APPLICATION OF EXXON MOBIL CORPORATION TO CONSIDER AN EXCEPTION TO STATEWIDE RULE 37 FOR ITS PROPOSED WELL NO. 1076, KING RANCH LAGUNA LARGA LEASE, IN THE T-C-B (LWR FRIO-UPVXBG), T-C-B (LOWER VICKSBURG), AND WILDCAT FIELDS, IN KLEBERG COUNTY, TEXAS

APPEARANCES:

APPLICANT -	**REPRESENTING -**
David Jackson, Attorney	Exxon Mobil Corporation
Dr. Maurice Kucci	Exxon Mobil Corporation
Trina Engels	Exxon Mobil Corporation
William Duncan	Exxon Mobil Corporation
PROTESTANT -	
David Gross, Attorney	Kerr-McGee Oil & Gas Onshore, LLC
Terry Payne	Kerr-McGee Oil & Gas Onshore, LLC
Mark Galloway	Kerr-McGee Oil & Gas Onshore, LLC
INTERVENOR -	
Brian Sullivan, Attorney	Canales Family
James Murry, Jr.	Canales Family

PROCEDURAL HISTORY

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Heard by:	Scott Petry, Hearings Examiner Thomas Richter, P.E., Technical Examiner

STATEMENT OF THE CASE

This is the Rule 37 exception application of Exxon Mobil Corporation ("Exxon Mobil" or "applicant") to drill its King Ranch Laguna Larga Lease Well No. 1076 ("subject well") in the T-C-B (Lower Frio-Upper Vicksburg) Field, T-C-B (Lower Vicksburg) Field, and wildcat field ("subject fields") on the basis of preventing waste. The proposed well will be 358 feet from the common lease line with the protestant, Kerr-McGee Oil & Gas Onshore, LLC ("Kerr-McGee" or "protestant"). The King Ranch Laguna Larga Lease ("subject lease") encompasses 13,142.78 acres, as outlined on the plat attached to the Form W-1 (Application for Permit to Drill, Deepen, Plug Back, or Re-enter) submitted by Exxon Mobil on June 5, 2002. See Appendix 1.

Exxon Mobil claims that an exception is necessary to prevent waste and promote conservation of resources. Exxon Mobil asserts that subsurface faulting creates an unusual condition which will prevent it from recovering its reserves in the subject fields. While the log analyses show other sands in the Lower and Upper Vicksburg Fields may be productive, the applicant asserts that the J43, 10,600 and Purple sands have the greatest probability of achieving an economic well. The Purple and 10,600 sands are targets in the T-C-B (Lower Vicksburg) Field, and the J43 sand is a target in the T-C-B (Lwr Frio-UPVXBG) Field.[1] Exxon Mobil claims that its proposed exception location is necessary to prevent waste as no other well at a regular location on or off the subject lease will recover the gas reserves within the fault block at issue. There are regular locations within the fault block, but these locations would be in close proximity to a north-south trending fault that is to the east of the proposed exception location. Exxon Mobil asserts that it must drill farther from the fault based on the five criteria discussed below.

Kerr-McGee is the operator of the lease to the west of subject lease. Kerr-McGee has leased the property from the Canales family, which owns approximately 15,000 acres in the immediate vicinity.[2] Kerr-McGee asserts that Exxon Mobil has failed to establish that unusual subsurface conditions exist on the subject lease. Further, Kerr-McGee believes a well at a regular location will allow production of the subject reserves because Exxon Mobil's criteria are primarily based on the applicant's erroneous interpretation of the problems associated with its 1059 Well.

The Canales Family, the royalty owner underlying Kerr-McGee's lease, takes no position concerning the granting/denying of the application. However, if granted as a Rule 37 exception, it requests that a directional survey be mandated to insure that the well stays under Exxon Mobil's lease

[1] For purposes of brevity, these terms will be used to identify the target sands in the Lower Vicksburg and Upper Vicksburg Fields.

[2] The Canales family participated in the hearing as an intervenor, but did so to assure that its lessee, Kerr-McGee was adequately protecting its interests.

and that any fracture stimulation be restricted to assure that there is no trespassing across the lease line.

BACKGROUND

The target sands that form the basis of Exxon Mobil's application are in the T-C-B (Lower Vicksburg) Field (hereinafter "Lower Vicksburg") and T-C-B (Lower Frio-Upper Vicksburg) Field (hereinafter "Upper Vicksburg"). The Lower Vicksburg and Upper Vicksburg are both the result of field consolidations.

In Order No. 04-0202097, effective August 9, 1993, the Railroad Commission consolidated approximately fifty-four fields in Jim Wells and Kleberg counties, and the entire correlative interval from 9,360 to 12,263 feet, into one field designated as the T-C-B (Lower Vicksburg) Field. Special field rules for the Lower Vicksburg provide for 660 feet lease line spacing and 933 feet between well spacing. The field rules further specify 80 acre proration units, with optional 40 acre density, and a 25% per well and 75% deliverability allocation formula.

In Order No. 04-0221067, effective March 9, 1999, the Railroad Commission consolidated approximately fifteen fields in Jim Wells and Kleberg Counties, and the entire correlative interval from 7,572 to 9,360 feet, into one field designated as the T-C-B (LWR FRIO-UP VXBG) Field. Special field rules for the Upper Vicksburg provide for 660 feet lease line spacing and 933 feet between well spacing. The field rules further specify 80 acre proration units, with optional 40 acre density, and an allocation formula based on 50% acreage and 50% deliverability.

DISCUSSION OF THE EVIDENCE

I. Applicant's Position

The applicant argues that subsurface faulting in the subject fields constitutes an unusual subsurface condition, and that this unusual condition prevents the applicant from recovering the underlying reserves at a regular location. Exxon Mobil asserts that this faulting has created a sealing fault "block" which has trapped an estimated 3.37 billion cubic feet of natural gas in the three target sands. To successfully drill for these reserves, the applicant argues that the proposed location must be positioned away from the north-south trending fault that forms the eastern boundary of the fault block. More specifically, Exxon Mobil argues that the proposed location must meet certain criteria to prevent waste in the target sands. These criteria are that the proposed location:

1. encounter a full section in each of the three target sands within this fault block,
2. encounter favorable geological facies in each of the three target sands,
3. avoid proximity to the major faults cut by the offsetting 1059 Well,
4. be located in an area which will not be affected by drawdown from other wells, and

5. be located to accommodate a completion in each of the three target horizons, with there being "of paramount importance to...encounter a full section of the Purple."

