STATE OF NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION DIVISION FOR THE PURPOSE OF CONSIDERING:

APPLICATION OF CHEVRON U.S.A. INC. FOR A NON-STANDARD SPACING AND PRORATION UNIT AND COMPULSORY POOLING, LEA COUNTY, NEW MEXICO.

CASE NO. 15074

AND

APPLICATION OF ENDURANCE RESOURCES, LLC FOR COMPULSORY POOLING AND NON-STANDARD SPACING AND PRORATION UNIT, LEA COUNTY, NEW MEXICO.

CASE NO. 15084 ORDER NO. R-13896

ORDER OF THE DIVISION

BY THE DIVISION:

These cases came on for hearing on February 20, 2014, at Santa Fe, New Mexico, before Examiner Richard I. Ezeanyim.

NOW, on this 22^{nd} day of September, 2014, the Division Director, having considered the testimony, the record and the recommendations of the Examiner,

FINDS THAT:

(1) Due public notice has been given, and the Division has jurisdiction of these consolidated cases and of the subject matter.

(2) Case Nos. 15074 and 15084 were consolidated at the hearing, and one order should be issued for both cases.

(3) In Case No. 15074, Chevron U.S.A. Inc. ("Chevron") seeks approval of a non-standard 157.7-acre, more or less, oil spacing and proration unit and project area in the Bone Spring formation, North Bell Lake-Bone Spring Pool (**Code 5150**) consisting of

fee lands in the S/2 N/2 of Section 18, Township 23 South, Range 34 East, NMPM, Lea County, New Mexico. Chevron further seeks an order pooling all uncommitted interests underlying this proposed non-standard spacing unit in the Bone Spring formation.

(4) This Unit is to be dedicated to Chevron's Bell Lake 18-23-34 Well No. **1H (API No. 30-025-41481)** ("the proposed well"), a horizontal well to be drilled from a surface location 2290 feet from the North line and 330 feet from the West line (Unit E), to a standard bottomhole location 2290 feet from the North line and 330 feet from the East line (Lot 2) of Section 18. The completed interval of the proposed well will remain entirely within the 330-foot setbacks required by Division rules.

(5) In Case No. 15084, Endurance Resources, LLC ("Endurance") seeks approval of a non-standard 320-acre oil spacing and proration unit and project area in the Bone Spring formation, the North Bell Lake-Bone Spring Pool (**5150**), consisting of a mixture of federal and fee lands in the E/2 of Section 18, Township 23 South, Range 34 East, NMPM, Lea County, New Mexico. Endurance further seeks on order pooling all uncommitted interests underlying this proposed non-standard spacing and proration unit in the Bone Spring formation.

(6) At the hearing, Endurance changed its application and seeks approval of a non-standard 160-acre oil spacing and proration unit and project area in the Bone Spring formation, the North Bell Lake-Bone Spring Pool (**5150**), consisting of the E/2 E/2 of Section 18, Township 23 South, Range 34 East, NMPM, Lea County, New Mexico. Endurance further seeks an order pooling all uncommitted interests underlying this proposed non-standard 160-acre spacing and proration unit (project area) in the Bone Spring formation. Chevron did not object to this change in application by Endurance.

(7) This Unit is to be dedicated to Endurance Starcaster 18 Federal Well No. 4H (API No. 30-025-42025), a horizontal well to be drilled from a surface location 330 feet from the North line and 660 feet from the East line (Unit A), to a standard bottomhole location 330 feet from the South line and 660 feet from the East line (Unit P) of Section 18. The completed interval of the proposed well will remain entirely within the 330-foot setbacks required by Division rules.

Chevron appeared at the hearing through counsel and presented the following testimony.

(8) Chevron owns an undivided forty-two (42%) percent mineral interest in the fee lands comprising the N/2 of Section 18, and in November of 2013, the Division approved a permit to drill Chevron's proposed well on these fee lands.

(9) Chevron proposed its initial development well to the interest owners in the fee acreage in the N/2 of Section 18 on November 12, 2013, and thereafter hosted a meeting at Chevron's offices to discuss its development plans for this fee acreage. At that meeting, certain mineral owners suggested that Chevron drill a "standup" well in the E/2 E/2 of Section 18.

