



RAILROAD COMMISSION OF TEXAS

HEARINGS DIVISION

PROPOSAL FOR DECISION

Rule 37 Case No. 0281091
Status No. 754866
District 09

APPLICATION OF CHESAPEAKE OPERATING, INC. FOR A RULE 37 EXCEPTION FOR THE EDERVILLE LEASE, WELL NO. 5H, NEWARK, EAST (BARNETT SHALE) FIELD, TARRANT COUNTY, TEXAS

APPEARANCES

FOR APPLICANT:

Glenn Johnson
Bill Spencer
David Triana
Rachel Pollard
Will Jordan

REPRESENTING:

Chesapeake Operating, Inc.

FOR PROTESTANTS:

Mark Hixson

REPRESENTING:

Michael Clapp

PROCEDURAL HISTORY

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|----------------------------|---|
| DATE APPLICATION FILED: | APRIL 1, 2013 |
| DATE OF NOTICE OF HEARING: | NOVEMBER 19, 2013 |
| DATE OF HEARING: | DECEMBER 20, 2013 |
| DATE TRANSCRIPT RECEIVED: | JANUARY 2, 2014 |
| HEARD BY: | Michael Crnich, Hearings Examiner Richard Atkins, Technical Examiner |
| PREPARED WITH: | Karl Caldwell, Technical Examiner |

STATEMENT OF THE CASE

By this application, Chesapeake seeks a Rule 37 exception for the as-drilled location of the Ederville Lease, Well No. 5H, a horizontal well in the Newark, East (Barnett Shale) Field in Tarrant County, Texas. The Ederville No. 5H (the "well" or "subject well") has an existing drilling permit, which was issued on March 29, 2013, and is subject to one no perforation zone ("NPZ") surrounding Protestant Clapp's unleased tract. This well has been drilled, but not fully

completed. At the time of hearing, the Ederville Lease also contained Well Nos. 1H, 2H, 4H, and 6H. The purpose of Chesapeake's application is to obtain a third amended drilling permit unencumbered by an NPZ and allow Chesapeake to complete the entire 2,849 feet of the No. 5H's drainhole. Appendix 1 to this Proposal for Decision is a copy of the a plat admitted into evidence as Chesapeake Exhibit No. 36, which shows the Ederville Lease, tracts within the unit that are leased and unleased, the as-drilled location of the well, and the NPZ that Chesapeake seeks to remove.

DISCUSSION OF THE EVIDENCE

Chesapeake's Case

Chesapeake's retained regulatory consultant, Mr. Bill Spencer, explained the permitting history of the No. 5H. Chesapeake filed its original drilling permit application on January 15, 2013, and the Commission issued the corresponding drilling permit on January 22, 2013. The first permit application was for a short lateral. Chesapeake sought only a short lateral with its initial application because the City of Fort Worth, from which Chesapeake also must obtain a permit, requires that an applicant for a city permit have a Commission-issued permit for the surface location of the well. The Form P-12 Certificate of Pooling Authority filed with the first application indicated there were 360.95 leased acres in the Ederville Pooled Unit.

Chesapeake filed the application for a first amended permit on February 18, 2013, and the Commission issued the corresponding permit on February 21, 2013. That application sought to permit a long horizontal lateral subject to two NPZ's surrounding unleased tracts within 330 feet of the wellbore. Chesapeake filed an application for a second amended permit on February 27, 2013, to remove those two NPZ's. In response to the Notice of Application issued for this first Rule 37 exception, the Commission received a protest from one person – Michael Clapp, the owner of unleased tract number NL18. Chesapeake elected to keep an NPZ surrounding Clapp's tract, allowing the Commission to administratively approve a permit subject to this one NPZ on March 29, 2013.

Chesapeake filed the current application for a third amended permit on April 1, 2013. This current application seeks to permit the well at the as-drilled location and remove the NPZ. The Form P-12 and plat for the present application indicate that the pooled unit contains 358.281 leased acres, 14.708 unleased acres, and 372.989 total acres. The surface location of the well is 281 feet from the north line and 874 feet from the east line of the R. Collins Survey, A-351, and 169 feet from the north line and 568 feet from the west line of the unit. The terminus, or bottom hole, location is 3,054 feet from the north line and 368 feet from the west line of the W.S. Sublett Survey, A-1443, and 1,213 feet from the south line and 1,164 from the west line of the unit. The upper, or first, perforation point is 330 feet from the northwest line and 496 feet from the west line of the unit. The lower, or last, perforation point is 1,289 feet from the south line and 1,116 feet from the west line of the unit.

