



RAILROAD COMMISSION OF TEXAS

HEARINGS DIVISION

PROPOSAL FOR DECISION

OIL AND GAS DOCKET NO. 02-0284942

THE APPLICATION OF PIONEER NATURAL RES. USA, INC., TO CONSIDER
PERMANENT GAS WELL CLASSIFICATION FOR ALL WELLS ON THE RIDLEY 01
UNIT, SUGARKANE (EAGLE FORD) FIELD, KARNES COUNTY, TEXAS

HEARD BY: Paul Dubois – Technical Examiner
Marshall Enquist – Administrative Law Judge

APPEARANCES:

REPRESENTING:

APPLICANT:

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PROCEDURAL HISTORY

Application Filed: October 2, 2013
Notice of Hearing: October 23, 2013
Dates of Hearings: November 13, 2013 and April 29, 2015
Proposal For Decision Issued: October 27, 2015

STATEMENT OF THE CASE

Pioneer Natural Resources USA, Inc. (Pioneer) seeks permanent gas well classification for all wells on its Ridley 01 Unit (Unit), in the Sugarkane (Eagle Ford) Field, Karnes County, Texas. Eleven wells were completed in the Unit between July 6, 2011, and October 8, 2013, and all wells are currently producing:

1. Commission staff has administratively approved gas well classification for four of these wells based on field rules and initial gas-to-oil ratios (GOR) of 3,000:1 standard cubic feet per barrel (scf/bbl) or greater.
2. Commission staff has administratively denied gas well classification for two of the wells because the wells do not meet the field rule or current Commission policy requirements for permanent gas well classification.
3. Commission records (as of September 21, 2015) indicate that Pioneer has not filed completion reports for the remaining five wells.

Pioneer argues, based on records of some wells on the lease and a few other wells in the area, that the Sugarkane (Eagle Ford) Field underlying the Ridley 01 Gas Unit is a retrograde gas reservoir, and therefore all wells on the Unit should be eligible for classification as gas wells. Pioneer's stated purpose for requesting the classification is to ease its present administrative burden; the Unit was pooled and set up as a gas unit, and Pioneer prefers to manage all wells on the Unit as gas wells. The Examiners note that Pioneer has filed Form ST-1 (Application for Texas Severance Tax Incentive Certification) for six wells on the Unit. If eligible, the severance tax reduction for an individual well can be significant—up to one-half of the cost to drill and complete a well. This may be an unstated rationale behind Pioneer's application for permanent gas well classification for all wells on the Ridley 01 Unit, even those wells that do not meet the gas well classification criteria.

The Examiners recommend Pioneer's application be denied. The Commission's long-standing rules provide for well classification (and reclassification) based on the production characteristics of individual wells—not based on the preponderance of well classifications in a given area. Indeed, many fields are populated with both gas and oil wells. To recommend approval of the application would: (1) deviate from long-standing Commission practice; (2) provide a gas well classification for wells that do not meet the gas well classification criteria, including potential future wells on the Unit; and (3) establish a precedent for gas well classification based not on individual well characteristics, but on the production characteristics of *some* other wells in the area. In addition, such a precedent would not provide clear requirements or guidance going forward.

Applicable Law

The Natural Resources Code §86.001(5) defines gas well as one that:

- A. Produces gas not associated or blended with oil at the time of production;
- B. Produces more than 100,000 cubic feet of gas to each barrel of oil from the same producing horizon; or
- C. Produces gas from a formation or producing horizon productive of gas only encountered in a well bore through which oil also is produced through the inside of another string of casing.

Similarly, a gas well is defined in 16 Tex. Admin. Code § 3.79(11) 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 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.

On August 3, 2006, the Commission most recently adopted a change in its administrative determination policy for gas well classification.¹ The T-bar memorandum identified four independent means by which an operator can seek and administrative staff can grant gas well classification for an individual well:

¹ T-Bar memorandum dated August 3, 2006. Change in administrative determination policy for gas well classification. From Richard Varela, Director, Oil and Gas Division, to the Commissioner's Offices.

1. The gas-oil ratio (GOR) on well completion reports (Form G-1) is 100,000 standard cubic feet (scf) of natural gas to each barrel (bbl) of oil at standard pressure and temperature conditions.
2. An American Society of Testing Materials (ASTM) distillation test may be conducted and the results submitted on Form G-5. The administrative policy specifies threshold classification criteria for GOR, fluid gravity, liquid color, and specific distillation points.
3. A pressure-volume-temperature (PVT) test may be conducted to simulate the phase characteristics of a hydrocarbon sample at reservoir conditions. A well is classified as a gas well if the GOR exceeds 100,000 scf/bbl at reservoir conditions or if the hydrocarbon sample is above the dew point at reservoir conditions.
4. Finally, the policy memo adopts a new 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. This method of classification is supported by research referenced in the policy.²

In its Final Order for Oil & Gas Docket No. 02-0272551, dated January 10, 2012, the Commission established a permanent gas well classification criteria for all wells in the Sugarkane (Eagle Ford) Field³. Pioneer intervened in support of the application in that case. The adopted classification rule states:

"Therefore, it is ordered by the Railroad Commission of Texas that all wells completed with a gas-oil ratio of 3,000 cubic feet per barrel and above in the Sugarkane (Eagle Ford) Field, Bee, De Witt, Karnes, and Live Oak, Counties, Texas, are permanently classified as gas wells without the need of further administrative review, effective the date of initial completion."

² 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.

³ Oil & Gas Docket No. 02-0272551, the application of Petrohawk Operating Company to consider a permanent gas well classification for the Sugarkane (Eagle Ford) Field in Bee, De Witt, Karnes, and Live Oak Counties, Texas. Final Order dated January 10, 2012.

The PFD in Oil & Gas Docket No. 02-0272551 cited the work of Philip Moses as a basis for this classification.⁴ This gas well classification rule has since been incorporated into the field rules for the Sugarkane (Eagle Ford) Field (Oil & Gas Docket 02-0295357 dated April 28, 2015).

Docket Time Line

The initial hearing in this case was held on November 13, 2013. On January 13, 2014, the Examiners notified Pioneer's counsel that a recommendation to approve gas well classification for all wells on the Ridley 01 Unit would not be forthcoming. Then, and on several subsequent occasions, Pioneer requested additional time to provide evidence in support of its application. At Pioneer's request the hearing was reopened on April 29, 2015. No substantial new information was offered at that time. A time line of events and correspondence in this docket is presented in Attachment 1.

Matters Officially Noticed

The Examiners take official notice of Commission records as of September 21, 2015, of Pioneer's filings for individual wells drilled on the Ridley 01 Unit. By letter dated September 22, 2015, the Examiners notified Pioneer of their intention to take official notice of these records. Pioneer did not object.

DISCUSSION OF THE EVIDENCE

Pioneer's Ridley 01 Unit is located about 4.5 miles west of Runge, in Karnes County, Texas. Pioneer has completed eleven wells on the 1,017.423 acre unit. The Unit was created by pooling twelve tracts of land, most of which were too small in size, too irregular in shape, or not optimally oriented to be efficiently developed independently.⁵ The current field rules set the standard proration unit size for a gas well at 320 acres, and an operator may chose optional 80-acre units. Pioneer stated the Unit was pooled for development of the Sugarkane (Eagle Ford) Field with gas wells; Pioneer expected all wells on the Unit would prove to be gas wells based on initial production characteristics of individual wells.⁶

All eleven wells have been drilled, completed, tested, and are producing. The eleven Ridley 01 Unit wells are all completed in the same Eagle Ford Formation interval,

⁴ Exh. No. 4, citing Moses 1986.

⁵ Exh. No. 36.

⁶ Tr. vol. 2, 31:18-23.

with total vertical depths of about 12,850 feet.⁷ The cumulative production from the Ridley 01 Unit wells is presented on Table 1.