(10) Chevron reviewed the information provided at the interest owner meeting and ultimately concluded a west to east orientation was more appropriate for the initial development well for the fee acreage in the N/2 of Section 18. After confirming that certain mineral interest owners in the N/2 of Section 18 would not participate in Chevron's proposed well, Chevron filed a pooling application with the Division on December 12, 2013.

(11) At the time Chevron filed its pooling application, one of its fee leases covering the N/2 of Section 18 was due to expire. When a drilling rig became available at the end of December, Chevron commenced drilling the vertical portion of its proposed well on or about December 25, 2013, in order to hold its lease.

(12) Six weeks after Chevron proposed its well, and two weeks after Chevron filed its pooling application, Endurance submitted a formal proposal to Chevron for a well in the E/2 E/2 of Section 18. This letter constituted the first time Endurance formally proposed to all of the mineral interest owners that it desired to drill a well in the E/2 of Section 18.

(13) Upon receipt of Endurance's competing well proposal, Chevron halted the drilling of its proposed well at around 5,000 feet.

(14) Endurance provided Chevron with a proposed Joint Operating Agreement proposing overhead rates of \$9,400 a month while drilling and \$1,000 a month while producing. In contrast, Chevron seeks overhead rates in the amount of \$6,500 a month while drilling and \$650 a month while producing.

(15) Endurance's proposed well in Section 18 will require approval from the BLM to commingle fee and federal minerals, will require communitization of federal and fee acreage in the E/2 of Section 18, and will require a federally approved drilling permit.

(16) The target interval for both of the proposed wells is the Second Bone Spring Sands.

(17) A structure map developed by Chevron which is based on 3D seismic data indicates that a North to South trending anticline exists in Section 18 that extends into the N/2 of Section 19.

(18) Chevron also presented a curvature analysis of Section 18 based on the 3D seismic data that indicates North to South trending lineaments in Section 18.

(19) The curvature analysis supports an anticline in Section 18 and the corresponding North to South trending fracture orientation.

(20) The existence of an anticline in Sections 18 and 19 is a unique feature for the Bone Spring formation.

(21) The existence of a North to South trending anticline in Section 18 indicates that the natural fracture system will also be North to South due to the folding nature of the anticline structure.

(22) The Second Bone Spring sands in the N/2 of Section 18 are suitable for development by horizontal drilling, and that the quarter-quarter sections to be included in Chevron's proposed S/2 N/2 spacing and proration unit are expected to be more or less equally productive.

(23) No waste will occur by developing the N/2 of Section 18 with laydown horizontal wells, and that laydown horizontal wells will efficiently develop the oil and gas reserves in the N/2 of Section 18.

(24) Chevron's proposed East to West well will result in a toe up configuration for better drainage.

(25) Section 18 is located in a North to South trending slope valley system in which the productive sands will be channelized from north to south. Chevron's proposed East to West well will have a better chance of encountering the channel system containing higher porosity sands.

(26) Chevron presented Estimated Ultimate Recovery (EUR) analysis of an area three to seven miles Southeast of Section 18, that indicates laydown horizontal wells in the Second Bone Spring Sands outperform standup horizontal wells.

(27) Chevron's EUR analysis focused on an area that contained a consistent geologic setting, wells with similar completion techniques, and that contained a mixture of well orientations.

(28) In this geologic setting, East to West wells in the Second Bone Spring sands outperformed the North to South oriented wells. Accordingly, Chevron's application should be approved.

Endurance appeared at the hearing through counsel and presented the following testimony.

(29) Endurance commenced leasing efforts for the N/2 of Section 18 in April 2013 in conjunction with its exploration and development of the Second Bone Spring formation, specifically the second Bone Spring sands. To date, Endurance has drilled and completed five (5) north/south horizontal wells in the Bone Spring formation, as well as participated in one additional well in the Bone Spring formation.

(30) Following commencement of leasing efforts by Endurance in April 2013, both Chevron and Endurance competed to acquire oil and gas leases in the N/2 of Section 18. Endurance staked its North to South location in the first week of November 2013.

(31) After learning that Chevron had proposed an East to West well in Section 18, Endurance met with Chevron in Houston Texas, on November 20, 2013, to discuss proposed lease trades and the drilling of Endurance's proposed well to be oriented North to South and covering the E/2 E/2 of Section 18. At the meeting Endurance provided geological and economic data supporting its proposed North to South well.