The applicant further asserts that the proposed location meets these criteria and is supported by data from the surrounding wells, by the three-dimensional seismic imaging that it performed on the subject lease, and by the overall analysis of the field.

A. WELL CONTROL OF SURROUNDING WELLS

Specifically, the applicant asserts that past experience has shown that wells that encounter faulting in the target sands are adversely affected. At the forefront of this argument was Exxon Mobil's 1059 Well, which the applicant characterized as an "expensive lesson" in avoiding locations near faults. Located only 968 feet from the western lease line of the subject lease, the 1059 Well was an attempt in 1997 to complete in the Purple and 10,600 horizons. This well, however, was located close to the offsetting eastern fault in the Purple sand. *See Appendix 2.* The applicant argues that the 1059 Well "...cut a series of faults at all major horizons in the T-C-B Fields...." and that the faulting prevented the completion in the initial target sands. The 1059 Well, however, was completed in a secondary sand known as the 11,300, and eventually produced approximately 300 million cubic feet of gas before the well was plugged and abandoned.

According to Exxon Mobil, the 1059 Well's Purple sand was split by the fault, with a substantial portion of the sand isolated on the eastern side of the fault. This split resulted in approximately 131 feet of Purple sand being located on the western side and above the fault, whereas approximately 500 feet of the sand was located on the eastern side and below the fault. The applicant acknowledged that the 1059 Well could not perforate the Purple, but argued that it could not have drained the lower portion of the Purple even if a completion could have been made.

Exxon Mobil argues that experiences with past wells show that the well must be located further away from faults to recover a full section of its target sands. Testimony put forth by the applicant indicates that the faults are sealing faults and that the fault blocks are closed, or nearly closed, containers. Further testimony suggests that the area has many complex faults where the fault planes "dip" toward the western lease line with Kerr-McGee. Therefore, the testimony suggests that the plane of the fault intersects sand sections higher as a well location is moved east towards the fault. The applicant argues that the location must be moved in a western direction away from the fault and that a complete section of the target sands cannot be encountered without the exception location.

B. SEISMIC IMAGING

In addition to the data from offsetting wells, the applicant asserts that seismic data also supports the proposed location. Exxon Mobil's seismic interpretation for the 1059 Well shows that the well is

missing a section of the Purple sand because of the faulting, and that the well encountered unfavorable formation facies in the J43 sand because of the proximity of the fault. Seismic data was used to pick the 1059 Well location and to avoid faulting, but the actual drilling of the well exposed significant flaws in the seismic interpretation. As a result of the 1059 Well's difficulties, Exxon Mobil reprocessed its seismic data to give what it considers a more accurate description of the subsurface conditions.

According to the applicant, the reprocessed seismic interpretation indicates that the proposed 1076 Well will encounter a full section of the Purple sand at a top depth of 11,225 feet, with a *net* pay thickness of approximately 120 feet. Additionally, the proposed well will encounter the 10,600 sand at 10,505 feet, with a net pay thickness of approximately 50 feet, and encounter the J43 sand at 9,490 feet, with a net pay thickness of approximately 15 feet. Using seismic interpretation, the proposed location would intersect the fault approximately twenty feet below the base of the Purple sand.[3]

C. ANSWER LOG

While the proposed location for the subject well is largely based on seismic data interpretation, the applicant argues that many factors must be considered to take in the "big picture" that supports the proposed location. As previously mentioned, the proposed location must be away from the fault, provide for favorable geological facies, encounter a full section in each of the three main target sands, and stay away from possible pressure communication with nearby wells. Any alternate location would reduce the possibility of a productive well and would contribute to waste.

To integrate these factors with the seismic and well data, Exxon Mobil produced a complex modeling interpretive log called an "answer log." According to the applicant, the actual identification of productive Vicksburg sands is difficult to determine and requires more than the basic suite of porosity, gamma ray and induction/density logs to analyze the formations. Therefore, the "answer log" provided by the applicant also included factors such as caliper curve, spontaneous potential curve, capture cross section curve, sonic transit curve, quality control curves (stand-off distance), and cable tension curve. These parameters and modeling histories were then analyzed together to give a more "complete" picture.[4]

D. VOLUMETRICS

Finally, the applicant submitted volumetric analyses to establish the amount of reserves

[3] This interpretation would assume that the top and base of the Purple sand are identical in the 1076 Well and the 1059 Well.

[4] The interpreted results of the answer log parameters are derived by applying models of core and fluid salinity data, which in turn provide the clay volume from the density neutron cross plot and the gamma ray models. The matrix density is calculated from the density neutron cross plot, and the core analysis is then used to assist in the determination of permeability. This is then compared to the RFT (repeat formation tester) data for confirmation, and the data is then analyzed for the determination of net hydrocarbon sand.

underlying the subject lease in the target sands. According to the applicant, the proposed location will encounter approximately 540 feet of the Purple target sand in the 11,240' to 11, 780' interval. With an estimated 87 feet of net pay and an estimated fifty acre drainage area, the applicant asserts that 1.8 billion cubic feet will be recovered in the Purple.[5] In the 10,600 target sand, the proposed location will encounter approximately 135 feet in the 10,490' to 10,625' interval. With an estimated 36 feet of net pay and an estimated 75 acre drainage area, the applicant asserts that 1.1 billion cubic feet will be recovered in the 10,600. Finally, the proposed location would also allow the applicant to encounter approximately 25 feet of the J43 target sand in the 9,575' to 9,600' interval. With an estimated 20 feet of net pay and an estimated 60 acre drainage, the applicant asserts that it would recover .47 billion cubic feet. The combined, anticipated recovery for all three zones is 3.37 billion cubic feet.

