



# RAILROAD COMMISSION OF TEXAS

## HEARINGS DIVISION

### EXAMINERS' REPORT AND RECOMMENDATION

**OIL AND GAS DOCKET NO. 10-0298029**

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**THE APPLICATION OF MEWBOURNE OIL COMPANY TO AMEND THE PERMANENT  
FIELD RULES FOR THE LIPSCOMB, S.E. (CLEVELAND) FIELD IN HEMPHILL,  
LIPSCOMB, OCHILTREE & ROBERTS COUNTIES, TEXAS**

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**HEARD BY:** Paul Dubois – Technical Examiner  
Laura Miles-Valdez – Hearings Examiner

**PREPARED BY:** Paul Dubois – Technical Examiner  
Jennifer Cook – Administrative Law Judge

**HEARING DATE:** November 10, 2015

**CONFERENCE DATE:** June 21, 2016

**APPEARANCES:**

**REPRESENTING:**

**Applicant**

James M. Clark, P.E.

Mewbourne Oil Company

**Intervenors**

Mickey Olmstead

Courson Oil & Gas, Anadarko Co.

**Observers**

Raul Cantu  
Phillina Lai

BP America

**STATEMENT OF THE CASE**

In this case, the Examiners consider two applications ("the Applications") filed by Mewbourne Oil Company ("Mewbourne") to amend field rules. One application, Oil and Gas Docket No. 10-0298030, requests amending the field rules of the Lipscomb (Cleveland) Field in Hemphill, Lipscomb and Ochiltree Counties, Texas. The other application, Oil and Gas Docket No. 10-0298029, requests amending the field rules of the Lipscomb, S.E. (Cleveland) Field in Hemphill, Lipscomb, Ochiltree and Roberts Counties, Texas. The Technical Examiner and Administrative Law Judge (collectively referred to as "the Examiners") chose to consolidate these two dockets due to the common facts and parties of the cases.

In the Applications, Mewbourne seeks to add a provision to the existing field rules allowing an operator to obtain a permanent gas well classification when a well's initial gas-to-oil ratio ("GOR")<sup>1</sup> is 3,000 cubic feet per barrel or greater. Mewbourne provided recombined wellstream composition analytical data from 144 wells in the two fields for which the Commission has previously accepted as proof of gas well classification for those wells based on current Railroad Commission ("Commission") policy. Data from the two subject fields confirmed a relationship between heptanes-plus compositional analysis and GOR, as supported by scientific literature previously relied on by the Commission in gas well classification matters. All operators of oil or gas wells in the two fields were notified of the Applications, which are not protested. The Examiners recommend that the Applications be granted such that the field rules for each of the two subject fields be amended to include the following provision:

*For any well in the subject field completed with a gas-oil ratio (GOR) of 3,000 cubic feet per barrel and above, the operator may elect to have such well permanently classified as a gas well without the need of further administrative review effective the date of initial completion, provided the initial producing GOR was determined by stabilized well test conducted within 90 days of well completion and in accordance with the GOR determination requirements of Commission procedures as indicated on Forms G-1, G-5 or W-2 as appropriate, and using gas measurement methods as described in the current Commission publication Gas- Oil Ratio Calculation, or methods of at least equal accuracy.*

The Examiners anticipate that one result of this field rule amendment may be that operators seek to reclassify existing oil wells as gas wells effective the date of first production. As a solely technical matter, it is possible that such a reclassification can be supported by the underlying science and Commission precedent in other fields. Mewbourne has not requested any oil wells be reclassified through this docket.

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<sup>1</sup> GOR may also be referred to as "gas-to-liquid hydrocarbon ratio" (GLR).

***Jurisdiction and Notice***

This case involves applications to amend permanent field rules of Commission recognized oil and gas fields regarding the classification of certain wells as gas wells as defined by Commission rule.<sup>2</sup> The Commission has jurisdiction to adopt field rules<sup>3</sup> and classify gas wells.<sup>4</sup>

On September 11, 2015, the Commission's Hearings Division issued a Notice of Hearing on the Applications setting a hearing date of October 12, 2015. The Notice of Hearing included the time, place and nature of the hearing, identified the legal authority and jurisdiction for the hearing and contained a statement of the factual matters and legal issues involved. The Notice of Hearing was sent to potentially interested parties, including the operators affected, as identified by Mewbourne.<sup>5</sup> Mewbourne requested a continuance of the hearing. In a letter dated September 30, 2015 issued by Hearings Division Examiner Terry Johnson, Examiner Johnson granted the continuance and set a new hearing date of November 10, 2015; this letter was sent to everyone on the service list.