(32) After the meeting Endurance submitted to Chevron its proposed Authorization For Expenditure (AFE) on November 27, 2013 for its proposed Starcaster 18 Federal Well No. 4H in the E/2 E/2 of Section 18. Chevron did not respond to the Endurance well proposal or the AFE.

(33) However, Chevron moved a rig unto a location in the SW/4 NW/4 of Section 18, and commenced the drilling of its proposed well on December 25, 2013, and by January 6, 2014, had set pipe to an unspecified depth.

(34) Endurance protested commencement and drilling of this well to the Division's Director on December 27, 2013. Chevron began drilling its well prior to notifying Endurance with regard to the compulsory pooling requirements.

(35) At the time that Chevron commenced the drilling of its proposed well, it controlled and held approximately 42% interest in the N/2 of Section 18. Endurance owned approximately 54% and had commitment for the remaining 4% interest for a total of approximately 58% interest in the N/2 of Section 18.

(36) On January 7, 2014, Endurance filed with the Division its competing application for compulsory pooling and non-standard spacing and proration unit comprised of the E/2 of Section 18. At the hearing the spacing and proration unit was amended to the E/2 E/2 of Section 18.

(37) At the time that Endurance filed its application for compulsory pooling and non-standard spacing and proration unit, it had acquired oil and gas leases from outstanding working interest owners to the drilling of its proposed north/south oriented well. Endurance had reached agreement with Ray Westall, Randall Harris, and BTA Oil Producers, LLC.

(38) BTA Oil Producers LLC owns all of the pertinent oil and gas leasehold working interests in the S/2 of Section 18. BTA pledged to join Endurance in a north/south well. With BTA agreeing to the drilling of a north/south well, approximately 79% of the ownership in Section 18 agrees to the drilling of the Endurance proposed well. Chevron, which owns 21% interest in Section 18, is the only dissenting interest owner to the North to South well proposal.

(39) Endurance commissioned a geo-mechanical study to establish stress directions, optimal drilling direction, and to optimize hydraulic fracturing. The study shows that north/south wells are oriented for optimal hydraulic fracturing, for intersection

of natural fractures, and for highest recovery factors. The history match of the fracture treatments showed that the natural fractures are transverse, and aligned East to West.

(40) In the immediate area, Endurance has drilled or participated in the drilling and completion of the following wells in the Second Bone Spring sand, in the same formation as in Section 18, all of which have been oriented North to South:

- a. Endurance Stratocaster 20 Fed. Well No. 4H, (API No. 30-025-27051), E/2 E/2 of Section 20, T23S, R34E;
- b. Endurance Stratocaster 20 Fed. Well No. 1H, (API No. 30-025-37295) W/2 W/2 of Section 20, T23S, R34E;
- c. Endurance Telecaster 30 Fed Well No. 3H, (API No. 30-025-41455) W/2 E/2 of Section 30, T23S, R34E;
- d. Caza-Copperline 29 Fed. Com. Well No. 1H (API No. 30-025-41313) E/2 W/2 of Section 29, T23S, R34E;
- e. Endurance Telecaster 30 Fed. Well No. 4H (API No. 30-025-41456) E/2 E/2 of Section 30, T23S, R34E; and
- f. Endurance Stratocaster 20 Fed. Well No. 2H (API No. 30-025-41381) E/2 W/2 of Section 20, T23S, R34E.

(41) Endurance also has drilled or plans to drill the following North to South wells in the Second Bone Spring sands.

- a. Endurance Stratocaster 20 Fed. Well No. 3H, (API No. 30-025-41447) W/2 E/2 of Section 20, T23S, R34E;
- b. Endurance Nocaster 19 Federal Well No. 4H (API No. 30-025-41449) E/2 E/2 of Section 19, T23S, R34E;
- c. Endurance Nocaster 19 Federal Well No. 3H, (API No. 30-025-41448) W/2 E/2 of Section 19, T23S, R34E;
- d. Endurance Broadcaster 29 Federal Well No. 3H (API No. 30-025-41909) W/2 E/2 of Section 29, T23S, R34E;