II. Protestant's Position

Kerr-McGee, on the other hand, argues that a well at a regular location will result in the recovery of the reserves underlying the subject lease in the target horizons. The protestant argues that the applicant's waste case is erroneously based on misconstrued data from a prior Exxon Mobil well, the 1059 Well, and that full sections of each of the target sands could be encountered at regular locations. Kerr-McGee asserts that the applicant's own drilling practices indicate that proximity to the faults is not detrimental to the drilling of a well and that Exxon Mobil wells drilled subsequent to the 1059 Well were located even closer to the fault than the proposed location in this docket. Finally, the protestant asserts that the faulting in the area is extensive and should not qualify as an "unusual condition".

A. MISCONSTRUED DATA

First, Kerr-McGee argues that the data from the 1059 Well is unreliable because the problems with the well were due to drilling and completion problems, and not due to the subsurface geological conditions. The protestant argues that the cementing and mechanical problems of the 1059 Well meant that none of the target sands were properly perforated and/or fracture stimulated, and there was, therefore, no adequate testing or production in these sands.

The protestant submitted the applicant's own drilling reports, Authorizations for Expenditures, and well prognosis summaries to substantiate that the well was productive in the three target horizons, as well as in a number of other zones, within these two fields. Kerr-McGee alleges that these reports substantiate the theory that the problem with the 1059 Well was drilling and completion difficulties, and

[5] The drainage areas are based on the average drainage areas of other wells on the lease that were/are completed in the subject target sands.

not the proximity to the fault. The reports state that the 1059 Well "...took gas kicks and time to circulate gas out of mud" and that the crews had to take numerous drilling breaks, as well as reduce drilling rates, to maintain drilling mud properties. The reports also state that the well was drilled in record time, and the protestant asserts that all of these factors led to problems with mud properties, hole washout, and cementing.

After the initial drilling was completed, the well experienced numerous technical difficulties in the completion stages. Applicant's personnel took almost six months to complete the 1059 Well and, even then, the well was completed in the 11,300 sand, which Exxon Mobil admits was a secondary target sand.[6] While the applicant argued that faulting prevented completion in its primary target zones, the protestant points out that the drilling/ completion personnel experienced problems running the production casing string, during attempts to cement the production casing, during attempts to perform block squeezes, and during attempts to perforate and test.

Additionally, the problems were severe enough that the applicant was unable to fracture stimulate in the initial target sands. The J43 and 10,600 target sands were never perforated, and the lower Purple sand, while perforated, filled up with mud. Exxon Mobil could not sufficiently clean out the 1059 Well to fracture stimulate in the lower Purple, and the middle and upper Purple were never perforated because of the casing problems. The ability to perforate and fracture stimulate is particularly important in the Vicksburg sands, as they are designated as "tight" gas formations and require fracture stimulations for effective production. These problems meant that none of the target sands were properly perforated and/or fracture stimulated, and there was, therefore, no adequate testing or production in the three target sands.

In sum, Kerr-McGee asserts that the primary reasons for Exxon Mobil's failure to complete the 1059 Well in the Purple, 10,600, and J43 sands were problems with the completion of the well, and not the subsurface faulting underlying the lease.

B. FULL SECTIONS OF THE TARGET SANDS ARE AVAILABLE.

Second, the protestant argues that the reserves for each of the target sands could be encountered at regular locations. While the applicant asserts that it must have a full sand section, the protestant asserts that there are discrepancies in the applicant's rationale. With regards to two of the three target

[6] The 1059 Well produced for approximately sixteen months before going off production and a workover was attempted. According to the evidence in the record, the 11,300 Sand had a potential of 2 MMCFD. When the workover was attempted, however, the personnel found approximately 5,000 feet of formation cement and debris above the perforations. Nevertheless, the technical data indicates that the 11,300 sand still has recoverable reserves and approximately 1.6 BCF original gas-in-place. The last reported pressure was 5,329 psi.

sands, the applicant's witness admitted that Exxon Mobil could achieve a full section at regular locations. Under cross examination, the applicant's witness stated that a full section of the J-43 target sand could be achieved at a distance 25 feet west of the fault and that a full section of the 10,600 target sand could be achieved at a distance 135 feet west of the fault. Both of these locations would constitute regular locations. Further, Kerr-McGee points out that Exxon Mobil presented no support for a wildcat exception, and that the wildcat portion of the Rule 37 exception should be denied outright for insufficient evidence.

The applicant countered that the locations for the J-43 and 10,600 target sands which were pointed out by the protestant must be examined in conjunction with the "...fundamental geoscience presented...rather than the simplistic geometric approach...." This "trig talk", the applicant contends, does not take into account the various geological conditions, including "favorable facies", underlying the subject lease. Nevertheless, the protestant argues that the applicant's witness admitted that it could encounter full sections of the J-43 and 10,600 target sands at regular locations. Therefore, the protestant argues that the true issue is whether the proposed location is necessary to recover the reserves in the Purple target horizon.

Kerr-McGee asserts that the proposed location is also not necessary to recover the reserves in the Purple target horizon and that the applicant's arguments are not supported by the evidence. First, Kerr-McGee asserts that the applicant could have recovered the reserves at the 1059 Well location. Protestant argues that the pressure responses in the 1059 Well indicate that the well was productive in the Purple target horizon both above and below the fault, but that the 1059 Well's "maladies" prevented Exxon Mobil from completing in this horizon. Further, the potential production of the 1059 in the Purple cannot be determined because these maladies prevented fracture stimulation of the well.

Second, Kerr-McGee points out that the applicant's own witness asserts that the favorable facies "predominate in the upper portion of the section [of the Purple]", and that a completion at a regular location would give it favorable facies. The applicant estimates that the Purple target sand at the proposed location will be approximately 540 feet in thickness. According to the applicant's cross section, the 1071 Well and the 1059 Well have 720 feet of gross thickness in the Purple, and the 1059 Well has approximately 131 feet of the *upper* Purple target sand above the fault plane. Using Exxon Mobil's own assertion that the angle of the fault plane is 47.5E, and that the Purple section thins to 540 feet thick at the proposed location, Kerr-McGee asserts that a well at a regular location would gain an additional 281 feet of the upper Purple section. When this is added to the 131 feet of the Purple above the fault plane, there would be a total of 412 feet in the Purple target sand at a regular location.