Special field rules for the Newark, East (Barnett Shale) Field provide for 330-foot lease-line spacing. As to horizontal wells, where the horizontal portion of the well is cased and cemented back above the top of the Barnett Shale formation, the distance to any property line,

lease line, or subdivision line is calculated based on the distance to the nearest perforation in the well, and not based on the penetration point or terminus.

A Chesapeake reservoir engineer, Ms. Rachel Pollard, presented a two-well stratigraphic cross section hung on top of the Barnett Shale formation. The wells on the cross section are two pilot wells drilled through the Barnett Shale at locations on the Ederville Unit and to the southwest of the Ederville Unit. Pollard also presented a gross isopach map demonstrating that the thickness of the Barnett Shale is about 340 feet in the area of the Ederville Unit. The thickness indicated by the isopach mapping and cross section were then used in making volumetric calculations of reserves.

Chesapeake's reservoir engineer presented her estimate of gas in place and current recoverable gas in the Newark, East (Barnett Shale) Field beneath the Ederville Unit. She based her estimate on a traditional volumetric calculation performed by Devon Energy & Production Company, L.P. in a 2005 Barnett Shale field rules hearing before the Commission in Oil & Gas Docket No. 09-0243843. Devon's study developed a gas in place calculation of 139 BCF per square mile (640 acres) for Tarrant County based on reservoir thickness of 433 feet. The Commission accepted Devon's volumetric calculation and relied upon it in the 2005 Barnett Shale field rules hearing, and the results of the Devon study have been presented and relied upon in several subsequent Rule 37 cases involving the Barnett Shale. Adjusting for an average thickness of 340 feet, Pollard calculated that original gas in place beneath the 358,816 leased acres in the unit is 61.192 BCF. Assuming a recovery factor of 47 percent, the original recoverable gas in place beneath the leased acreage of the unit is 28.454 BCF. Pollard testified that she arrived at a 47 percent recovery factor based on studying fully-developed units within the same area as the Ederville Unit. She used decline-curve analysis to determine the EUR for each well in the surrounding fully-developed units. Then she divided the total EUR for each unit by the total gas in place for each unit and averaged the resulting recovery factors to arrive at 47 percent. At the time of the hearing, the Ederville No. 1H had produced cumulative gas of 0.538 BCF; therefore, the remaining recoverable gas in place was calculated to be 27.916 BCF.

To determine the EUR for wells within the Ederville Unit, Chesapeake's reservoir engineer prepared a plot of estimated ultimate recovery versus drainhole length for 107 producing Barnett Shale wells located within three miles of the Ederville Unit. A computer-generated least-squares regression of the data points on the plot developed a line through the data points with a positive slope of 1.0461 and a y-intercept of 376.22. The implication of this plot is that a horizontal well in the Barnett Shale ultimately will recover 1.0461 MMCF, or about 1,046.1 MCF, of gas per incremental foot of drainhole plus the plot's intercept of 376.22 MMCF.

Applying this equation to the five wells that have been drilled on the Ederville Unit, Chesapeake's engineer calculated the well's EUR's. At the time of the hearing, the permits for Well Nos. 4H and 6H were subject to NPZ's. If only the then-permitted length of the wells were available for completion, then Chesapeake expected to recover 18.058 BCF of the estimated 28.454 BCF of original recoverable gas in place. This calculation shows that 10.396 BCF of the 28.454 BCF would go unrecovered without additional productive lateral length. If the full drainhole length of the Ederville wells were available for completion – because, for example, Rule 37 exceptions were granted for Wells 4H and 6H – then Chesapeake would expect to

recover 21.256 BCF of the 28.454 BCF of recoverable gas in place. Thus, even if Chesapeake is permitted to complete the full drainhole length of all wells on the Ederville Unit, Chesapeake will not recover its and its lessors' fair share of gas.

