

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:

CASE NO. 14301
ORDER NO. R-13192

THE FIRST AMENDED APPLICATION OF CHESAPEAKE OPERATING, INC.
FOR SPECIAL RULES AND REGULATIONS FOR THE LOST TANK-
DELAWARE POOL, OR IN THE ALTERNATIVE, FOR THE CANCELLATION
OF ACCUMULATED OVERPRODUCTION, AN EXCEPTION TO THE DEPTH
BRACKET ALLOWABLE AND PROCEDURES FOR THE "BALANCING" OF
FUTURE OVERPRODUCTION, LEA COUNTY, NEW MEXICO

ORDER OF THE DIVISION

BY THE DIVISION:

This case came on for hearing at 8:15 a.m. on June 2, 2009, at Santa Fe, New Mexico before Examiner William V. Jones.

NOW, on this 16th day of November, 2009, 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 this case and its subject matter.
- (2) By Division Order No. R-9545 issued in Case 10343, the Division created and defined the Lost Tank-Delaware Pool (Pool Code No. 40299) effective July 1, 1991 for the production of oil from the Delaware formation, initially consisting of all of Section 36, Township 21 South, Range 31 East and the NE/4 of Section 1, Township 22 South, Range 31 East, NMPM, Eddy County. The Pool has since been expanded seven times and now extends over into Lea County.
- (3) The Lost Tank-Delaware Pool has no special pool rules and is currently governed by Division Rule 15.9, which requires standard 40-acre spacing and proration units with wells to be located no closer than 330 feet to the outer boundary of the unit.

(4) According to Division records, the first well completed in this pool was Yates Petroleum Corporation's Lost Tank AIS State Well No. 3 (API No. 30-015-26586). This well has perforations over a gross interval from 6783 feet to 7084 feet in the Cherry Canyon and Brushy Canyon members of the Delaware Mountain Group. At the 6783 foot depth, for 40-acre oil spacing and proration units, Division Rule 20.12 provides for a depth bracket allowable of 142 barrels of oil per day, while Division Rule 20.13 provides for a limiting gas-oil ratio of 2000 cubic feet of gas per barrel of oil.

(5) Chesapeake Operating, Inc. ("Chesapeake" or "applicant") applied in this case to raise the depth bracket of the Lost Tank-Delaware Pool to 400 barrels of oil per day effective January 1, 2009 and to cancel accumulated overproduction of oil on its Lost Tank 16 State Well No. 4 (API No. 30-025-38907) located within one mile of the Pool boundary in Unit D, Section 16, Township 21 South, Range 32 East, NMPM, Lea County; New Mexico. At the hearing, Chesapeake withdrew the portion of its application seeking special pool rules for the entire pool and limited its request to addressing the overproduction from this one well.

(6) Yates Petroleum Corporation, Yates Drilling Company, Abo Petroleum Corporation, and Sharbro Oil Ltd Co (collectively "Yates") appeared at the hearing in opposition to Chesapeake's application. OXY USA, Inc. entered an appearance and was represented at the hearing by counsel but did not oppose the application. No other parties appeared or otherwise opposed this application.

(7) Chesapeake presented two witnesses who testified and presented exhibits in support of its case. Yates presented three witnesses who testified and presented exhibits in opposition to the Chesapeake application.

(8) The evidence presented in this case can be summarized as follows:

- a. The gross interval of the lower Delaware formation - Cherry Canyon and Brushy Canyon members - consists of layers of marine shales and fine grained sands. The interval drills faster than other reservoir rocks; therefore mudlog shows may be masked and the latest electric logs are used to pick depths to perforate and complete. Drill-stem tests were used in early wells to determine gross Delaware pay intervals.
- b. The individual sand intervals picked for completion are sometimes but not always continuous from well to well. If they are found in an offset well, the porosity is often not developed. Structure does not play a role in this lower Delaware. Each completed sand lens may have its own oil, water, and gas production, and often water is found above oil.
- c. Oil wells completed in this lower Delaware exhibit early hyperbolic oil production behavior, indicating early recovery from

multiple pay intervals of varying drainage radius or varying permeabilities. Early, steep declines soon give way to shallow, longer term exponential declines indicating lower permeability, radial flow.