**TABLE 1
CUMULATIVE WELL PRODUCTION THROUGH JANUARY 2015**

Well No.	API No.	Gas ID No.	Completion Date	Cumulative Gas Production (mcf)	Cumulative Oil/Condensate Production (bbl)	Cumulative GOR (scf/bbl)
1H	255-31871	263530	6-Jul-11	1,106,007	404,985	2,731
2H	255-32196	268662	5-Feb-12	764,343	301,403	2,536
3H	255-32753	269546	20-Dec-12	459,526	160,763	2,857
4H	255-32821	269685	4-Jan-13	651,521	226,325	2,879
5H	255-32959	n/a	8-Oct-13	262,156	161,885	1,619
6H	255-32960	n/a	8-Oct-13	350,293	193,091	1,814
7H	255-32961	271813	8-Oct-13	752,660	254,147	2,962
8H	255-32976	n/a	4-Oct-13	348,464	184,671	1,887
9H	255-32975	271605	4-Oct-13	599,403	205,089	2,923
10H	255-32978	n/a	4-Oct-13	347,559	194,975	1,783
11H	255-32977	n/a	4-Oct-13	349,649	199,530	1,752
Unit Cumulative				5,991,581	2,486,864	2,409

Sources: Exh. Nos. 12 & 21.

Commission staff has administratively approved gas well classification for four of the wells (Nos. 1H, 3H, 7H and 9H), and has denied gas well classification for two of the wells (Nos. 2H and 4H) based on the field rules and current Commission policy requirements for permanent gas well classification. Commission records (as of September 21, 2015) indicate that Pioneer has not filed completion reports for the remaining five wells. Table 2 summarizes the administrative well classification status of the unit wells and tabulates the classification criteria in evidence.

⁷

Exh. No. 31.

TABLE 2
ADMINISTRATIVE GAS WELL CLASSIFICATION

Well No.	Completion Date	Test/Sample Date	GOR (scf/bbl)	C ₇₊ (mol %)	References (Exhibit Nos.)	Administrative Classification
1H	6-Jul-11	7-Jul-11 17-Aug-11	- 3,032	8.422 -	8, 12, 27 12	Gas well
2H	5-Feb-12	14-Feb-12 14-Feb-12 13-Feb-13	2,185 2,114 2,093	- - 11.730	12 35 9, 27	Denied
3H	20-Dec-12	23-Dec-12	3,062	-	12	Gas well
4H	4-Jan-13	7-Jan-13 7-Jan-13 22-Feb-13 7-Nov-13	2,138 2,263 1,940 2,239	- - 14.183 13.592	12 35 10 27	Denied
5H	8-Oct-13	17-Nov-13	2,085	-	35	No filings
6H	8-Oct-13	28-Oct-13 7-Nov-13	2,792 2,046	- 15.685	12 27, 35	No filings
7H	8-Oct-13	28-Oct-13	3,276	-	12	Gas well
8H	4-Oct-13	25-Oct-13 7-Nov-13	1,618 2,216	- 15.023	12 27, 35	No filings
9H	4-Oct-13	25-Oct-13	4,483	-	12	Gas well
10H	4-Oct-13	25-Oct-13 7-Nov-13	2,560 2,114	- 15.508	12 27, 35	No filings
11H	4-Oct-13	25-Oct-13 7-Nov-13	2,613 2,114	- 15.483	12 27, 35	No filings

- Notes:**
- Bold data values indicate the administrative criterion achieved for gas well classification.
 - Well Nos. 1H, 3H, 7H and 9H were administratively granted permanent gas well classification based on GOR. Well No. 1H met the administrative criteria for gas well classification based on C₇₊.
 - Classifications for Well Nos. 2H and 4H were administratively denied and are pending the outcome of this docket; the GOR and C₇₊ values do not meet the administrative criteria.
 - Pioneer has not filed completion reports for Well Nos. 5H, 6H, 8H, 10H and 11H.

The Eagle Ford Formation in this part of Texas exhibits a characteristic gradation of reservoir classification as one moves from up-dip in the northwest to down-dip in the southeast. Up-dip wells tend to classify as oil wells, and are referred to as being in the Eagle Ford Formation's "oil window." Likewise, down-dip wells tend to classify as gas

wells, and are referred to as being in the Eagle Ford Formation's "dry gas window". The area in between the oil and dry gas windows can be referred to as a "condensate-rich" or "liquids-rich" window. Wells completed in this transition zone produce large volumes of hydrocarbon liquids. The liquids may be shown to be condensates at the surface that exist as a gas at reservoir conditions. These latter wells, by Statute and Rule, are often classified as gas wells because the operators have provided evidence that liquids produced at the surface exist as a gas in the reservoir. As shown on Attachment 2, the Ridley 01 Unit is located in this liminal transition zone between oil and gas.⁸

Pioneer asserts that all of the wells in the Ridley 01 Unit are, in fact, gas wells. The basis for this assertion is that there are other wells near and around the Ridley 01 Unit that have received permanent gas well classification, and that some of these wells were used to support the permanent gas well classification rule for the Sugarkane (Eagle Ford) Field based on a 3,000:1 scf/bbl GOR.⁹

In the earlier case, GOR, C₇₊, and PVT data from 19 wells completed in the Sugarkane (Eagle Ford) Field, and 18 wells completed in the adjacent Hawkville and DeWitt (Eagle Ford) Fields, were presented to establish that this part of the Eagle Ford Formation exhibits retrograde gas behavior when the GOR values are 3,000:1 scf/bbl or greater. All 37 of these wells—which were drilled by several different operators—were determined by Commission staff to be gas wells based on at least one of the following criteria:

- GOR greater than 100,000:1 scf/bbl;
- C₇₊ composition less than 11 mol percent; or
- PVT analysis indicating the observation of a dew point.

By establishing a gas well classification criterion based on GOR, operators are saved the expense of having to run more costly C₇₊ or PVT analysis to secure gas well classification. A C₇₊ analysis costs about \$5,000 and takes two weeks for results. The cost to run a PVT test is about \$25,000 to \$30,000 and takes six months.¹⁰ That is, in this field, a GOR of 3,000:1 scf/bbl or greater is a reliable surrogate indicating that the C₇₊ and/or PVT analysis would confirm a gas well classification. Lacking a 3,000:1 scf/bbl or

⁸ Exh. No. 19.

⁹ Oil & Gas Docket No. 02-0272551, the application of Petrohawk Operating Company to consider a permanent gas well classification for the Sugarkane (Eagle Ford) Field in Bee, De Witt, Karnes, and Live Oak Counties, Texas. Final Order dated January 10, 2012.

¹⁰ Tr. vol. 1, 18:22 to 19:3.

greater GOR, an operator retains the option to seek gas well classification via an affirmative C₇₊ or PVT analysis.

Pioneer also points out that, of the data presented in Docket No. 02-0272551, six wells had C₇₊ compositions greater than 12.54 mol percent but were still classified as gas wells based on the observation of a dew point during the PVT analysis (five of the six wells had GORs less than 3,000:1 scf/bbl).

Of the 19 Sugarkane (Eagle Ford) Field wells used in the Docket No. 02-0272551 analysis, six were within close proximity—three miles—of the Ridley 01 Unit. Classification data for these wells is summarized below:

TABLE 3
DOCKET NO. 02-0272551 WELLS WITHIN 3 MILES OF THE RIDLEY 01 UNIT

Well	G-1 GOR (scf/bbl)	Heptanes-Plus Composition (mol %)	PVT Results	Classification
Spear Reynolds A Unit No. 1 (API 255-31714)	1,956	12.46	<i>Dew Point</i>	Gas Well
Schendel Unit No. 1 (API 255-31691)	2,397	14.39	<i>Dew Point</i>	Gas Well
Yanta Cattle Co. A-288 No. 1 (API 255-31719)	4,329	10.28	<i>Dew Point</i>	Gas Well
Yanta Cattle Co. A-288 No. 2 (API 255-31677)	5,332	7.34	<i>Dew Point</i>	Gas Well
Douglas GU No. 1 (API 255-31679)	4,536	4.64	<i>Dew Point</i>	Gas Well
Handy No. 1 (API 255-31635)	3,448	11.58	<i>Dew Point</i>	Gas Well

Note: Bold data values indicate the administrative criterion achieved for gas well classification.