The No. 5H's current permit allows Chesapeake to complete 2,404 feet of the drainhole; completion of only this amount of drainhole would yield an EUR of 2.891 BCF. If Chesapeake's Rule 37 application is granted, allowing it to complete the full 2,849 feet of drainhole, the No. 5H will have an EUR of 3.357 BCF. Therefore, in the absence of Rule 37 relief, Chesapeake estimates that 0.466 BCF of gas – a significant amount of gas in the engineer's opinion – would go unrecovered.

Michael Clapp's and Mark Hixson's Case

Mark Hixson, representing Michael Clapp, did not appear at the hearing. However, Chesapeake agreed that selected statements made by Hixson at the July 2013 hearing for Rule 37 exceptions for Ederville Wells 4H and 6H would be incorporated into the record. Hixson did not present evidence; he cross-examined some Chesapeake witnesses and made opening and closing statements.

Hixson argued that the entire Rule 37 process is unfair. He believes that the procedure of applying for an initial permit for a short-lateral well and applying for subsequent permits subject to NPZ's surrounding tracts of unleased owners with whom Chesapeake could not reach a deal is dishonest. Hixson believes that approval of Chesapeake's Rule 37 application would allow Chesapeake to confiscate the minerals of unleased tract owners. Hixson argued that Chesapeake is seeking to "take" the value of the gas that belongs to the owners of the 3.8 percent of the acreage within the Ederville Unit that remains unleased. Hixson thinks that, at a minimum, Chesapeake should have to pay unleased owners for their minerals once Chesapeake has recovered the cost of drilling the well.

EXAMINERS' OPINION

An owner of oil and gas is entitled to a reasonable opportunity to recover the reserves underlying his tract, and any denial of that opportunity amounts to confiscation. *Atl. Ref. Co. v. Railroad Commn. of Tex.*, 346 S.W.2d 801 (Tex. 1961); *Imperial Am. Resources Fund, Inc. v. Railroad Commn. of Tex.*, 557 S.W.2d 280 (Tex. 1977). To obtain an exception to Rule 37 for the purpose of preventing confiscation and protecting correlative rights, an applicant must show that (1) it is not feasible to recover its fair share of hydrocarbons from regular locations and (2) the proposed irregular location is reasonable.

The examiners believe that the Chesapeake application should be granted as necessary to prevent confiscation. Chesapeake and its lessors within the Ederville Unit are entitled to a reasonable opportunity to recover their fair share of hydrocarbons from the reservoir, and it is not feasible for Chesapeake to recover its fair share of hydrocarbons from regular locations on the unit. Their "fair share" of gas, within the context of the legal confiscation theory, is measured by the recoverable gas beneath the drillable portion of the Ederville Unit that is under lease to Chesapeake. The evidence shows that the recoverable gas beneath the leased acreage of the unit

was originally 28.454 BCF, and at the time of hearing, remaining recoverable gas was 27.916 BCF due to production from the No. 1H on the unit.

The Ederville No. 5H is one of five drilled wells on the unit. Even under optimal circumstances, under which the full lateral drainhole of each unit well is completed and each well recovers its EUR predicted by Chesapeake, the five wells will not recover Chesapeake's entire "fair share" of 28.454 BCF.¹ Retention of the NPZ on the existing permit for the No. 5H would cause a further "fair share" deficit. If the NPZ around the Protestant's tract were retained, leaving 2,404 feet of drainhole available for completion, the ultimate recovery of the No. 5H would be 2.891 BCF. If this well can be completed along its entire 2,849-foot drainhole, the well ultimately will recover about 3.357 BCF. This comparison indicates that 0.466 BCF of gas that otherwise could be recovered by the No. 5H would go unrecovered if the NPZ were retained. Recovery of this 0.466 BCF is necessary to give Chesapeake and its lessors a reasonable opportunity to recover as much as possible of their fair share of gas.

The Protestant's representative argued that the permitting procedure used by Chesapeake for this well was unfair and, if approved, would lead to confiscation. But, neither the use of NPZ's in permit applications nor the initial application for a short lateral is improper under the current field rules for the Newark, East (Barnett Shale) or the Commission's current permitting procedure.