e. Endurance Broadcaster 29 Federal Well No. 4H (API No. 30-025-Pending), E/2 E/2 of Section 29, T23S, R34E;

f. Caza-Copperline 29 Well No. 2H (**API No. 30-025-41640**) W/2 W/2 of Section 29, T23S, R34E;

g. Endurance Starcaster 18 Fed. Well No. 4H (API No. 30-025-42025) E/2 E/2 of Section 18, T23S, R34E;

h. Endurance Starcaster 18 Fed. Well No. 3H (API No. 30-025-Pending) W/2 E/2 of Section 18, T23S, R34E; and

i. Endurance Telecaster 30 Fed. Well No. 2H (**API No. 30-025-41747**) E/2 W/2 of Section 30, T23S, R34E.

(42) Endurance stated that the anticline that Chevron testified does not exist during deposition of the Second Bone Spring Sand; it is a drape feature over a deep-seated fault. Therefore, the stress fields would differ from an anticline.

(43) Endurance stated that the anticline that Chevron testified is a very long linear feature that extends over a large geographic area. The best sands are piled up against the upthrown side of this fault block.

(44) Endurance conducted geo-mechanical studies of the sands in the area and determined that the stress field and orientation is such that a North to South well orientation will be more productive than East to West orientation.

(45) The second Bone Spring sand is a conventional reservoir, where porosity and permeability are the primary driving factors for recovery.

(46) Endurance analyzed four (4) core samples from Caza-Copperline 29 Well No. 1H (API No. 30-025-41313), located in the E/2 W/2 of Section 29, Township 23 South, Range 34 East, and determined that the average permeability in the Bell Lake Bone Spring formation is approximately 0.017 millidarcy (md).

(47) The geo-mechanical model studies conducted by Endurance indicate that if the permeability in the Bone Spring sands in this area is 0.05 millidarcy or more, the wells can either be oriented North to South or East to West. The model also demonstrates that if the permeability is less than 0.05 millidarcy, horizontal wells should be oriented North to South in order to access the most productive zones in the second Bone Spring sands in this area.

(48) Endurance conducted volumetric calculations of Original Oil in Place (OOIP), and Estimated Ultimate Recoveries (EUR) using off-set wells located in Sections 20, 28, and 30 of Township 23 South, Range 34 East, NMPM, Lea County, New Mexico. Using decline curve analysis and a recovery factor of 13.8%, Endurance demonstrated that over the life of the two wells in question, Endurance's North to South well in the E/2 E/2 of Section 18 will produce 83,000 barrels of oil more than Chevron's East to West well in the S/2 N/2 of Section 18.

The Division concludes as follows:

(49) The Division is charged with preventing waste and protecting correlative rights. Section 70-2-33 (H) of the Statutes defines correlative rights as follows: "correlative rights means the opportunity afforded, so far as it is practicable to do so, to the owner of each property in a pool to produce without waste his just and equitable share of the oil and gas or both in the pool, being an amount, so far as can be practicably determined and so far as can be practicably obtained without waste, substantially in the proportion that the quantity of recoverable oil or gas or both under the property bears to the total recoverable oil or gas or both in the pool and, for such purpose, to use his just and equitable share of the reservoir energy".

(50) To prevent waste and protect correlative rights, the Division must decide whether the North to South horizontal well orientation will be more productive than the East to West horizontal well orientation, based on the evidence presented by both parties.

(51) Both parties could not determine with any degree of certainty the direction of the natural fractures in Section 18. The question of whether the structure in Section 18 is an anticline, syncline, or simply a mass of sand is indeterminate and inconclusive. However, even if the structure of Section 18 is actually determined to be an anticline, syncline, or a mass of sand, regional geology and reservoir characteristics such as permeability and porosity will still play a major role in horizontal well design and orientation.

(52) In this area of the Second Bone Spring sands, if the permeability is greater than 0.05 millidacy, horizontal wells can be oriented in any direction. However, if the permeability is less than 0.05 millidarcy, North to South horizontal wells will be more productive of hydrocarbons than the East to West horizontal wells in Section 18.