C. PROXIMITY TO THE FAULT WILL NOT PREVENT COMPLETION.

Finally, Kerr-McGee asserts that the applicant's actions are inconsistent with its statements regarding the detrimental effects of faulting on its wells. While the applicant spent considerable time emphasizing the lessons learned in avoiding faults, Kerr-McGee points out that the applicant has drilled subsequent wells in even closer proximity to faults. For instance, the most productive well on Exxon Mobil's lease, the 1071 Well, is in the very same fault block that is at issue in this docket. See Appendix 2. With approximately 3.65 billion cubic feet of natural gas produced in the Purple and 10,600 sands, the 1071 Well has the highest cumulative production of any well in the Lower Vicksburg. Yet, the 1071 Well is located only *250 feet away from the very same fault* that would offset the proposed 1076 Well.

While the most productive well on the subject lease was located approximately 250 feet west of the eastern fault, a well at a regular location would be approximately 308 feet west of the eastern fault. Further, as the protestant points out, there appears to be no ill effects suffered by the 1071 Well being located approximately *250 feet* from the fault in the Purple target sand and approximately *230 feet* from the fault in the 10,600 target sand. While the 1059 Well completed drilling in October 1997, the 1071 Well was completed in February 1999, approximately 15 months after the applicant learned its lesson regarding faulting. Exxon Mobil asserts the problems with the 1059 Well were what prompted them to reprocess the three-dimensional seismic imaging, but the 1071 Well did not encounter problems with the fault that Exxon Mobil now claims must be avoided.

Kerr-McGee also points to other wells that Exxon Mobil has drilled in close proximity to faults. The 1074 Well was completed in August 2001 in the same fault block as the proposed location, and was located "*...virtually on a fault...*" The 1074 Well was completed in the Purple target horizon almost four years after the 1059 Well was drilled on the eastern side of the western fault that bounds this fault block. See Appendix 2. This well produced one billion cubic feet of gas in its first year of production. The 1075 Well, on the other hand, was drilled in October 2001 in an adjacent fault block to the east of the subject fault block. The 1075 Well was drilled approximately four years after the 1059 Well, yet the 1075 Well is located only *290 feet* from the nearest fault and has already produced .36 billion cubic feet of natural gas. The protestant argues that Exxon Mobil's own actions in choosing subsequent well locations indicates "that locating wells in close proximity to major faults does not pose a problem." Rather, the protestant contends that the applicant's motivation in choosing the proposed location is to move further away from the drainage occurring from Exxon Mobil's 1062 Well, which is located to the north of the proposed location.

III. Intervenor's Position

While the Canales family participated in the hearing as an intervenor, it did not take a position regarding whether the Rule 37 exception should be granted or denied. Rather, the family expressed its

concern that, should the Rule 37 exception be granted, the "...deep well could clearly wander across lease lines or move even closer than the surface location to the Family's lease. Additionally, the Canales family is concerned that a fracture stimulation of the well will trespass across the lease line." In the event of a granting of the application, the intervenors requested that the Commission consider placing restrictions on fracture stimulation, and that a directional survey also be mandated.

EXAMINERS' OPINION

An applicant seeking an exception to Rule 37 based on waste must establish: 1) that unusual conditions, different from conditions in adjacent parts of the field, exist under the tract for which the exception is sought; 2) that, as a result of these conditions, hydrocarbons will be recovered by the well for which a permit is sought that would not be recovered by any existing well or by additional wells drilled at regular locations; and, 3) that the volume of otherwise unrecoverable hydrocarbons is substantial. Exxon Mobil has failed to adequately establish the first and second prongs, and the application should, therefore, be denied.

A. UNUSUAL CONDITION

Exxon Mobil claims that the unusual condition in the field is the existence of the fault and that the "...faulting beneath this tract precludes the drilling of a well at a regular location." To be entitled to an exception based on the doctrine of waste, it is well-established that an applicant must show that the area in question presents an unusual condition "...underlying the tract...different from those in the adjacent area or the part of the field in which the tract is situated."[7] The condition does not need to be absolutely unique, but it must establish something which distinguishes it from the generally prevailing aspects of the field. It cannot be a condition found generally or at numerous places throughout the field. As the Texas Supreme Court phrased it:

> The waste exception clause in Rule 37 has no application where ordinary or usual conditions prevail. To justify an exception under that clause it is necessary to show that the conditions affecting the drainage of wells on a particular tract are so peculiar, unusual, and abnormal that it is removed from the same category of the surrounding area to which the general rule applies.[8]

[7]Hawkins v. Texas Co., 209 S.W.2d 338, 343 (1948).
[8]Wrather v. Humble Oil & Refining Co., 214 S.W.2d 112, 117 (1948).

In a situation where the condition in question is found throughout the surrounding area, the waste may be prevented by the adjustment of the general rules, not by the granting of exceptions. Otherwise, virtually every operator would be entitled to an exception, and exceptions would have to be granted all over the field. Exceptions are to be exceptional, and not something required or available generally throughout the field.[9]

The Upper and Lower Vicksburg Fields are the results of the consolidations of numerous fields over a large vertical interval. The various sand horizons are discontinuous across the area from one well to the next, and the various sand lenses vary in quality, e.g. porosity, saturations, permeability, etc., as well as in quantity, e.g. gross sand thickness, net productive hydrocarbon bearing sand thickness, etc. The findings of fact in the prior consolidation dockets stated that the consolidation would result in the recovery of additional reserves, and the consolidation of these formerly independent fields allowed for multiple, simultaneous downhole completions.[10]

