement set forth all understandings between the parties respecting the subject matter of this transaction, and all prior agreements, understandings and representations, whether oral or written, respecting this transaction are merged into and supersected by this written agreement.
- 12. This agreement shall be binding upon and shall insure to the benefit of the parties and their tespective successors and permitted assigns and the terms horoof shall be deemed to run with the lands described herein. If any transfer is effected by a party pursuant to the terms of this agreement, or by any of its successors or assigns, the transfer will be made expressly subject to this agreement, and the transferor shall remain responsible for the obligations of the transfere until the transferee expressly assumes in writing all of the cuisting duties and obligations of the transferor.
- 13. This agrounds may not be altered or amonded, nor any rights become waived, except by an instrument, in writing, executed by the party to be charged with such amendment or waiver. No waiver of any other term, provision or condition of this agreement, in any one or more instances, shall be deemed to be, or construct as, a further or continuing waiver of any such term, other provision or condition or as a waiver of any other term, provision or condition of this agreement.
- 14. EACH PARTY WAIVES, TO THE FULLEST EXTENT PERMITTED BY APPLICABLE LAW, ANY RIGHT IT MAY HAVE TO A TRIAL BY JURY WITH RESPECT TO ANY SUIT, ACTION OR PROCEEDING RELATING TO THIS AGREEMENT.
- 15. If any provision of this agreement is invalid, illegal or incapable of being enforced, all other provisions of this agreement shall acvertbeless remain in full force and effect, so long as the economic or legal substance of the transactions contemplated hereby is not affected in a materially adverse manner with respect to either party.

۵-02 09:31<u>A</u>. ما العدر 10:00 -02 Mr. Derold Maney Occan Energy, Inc. September 10, 2001 Page 6 of 6 If this properly sets forth your understanding of our agreement, please so indicate by signing in the space provided below, and remining to my attention. . It was properly see your uncersuboung or our space provided below, and rearning to my attention. .

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Mr. Decald Mancy Occan Energy, Inc. September 10, 2001 Page 7 of 6

Yours truly,

DAVID H. ARRINGTON OIL & GAS, INC.

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David H. Arrington President

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NOV PM ACCEPTED AND AGREED THIS ______ BER 2001

Schedule 1 to that certain Letter Agreement, by and between Ocean Energy, Inc., a Louisiana corporation and David H. Arrington Oil & Gas, Inc., dated as of September 10, 2001

- 1. Farmont Agreement, dated as July 23, 2001, by and between Ocean Energy, Inc., a Louisiana corporation, as Farmer, and Branex Resources, Inc., as Farmor, as amended by that certain Letter Agreement, dated as of August 14, 2001, attached hereto as Exhibits B-1 and B-2;
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Feb-26-02 09:28A

214 West Texas Suize 400, (Zip 79701) P.O. Box 2071 Midland, Texas 79702 DAVID H. ARRINGTON OIL & GAS, INC.

Phone: (915) 682-6685 Fax: (915) 682-4139

September 10, 2001

Mr. Derold Maney Ocean Energy, Inc. 1001 Fammin, Suite 1600 Houston, TX 77992

> Re: Assignment Of Rights In And To Certain Farmout Agreements Concerning The SW/4 Of Section 25, T16S, R35E, Les County, New Mexico South Payday "25" Prospect

Gentlaman:

When executed by the parties hereto, this lener agreement (this "Agreement") shall set forth the agreement between Ocean Energy, Inc. a Louisiana corporation ('Ocean") and David H. Arrington Oil & Gas, Inc. ('Arrington') concerning the assignment of thirty percent (30%) of Ocean's right in md to those certain farmout agreements covering the SW/4 of Section 25, T16S, R35E, Lea County, New Mexico, more particularly described on Schedule 1 hereto (such agreement, as may be amended, supplemented, restated or otherwise modified from time to time, a "Farmout Agreement", and collectively, the "Farmout Agreements"). For good and valuable consideration, the sufficiency of which is hereby acknowledged, the parties do hereby agree as follows:

1. On or before July 1, 2002, but not cardier than January 10, 2002, time being of the essence, Arrington shall commence actual drilling of a test well (the "Test Well") to be located in the NW/4 of Section 25, T165, R35E, Lea County, New Mexico, referred to as the Triple Hackle Dragon 25 #1 Well, and shall thereafter prosecute drilling of the Test Well to penetrate and test the lower Mississippian Line formation (as hereinafter defined) or to a depth of approximately thirteen thousand two hundred feet (13,200"), whichever is the lesser depth (the "Contract Depth") and shall complete the Test Well as capable of producing oil and/or gas in paying quantities or plug and abandon the same. Ocean shall participate in the drilling of this Test Well for its proportionate share. The Lower Mississippian Line formation is defined as that certain gas and condensate bearing zone encountered at the stratigraphic equivalent depth of twelve thousand four hundred and four feet (12,404"), as shown on that certain compensated neutron three detector density log measurement in the Mayfly "14" State Com # 1 Well, located in Section 14, Township 16 South, Range 35 East, Lea County, New Mexico.

ARRINGTON OIL & GAS, INC. BEFORE THE COMMISSION NMOCD CASE NO. 12731 & 12744 DATE: 03/26/02 EXHIBIT NO.

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Mr. Derold Maney Ocean Energy, Inc. September 10, 2001 Page 2 of 6

In the event that the drilling tile opinion rendered by a law firm licensed to do business in the State of New Mexico shall contain title requirements such that Arrington or Ocean as a reasonable and prudent operator is unable to commence drilling operations on the Test Well prior to July 1, 2002, Arrington or Ocean shall no later than January 5, 2002, initiate force pooling proceeding for a 320 arre unit comprised of the W/2 of Section 25, T165, R35E, Lea County, New Mexico. Arrington or Ocean shall diligently and expeditiously pool such lands in order to cure such title requirements so that the Test Well may be drilled prior to July 1, 2002.

Should Arrington or Ocean fail to successfully cure such title defects through force pooling proceeding or otherwise and fail to timely commence drilling operations on the Test Well by July 1, 2002, then Ocean shall have the right, but not the obligation, to become the designated Operator under the Operating Agreement for the drilling of the Test Well through the point of first production; subsequently, Ocean shall relinquish operations under said Test Well to Arrington, and Arrington shall be the designated Operator under the Operating Agreement. Notwithstanding anything contained in this Agreement to the contrary Ocean shall not be obligated to participate in the drilling of the Test Well for a share of costs greater than thirty-five percent (35%) and Ocean is statisfied in its sole discretion that the remainder of the costs for the Test Well will be paid, either by Arrington or another third party with title to the leasehold interest in the lands contained within the pooling order issued by the New Mexico Oil Conservation Division.

- 2. In the event any well is lost for any reason prior to being dulled to Contract Depth or Arrington has encountered, during the drilling of any well, mechanical difficulty or a formation or condition which would render further drilling impracticable or impossible, Arrington may plug and abandon that well and may continue its rights under this agreement by commencing a substitute well (or wells) ("Substitute Well(3)") for any such well which has been lost or abandoned within sixty (60) days from the date the drilling rig is removed from the location of the prior well. Any Substitute Well drilled shall be drilled subject to the same terms and conditions and to the same depth as provided for the well so lost or abandoned. Any reference in this agreement to the Test Well shall be deemed to be a reference to any well or wells, which may be drilled as a Substitute Well. In the event that either party elects to drill a Substitute Well as provided herein, the other party must participate in same, or forfirir to the participating party any interest which it would have otherwise carned by virtue of its participation in such Substitute Well.
- 3. Contemporaneously herewith, Arrington and Ocean shall have entered into that certain Operating Agreement attached hereto as Exhibit A (the "Operating Agreement"), covering the W/2 of Section 25, T16S, R35E, Lea County, New Mexico (the "Contract Area"). Exhibit "A" to the Operating Agreement shall be completed based apon the results of the drillsite title opinion being prepared covering the W/2 of said Section 25.
- 4. Subject to the terms and conditions (1) of this agreement, (1) each Farmout Agreement and (11) the Joint Operating Agreement, Ocean hereby assigns unto Arrington, an undivided

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Mr. Derald Maney Comm Energy, Inc. September 10, 2001 Page 3 of 6

> thirty percent (30%) of Ocean's right in and to cach Farmoor Agreement. In the event that any Farmout Agreement comming a requirement that the Farmor (as defined in such Farmout Agreement) thereunder concent to any such assignment. Ocean shall use its best efforts to obtain such concent provided heavyer, that in the event that Ocean is unable to acquire such Farmor's consect to assign, then Ocean shall assign additional interest(s) from such other of the Farmout Agreements as Ocean may elect in its discretion such that the aggregate of Arrington's right to earn rights under all Farmout Agreements will entitle Arrington to an assignment of Ocean's interest in the Contract Area equal to an undivided thirty percent (30%), proportionately reduced to Ocean's interest in the Contract Area. The terms and conditions of this letter agreement shall apply to any extensions or renewals of each Farmout Agreement acquired by either Arrington or Ocean within 180 days of the expiration of the farmout agreement.