Sources: Exh. Nos. 5 & 23.

Because the Commission has classified these nearby wells as gas wells, Pioneer contends the Ridley 01 Unit wells should also be classified as gas wells, as all of the Ridley wells exhibit comparable GOR data (ranging from 1,168 to 4,483 scf/bbl) and, when available, C₇₊ data (ranging from 8.42 to 15.69 mol percent).

Finally, Pioneer stated that the gas and liquid samples for Form G-5, Gas Well Classification Report, were not collected in accordance with the instructions on the Form. The samples were collected from a pressurized separator, not from vessels that have been flashed to atmospheric pressure and ambient temperature as required. Pioneer presented

a published study providing a method to correct the GOR in such cases.¹¹ Applying this methodology to the seven wells not yet classified as gas wells resulted in an increased GOR for all of the wells. But for only one of the wells, 6H, did the increased GOR exceed 3,000:1 scf/bbl.

In a letter to the Examiners dated April 10, 2014, Pioneer stated that it would be conducting a very detailed PVT analysis of fluids from the Ridley 01 Unit Well No. 8H. Pioneer stated the test would take about four months and cost \$40,000. The record contains no evidence of PVT analysis of fluid samples from any of the Ridley 01 Unit wells.

EXAMINERS' ANALYSIS OF THE EVIDENCE

The Examiners recommend Pioneer's application to permanently classify all wells on the Ridley 01 Unit as gas wells be denied. Pioneer asserts that being able to operate all Unit wells as gas wells would protect its correlative rights, but it did not demonstrate how its rights would be harmed if one or more of the wells failed to qualify for gas well classification—other than as a matter of convenience and the desire to resolve general, unspecified private contractual issues or administrative preferences. No evidence was offered in support of its claim that gas well classification was necessary to protect correlative rights, not to mention prevent waste or promote conservation. Operators are entitled to produce their fair share of hydrocarbons from a tract, but there is no entitlement that these hydrocarbons be produced from a particular well classification. On the surface, therefore, the application appears to be simply a matter of convenience or preference for Pioneer.

However, what may be a convenience for an individual operator may also hold consequences for which the Commission should be informed and attend. The Commission's Statewide Rules and special field rules provide for well classification based on the proven production characteristics of individual wells. Pioneer's proposal seeking permanent gas well classification simply because *some* of the other wells in the area have demonstrated similar characteristics amounts to a dilution of the technical integrity of these rules and may work to establish an inappropriate precedent. Pioneer's approach is troublesome because the methodology is defective.

Further, the evidence suggests an otherwise unstated rationale for the proposed Unit-wide classification is to qualify otherwise unqualified wells for a reduced severance tax rate pursuant to the Texas Tax Code, § 201.057 and Statewide Rule 101 (16 Tex. Admin. Code § 3.101).

¹¹

Exh. No. 34. Gold, D. K., McCain, W. D, and Jennings, J. W. "An Improved Method for the Determination of the Reservoir Gas Specific Gravity for Retrograde Gases." *Journal of Petroleum Technology*. Society of Petroleum Engineers. July 1989.

The Ridley 01 Unit Wells: Individual Well Classification

The evidence in the record demonstrates that four of the eleven Ridley 01 Unit wells meet the administrative criteria for gas well classification based on a GOR greater than 3,000:1 scf/bbl. These include Well Nos. 1H, 3H, 7H, and 9H. In addition, Well No. 1H also meets the administrative criteria for gas well classification based on a C₇₊ composition of less than 11 mol percent. Commission staff has granted these classifications administratively. Based on all evidence in the record, the Examiners find no further relief is available to Pioneer for the classification of the Ridley 01 Unit wells.

The evidence in the record demonstrates that, based on individual well production characteristics, seven of the eleven Ridley 01 Unit wells (Nos. 2H, 4H, 5H, 6H, 8H, 10H, and 11H) do not meet the requirements for administrative gas well classification. The evidence indicates GOR values less than 3,000:1 scf/bbl and C₇₊ compositions of greater than 11 mol percent (in fact, the lowest C₇₊ value at completion was 14.18 mol percent for Well No. 4H). There is no evidence in the record that Pioneer conducted any PVT analysis for any wells on the Unit.

Producing Characteristics of Retrograde Gas Reservoirs

The evidence in the record indicates that Ridley 01 Unit Well No. 2H reported a C₇₊ composition of 11.73 mol percent. While this value does not meet the administrative classification criterion (less than 11 mol percent), it is less than the 12.5 to 12.9 mol percent documented in literature regularly cited and accepted as evidence in Commission hearings for gas well classification.¹² However, as shown on Table 2, Well No. 2H was completed on February 5, 2012, but the C₇₊ sample was collected one year later, on February 13, 2013. The timing of the sample draws attention to an important issue: The same literature used to support gas well classification based on GOR and/or C₇₊ analysis also and unequivocally states that such analysis should be conducted early in the life of a well, before reservoir pressure has declined below the dew point.¹³ A brief discussion of the phase behavior is appropriate at this juncture.

The phase state of a hydrocarbon fluid—whether it be gas, liquid or a combination of the two—in the reservoir is a function of: (1) the composition of the fluid as a complex mixture of various hydrocarbon classes and families; (2) reservoir pressure; and (3) reservoir temperature. Changes to any of these three variables may affect the phase behavior of the fluid (*i.e.*, cause a liquid to evaporate into a gas, or cause a gas to condense into a liquid). Generally, the reservoir temperature does not change. So, for a

¹² See McCain, 1990.
See also McCain, William D., *et al.* Petroleum Reservoir Fluid Property Correlations. Penn Well Corporation. Tulsa, Oklahoma. 2011. 219 pages.

¹³ Exh. No. 15.

given temperature, the phase state is a function of fluid composition and reservoir pressure. In a retrograde gas reservoir at initial conditions (before production) the hydrocarbon fluid mixture in the reservoir exists as a gas, and the reservoir pressure is higher than the dew point pressure. The dew point pressure is the saturation pressure below which the hydrocarbon gas mixture begins to condense into liquid. If, at initial conditions, the reservoir pressure is below the dew point, then the fluids exist in both gas and liquid phases in the reservoir.

As a retrograde gas reservoir is produced two changes occur. First, the pressure declines. As the pressure declines below the dew point, some fraction of the hydrocarbon fluid—the heavier molecules first—will condense from gas to liquid. The condensed liquids will typically remain in the reservoir and will not be produced through a well, because the liquid hydrocarbon saturation must exceed 35 percent of the available pore space before the condensed hydrocarbon liquid can flow in the reservoir. That is, liquids which condense in the formation are generally immobile. Second, while the heavier ends are condensing (and remain stranded) in the reservoir, the composition of the gas fluid that flows into a well and can be produced changes—it gets lighter by the loss of the heavier fractions to condensation. As this fluid is produced up the wellbore and pressure continues to decline, more liquid is produced by condensation.