**DISCUSSION OF EVIDENCE**

The Lipscomb (Cleveland) and Lipscomb, S. E. (Cleveland) Fields produce oil and gas from the Cleveland Sandstone Formation in the Texas Panhandle. The productive area of the Cleveland Formation has grown both by development and by consolidation of various Cleveland Formation fields into the two subject fields (and others). The current field rules for both fields include special provisions to facilitate development with horizontal wells.

***Overview of Lipscomb (Cleveland) Field (ID No. 53869 270)***

The first Lipscomb (Cleveland) Field oil well was discovered on May 24, 1958 at a depth of 7,802 feet, and the first gas well in the field was discovered on July 13, 1959 at a depth of 7,966 feet. Commission records indicate about 1,002 gas wells and 192 oil

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<sup>2</sup> 16 Tex. Admin. Code § 3.79(11); *see also* Tex. Nat. Res. Code §§ 86.002.

<sup>3</sup> *See, e.g., Railroad Com'n of Texas v. WBD Oil & Gas Co.*, 104 S.W.3d 69, 70 (Tex. 2003) (discussing Commission's authority to adopt field rules); 16 Tex. Admin. Code § 3.43.

<sup>4</sup> *See, e.g., Hufo Oils v. Railroad Com'n of Texas*, 717 S.W.2d 405 (1986); *see also* Tex. Nat. Res. Code §§ 86.002, 86.041 and 86.042.

<sup>5</sup> *See* letter dated August 28, 2015 filed by Mewbourne.

wells have been completed in the field.<sup>6</sup> Most of the development in the field has been in Lipscomb County, with a smaller number of wells in each of Hemphill and Ochiltree Counties.

The current field rules for the Lipscomb (Cleveland) Field are provided for in the Final Order for Oil & Gas Docket No. 10-0281871, effective September 19, 2013. The Examiner's Report and Recommendation for that docket provides the following description of the reservoir in the Cleveland Formation<sup>7</sup>:

*The depositional environment for the Cleveland sand is a tidally influenced delta shoreface with a lowstand to highstand sequence. There is no structurally influenced accumulation. The Cleveland Sandstone is widespread and found throughout the area. Within the Cleveland Sandstone are pockets of higher quality of sands that are distributed both vertically and horizontally. The correlative interval is from 7,779 feet to 8,156 feet as shown on the type log of the Mewbourne Oil Company Tubb "423" Lease, Well No. 3. The Cleveland sand has a gross interval that is 200 to 400 feet thick with a typical net pay thickness of 25 to 80 feet of high quality reservoir sand. The Cleveland has a average 10% porosity with a range of 8% to 14% porosity.*

#### **Overview of Lipscomb, S. E. (Cleveland) Field (ID No. 53878 250)**

The first Lipscomb, S.E. (Cleveland) Field (ID No. 53878 250) oil well was discovered on December 21, 1983 at a depth of 8,050 feet, and the first gas well in the field was discovered on February 16, 2006 at a depth of 8,138 feet. Commission records indicate about 178 gas wells and 188 oil wells have been completed in the field. Most of the development in the field has been in Lipscomb and Hemphill Counties, with a smaller number of wells in each of Roberts and Ochiltree Counties.

The current field rules for the Lipscomb, S.E. (Cleveland) Field are provided for in Oil & Gas Docket No. 10-0272543, effective November 22, 2011. The Examiner's Report

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<sup>6</sup> Information about the fields was obtained by the Examiners' review of Commission records regarding the two fields at issue; after notice provided to all the parties, the Examiners hereby take official notice of these records as well as the Final Orders and Examiner's Report and Recommendations for the two prior Commission cases adopting the current field rules for the subject.

<sup>7</sup> See O&G Docket No. 10-0272543: The Application of Chesapeake Operating, Inc., to Consolidate Various Cleveland Fields into the Lipscomb, S. E. (Cleveland) Field and to Amend the Field Rules for the Lipscomb, S. E. (Cleveland) Field, Hemphill, Lipscomb and Ochiltree Counties, Texas (Final Order entered on November 22, 2011).

and Recommendation for that docket provides the following description of the reservoir in the Cleveland Formation<sup>8</sup>:

*The Cleveland is a low permeability sand, however within the Cleveland sandstone are pockets of higher quality of sands that are distributed both vertically and horizontally.*

The testimony of Mewbourne's expert witness, James M. Clark, P. E., was consistent with the geological descriptions of the Cleveland Formation in the two subject fields as described in the previous field rule dockets. The fields were originally developed with vertical wells, but recent attention has turned to horizontal wells. The character of the reservoir includes individual stratigraphic compartments. While a vertical well may penetrate and drain only one compartment, a single horizontal well can access several. As a result, new wells in the field continue to encounter virgin reservoir pressures in untapped and undrained compartments.