- d. The completed intervals are oftentimes 1700 or more feet from top to bottom and require multiple, costly fracture treatments. Fracture sand or formation sand often causes trouble with the artificial lift equipment.
- e. In the case of the subject well, the electric submersible pump was sized to handle the anticipated early oil and water (liquid) capacity of the well and was installed above the completed interval (6698 to 8554 feet) in order to prevent sand problems. The pump is now being run at its lowest feasible speed and is handling production from the well as the well's oil declines. Changing out the pump is prohibitively expensive and is a risk to the well.
- f. Chesapeake stated that the primary reason for the requested relief is to prevent risk to its well and cost to its operations from downsizing the artificial lift equipment or cycling the pump on and off.
- g. The early production from this well has been better than normal for this Pool. On February 2, 2009, the well was tested at 396 barrels of oil, 120 Mcf of gas, and 201 barrels of water with 300 Psi flowing tubing pressure. None of the witnesses knew why this well was better than others or could predict that other wells if drilled nearby would be this good – although Yates appears eager to drill in nearby spacing units.
- h. Chesapeake proposes that the maximum oil allowable should be changed to 200 barrels of oil per day and it be allowed to continue producing at the well's capacity and be given one additional year to naturally make up the accumulated overage in oil production.
- i. The net cumulative oil overproduction was reported at the hearing to have been 14,628 barrels of oil. Gas production has never been over the top allowable. Chesapeake estimates that by July of 2009, production for this well will decline to less than the existing top bracket allowable of 142 barrels per day and, even if the existing top allowable is not increased, by May of 2010 all overproduction would be mitigated.
- j. The reservoir pressure (or pressures of each sand lens) was assumed to be at or above the bubble point at discovery and

Chesapeake's reservoir engineer testified that there are no lateral or bottom water drive issues. In fact, water production has been declining on this well. The reservoir(s) are clearly under solution gas drive and Chesapeake testified that these types of reservoirs are not harmed by the rate of withdrawal and the bulk of the published literature also supports that. Yates' reservoir engineer did not disagree with this statement.

- k. Yates has been an early operator in this pool and has drilled many wells – themselves exhibiting hyperbolic behavior. Its witnesses had access to PVT data and did not assert or attempt to present evidence that this reservoir was being harmed by producing at higher rates than the Division statewide rules allow.
- l. Yates is concerned about correlative rights of its offsetting 40-acre tracts relating to drilling delays and therefore opposed any relief requested by Chesapeake in this case.
- m. Yates testified that its preferred method of protecting its correlative rights is to drill wells, but if the Division required Chesapeake's well to be curtailed or shut-in while balancing overproduction, then Yates' correlative rights would be protected. Chesapeake's witnesses maintained that Yates' correlative rights have not been violated and the well will soon take care of the overage without any regulatory reduction in rate.
- n. Chesapeake presented a volumetric calculation showing the 14,628 barrels of overproduction has affected only about 3.5 acres. Yates presented a volumetric calculation using the estimated ultimate oil recovery from this well, showing a final drainage radius of 703 feet. Both sides agreed that if Yates never drilled its offsetting wells, then it is possible the subject well will someday affect reserves outside its 40-acre unit.
- o. Chesapeake's well is on State of New Mexico acreage and in the R-111-P defined "potash" area. Chesapeake obtained a waiver to allow its well to be drilled from Intrepid Potash Inc ("Intrepid"). The well was drilled at a standard oil well location within a standard sized spacing and proration unit.
- p. Yates reported its drilling permits in offsetting Section 17 are being held up in the DC Circuit Court of Appeals by Intrepid who apparently has decided - after granting Chesapeake's waiver for the subject well - to oppose further oil drilling in this area. Section 17 is also in the R-111-P defined potash area and comprises a federal oil and gas lease held by Yates. The BLM granted drilling

permits to Yates in Section 17 on all 16, 40-acre units but those are stayed pending appeal. Yates drilled a few of these wells; then the remaining undrilled permits were appealed by Intrepid.