So, over time, the fluids produced from a retrograde gas reservoir can be expected to get lighter because the heavier molecules will condense and remain behind in the reservoir. This suggests the critical importance of timing with regard to well classification:

- The mol percent of heptanes and heavier molecules (C7+) will decline over time, as heavier molecules condense and remain in the reservoir. Such a test, therefore, is only representative of the initial reservoir conditions early in the life of the well, as later sampling times will yield lower C7+ mol percent values more favorable for gas well classification under current policy
- GOR will increase over time, as heavier components condense and remain in the reservoir and the rates of liquid hydrocarbon production declines. Such a test, therefore, is only representative of the initial reservoir conditions early in the life of the well, as later testing times will yield higher GOR values more favorable for gas well classification under the existing field rules.

The literature used to support the Commission's gas well classification policies recognize this aspect of retrograde gas reservoir behavior. Consider the following:

- "The term *initial*... means 'at a time when the average reservoir pressure is above the dew point pressure... of the reservoir fluid'" (McCain 2011, page 193, emphasis in original.)

- “Gas-condensate reservoirs should be sampled early in their life, before significant pressure loss has occurred. Once reservoir pressure has declined below the original dewpoint, it is no longer possible to get samples that represent the original reservoir fluid” (Moses 1986, page 718.)
- “Producing gas-oil ratios for a retrograde gas will increase after production begins when reservoir pressure falls below the dew-point pressure of the gas” (McCain 1990, page 155.)

As shown on Table 2, Well No. 4H demonstrates C_7+ analyses that decrease over the time the well produced, consistent with a changing reservoir composition due to pressure decline. Between February 2013 and November 2013 the C_7+ measured for Well No. 4H decreased from 14.18 to 13.59 mol percent (see Table 2). Further, there is no documentation of reservoir pressure—at initial or sampled conditions—in evidence.

Therefore, the Examiners conclude Pioneer has not demonstrated that the C_7+ analysis for Well No. 2H—sampled a year after the well was completed—is representative of initial reservoir fluids; the 2H well does not merit permanent gas well classification.

Finally, the GOR characteristics of a well are only valid for classification early in the life of the well, before the reservoir pressure has fallen below the dew point. In addition, Moses indicates that wells should be stabilized, properly conditioned and producing at or slightly above the minimum stable rate.¹⁴ McCain states that “Producing gas-oil ratios for a retrograde gas will increase after production begins when reservoir pressure falls below the dew-point pressure of the gas.”¹⁵ However, Pioneer’s evidence indicates the GORs for all eleven wells on the unit have remained remarkably constant *and* below 3,000:1 scf/stb. Only occasionally does the GOR for a few of the wells exceed 3,000:1, often only in concert with a transient change in production characteristics (see Exhibit Nos. 13 and 21, and Attachment 3).¹⁶ None of the GOR data is convincing with regard to gas well classification (even for the four approved gas wells), and none of the supporting literature suggests that a single daily GOR is demonstrative of gas well classification for a well completed in a retrograde gas reservoir.

The Ridley 01 Unit Wells: Unit-Wide Well Classification

The evidence in the record demonstrates four of the eleven wells have been permanently classified as gas wells at the time of initial completion. That is, less than half of the wells on the Unit.

¹⁴ Moses 1986, page 717.

¹⁵ McCain 1990, page 155.

¹⁶ Exh. No. 21.

Pioneer then turns to other available data from an earlier matter (Docket No. 02-0272551) to buttress its argument that all wells on the Ridley Unit are gas wells. From the earlier case, Pioneer identifies six wells within three miles of the Ridley 01 Unit that have been administratively granted gas well classification. These six wells exhibit similar GOR and C₇₊ values to those of the Ridley 01 Unit wells (see Table 3). In the re-opened hearing, Pioneer added a few additional nearby gas well data points.

However, Pioneer's analysis of available data fails to consider the fact that there are many other wells in the same area that do not meet or have not attempted to obtain the gas well classification standards and are therefore oil wells. Pioneer's basic approach has two flaws. First, Pioneer only presents data that demonstrates the objective it seeks to achieve, and does not address information that counters its objective—even though such evidence was obvious on its own exhibits. Specifically, there are many oil wells on adjoining tracts, in addition to the seven wells on the Ridley 01 Unit that should be classified as oil wells. The preponderance of the evidence shows oil well classification to be appropriate for most of the Ridley 01 Unit wells. Attachment 4 is a modification of Pioneer's Exh. No. 19, identifying some of the oil wells in the area. It appears, therefore, that Pioneer bases its argument for a unit-wide gas well classification only on nearby *gas* wells, not *all* nearby wells. Second, in such cases the available data will nearly always be incomplete. The Examiners (nor Pioneer) have no way of knowing for certain whether a particular oil well failed a C₇₊ or PVT test, as operators typically do not make information public in Commission records unless necessary to support a regulatory determination. Together, any area average of well data presented is likely to be biased in favor of gas classification. Hence, the Commission has always required individual well tests.

Reservoir Transitions

Based on the location of the Ridley 01 Unit, one might reasonably anticipate that some of the wells would be gas wells and some would be oil wells. The Ridley 01 Unit is located in an Eagle Ford Formation transition zone in which the reservoir fluids grade from dry gas to gas condensate to oil as one moves up-dip from southeast to northwest. This trend is apparent on Pioneer's Exhibit No. 19 (Attachments 2 and 4), which illustrates Sugarkane (Eagle Ford) Field gas wells (red) and Eagle Ford Formation oil wells (green). The Ridley Unit is located within this transition zone. Horizontal wellbores in the area, which are typically about 6,000 feet long, parallel this transitional trend along a southeast to northwest orientation. This implies that the reservoir fluid characteristics may change along an individual horizontal wellbore. That is, for a given horizontal wellbore, a fracture stage to the southeast may drain fluids that exist in a gas phase at reservoir conditions, whereas a stage 6,000 feet to the northwest may drain fluids that exist as liquids at reservoir conditions. Ideally, then, there would be a gradual gradation in fluid properties along the horizontal wellbore. Thus it is a functional reality that such a horizontal wellbore may produce a composite of hydrocarbon fluids that exhibit varied phase states within the

reservoir (whereas a traditional vertical well in a conventional reservoir is more likely to produce from more of a discrete reservoir area with homogenous phase characteristics).

Of course, heterogeneity in the reservoir rock itself also likely influences fluid characteristics. Fluid phase in the reservoir—gas or oil—may depend on more than simply the location of the reservoir along the dip of the formation. In addition, the effectiveness of fracture stimulation treatments can also affect the characteristics of produced fluids, as can the conditioning, stability and production history of a well. Given all of these variables—and possibly more—the Examiners conclude it is entirely reasonable to find that some of the wells on a unit in such a transition window would exhibit characteristics indicative of oil well classification, while others on the same unit might exhibit characteristics of gas well classification. The only effective way to accurately and appropriately classify wells, then, is to provide data demonstrating individual reservoir and well production characteristics sufficient to achieve current classification criteria, which Pioneer failed to do by not running PVT analyses on its Ridley 01 Unit wells.

The burden of proof is Pioneer's to provide evidence necessary for proper well classification. In this case, individual well PVT data could have conclusively settled the matter. No such data, for any wells on the Unit, were provided.

Potential Ramifications of Unit-Wide Classification

The Commission has consistently maintained, and, when appropriate, updated its administrative policy for gas well classification of individual wells. Operators are provided with multiple options to establish the appropriate well classification. These options range from the simple (a GOR is reported for all wells) to more complex and possibly expensive (C_7+ or PVT analysis). A decision to approve a unit-wide classification as requested in this case would not simplify, clarify, or improve on the current process. Indeed, it would only obscure and make less clear what, exactly, is the distinction between a gas well or an oil well. If four wells out of eleven are sufficient to classify all wells on the Unit as gas wells... are three out of eleven sufficient? What if development of the 1,017-acre Ridley 01 Unit had only just begun... would, say, one well be sufficient to justify unit-wide gas well classification? Well classification should be based on reservoir and individual well production characteristics, consistent with current and historical Commission rules, policy and practice.