- 5. Arrington has acquired proprietary 3D seismic data across certain lands, including, without limitation; T16S, R3SE, Les County, New Mexico (i) Section 23; E/2E/2; (ii) Section 24: All that Arrington has in the SW/4; (iii) Section 25: W/2, W/2E/2; (iv) Section 26: E/2E/2; (v) Soction 35: NE/4NE/4; and (vi) Soction 36: N/ZNW/4, NW/4NE/4 (such 3D scismic data, colloctively, the "Arrington 3D Data"). Atrington agrees (and represents to Ocean that Arrington has the right to so agree) that Ocean shall (1) have access to the Arrington 3D Data in Arrington's offices during normal business hours, in order to work and interpret the Arrington 3D Data and (ii) have access to and copies of Arrington's interpretations of the Arrington 3D Data (the Arrington 3D Data together with such interpretations thereof, the "Arrington Evaluation Material"). Arrington shall rotain full ownership rights to the Arrington 3D Data, and no ownership or license to the Arrington 3D Data shall be conveyed to Occan. Except as provided for in this Paragraph 5, Arrington makes no representations or warranties to Ocean (i) as to the Arrington 3D Data (ii) or in respect of Ocean's reliance upon the Arrington Evaluation Material. Ocean shall keep the Arrington Evaluation Material confidential; provided however, that such obligation of confidentiality shall not apply to information which (i) was or becomes available to the public other than as a result of a disclosure by Ocean, (ii) was or becomes available to Ocean on a non-confidential tasis from a source other than Arrington, provided that such source is not known by Ocean to be bound by a confidentiality agreement with Arrington or otherwise prohibited from transmitting the information by a contractual, legal or fiduciary obligation, (iii) was within Ocean's possession prior to its being furnished by Arrington, (iv) is developed or derived without the aid, application or use of the Arrington Evaluation Material, (v) is disclosed following receipt of the written consent of Arrington to such disclosure being made. or (vi) is disclosed pursuant to Paragraph 6 hereof.
- 6. In the event that Ocean is requested or required (by oral questions, interrogatories, requests for information or documents, subpocus civil investigative demand or other process) to disclose any of the Arrington Evaluation Material, Ocean agrees that it will provide Arrington may seek an appropriate protective order or value compliance with the provisions of this Agreement. If, failing the entry of a protective order or the receipt of a waiver hereunder prior to the time such disclosure is required to be made, Ocean may disclose that

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Mr. Derold Maney Ocean Energy, Inc. September 10, 2001 Fage 4 of 5

> portion of the Arrington Evaluation Material which Ocean's counsel advises that it is compelled to disclose and will exercise remonable efforts to obtain assurance that confidential treatment will be accorded to that portion of the Arrington Evaluation Material which is being disclosed. Arrington agrees that Ocean shall have no liability hereucher for any disclosure of the Arrington Evaluation Material made in compliance with this Paragraph 6.