(53) It is the oil and gas industry practice to use the analysis of the off-set well data to estimate what might happen in an undeveloped area of concern. Using such information, it was determined that the North to South well in the E/2 E/2 of Section 18 will produce 83,000 barrels of oil more than the East to West well in the S/2 N/2 of Section 18 over the life of the wells. In today's oil price which is \$92.27, this will translate into \$92.27 X 83,000 = \$7,658,410 of additional revenues by drilling the wells North to South.

(54) Accordingly, the application of Endurance in Case No. 15084 should be approved in order to prevent waste and protect correlative rights, while the application of Chevron in Case No. 15074 should be denied.

(55) Two or more separately owned tracts are embraced within the Unit, and/or there are royalty interests and/or undivided interests in oil and gas minerals in one or more tracts included in the Unit that are separately owned.

(56) Endurance is an owner of an oil and gas working interest within the Unit and has the right to drill the proposed well to a common source of supply within the Unit at the proposed location.

(57) There are interest owners in the Unit that have not agreed to pool their interests.

(58) To avoid the drilling of unnecessary wells, protect correlative rights, prevent waste and afford to the owner of each interest in the Unit the opportunity to recover or receive without unnecessary expense its just and fair share of hydrocarbons, Endurance's application for a 160-acre non-standard spacing and proration unit or project area, and pooling all uncommitted interests, whatever they may be, in the oil and gas within the Unit should be approved.

(59) Endurance should be designated the operator of the proposed well and of the Unit.

(60) Any pooled working interest owner who does not pay its share of estimated well costs should have withheld from production its share of reasonable well costs plus an additional 200% thereof as a reasonable charge for the risk involved in drilling the well.

(61) Reasonable charges for supervision (combined fixed rates) should be fixed at \$6,000 per month while drilling and \$600 per month while producing, provided that these rates should be adjusted annually pursuant to Section III.1.A.3 of the COPAS form titled "Accounting Procedure-Joint Operations."

IT IS THEREFORE ORDERED THAT:

(1) The application of Chevron U.S.A. Inc. in Case No. 15074, seeking approval of a non-standard 157.7-acre, more or less, oil spacing and proration unit and project area in the Bone Spring formation, North Bell Lake-Bone Spring Pool (Code 5150), consisting of fee lands in the S/2 N/2 of Section 18, Township 23 South, Range 34 East, NMPM, Lea County, New Mexico, is hereby denied.

(2) The application for compulsory pooling by Chevron U.S.A. Inc. of all uncommitted interests underlying this proposed non-standard spacing unit in the Bone Spring formation is also **denied**.

(3) The application of Endurance Resources, LLC in Case No. 15084, seeking approval of a non-standard 160-acre oil spacing and proration unit and project area in the Bone Spring formation, North Bell Lake-Bone Spring Pool (**Code 5150**), consisting the E/2 E/2 of Section 18, Township 23 South, Range 34 East, NMPM, Lea County, New Mexico, is hereby granted.

(4) Pursuant to the application of Endurance Resources, LLC, all uncommitted interests, whatever they may be, in the oil and gas in the Bone Spring formation underlying the Unit are hereby pooled.

(5) The Unit shall be dedicated to Endurance's Starcaster 18 Well No. 4H (API No. 30-025-42025) ("the proposed well"), a horizontal well to be drilled from a surface location 330 feet from the North line and 660 feet from the East line (Unit A) of Section 18, to a standard bottomhole location 330 feet from the South line and 660 feet from the East line (Unit P) of Section 18. The completed interval of the proposed well will remain entirely within the 330-foot setbacks required by Division rules.

(6) Endurance Resources, LLC (**OGRID 270329**), is hereby designated the operator of the well and of the Unit.

(7) The operator of the Unit shall commence drilling the proposed well on or before September 30, 2015, and shall thereafter continue drilling the well with due diligence to test the Bone Spring formation.

(8) In the event the operator does not commence drilling the proposed well on or before September 30, 2015, Ordering Paragraphs (3) and (4) shall be of no effect, unless the operator obtains a time extension from the Division Director for good cause demonstrated by satisfactory evidence.

(9) Should the proposed well not be drilled and completed within 120 days after commencement thereof, Ordering Paragraphs (3) and (4) shall be of no further effect, and the unit and project area created by this order shall terminate, unless operator appears before the Division Director and obtains an extension of the time for completion of the proposed well for good cause shown by satisfactory evidence. If the proposed well is not completed in all of the quarter-quarter sections included in the proposed unit within 120 days after commencement of drilling, then the operator shall apply to the Division for an amendment to this Order to contract the Unit so that it includes only those quarter-quarter sections in which the well is completed.