The Sugarkane (Eagle Ford) Field in Karnes County has been designated as a tight formation area pursuant to Statewide Rule 101, Certification of Severance Tax Exemption or Reduction for Gas Produced from high-Cost Gas Wells (16 Tex. Admin. Code § 3.101).¹⁷ The Examiners note Commission mainframe records indicate that Pioneer has

¹⁷

See Oil & Gas Docket No. 02-0267836, the application of Pioneer Natural Resources USA, Inc. for a tight gas area designation pursuant to Statewide Rule 101 for the Eagleford Shale Formation in all of Bee, DeWitt, and Karnes Counties, Texas. Final Order issued January 13, 2011.

filed Form ST-1 (Application for Texas Severance Tax Incentive Certification) for six of the wells on the Unit (1H, 2H, 3H, 4H, 7H, and 9H). Commission staff has administratively approved these forms, certifying the wells' eligibility to receive a reduction in the severance tax paid on fluids produced from these wells.

However, Commission records indicate that Form ST-1 certifications were issued for Ridley 01 Unit Well Nos. 2H and 4H, although the completion reports for these wells have not been approved by Commission staff, and so the wells have not yet been classified as gas wells.¹⁸ The evidence indicates that Well Nos. 2H and 4H are not eligible for the severance tax reduction. Statewide Rule 101(c)(5) states:

If the Commission determines that a gas well previously certified as producing high-cost gas no longer produces high-cost gas or if the Commission takes any action or discovers any information that affects the eligibility of gas for an exemption or tax reduction under Texas Tax Code, §201.057, the Commission shall notify within 48 hours, in writing, the Comptroller and the operator.

Administrative approvals of Form ST-1 for Well Nos. 2H and 4H appear to have been premature. If this finding is adopted by the Commission, Statewide Rule 101(c)(5) requires the Commission to notify the Comptroller and Pioneer.

The severance tax reduction is good for a period of 120 months, or until the value of the incentive equals one half of the cost to drill and complete the well. This is a significant incentive for permanent gas well classification. As shown in Table 1, a unit-wide gas well classification would enable Pioneer to seek this severance tax reduction for Well Nos. 4H, 5H, 6H, 8H, 10H, and 11H, potentially allowing Pioneer to recover half of the cost to drill and complete these oil wells which, collectively through January 2015, have produced 2,309,642 mcf gas and 1,160,477 bbl oil. The costs to drill and complete the Ridley 01 Unit wells are not in evidence. According to Pioneer, the cost to run a C₇+ analysis costs about \$5,000 and takes two weeks; the cost to run a PVT test is about \$25,000 to \$30,000 and takes six months.¹⁹ The analytical cost of gas well classification would appear to be nominal compared to the potential benefit.

Revised GOR Calculations

Fluid samples for GOR analysis, per Commission requirements, should be collected from vessels at atmospheric pressure and standard temperature. Pioneer asserts that the GOR fluid samples from the Unit wells were improperly collected from the first stage (high

¹⁸ Well No. 2H: Form ST-1 approved on October 28, 2013, high-cost gas docket no. 210867.
Well No. 4H: Form ST-1 approved on December 9, 2014, high-cost gas docket no. 213561.

¹⁹ Tr. vol. 1, 18:22 to 19:3.

pressure) separator. Apart from the testimony of its consulting engineer, no documentation was offered to support this claim (e.g., field notes, sampling logs, etc.). Pioneer provided a single published study from 1989 that describes the method for estimating a corrected GOR. For one well, Ridley Unit Well No. 6H, the revised GOR was greater than 3,000:1 scf/bbl.

The Examiners have several concerns with adopting this method and cannot recommend Well No. 6H be classified as a gas well. First, Commission requirements on Form G-5, Gas Well Classification Report, are long-established and Pioneer certainly has extensive experience with this procedure. Second, the GOR value already stands as a surrogate—a cost effective means of approximating, in certain circumstances, the phase behavior of a reservoir fluid based on established PVT and C_7+ data. To provide for a second estimate—that is, estimating an adjustment to an estimate—is not a sound or reasonable technical basis for classification. Third, Pioneer had the opportunity to obtain PVT analysis for this and all wells on the Unit, consistent with existing policy, and either did not do so or did not report the results. Finally, Pioneer has not filed completion reports, including documentation of GOR analysis, for Well Nos. 5H, 6H, 8H, 10H and 11H, which have been producing now for about two years.

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 Ridley 01 Unit, in the Sugarkane (Eagle Ford) Field, Karnes County, Texas, is located in an area where the Eagle Ford Formation transitions from gas wells to the southeast to oil wells to the northwest.
3. Pioneer has completed eleven wells on the 1,017.423 acre Ridley 01 Unit between July 6, 2011, and October 8, 2013. The wells have produced 5,991,581 mcf gas and 2,486,864 bbl oil and condensate through January 2015. The gas-oil ratios (GORs) of the individual wells have remained unchanged over time.
4. The eleven Ridley 01 Unit wells are all completed in the Sugarkane (Eagle Ford) Field, in the same depth interval, with total vertical depths of about 12,850 feet.
5. Commission rules, policy and practice for well classification—whether for gas wells or oil wells—is based on the well production characteristics of individual wells. Operators are provided with multiple options to establish the appropriate well classification.

6. Current Commission policy provides for gas well classification based a recombined wellstream compositional analysis indicating the composition of heptanes and heavier molecules (C₇₊) is 11 mol percent or less. Industry and academic literature support gas well classification for C₇₊ compositions less than 12.9 mol percent.
7. Field rules for the Sugarkane (Eagle Ford) Field provide for permanent gas well classification based on an initial gas-oil ratio (GOR) of 3,000 standard cubic feet per barrel or higher, effective the date of initial completion.
 - a. The field rule gas well classification criterion was established in Oil & Gas Docket No. 02-0272551 (Final Order issued on January 10, 2012) and was based on an analysis of 37 Eagle Ford Formation wells, including 19 wells in the Sugarkane (Eagle Ford) Field.
 - b. Evidence considered in Docket No. 02-0272551 included pressure-volume-temperature (PVT) analysis data from 33 wells indicating the well fluid exists as a gas at reservoir conditions; data from 33 wells indicated the C₇₊ values were less than 12.9 mol percent, and 24 wells had C₇₊ values of 11 mol percent or less.
 - c. Six of the gas wells used in Docket No. 02-0272551 are within about 3 miles of the Ridley 01 Unit.
8. The evidence in the record indicates that four of the eleven wells on the Ridley 01 Unit are gas wells (1H, 3H, 7H and 9H), and seven of the wells are oil wells (2H, 4H, 5H, 6H, 8H, 10H and 11H).
 - a. Commission staff has administratively approved gas well classification for four of these wells (1H, 3H, 7H and 9H) based on GOR and C₇₊ data. These wells demonstrated a range of GOR values between 3,032 scf/bbl and 4,483 scf/bbl. Well No. 1H exhibited a C₇₊ composition of 8.42 mol percent.
 - b. Commission staff has administratively denied gas well classification for two of the wells (2H and 4H) because the GOR does not meet the field rule requirement for permanent gas well classification. The GOR values for these two wells were 2,185 scf/bbl and 2,138 scf/bbl, respectively.
 - c. The recombined well-stream compositional analysis for Well No. 2H was collected one year after the well began producing. No evidence was offered to demonstrate the analyzed fluid is representative of initial reservoir fluid conditions.