### **Gas Well Classification**

Mewbourne requests an amendment to the permanent field rules for the above-referenced fields to allow gas well classifications for wells that meet specified conditions. Gas wells are defined as:

*Any well:*

- (A) which produces natural gas not associated or blended with crude petroleum oil at the time of production;*
- (B) which produces more than 100,000 cubic feet of natural gas to each barrel of crude petroleum oil from the same producing horizon; or*
- (C) which produces natural gas from a formation or producing horizon productive of gas only encountered in a wellbore through which crude petroleum oil also is produced through the inside of another string of casing or tubing. A well which produces hydrocarbon liquids, a part of which is formed by a condensation from a gas phase and a part of which is crude petroleum oil, shall be classified as a gas well unless there is produced one barrel or more of crude petroleum oil per 100,000 cubic feet of natural gas; and that the term "crude*

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<sup>8</sup> See O&G Docket No. 10-0281871: The Application of Chesapeake Operating, Inc., to Amend Permanent Field Rules for the Lipscomb (Cleveland) Field, Lipscomb County, Texas (Final Order entered on August 6, 2013).

*petroleum oil" shall not be construed to mean any liquid hydrocarbon mixture or portion thereof which is not in the liquid phase in the reservoir, removed from the reservoir in such liquid phase, and obtained at the surface as such.<sup>9</sup>*

Current Commission policy provides for a means by which a well may be administratively classified as a gas well when analysis demonstrates the proportion of heptanes and heavier hydrocarbon molecules (i.e, "heptanes plus" or "C7+") is less than 11 mole ("mol") percent of the recombined wellstream composition.<sup>10</sup> This method of classification is supported by research referenced in the policy memorandum<sup>11</sup>, and the research suggests a C7+ mol percent of 12.5 or less is sufficient to identify a retrograde condensate.

If an applicant cannot meet the established criteria for administrative classification, an applicant can request a hearing and provide additional information to show that a particular well meets the definition of "gas well" found in Statewide Rule 79. For example, similar to this case, the underlying research indicates that an initial producing gas-oil ratio (GOR) of more than 3,000 to 3,200 standard cubic feet (scf) per barrel may also be indicative of a retrograde gas condensate reservoir. In other cases in which the C7+ and initial producing GOR data demonstrate the conditions in which the fluid exists as a retrograde gas condensate in the reservoir, the Commission has adopted field-specific gas well classification rules that allow an operator to seek administrative gas well classification when the initial producing GOR is 3,000 scf/bbl or greater. Such a classification rule has been adopted in other fields currently being developed with horizontal wells, including the Briscoe Ranch (Eagleford), DeWitt (Eagle Ford Shale), Hawkville (Eagleford Shale), Sugarkane (Eagle Ford) Derby (Bone Spring), Sandbar (Bone Spring) Fields.<sup>12</sup> Further, basing well classification on GOR represents a significant cost savings for operators than requiring more expensive and time-consuming C7+ compositional analysis.

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<sup>9</sup> 16 Tex. Admin. Code § 3.79(11). 16 Tex. Admin. Code § 3.79 is generally referred to as Statewide Rule 79.

<sup>10</sup> See, e.g., Exh. No 1 (both dockets).

<sup>11</sup> *Id.* Note, the 2006 T-Bar Memorandum cites the following technical sources as the basis for this provision: (1) Moses, Phillip L., "Engineering Applications of Phase Behavior of Crude Oil and Condensate Systems." *Journal of Petroleum Technology*. Society of Petroleum Engineers. July 1986; and (2) McCain, William D. The Properties of Petroleum Fluids. Second Edition. PennWell Corporation. Tulsa, Oklahoma. 1990. 548 pages.

<sup>12</sup> Exh. No. 9 (10-0298029), Exh. No. 10 (10-0298030); Tr. at 24-25.

In this case, Mewbourne has provided C7+ and GOR data from 49 wells in the Lipscomb (Cleveland) Field and 95 wells in the Lipscomb, S. E. (Cleveland) Field.<sup>13</sup> The data was obtained from the completion reports for wells in both fields. The 144 combined wells are operated by 7 different operating companies, and the compositional analysis was performed by 6 different laboratories. The GOR and C7+ values are plotted on Attachment A<sup>14</sup>, and suggest a continuous inverse power function relationship as described by McCain. Although there is a significant amount of scatter, by far most of the data (about 139 of 144 data points) indicates that a C7+ value of 12.5 or less are associated with GOR values of 3,000 scf/bbl or greater. These data indicate the relationship between C7+ and GOR is sufficient to allow an initial producing GOR of 3,000 scf/bbl or greater to be a reliable surrogate for C7+ with regard to gas well classification.