These various factors were considered in both the consolidation hearings and this immediate docket, and the variation of these reservoir parameters is not surprising within the fault block referenced in this hearing. Nevertheless, these same variations occur within all the fault blocks in the fields, and applicant has failed to show that the subsurface faulting qualifies as an unusual condition. The applicant relied on the 1059 Well to show that faulting has detrimental effects on wells close to the fault, but the well control for surrounding wells indicates otherwise. Further, Exxon Mobil's own structure maps show numerous north-south trending faults across this large area, and the seismic data interpretation confirms the general east-to-west dip of the fault plane. This extensive faulting underlying the subject lease is illustrated by the applicant's Exhibit 5, which is attached as Appendix 2. In sum, Exxon Mobil's evidence undercuts the "unusual condition" aspect of its argument because it shows that faulting is not a unique geological reservoir feature that is different from the adjacent area or the part of the field in which the tract is situated. Rather, the evidence supports that the faulting is common across a large part of the adjacent area, and the applicant, therefore, fails to satisfy the first prong of the test regarding waste.

B. RECOVERY BY OTHER WELLS

The second element of the three part waste test is establishing that another well or a well at a regular location would not recover the same hydrocarbons which an applicant claims would be recovered at the exception location. In other words, the applicant must not only refute the ability of

[9] *See, in general*, ERNEST E. SMITH ET AL., TEXAS LAW OF OIL AND GAS, § 9.5 (8th ed. 1997).
[10] Oil & Gas Docket No. 04-0221067 Findings of Fact 4(b) and 5 (a).

existing wells to recover the reserves in question, but must also refute *additional wells drilled at regular locations*. In determining whether there is an "ultimate loss of oil"[11] or other hydrocarbons, there is no ultimate loss of hydrocarbons if the reserves in question could be recovered from wells at regular locations or by other existing wells, whether those wells be on or off of the subject tract.

The applicant, in describing its rationale for the proposed location, argues that this well has to encounter a full section in each of the three target sands within this fault block, has to encounter favorable geological facies in each of the three target sands, has to avoid proximity to the major faults, has to be located in an area which could not be affected by drawdown from other wells, and has to accommodate a completion in each of the three target horizons. The applicant spent considerable time focusing on the relationship of the 1059 Well to the fault, to the seismic imaging that it used in selecting the location, and to the rock facies that it considered necessary to support a productive well. While failure to meet the first prong of the economic waste test is grounds for denial of the requested exception, these factors warrant examination.

Favorable Facies

At the hearing, there was much discussion regarding "favorable facies" and the detrimental effects of the close proximity that the fault has on the rock matrix. According to the applicant, this proximity causes deteriorating porosity and permeability, and the available hydrocarbon pore space is adversely affected. Yet, the applicant did not present sufficient geological reservoir data to estimate the horizontal depth of invasion into the formation, and the evidence submitted does not show the lateral extent of the fault's effects on porosity and permeability.

Exxon Mobil asserts that these "calcium carbonate cements and silicate cements precipitate in the pore space and thus reduces porosity and more importantly - permeability", but the examiners are unable to glean, from the evidence adduced, the extent of the *effects* of these adverse facies. This key piece of evidence is missing from the record. For instance, one is unable to determine whether these detrimental effects extend as far as 50, 100, 200, or 300 feet away from the fault plane. The most productive well in the Purple target sand, the 1071 Well, is approximately 250 feet from the fault. In other words, whatever the detrimental effects the fault plays in adverse sand facies, the depth of invasion, at least for the 1071 Well, is apparently less than 250 feet and undercuts the applicant's argument regarding the proposed location's movement away from the fault.

Three-dimensional Seismic Imaging

[11] Gulf Land Co. v. Atlantic Refining Co., 131 SW2d 73 (Tex. 1939).

Additionally, the three-dimensional seismic interpretation supplied by the applicant was questionable in terms of resolution. This concern was particularly evident in the following question and answer exchange from the hearing, where the technical examiner questioned the applicant regarding the horizontal and vertical resolution capability of the seismic imaging:

Question:	Do you know the resolution ability, the horizontal resolution ability of the three-D seismic?
Answer:	I can't tell you off hand but that could be calculated using Frenal zones calculations. And I would need to get the frequency of the seismic to get the horizontal spatial resolution.
Question:	What about the vertical resolution?
Answer:	Vertical resolution is on the average – again, I have not determined the calculation recently. I believe it might be in – the vertical resolution might be in the order of perhaps 100 to 150 feet. I mean, that can be calculated.
Question:	... What is the percent error or the resolving ability of thing to see a 15 foot sand?
Answer:	The way this ... it would not be able to resolve a 15 foot sand.
Question:	On a 100 foot sand?
Answer:	It would likely resolve a 100 foot sand.

Three-dimensional seismic imaging is not an absolute because, for practical reasons, some variable parameters must be assumed, and the quantitative horizontal and vertical resolution capability is only as accurate as the human interpretation that accompanies it. As the quoted interchange above points out, however, the seismic does not supply a resolution that is detailed enough to positively show whether the proposed location will hit or miss the fault. Indeed, the seismic that was initially provided for the location of the 1059 Well was later proven to be inaccurate when the well was actually drilled, and the seismic data had to be "reprocessed".

However, in discussing whether a full section of the target sands would be encountered, the applicant's witness stated that his interpretation entailed "...relying on where the fault crosses the seismic, and so that would supercede the [trigonometric] calculations." Applicant went on to testify that this was "...the only way that you can determine where the full section is." Nevertheless, as mentioned earlier, Exxon Mobil has used seismic interpretation to place wells in even closer proximity to the faults. Overall, the lack of proper resolution and the placement of other wells in close proximity to faults severely undercut the applicant's argument that a regular location could not recover these reserves because of faulting.