- d. Commission records (as of September 21, 2015) indicate that Pioneer has not filed completion reports for the remaining five wells (5H, 6H, 8H, 10H and 11H). Evidence demonstrates the GOR values for these wells ranged from 1,618 scf/bbl to 2,792 scf/bbl. The C₇₊ values ranged from 15.02 to 15.69.
9. Pioneer did not provide PVT analysis data for any of the Ridley 01 Unit wells.
10. There are gas wells and oil wells on tracts adjoining the Ridley 01 Unit.
11. Pioneer did not consider oil wells in the area in its analysis of nearby well classifications.
12. Well Nos. 2H, 4H, 5H, 6H, 8H, 10H, and 11H have produced 2,309,642 mcf gas and 1,160,477 bbl oil.
13. Pioneer has filed and received Commission certification that Well Nos. 1H, 2H, 3H, 4H, 7H and 9H produce high-cost gas pursuant to Statewide Rule 101.

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. Ridley 01 Unit Well Nos. 2H, 4H, 5H, 6H, 8H, 10H, and 11H do not meet the statutory, policy and field rule requirements for gas well classification and should be classified as oil wells. 16 Tex. Admin. Code § 3.79(11)
4. Permanently classifying all wells on the Ridley 01 Unit will not protect correlative rights, promote conservation, or prevent waste.
5. Ridley 01 Unit Well Nos. 2H and 4H are not gas wells, do not produce high-cost gas defined by Statewide Rule 101, and are not eligible for the severance tax reduction under Texas Tax Code, §201.057. 16 Tex. Admin. Code § 3.101(b)(7)

RECOMMENDATION

Based on the above findings of fact and conclusions of law, the Examiners recommend the Commission enter an order denying the application of Pioneer Natural Res. USA, Inc., to consider permanent gas well classification for all wells on the Ridley 01 Unit, Sugarkane (Eagle Ford) Field, Karries County, Texas.

Respectfully submitted,



Paul Dubois
Technical Examiner



Marshall Enquist
Administrative Law Judge

ATTACHMENT 1

Docket Time Line

Date	Event
October 2, 2013	Letter from Clark Jobe, Attorney for Pioneer, to Tim Poe, RRC. Request for hearing.
November 13, 2013	Hearing.
December 30, 2013	Email from Examiner Dubois to Mr. Jobe. At the hearing on November 13, 2013, Pioneer stated that additional analytical data for some of the Ridley 01 Unit wells would be provided. By this email, Examiner Dubois followed up with Mr. Job regarding the status of the additional data.
December 30, 2013	Email from Mr. Jobe to Examiner Dubois. Mr. Job stated that he will look into the status and availability of the additional data. The additional data was not provided.
January 13, 2014	Examiner Dubois telephoned Mr. Job and informed him that an affirmative recommendation would not be made for the Ridley 01 Unit. Mr. Jobe was informed that the Examiners are available to meet and discuss the case. Mr. Jobe was informed the Examiners will wait for a response from Pioneer.
April 10, 2014	Letter from Brian Sullivan to the Examiners. Mr. Sullivan stated that Pioneer has been actively analyzing data. Pioneer requests the docket be held open pending completion of very detailed PVT testing.
May 22, 2014	Examiner Dubois spoke in person with Mr. Sullivan (following the scheduled Commission open conference) and offered to meet to discuss the Examiners' issues with this case.
May 22, 2014	Email Exchange between Examiner Dubois and Brian Sullivan, Attorney for Pioneer. Examiner Dubois and Mr. Sullivan agreed to meet at RRC offices that afternoon to discuss this case.
May 22, 2014	Examiner Dubois and Mr. Sullivan met at RRC offices. Mr. Dubois described the technical difficulties with the case as it stood. The case remained open per Pioneer's request of April 10, 2014.
February 5, 2015	Letter from Examiner Enquist to Mr. Sullivan. The Hearings Division requested that Pioneer set the case for hearing, withdraw the docket, or face dismissal.
February 12, 2015	Letter from Mr. Sullivan to the Examiners, requesting the hearing be re-opened on April 29, 2015.

ATTACHMENT 1

Docket Time Line

Date	Event
April 29, 2015	Hearing
June 8, 2015	Letter from the Examiners to Mr. Sullivan notifying Pioneer that record is closed and adverse recommendation likely forthcoming.
June 22, 2015	Letter from Mr. Sullivan to the Examiners. Mr. Sullivan requests additional time, until July 6, 2015, to provide information.
July 6, 2015	Letter from Mr. Sullivan to the Examiners. Mr. Sullivan has new PVT data from another operator that he believes is relevant to the case. Mr. Sullivan request additional time, until July 24, 2015, to secure permission to use the third-party data.
July 24, 2015	Letter from Mr. Sullivan to the Examiners. The additional data is not available. Mr. Sullivan request the Examiners keep the docket open until Oil & Gas Docket No. 01-0297472, the application of Devon Energy Production Company, LP to amend field rules for gas classification in the Eagleville (Eagleford-1) and (Eagleford-2) Fields, is heard, and for the Examiners to consider the evidence in the Devon matter.
September 16, 2015	The Devon hearing (Oil & Gas Docket No. 01-0297472) was called and continued until November 2, 2015, by Examiners Caldwell and Johnson.
September 22, 2015	Letter from Examiner Dubois to Mr. Sullivan, indicating the Examiners will prepare a PFD and request Pioneer provide a written transcript of the audio files from the two hearings.
October 7, 2015	Transcripts received.
October 27, 2015	PFD issued.