The examiners believe that the location of the Ederville No. 5H is reasonable. The well is between Well No. 4H to the west and Well No. 1H to the east. There is no regular location on the unit where a comparable horizontal well, unencumbered by NPZ's, could be drilled. There is no less irregular location that is more reasonable or that would give Chesapeake and its lessors an opportunity to recover their fair share of gas. There is at least one unleased tract that would be in the path of the 5H if it were extended on its current path towards the southern boundary of the unit. Given the between-well spacing that must be observed to avoid interference with other drilled horizontal wells and the spacing relative to unleased tracts within the unit, the No. 5H is reasonably located.

Based on the evidence in the record of this case, the examiners recommend adoption of the following Findings of Fact and Conclusions of Law.

FINDINGS OF FACT

1. The Commission provided at least ten days notice of this hearing to all affected persons as defined by Statewide Rule 37(a)(2) and 37(a)(3) and the special field rules for the Newark, East (Barnett Shale) Field.
2. Chesapeake Operating, Inc. ("*Chesapeake*") seeks a Rule 37 exception for the as-drilled location of the Ederville Lease, Well No. 5H, a horizontal well in the Newark, East (Barnett Shale) Field, Tarrant County, Texas.

¹ If the complete lateral drainhole of each well on the unit is perforated, the aggregate EUR would be 21.256 BCF.

3. The Ederville No. 5H has an existing drilling permit issued March 29, 2013, which is subject to one no-perforation-zone (“NPZ”).
4. The No. 5H has been drilled but not completed.
5. The No. 5H is located within the City of Fort Worth, Texas. The surface location of the well is 281 feet from the north line and 874 feet from the east line of the R. Collins Survey, A-351, and 169 feet from the north line and 568 feet from the west line of the unit. The terminus, or bottom hole, location is 3,054 feet from the north line and 368 feet from the west line of the W.S. Sublett Survey, A-1443, and 1,213 feet from the south line and 1,164 from the west line of the unit. The upper, or first, perforation point is 330 feet from the northwest line and 496 feet from the west line of the unit. The lower, or last, perforation point is 1,289 feet from the south line and 1,116 feet from the west line of the unit.
6. The Ederville Unit is composed of 372.989 total acres. As of the date of the hearing, Chesapeake had 358.816 of these acres – about 96 percent – under lease.
7. The purpose of this application is to obtain a third amended drilling permit for the Ederville No. 5H that is unencumbered by the NPZ and that will allow Chesapeake to complete the entire 2,849 feet of drainhole. Appendix 1 to this proposal for decision is a copy of a plat presented as Chesapeake’s Exhibit No. 36, which shows the Ederville Unit, tracts within the unit that are leased and unleased, the as-drilled location of the well, and the NPZ that would be retained if the current Rule 37 application is not approved. Appendix 1 is incorporated into this finding by reference.
8. The Chesapeake application is protested by the owner of Tract NL18, Michael Clapp (the “Protestant”), who was represented by Mark Hixson. The parties stipulated that the comments of Mark Hixson from the July 24, 2013 hearing for Rule 37 Case No. 0281194 (Ederville Well Nos. 4H and 6H) would be incorporated into the record for this proceeding without Hixson having to appear at the hearing.
9. Special field rules for the Newark, East (Barnett Shale) Field provide for 330-foot lease-line spacing. As to horizontal wells, where the horizontal portion of the well is cased and cemented back above the top of the Barnett Shale formation, the distance to any property line, lease line, or subdivision line is calculated based on the distance to the nearest perforation in the well, and not based on the penetration point or terminus.
10. The stratigraphic cross section and isopach map prepared by Chesapeake’s reservoir engineer demonstrate that the Barnett Shale is present and productive throughout the area of the Ederville Unit. Average Barnett Shale thickness beneath the Ederville Unit is about 340 feet.
11. Volumetrically calculated gas in place beneath the 358.816 leased acres in the Ederville Unit is 61.192 BCF.