(10) Upon final plugging and abandonment of the proposed well and any other well drilled on the Unit pursuant to Division Rule 19.15.13.9 NMAC, the pooled unit created by this Order shall terminate, unless this order has been amended to authorize further operations.

(11) After pooling, uncommitted working interest owners are referred to as pooled working interest owners. "Pooled working interest owners" are owners of working interests in the Unit, including unleased mineral interests, who are not parties to an operating agreement governing the Unit. After the effective date of this order, the operator shall furnish the Division and each known pooled working interest owner in the Unit an itemized schedule of estimated costs of drilling, completing and equipping the proposed well ("well costs").

(12) Within 30 days from the date the schedule of estimated well costs is furnished, any pooled working interest owner shall have the right to pay its share of estimated well costs to the operator in lieu of paying its share of reasonable well costs out of production as hereinafter provided, and any such owner who pays its share of estimated well costs as provided above shall remain liable for operating cots but shall not be liable for risk charges. Pooled working interest owners who elect not to pay their share of estimated well cots as provided in this paragraph shall thereafter be referred to as "non-consenting working interest owners."

(13) The operator shall furnish the Division and each known pooled working interest owner (including non-consenting working interest owners) an itemized schedule of actual well costs within 90 days following completion of the proposed well. If no objection to the actual well costs is received by the Division, and the Division has not objected, within 45 days following receipt of the schedule, the actual well costs shall be deemed to be the reasonable well costs. If there is an objection to actual well costs within the 45-day period, the Division will determine reasonable well costs after public notice and hearing.

(14) Within 60 days following determination of reasonable well costs, any pooled working interest owner who has paid its share of estimated costs in advance as provided above shall pay to the operator its share of the amount that reasonable well costs exceed estimated well costs and shall receive from the operator the amount, if any, that the estimated well costs it has paid exceed its share of reasonable well costs.

(15) The operator is hereby authorized to withhold the following costs and charges from production:

(a) The proportionate share of reasonable well costs attribute to each nonconsenting working interest owner; and

costs.

(b) as a charge for the risk involved in drilling the well, 200% of the above

(16) The operator shall distribute the costs and charges withheld from production, proportionately, to the parties who advanced the well costs.

(17) Reasonable charges for supervision (combined fixed rates) are hereby fixed at \$6,000 per month while drilling and \$600 per month while producing, provided that these rates shall be adjusted annually pursuant to Section III.1.A.3 of the COPAS form titled "Accounting Procedure-Joint Operations." The operator is authorized to withhold from production the proportionate share of both the supervision charges and the actual expenditures required for operating the well, not in excess of what are reasonable, attributable to pooled working interest owners.

(18) Except as provided in Paragraphs (15) and (17) above, all proceeds from production from the well that are not disbursed for any reason shall be held for the

account of the person or persons entitled thereto pursuant to the Oil and Gas Proceeds Payment Act (NMSA 1978 Sections 70-10-1 through 70-10-6, as amended). If not disbursed, such proceeds shall be turned over to the appropriate authority as and when required by the Uniform Unclaimed Property Act (NMSA 1978 Sections 7-8A-1 through 7-8A-28, as amended.

(19) Any unleased mineral interest shall be considered a seven-eighths (7/8) working interest and a one-eighth (1/8) royalty interest for the purpose of allocating costs and charges under this order. Any well costs or charges that are to be paid out of production shall be withheld only from the working interests' share of production, and no costs or charges shall be withheld from production attributable to royalty interests.

(20) Should all the parties to this compulsory pooling order reach voluntary agreement subsequent to entry of this order, this order shall thereafter be of no further effect.

(21) The operator of the well and Unit shall notify the Division in writing of the subsequent voluntary agreement of all parties subject to the compulsory pooling provisions of this order.

(22) This Order is subject to approval of compulsory pooling of federal lands by the United States Bureau of Land Management.

(23) Jurisdiction of this case is retained for the entry of such further orders as the Division may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.



STATE OF NEW MEXICO OIL CONSERVATION DIVISION

JAMI BAILEY Director