- q. Yates recently submitted APD's to the BLM in Sections 8 and 9 to the north, but stated that if drilling permits are issued, they are also subject to appeal by the potash lessee.

The Division concludes as follows:

(9) There was never an issue in this case of possible harm to the reservoir due to the rate of production and the evidence presented confirmed this. In this instance, the lower Delaware is an enormous interval with numerous stratigraphic, fine grained sand reservoirs under solution gas drive without gas production or GOR problems.

(10) The Lost Tank-Delaware Pool currently includes all Delaware rocks including the productive intervals in the Cherry Canyon and Brushy Canyon members of the Delaware Mountain Group. The completion interval in the Brushy Canyon is below 8000 feet; which if it were a separate Pool, would have a top depth bracket allowable of 230 barrels of oil per day. The case for separate Pools was not made, but it is evident that multiple reservoirs do exist here.

(11) The Division Rules provide that after notice and hearing, the top bracket allowable for any Pool can be increased or decreased. Normally this case would be presented after sufficient production occurs and the necessary evidence is gathered. However, the portion of the application asking for an increase in the Pool allowable was dropped by the applicant at the hearing and should be dismissed from this case.

(12) Division Rules do not specifically provide for increasing the top allowable for only an individual well in a Pool, and Chesapeake did not make a showing of necessity for an increased allowable to protect correlative rights pursuant to NMSA 1978 Section 70-2-17.A because it did not present evidence of total reserves in the Pool. Therefore, the proposal by Chesapeake to increase the allowable for this well from 142 to 200 barrels of oil per day should be denied.

(13) Since the hearing in June, Division records indicate that the well has already declined to below the 142 barrels per day top allowable and a calculation using these records indicates that almost all of the early overproduction has been mitigated and will certainly be mitigated in the near future without any change to the well operation. Therefore, Chesapeake's request in this case for cancellation of accumulated overproduction or a procedure for balancing of any overproduction should be dismissed.

(14) The evidence presented indicates that Yates' correlative rights have not been violated by Chesapeake's operations or the early production rates from this well, and Chesapeake should be allowed to continue uninterrupted oil production from this well in order to prevent waste and protect its correlative rights.

IT IS THEREFORE ORDERED THAT:

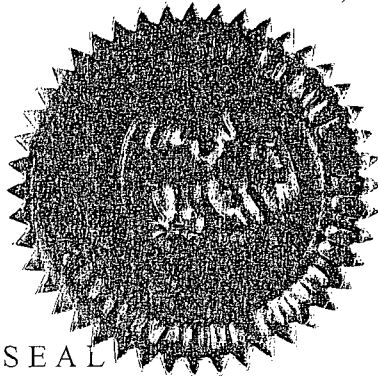
(1) Chesapeake's request to increase the top depth bracket allowable for the Lost Tank 16 State Well No. 4 (API No. 30-025-38907) located in Unit D, Section 16, Township 21 South, Range 32 East, NMPM, Lea County New Mexico, to 200 barrels of oil per day is denied.

(2) Chesapeake's request to cancel accumulated overproduction or a procedure for the balancing of any overproduction from the Lost Tank 16 State Well No. 4 is dismissed.

(3) The portion of Chesapeake's application to create Special Rules for the Lost Tank-Delaware Pool raising the top depth bracket allowable for all spacing units to 400 barrels of oil per day is dismissed without prejudice.

(4) 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

A handwritten signature in black ink, appearing to read "Mark E. Fesmire".

MARK E. FESMIRE, P.E.
Director