The 1059 Well

Finally, the applicant places a good deal of emphasis on the 1059 Well and the lessons learned from faulting. However, given the evidentiary testimony in this hearing and Exxon Mobil's documented, numerous attempts at completion, it is apparent that the 1059 Well was beset by problems other than faulting. While the 1059 Well would have encountered a "split" Purple sand (e.g. 131 feet on the west side and the remainder of the Purple on the east side), this factor must be examined in conjunction with fracture stimulation. The subject field areas are designated as tight gas sand fields, with a permeability of 0.01 millidarcies[12] or less, and it is a necessity that a well be fracture stimulated to obtain viable production. Even without fracture stimulation, the 1059 Well exhibited approximately 5,500 to 6,500 psi shut-in pressure, which indicates that there was good reservoir energy for the Purple sand at this location. Nevertheless, this well could not be fracture stimulated because of well problems. Therefore, the well's ability, or lack thereof, to produce in the target sands is not dispositive. As the protestant phrased it, "The 1059 well does not condemn [Exxon Mobil's] ability to drill at a regular location simply because Exxon was not able to analyze what it found in that wellbore."

While Exxon Mobil would like a single well that satisfies each of its objectives, it is not entitled to an exception if these sands may be produced, either through a single well or via multiple wells, at regular locations. *Ultimate* loss of hydrocarbons has a plain meaning. The applicant focuses on a single wellbore to encounter all three of the target sands and to meet all of its criteria, but it implicitly acknowledges that these three horizons, which were once specific fields before consolidation, are stand alone zones. In sum, the applicant fails to satisfy the second prong of the test regarding waste. Phrased another way, the totality of the evidence submitted into the record indicates that each of these sands could be reached by a well(s) at a regular location.

C. SUBSTANTIAL VOLUME

In determining whether a Rule 37 exception is necessary to prevent waste, one also has to show that a substantial volume of hydrocarbons is otherwise unrecoverable. While the concept of "substantial volume" may appear to be somewhat nebulous, it is safe to assert that the applicant's volumetrics and initial figure of 3.37 billion cubic feet of natural gas qualify as substantial under applicable case law.[13] The evidence in the record suggests that there are approximately 1.8 billion cubic feet of natural gas

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[12] Rather that the standard of .01 millidarcies, the applicant used a cutoff of *.1* millidarcies, which is a more restrictive standard.

[13] *See* Gulf Land Co. v. Atlantic Refining Co., 131 SW2d 73 (Tex. 1939), Humble Oil & Ref. Co. v. Turnbow, 133 S.W.2d 191 (Tex. Civ. App. - Austin 1939, writ ref'd), *cert. denied*, 311 U.S. 656 (1940), Hawkins v. Texas Co., 209 S.W.2d 338 (1948), et al.

underlying the subject lease in the Purple target sand, 1.1 billion cubic feet of natural gas underlying the subject lease in the 10,600 target sand, and .47 billion cubic feet of natural gas underlying the subject lease in the J43 target sand. Nevertheless, the evidence indicates that these substantial reserves can be recovered by regularly located well(s).

CONCLUSION

The evidence and legal authority presented in this docket fail to establish that Exxon Mobil is entitled to a Rule 37 exception in order to prevent waste in the in the T-C-B (Lwr Frio-UPVXBG) and T-C-B (Lower Vicksburg) Fields. Further, the application for the wildcat field should be denied for insufficient evidence.

Based on the record in this docket, the examiners recommend adoption of the following Findings of Fact and Conclusions of Law:

FINDINGS OF FACT

1. Proper notice of hearing was timely given to all persons legally entitled to notice. Counsel and witnesses appeared on behalf of Exxon Mobil Oil Company ("Exxon Mobil" or "applicant") and presented evidence. Kerr-McGee ("Kerr-McGee" or "protestant") appeared in protest of the application. The Canales family ("Canales" or "intervenor") appeared in an intervenor status.

2. Exxon Mobil applied on a Form W-1 (Application for Permit to Drill, Deepen, Plug Back, or Re-enter) for a permit to drill its proposed Well No. 1076 ("subject well") on the King Ranch Laguna Larga Lease ("subject lease"). Applicant proposes to drill the well at a location which is 358 feet from the western lease line in Kleberg County, Texas.

3. Applicant has applied to complete the subject well in the T-C-B (Lwr Frio-UPVXBG) Field ("Upper Vicksburg"), the T-C-B (Lower Vicksburg) Field ("Lower Vicksburg"), and wildcat field ("wildcat"), in Kleberg County, Texas.

4. Applicant's subject lease is a tract containing 13,142.78 acres.

5. In Order No. 04-0202097, effective August 9, 1993, the Railroad Commission consolidated approximately fifty-four fields in Jim Wells and Kleberg counties, and the entire correlative interval from 9,360 to 12,263 feet, into one field designated as the T-C-B (Lower Vicksburg) Field. Special field rules for the Lower Vicksburg provide for 660 feet lease line spacing and 933 feet between well spacing.

6. In Order No. 04-0221067, effective March 9, 1999, the Railroad Commission consolidated

approximately fifteen fields in Jim Wells and Kleberg Counties, and the entire correlative interval from 7,572 to 9,360 feet, into one field designated as the T-C-B (LWR FRIO-UP VXBG) Field. Special field rules for the Upper Vicksburg provide for 660 feet lease line spacing and 933 feet between well spacing.

7. The wildcat field is governed by rules mandating 467 feet minimum spacing to the nearest lease line and 1200 feet minimum between well spacing.

8. The area surrounding the proposed well has numerous faults trending in a north-south direction.

9. There are three primary target sands within the Upper and Lower Vicksburg Fields. Two of these horizons are located in the Lower Vicksburg and are referred to as the "Purple" and the "10,600" sands. The primary producing sand in the Upper Vicksburg is referred to as the "J-43".

10. The Upper and Lower Vicksburg Fields are designated as tight gas sand fields, with a permeability of .01 millidarcies or less. Tight gas sands typically require fracture stimulation to obtain viable production.

11. There is an estimated 1.8 billion cubic feet of recoverable natural gas within the subject fault block underlying the subject well in the Purple target sand, 1.1 billion cubic feet of natural gas within the subject fault block underlying the subject well in the 10,600 target sand, and .47 billion cubic feet of natural gas within the subject fault block underlying the subject well in the J43 target sand. The combined, anticipated recovery for all three zones is 3.37 billion cubic feet.