Legend

Eagle Ford Wells

RRC Classification

Gas ●

Oil ●

Gas Wells —

Oil Wells —

Ridley Unit

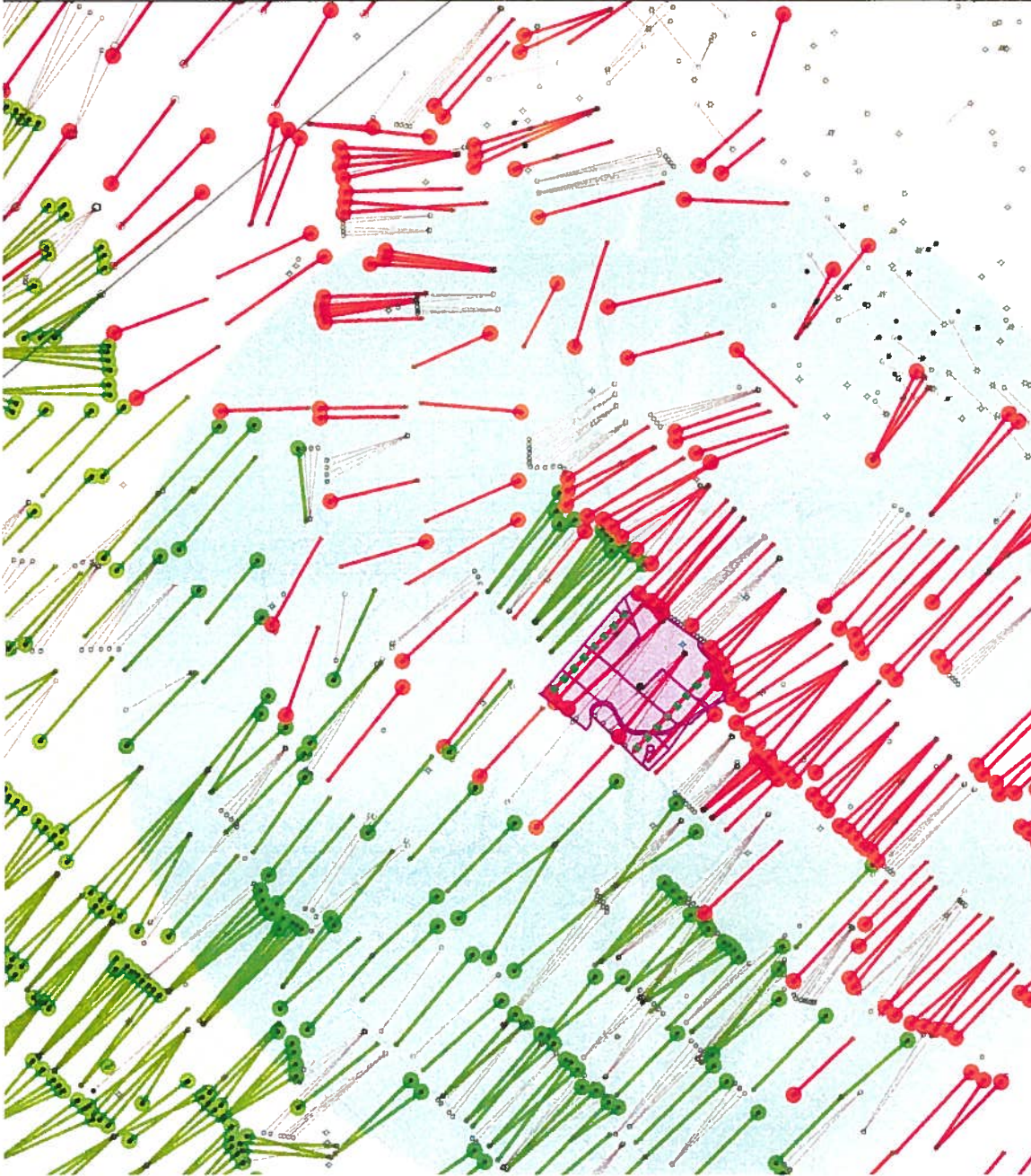
5 Mile Radius

Scale



**Eagle Ford
Oil and Gas Completions
Karnes & Dewitt Counties**

FTI
PLATT SPARKS
Exhibit No. 19
Doc# No. 02-0284942
Pioneer Natural Res. USA, Inc.
Date: April 29, 2015



02-0284942

ATTACHMENT 2

Pioneer Exh. No. 19

Examiners' Notes: The Ridley 01 Unit is in the transition zone from gas (southeast) to oil (northwest). Gas wells are in red, and oil wells are in green. Wells that are outlined but not colored are permitted locations that have not been drilled, or have been drilled but completion reports have not been approved (which includes 7 of the 11 Ridley 01 Unit wells). On Exhibit 19 Pioneer has identified six wells on the Ridley Unit as gas wells. This is incorrect. The 2H and 4H wells have not been classified as gas wells. The 2H and 4H wells are shown by the Examiners with green dashed lines.

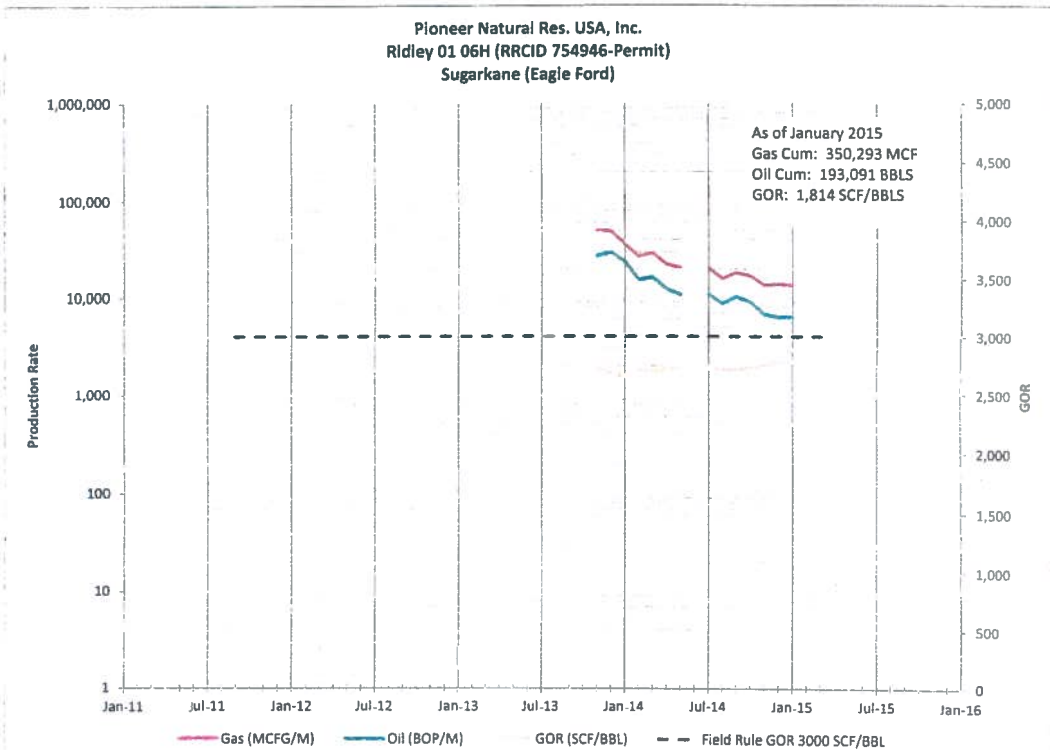
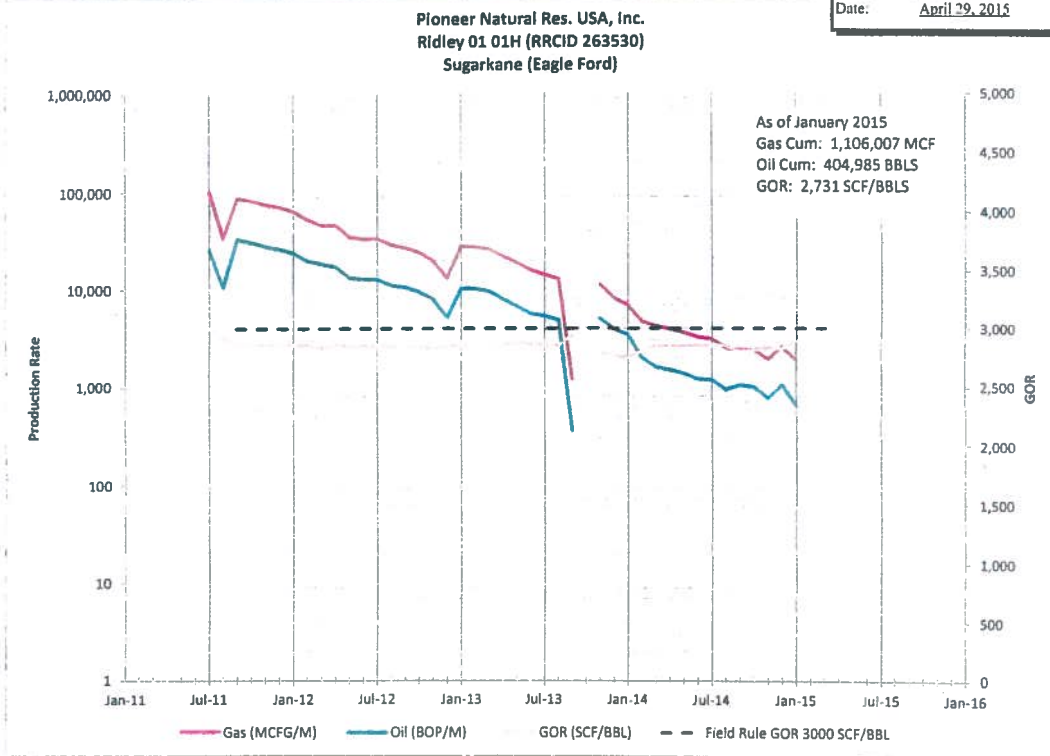
ATTACHMENT 3

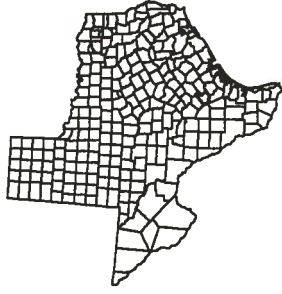
02-0284942

Pioneer Exh. No. 21

Examiner's Notes: Production history for Well Nos. 1H (top) and 6H (bottom). The black dashed line identifies the 3,000:1 gas-oil ratio (GOR) required for field rule classification as a gas well. For both wells (and all others on the unit portrayed on Exhibit no. 21) The individual well GORs remain below 3,000:1 for the producing history.