- 7. Ocean has acquired proprietary 3D seismic data across certain lands, including, without limitation, T15S, R35E, Lea County, New Mexico (1) Section 7: W/2, W/2NE/4, W/2SE/4, SE/4SE/4; (ii) Section 17: W/2NW/4, NW/4SW/4; and (iii) Section 18: N/2, N/2S/2 (such 3D seismic data, collectively, the "Occan 3D Data"). Occan agrees (and represents to Arrington that Ocean has the right to so agree) that Arrington shall (i) have access to the Ocean 3D Data in Ocean's offices during normal business hours, in order to work and interpret the Ocean 3D Data and (ii) have access to and copies of, Ocean's interpretations of the Ocean 3D Data (the Ocean 3D Data together with such interpretations thereof, the "Ocean Evaluation Material"). Ocean shall retain full ownership rights to the Ocean 3D Data, and no ownership or license to the Ocean 3D Data shall be conveyed to Arrington. Except as provided for in this Paragraph 7, Ocean makes no representations or warranties to Arrington (1) as to the Ocean 3D Data (ii) or in respect of Arrington's reliance upon the Ocean Evaluation Material Arrington shall keep the Ocean Evaluation Material confidential; provided however, that such obligation of confidentiality shall not apply to shall not apply to information which (i) was or becomes available to the public other than as a result of a disclosure by Arriogton, (ii) was or becomes available to Arrington on a nonconfidential basis from a source other than Ocean, provided that such source is not known by Arrington to be bound by a confidentiality agreement with Ocean or otherwise prchibited from transmitting the information by a contractual, legal or fiduciary obligation, (iii) was within Arrington's possession prior to its being furnished by Ocean, (iv) is developed or derived without the aid, application or use of the Ocean Evaluation Material, (v) is disclosed following receipt of the written consent of Ocean to such disclosure being made, or (vi) is disclosed pursuant to Paragraph 8 hereof.
- 8. In the event that Arrington is requested or required (by oral questions, interrogatories, requests for information or documents, subpoend civil investigative demand or other process) to disclose any of the Ocean Evaluation Material, Arrington agrees that it will provide Ocean with prompt notice of any such request or requirement (written if practical) so that Ocean may seek an appropriate protective order or whive compliance with the provisions of this Agreement. If, failing the entry of a protective order or the receipt of a waiver hereunder prior to the time such disclosure is required to be made, Arrington may disclose that it is compelled to disclose and will exercise reasonable efforts to obtain assurance that confidential treatment will be accorded to that portion of the Ocean Evaluation Material which Arrington Material which is being disclosed. Ocean agrees that Arrington shall have no liability hereunder for any disclosure of the Ocean Evaluation Material made in compliance with this Paragraph 3.

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Mr. Derold Maney Ocean Energy, Inc. September 10, 2001 Page 5 of 6

- 9. It is not the intention of the parties to create a partnership, nor shall this agreement be construed as creating a mining or other partnership, joint verture, agency relationship or other association, or to reader the parties liable as partners, co-vonturers or principals. Unless provided for to the contrary in the Operating Agreement, (i) the liability of the parties shall be several, not joint or collective and (ii) each party shall be responsible only for its obligations, and shall be liable only for its proportionate share of the coses, if any, to be incurred hereunder. No party shall have any liability hereunder to third parties to satisfy the default of any other party in the payment of any expense or obligation.
- 10. This Agreement and all matters pertaining hereto, including, but not limited to, matters of performance, non-performance, breach, remedies, procedures, rights, duties and interpretation or construction, shall be governed and determined by the law of the State of Texas. THE PARTIES HEREBY CONSENT TO THE EXCLUSIVE VENUE OF THE PROPER STATE OR FEDERAL COURT LOCATED IN MIDLAND COUNTY, TEXAS, AND HEREBY WAIVE ALL OTHER VENUES.
- 11. This Agreement, the Exhibits and Schedules hereto and the Operating Agreement set forth all understandings between the parties respecting the subject matter of this transaction, and all prior agreements, understandings and representations, whether oral or written, respecting this transaction are merged into and supersected by this written agreement.
- 12. This agreement shall be binding upon and shall insure to the benefit of the parties and their respective successors and permitted assigns and the terms horsof shall be deemed to run with the lands described herein. If any transfer is efficiend by a party pursuant to the terms of this agreement, or by any of its successors or assigns, the transfer will be made expressly subject to this agreement, and the transferor shall remain responsible for the obligations of the transferoe until the transferoe expressly assumes in writing all of the existing duties and obligations of the transferor.
- 13. This aground may not be altered or amonded, nor any rights becomder waived, except by an instrument, in writing, excepted by the party to be charged with such amendment or waiver. No waiver of any other term, provision or condition of this agreement, in any one or more instances, shall be deemed to be, or construed as, a further or continuing waiver of any such term, other provision or condition of any other term, provision or condition of this agreement.
- 14. EACH PARTY WAIVES, TO THE FULLEST EXTENT PERMITTED BY APPLICABLE LAW, ANY RIGHT IT MAY HAVE TO A TRIAL BY JURY WITH RESPECT TO ANY SUIT, ACTION OR PROCEEDING RELATING TO THIS AGREEMENT.
- 15. If any provision of this agreement is invalid, illegal or incapable of being enforced, all other provisions of this agreement shall nevertheless remain in full force and effect, so long as the economic or legal substance of the transactions contemplated hereby is not affected in a materially adverse manner with respect to either party.