12. In October 1997, the applicant drilled the 1059 Well approximately 968 feet from the western lease line and attempted to complete in the Purple and 10,600 horizons. Completions in these zones did not occur, however, and the 1059 Well produced from a secondary sand known as the 11,300 before it encountered problems and was plugged and abandoned. The production problems with the 1059 Well were due to cementing, completion, and mechanical problems and were not due to its proximity to the fault at issue.

13. Successful wells on the subject lease drilled subsequent to the 1059 Well have been located in close proximity to subsurface faults.

    A. In February 1999, the applicant drilled the 1071 Well and completed in the Purple and 10,600 horizons. It produced approximately 3.6 billion cubic feet of natural gas in the Purple and 10,600 sands during the period from February 1999 through May 2002, and is situated approximately 250 feet west of the eastern fault that bounds the Purple horizon in this fault block.

B. In August 2001,the applicant drilled the 1074 Well on the eastern side of the western fault that bounds this fault block and completed in the Purple target sand. Production for this well exceeded one billion cubic feet of gas for the period August 2001 to May 2002.

C. In October 2001, the applicant drilled the 1075 Well approximately 290 feet east of the fault that forms the eastern boundary of the proposed well's fault block. The 1075 Well has produced in excess of .36 billion cubic feet of natural gas.

14. No unusual subsurface condition was established on the subject lease which was shown to be different from the conditions in adjacent parts of the field.

A. There are numerous north-south trending faults underlying the subject lease and adjacent area, and faulting is common across a large part of the adjacent area, and,

B. There is a general east-to-west dip in the fault plane in the adjacent area, including the subject lease.

15. Production histories for surrounding wells on the subject lease indicate that faulting underlying the subject lease has not had a detrimental effect on wells drilled close to the fault at issue.

16. There are regular locations within the subject fault block that would give Exxon Mobil a reasonable opportunity to recover the reserves currently underlying the subject lease in that fault block.

A. Full sections of the J-43 target sand and 10,600 sand exist at regular locations within the subject fault block.

B. A regular location within the subject fault block would likely encounter 412 feet in the Purple sand.

17. The evidence does not establish that there would be a significant deterioration in the sand facies at a regular location due to the proximity of the subject fault.

CONCLUSIONS OF LAW

1. Proper notice of hearing was timely issued by the Railroad Commission to appropriate persons legally entitled to notice.

2. All things necessary to the Commission attaining jurisdiction over the subject matter and the parties in this hearing have been performed.

3. A well drilled at a regular location will recover the reserves underlying the subject lease within the subject fault block in the T-C-B (Lwr Frio-UPVXBG) Field and the T-C-B (Lower Vicksburg) Field, in Kleberg County, Texas.

4. An exception to Statewide Rule 37 to drill the subject well is not necessary to prevent waste in the T-C-B (Lwr Frio-UPVXBG), T-C-B (Lower Vicksburg), and wildcat fields.