12. Assuming a recovery factor of 47%, the original recoverable gas in place beneath the leased acreage within the Ederville Unit is 28.454 BCF. The 47% recovery factor used to estimate recoverable reserves is based on the average of estimated ultimate recoveries, determined by decline curve analysis, for Chesapeake's other fully developed units in the area of the Ederville Unit.
13. Chesapeake's "fair share" of gas, within the meaning of the legal confiscation theory, is measured by the amount of recoverable gas beneath the drillable portion of the Ederville Unit that is under lease to Chesapeake.
14. The estimated ultimate recovery (the "EUR") for horizontal wells on the Ederville Unit completed in the Barnett Shale is 376.22 MMCF plus 1,046.1 MMCF per foot of drainhole.
 - a. Chesapeake's reservoir engineer presented a plot of estimated ultimate recovery versus drainhole length for 107 producing Barnett Shale wells within three miles of the Ederville Unit.
 - b. A computer-generated least-squares regression of the data points on the plot developed a line through the data points with a positive slope of 1.0461 and a y-intercept of 376.22.
 - c. The implication of this plot is that a horizontal well in this area of the Barnett Shale ultimately will recover 1,046.1 MMCF of gas per foot of drainhole plus 376.22 MMCF.
15. In addition to the No. 5H, Chesapeake has also permitted and drilled the Nos. 1H, 2H, 4H, and 6H on the Ederville Unit.
16. If the Ederville No. 5H well can be completed along its entire 2,849-foot drainhole, without any NPZ restrictions, the well ultimately is expected to recover about 3.357 BCF.
17. If the Nos. 1H, 2H, 4H, 5H, and 6H are completed along their entire unrestricted lateral lengths and yield the EUR's as predicted by Chesapeake, the aggregate EUR would be 21.256 BCF. This amount is less than the fair share calculation of 28.454 BCF – the amount of original recoverable gas in place beneath the leased acreage within the Ederville Unit.
18. If the NPZ around the tract of the Protestant were retained, the estimated ultimate recovery of the Ederville No. 5H would be 2.891 BCF. This means that 0.466 BCF of gas that otherwise could be recovered by the No. 5H would go unrecovered if the NPZ were retained.
19. Retention of this NPZ would deny Chesapeake and its lessors a reasonable opportunity to recover as much as possible of their fair share of gas from beneath the Ederville Unit.

20. The NPZ on the existing permit for the Ederville No. 5H prevents the well from producing gas beneath tracts of land under lease to Chesapeake.
21. The location of the Ederville No. 5H is reasonable.
 - a. There is no regular location on the unit where a comparable horizontal well, unencumbered by NPZ restrictions, could be drilled and completed.
 - b. There is no alternative location for a comparable horizontal well that would be less irregular to surrounding mineral property lines or that would afford Chesapeake and its lessors a reasonable opportunity to recover as much as possible of their fair share of gas.
 - c. The No. 5H is reasonably located given the between-well spacing that must be observed to avoid interference with other drilled horizontal wells and the spacing relative to unleased tracts within the unit.

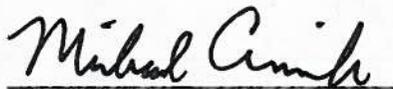
CONCLUSIONS OF LAW

1. Proper notice of hearing was timely issued by the Railroad Commission to appropriate persons legally entitled to notice.
2. All things necessary to the Commission attaining jurisdiction over the subject matter and the parties in this hearing have occurred.
3. Approval of a Rule 37 exception for the Ederville Lease, Well No. 5H, Newark, East (Barnett Shale) Field, Tarrant County, Texas, is necessary to prevent confiscation and protect the correlative rights of mineral owners.

RECOMMENDATION

The examiners recommend that the application of Chesapeake Operating, Inc. for a Rule 37 exception for the Ederville Lease, Well No. 5H in the Newark, East (Barnett Shale) Field, Tarrant County, Texas, be granted as necessary to prevent confiscation and protect correlative rights.

Respectfully Submitted on this 16TH day of July 2014.