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Mr. Derold Maney Ocean Energy, Inc. September 10, 2001 Page 6 of 6

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i. L If this properly sets forth your understanding of our agreement, please so indicate by signing in the space provided below, and returning to my attention.

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Mr. Derold Maney Occan Energy, Inc. September 10, 2001 Page 7 of 6

Yours truly,

DAVID H. ARRINGTON OIL & GAS, INC.

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David H. Arrington President

DD/ad

DAY OF SEPTER 144 ACCEPTED AND AGREED THIS ER, 2001

OCEAN ENERGY, INC. By: Hank Wood Anoracy-in-Faca

Schedule 1 to that certain Lotter Agreement, by and between Occan Energy, Inc., a Louisiana corporation and David H. Arrington Oil & Gas, Inc., dated as of September 10, 2001

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BEFORE THE NEW MEXICO

OIL CONSERVATION DIVISION

APPLICATION OF TMBR/SHARP DRILLING, INC. FOR COMPULSORY POOLING, LEA COUNTY, NEW MEXICO

CERTIFICATE OF MAILING

The undersigned hereby certifies that on January 25, 2002, he sent by

certified mail, return receipt requested, a copy of the Application on file in

this case to those parties set out in the mailing matrix attached hereto.

PHIL BREWER

PO Bdx 298 [/] Roswell, New Mexico 88202-0298 (505) 625-0298

PARTIES ENTITLED TO NOTICE TMBR/SHARP DRILLING, INC. APPLICATION FOR COMPULSORY POOLING

Robert M. Edsel 3111 Welborne, No. 1604 Dallas, TX 75219

James D. Huff PO Box 705 Mineola, TX 75773

Branex Resources, Inc. PO Box 2328 Roswell, NM 88202

R. N. & Jacqueline C. Williams PO Box 2010 Hobbs, NM 88241

Mark & Bonnie Caldwell 3534 Shell Midland, TX 79707

George M. O'Brien PO Box 1743 Midland, TX 79702

Barmar, Inc. PO Box 250 Hobbs, NM 88241

M. W. Oil Investments Co., Inc. 518 17th, Ste. 540 Denver, CO 80202

Ronald C. Agel 105 Countryside Road Newton, MA 02159 Bud & Mary Lou Flocchini Family Partnership PO Box 26158 San Jose, CA 95159-6158

Richard L. Vandenburgh 1777 South Harrison, Ste. P-300 Denver, CO 80201

Citadel Oil & Gas, Corp. PO Box 3052 Denver, CO 80201

Louis A. Oswald, III, Trustee of the Oswald Family Trust PO Box 36157 Denver, CO 80236

Jonathan S. & Carol Roderick 6154 W. 83rd Way Arvada, CO 80003

Lynne & Mark Baalman 4650 N. Flintwood Rd. Parker, CO 80134

Christopher R. F. Eckels, Trustee of the Robert Eckels Family Trust PO Box 30 Cedaredge, CO 81413

Christa L. Leavell, Individually and as Custodian for Michelle C. Leavell PO Box 470 Robinson, IL 62413

Wyotex Oil Co. 405 Ross Ave. Gillette, WY 82713 William N. & Susan E. Heiss, Trustees William N. Heiss Profit Sharing Plan PO Box 2954 Casper, WY 82602

Harle, Inc. PO Box 2608 Roswell, NM 88202

Robert J. Bullock, Sr., Trustee for Robert J. Bullock, Jr. c/o Carter Castell 245 South Sequin New Braunfels, TX 78139

Yates Petroleum Corporation Yates Drilling Company ABO Petroleum Corporation Myco Industries, Inc. 105 S. 4th Street Artesia, NM 88210

_	I also wish to receive the following services (for an exturn this extra fee): return this extra fee): es not 1. □ Addressee's Address most 2. □ Restricted Delivery edate Consult nontimeter for fee	Article Number 7001 0320 0004 5883 Service 1ype Registered Express Math Express Math Return Receiving Ansured Return Receiving Ansured Return Receiving Ansured	Addressee's Address Conjuggequested and fee is paid Domestic Return Receir
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