Exhibit No.: 21
 Operator: Pioneer Natural Resources USA, Inc.
 Docket No.: 02-0284942
 Date: April 29, 2015





Legend

**Eagle Ford Wells
RRC Classification**

- Gas
- Oil
- Gas Wells
- Oil Wells

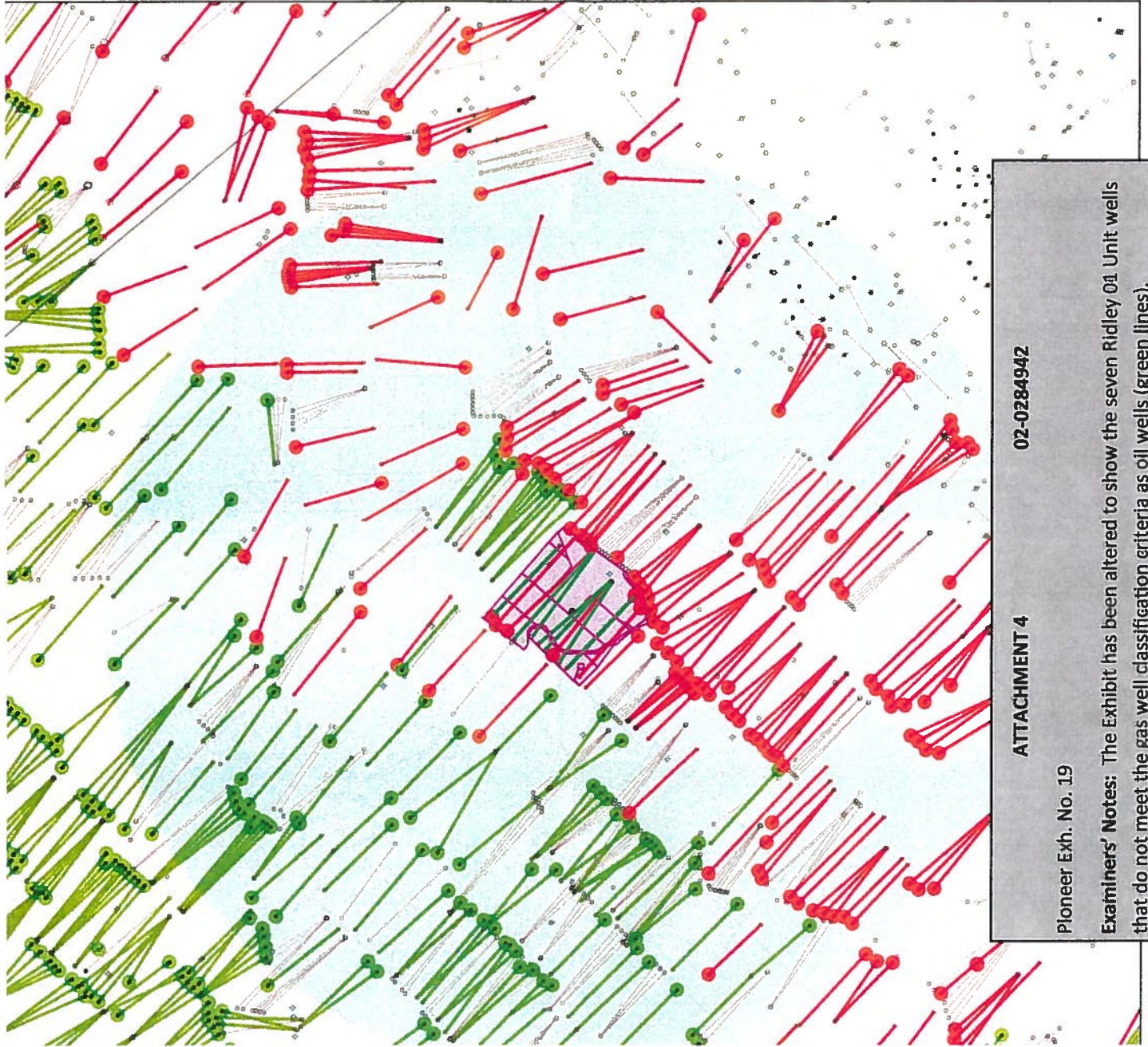
- Ridley Unit
- 5 Mile Radius

Scale



**Eagle Ford
Oil and Gas Completions
Karnes & Dewitt Counties**

FTI
PLATT SPARKS
Pioneer Natural Res. USA, Inc.
Exhibit No. 19
Doclet No. 02-0284942
Date: April 29, 2015



ATTACHMENT 4
02-0284942

Pioneer Exh. No. 19

Examiners' Notes: The Exhibit has been altered to show the seven Ridley 01 Unit wells that do not meet the gas well classification criteria as oil wells (green lines).

**RAILROAD COMMISSION OF TEXAS
HEARINGS DIVISION**

**OIL AND GAS DOCKET
NO. 02-0284942**

**IN THE SUGARKANE (EAGLE FORD)
FIELD, KARNES COUNTY**

**FINAL ORDER
DENYING THE APPLICATION OF PIONEER NATURAL RES. USA, INC.,
TO CONSIDER PERMANENT GAS WELL CLASSIFICATION
FOR ALL WELLS ON THE RIDLEY 01 UNIT,
SUGARKANE (EAGLE FORD) FIELD,
KARNES COUNTY, TEXAS**

The Commission finds that after statutory notice in the above-numbered docket heard on November 13, 2013 and April 29, 2015, the Examiners have made and filed proposal for decision containing findings of fact and conclusions of law, which was served on all parties of record; that the proposed application is not in compliance with all statutory requirements for all wells on the Ridley 01 Unit, Sugarkane (Eagle Ford) Field, Karnes County, Texas; and that this proceeding was duly submitted to the Railroad Commission of Texas at conference held in its offices in Austin, Texas.

The Commission, after review and due consideration of the Examiners' report and proposal for decision, the findings of fact and conclusions of law contained therein, and any exceptions and replies thereto, hereby adopts as its own the findings of fact and conclusions of law contained therein, and incorporates said findings of fact and conclusions of law as if fully set out and separately stated herein.

Therefore, it is **ORDERED** by the Railroad Commission of Texas that the application of Pioneer Natural Res. USA, Inc., to consider permanent gas well classification for all wells on the Ridley 01 Unit, Sugarkane (Eagle Ford) Field, Karnes County, Texas, is hereby **DENIED**.

Each exception to the Examiners' proposal for decision not expressly granted herein is overruled. All requested findings of fact and conclusions of law which are not expressly adopted herein are denied. All pending motions and requests for relief not previously granted or granted herein are denied.

It is further **ORDERED** by the Commission that this order shall not be final and effective until 25 days after the Commission's order is signed, unless the time for filing a motion for rehearing has been extended under Tex. Gov't Code §2001.142, by agreement under Tex. Gov't Code §2001.147, or by written Commission Order issued pursuant to Tex. Gov't Code §2001.146(e). If a timely motion for rehearing of an application is filed by any party at interest, this order shall not become final and effective until such motion is overruled, or if such motion is granted, this order shall be subject to further action by the

Commission. Pursuant to Tex. Gov't Code §2001.146(e), the time allotted for Commission action on a motion for rehearing in this case prior to its being overruled by operation of law is hereby extended until 90 days from the date Commission Order is signed.

Done this __th day of ____, 201_.

RAILROAD COMMISSION OF TEXAS

CHAIRMAN DAVID PORTER

COMMISSIONER CHRISTI CRADDICK

COMMISSIONER RYAN SITTON

ATTEST:

SECRETARY