Michael R. Crnich
Hearings Examiner



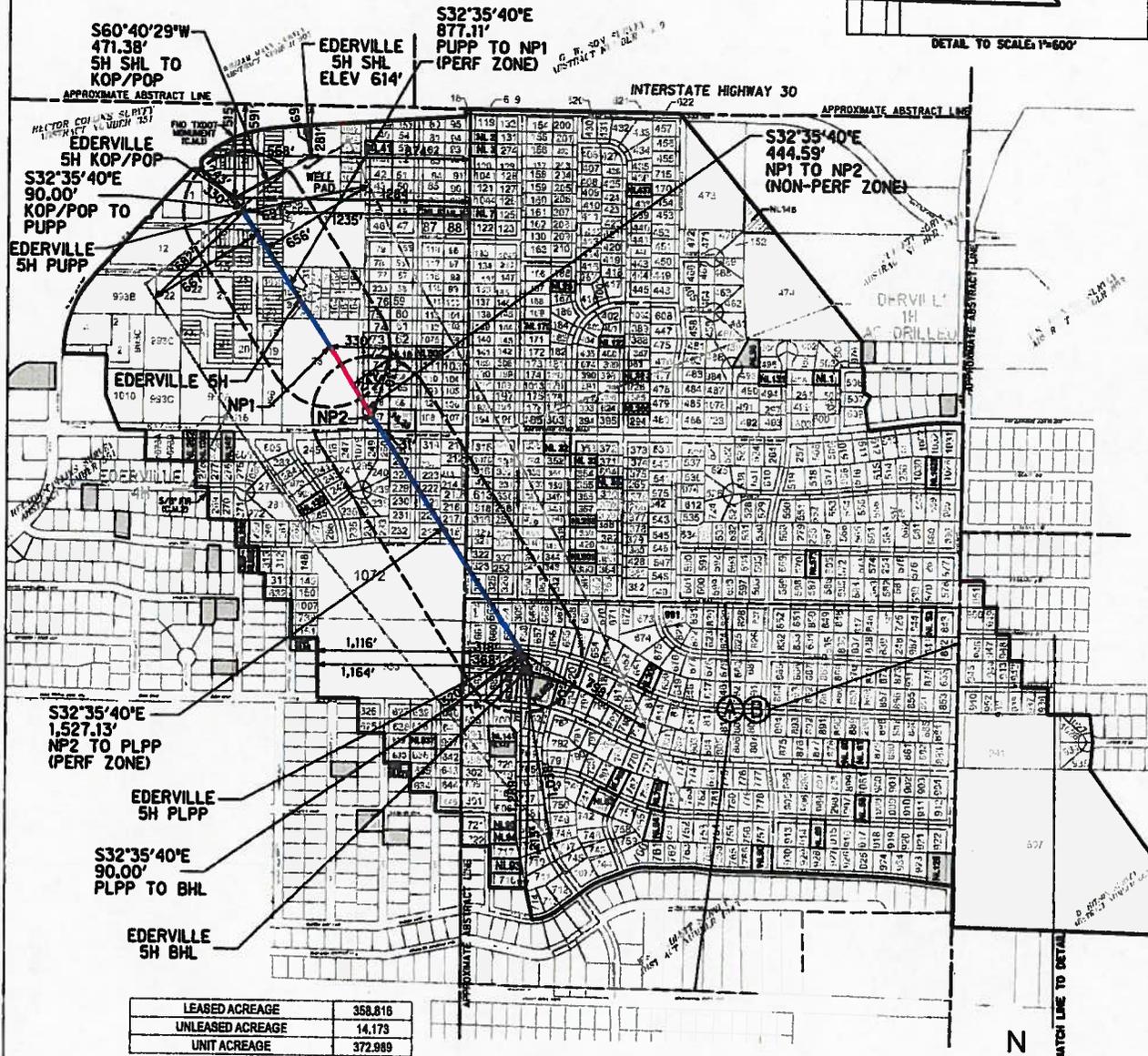
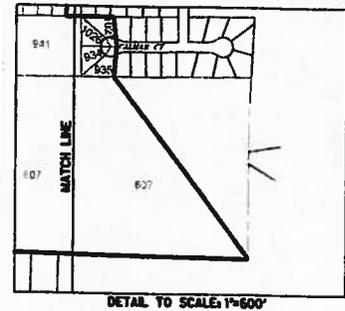
Karl Caldwell
Technical Examiner

APPENDIX 1

Proposal for Decision

Rule 37 Case No. 0281091

| | |
|---------------------------|-----------|
| TOTAL PERFORATED AREA | 2,404.24' |
| TOTAL NON-PERFORATED AREA | 444.59' |
| TOTAL LATERAL LENGTH | 2,848.83' |



NOTES:

1. IS INTENDED TO DEPICT THOSE TRACTS THAT NO LEASE INFORMATION HAS BEEN PROVIDED TO HALFF.

2. TRACT NUMBERS SHOWN HEREON ARE IN REFERENCE TO A SEPARATE SURVEYMENT CONTAINING LEASE INFORMATION AND AREA CALCULATIONS, SUBMITTED TO CTR AS OF THE DATE OF THIS PLAN.