The evidence presented by Mewbourne agrees with the analytical characteristics of reservoir fluid phase behavior described by Moses & McCain. Moses & McCain both cite certain conditions for sampling and analysis to ensure data quality. Therefore, the relationships between C7+, GOR and reservoir fluid phase behavior are dependent upon the requisite conditions described by Moses and McCain, which include the samples collected early in the life of a well that is producing at a stabilized rate. Further, Moses indicates "the well should ideally be produced at a rate equal to or slightly above the minimum stable rate...".<sup>15</sup> To the issue of data quality, Mewbourne's requested field rule amendment specifies that the initial producing GOR to be determined by stabilized well test conducted within 90 days of well completion and in accordance with the GOR determination requirements of Commission procedures as indicated on Forms G-1, G-5 or W-2 as appropriate, and using gas measurement methods as described in the current Commission publication Gas-Oil Ratio Calculation<sup>16</sup>, or methods of at least equal accuracy. Because Mewbourne's proposed language is consistent with established scientific methodologies, the Examiners recommend approval of Mewbourne's request.

### FINDINGS OF FACT

1. Notice of this hearing was given to all parties entitled to notice at least ten days prior to the date of hearing.
2. The Cleveland Formation is a low permeability sand, however within the Cleveland sandstone are pockets of higher quality of sands that are distributed both vertically and horizontally.

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<sup>13</sup> Tr. at 15-24; Exh. Nos. 3-8 (10-0298029) and 3-9 (10-0298030).

<sup>14</sup> Exh. No. 7 (10-0298029)(which is identical to Exh. No. 8 in 10-0298029).

<sup>15</sup> Moses, p. 717.

<sup>16</sup> See "Gas-Oil Ratio Calculation", Railroad Commission of Texas. February 1986.

- a. The character of the reservoir includes individual stratigraphic compartments.
  - b. A vertical well may penetrate and drain only one compartment, but a single horizontal well can access several.
  - c. New horizontal wells in the field continue to encounter virgin reservoir pressures in untapped and undrained compartments.
3. The first Lipscomb (Cleveland) Field oil well was discovered on May 24, 1958 at a depth of 7,802 feet, and the first gas well in the field was discovered on July 13, 1959 at a depth of 7,966 feet.
- a. Approximately 1,002 gas wells and 192 oil wells have been completed in the field.
  - b. The current field rules for the Lipscomb (Cleveland) Field are provided for in the Final Order for Oil & Gas Docket No. 10-0281871, effective September 19, 2013.
4. The first Lipscomb, S.E. (Cleveland) Field (ID No. 53878 250) oil well was discovered on December 21, 1983 at a depth of 8,050 feet, and the first gas well in the field was discovered on February 16, 2006 at a depth of 8,138 feet.
- a. Approximately 178 gas wells and 188 oil wells have been completed in the field.
  - b. The current field rules for the Lipscomb, S.E. (Cleveland) Field are provided for in Oil & Gas Docket No. 10-0272543, effective November 22, 2011.
5. Data from 49 wells in the Lipscomb (Cleveland) Field and 95 wells in the Lipscomb, S. E. (Cleveland) Field indicate a continuous inverse power function relationship.
- a. Most of the data (about 139 of 144 data points) indicates that a C7+ value of 12.5 or less are associated with GOR values of 3,000 scf/bbl or greater.
  - b. These data indicate the relationship between C7+ and GOR is sufficient to allow an initial producing GOR of 3,000 scf/bbl or greater to be a reliable surrogate for C7+ with regard to gas well classification.

6. Any well in the subject field completed with a gas-oil ratio of 3,000 cubic feet per barrel and higher may be classified as a gas well, provided:
  - a. The initial producing GOR was determined by stabilized well test conducted within 90 days of well completion; and
  - b. In accordance with the GOR determination requirements of Commission procedures as indicated on Forms G-1, G-5 or W-2 as appropriate, and using gas measurement methods as described in the current Commission publication Gas-Oil Ratio Calculation, or methods of at least equal accuracy.

**CONCLUSIONS OF LAW**

1. Resolution of the subject application is a matter committed to the jurisdiction of the Railroad Commission of Texas. Tex. Nat. Res. Code § 81.051.
2. All notice requirements have been satisfied. 16 Tex. Admin. Code § 1.45.
3. A well completed in the Lipscomb (Cleveland) or Lipscomb, S. E. (Cleveland) Field with an initial gas-oil ratio (GOR) of 3,000 cubic feet per barrel or higher meets the definition of gas well pursuant to Statewide Rule 79. 16 Tex. Admin. Code § 3.79 (11)(C).

**RECOMMENDATION**

Based on the above findings of fact and conclusions of law, the Examiners recommend the Commission enter an order granting the application of Mewbourne Oil Company to amend the field rules for the Lipscomb (Cleveland) or Lipscomb, S. E. (Cleveland) Fields.

Respectfully submitted,



Paul Dubois  
Technical Examiner



Jennifer Cook  
Administrative Law Judge