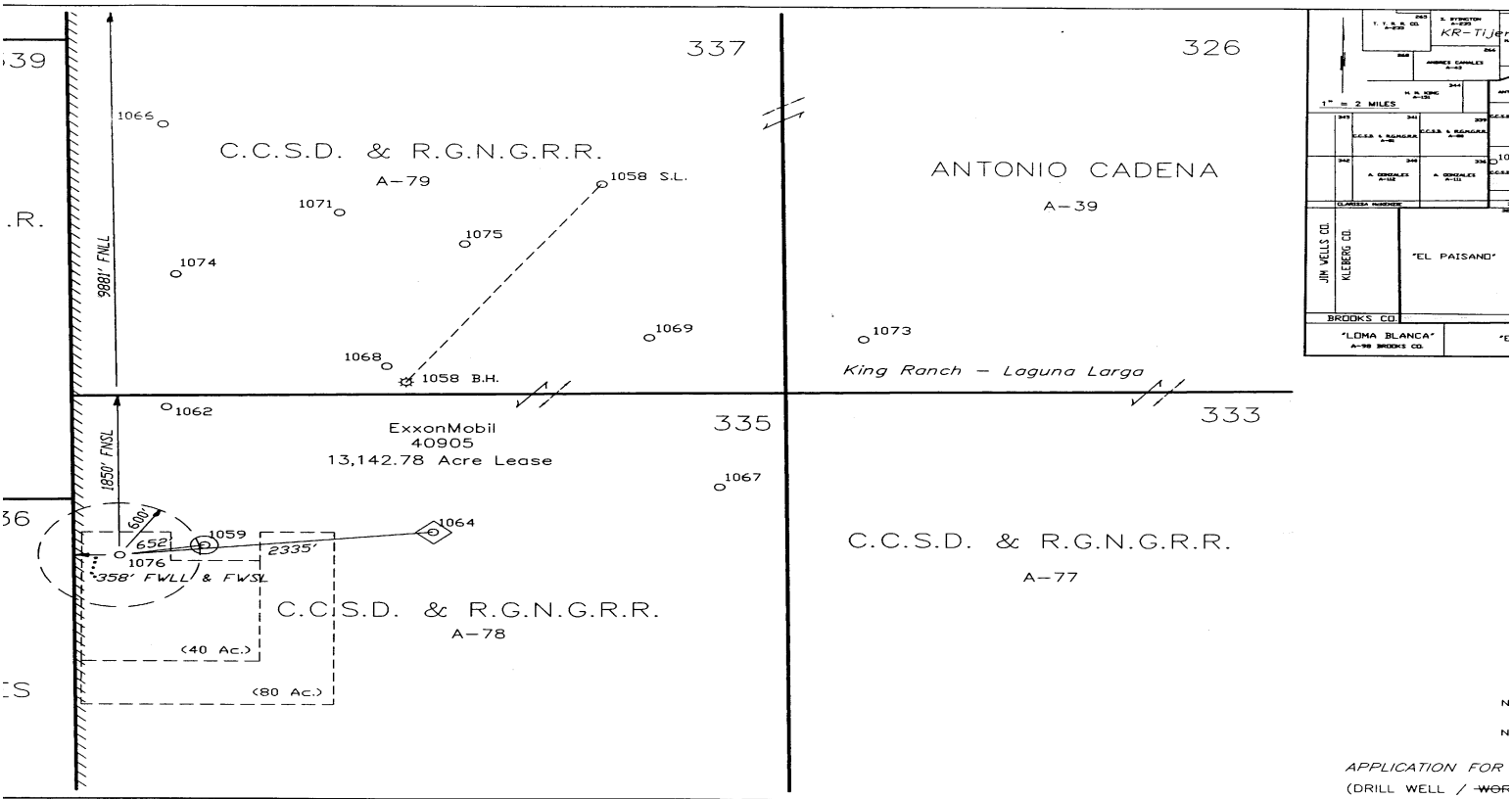
RECOMMENDATION

The examiners recommend that the Rule 37 exception application be **denied** for the T-C-B (Lwr Frio-UPVXBG), T-C-B (Lower Vicksburg), and Wildcat Fields, in Kleberg County, Texas.

Respectfully submitted,

_____	_____
Scott Petry	Thomas Richter, P.E.
Hearings Examiner	Technical Examiner

APPENDIX 1



PROPOSED COMPLETION:		CURRENT WELLS
LOWER VICKSBURG	○	15
LOWER FRIO–UP VXBG	◇	7
WILDCAT		--

PROPOSED COMPLETION:		CURRENT WELLS

LEASE: KING RANCH – LAGUNA LARGA
LEASE NO.: 40905 ACREAGE: 13,142.78
SURVEY: C.C.S.D.&R.G.N.G.R.R. SUR. 335 A– 78
FIELD: T–C–B COUNTY: KLEBERG TX.

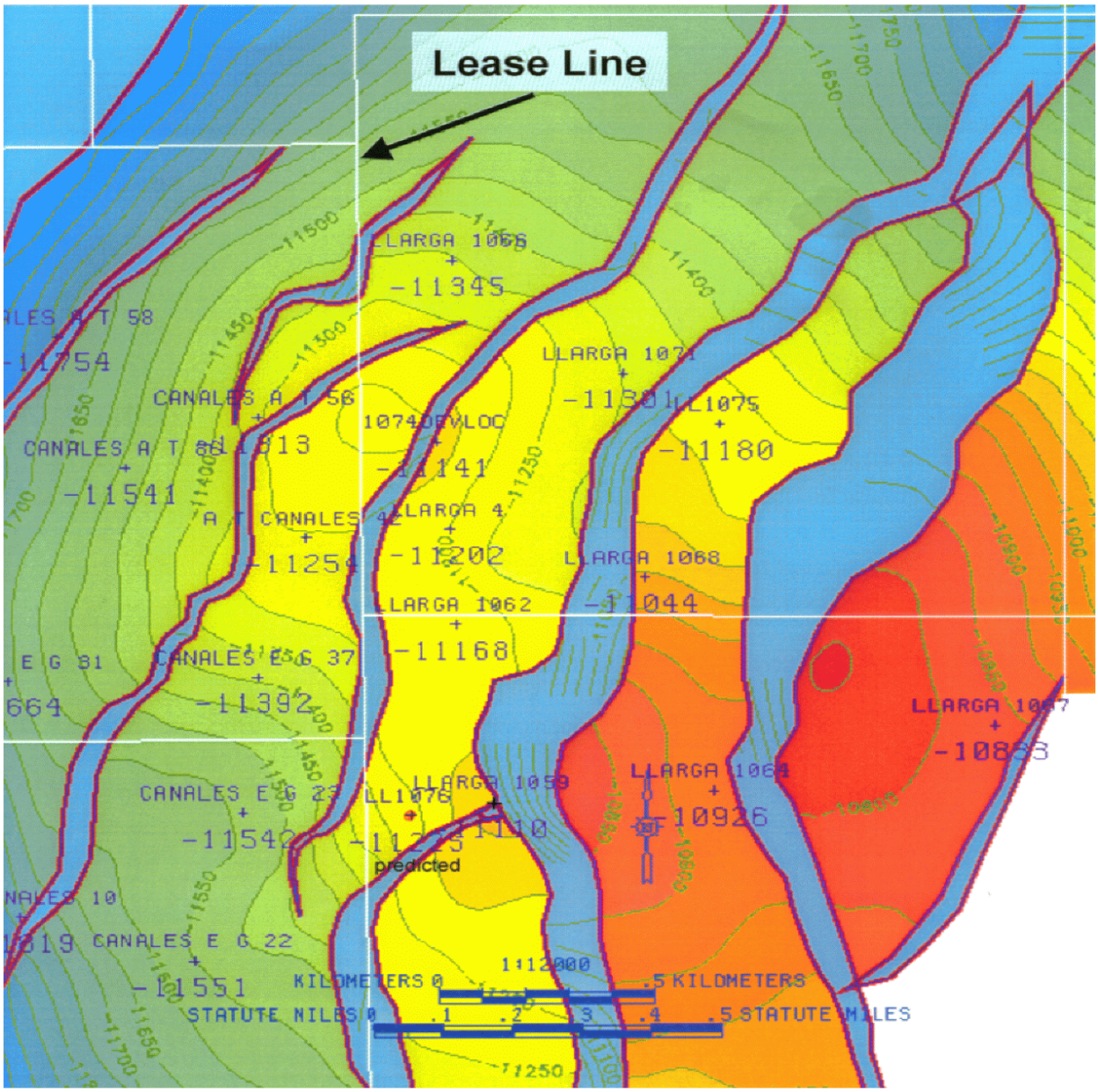
EXXON

SCALE: 1"=1000'
DATE: 4–13–02

APPLICATION FOR
(DRILL WELL / ~~WOR~~

Appendix 2

Examiners' Note: This image has been adjusted to fit this page. Therefore, the legend's scaling may not be accurate.



"Purple" Structure, Depth in feet subsea
Reds + Yellows = High areas
Greens + Blues = Low areas