3. COORDINATES FOR SURFACE HOLES, PROPOSED UPPER PERFORATION POINTS, PROPOSED LOWER PERFORATION POINTS, SINK OFF POINTS, AND BOTTOM HOLES ARE LISTED ON COORDINATES. COORDINATES WERE CONVERTED TO LAT/LONG USING COMPARISON OF BOUNDARIES VERSION 6.6.1. ALL COORDINATES ARE IN UTM VALUE. ALL MEASUREMENTS ARE SURFACE UNLESS OTHERWISE NOTED.

4. BASIS OF BEARING IS THE TEXAS COORDINATE SYSTEM (NAD83), NORTH CENTRAL ZONE (GCS) BASED UPON GPS MEASUREMENTS FROM TRANSMISSION STATION WASHINGTON BHP NATIONAL GEODETIC SURVEY CONTROL POINT AND 2011 AT 1000 PER YEAR.

5. CONFIDENCE ANGLE AT WASHINGTON BHP IS ±0.00 DEGREES 47 MINUTES 54.3 SECONDS AS EMPLOYED BY COMPARISON VERSION 6.6.1. COMBINED SCALE FACTOR RESULT = UNCORRECTED SURFACE COORDINATES - TEXAS COORDINATE SYSTEM ± 0.5'.

6. THIS EXHIBIT IS FOR WELL PERMITTING PURPOSES ONLY AND IS NOT INTENDED TO BE USED OR INTERPRETED AS A BOUNDARY SURVEY.

7. ALL MEASUREMENTS TO LEASE, UNIT, AND SURVEY LINES ARE PERPENDICULAR TO SAID LINES.

8. THE UNIT WAS LAST SURVEYED ON THE GROUND ON 04/05/2011.

9. THE SURVEYOR HAS RELIED ON LEASES PROVIDED BY CHESAPEAKE OPERATING INC TO CALCULATE THE LEASED AREAS. SURVEYOR HAS NOT CONDUCTED ANY FIELD RESEARCH OR RESEARCH HAS BEEN LIMITED TO THE SURVEYOR TO DETERMINE THE CORRECTNESS OF COMPLETENESS OF SAID LEASES.

10. DIMENSIONS TO SURVEY LINES ARE APPROXIMATE.

11. SHL = SINK OFF POINT

12. PUPP = PROPOSED UPPER PERFORATION POINT

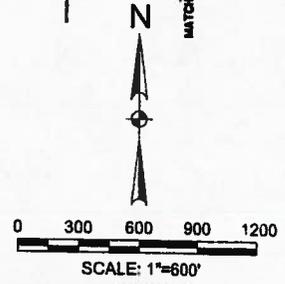
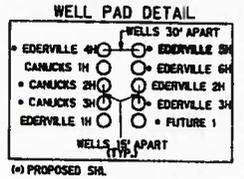
13. NP1 = PROPOSED LOWER PERFORATION POINT

14. NP2 = BOTTOM HOLE LOCATION

15. BHL = SURFACE HOLE LOCATION

LEGEND

- 330' BUBBLE
- UNIT LINE
- NON LEASED TRACTS
- LEASED TRACTS
- M. NON LEASED
- APPROXIMATE ABSTRACT LINE
- NON LEASED
- SHOWS STEPS AND CORES OUT TO ORIGINAL CENTRELINE OF ADJACENT STREET, RIGHT-OF-WAYS OR PROPERTY LINE
- MINERAL RESERVATIONS



EDERVILLE 5H WELL EXHIBIT

IN THE
CITY OF FORT WORTH,
TARRANT COUNTY, TEXAS

FOR
CHESAPEAKE OPERATING, INC.

DATED: 12/11/2013
BY

HALFF PAGE 1 OF 1

HALFF ASSOCIATES INC., ENGINEERS ~ SURVEYORS
1201 NORTH BOWSER ROAD ~ RICHARDSON, TEXAS ~ 75081-2275
SCALE: 1"=600' (214)346-6200 AVO. 26724

Exhibit No. 36
 CHESAPEAKE OPERATING, INC.
 Rule 37 Case No. 0281091
 December 20, 2013