

IN THE CIRCUIT COURT OF RITCHIE COUNTY, WEST VIRGINIA

ANTERO RESOURCES CORPORATION,

Petitioner,

v.

Civil Action No. 17-AA- *2*
The Honorable *Shumway*

THE HONORABLE DALE STEAGER,
West Virginia State Tax Commissioner,

THE HONORABLE ARLENE MOSSOR,
Assessor of Ritchie County, and

THE COUNTY COMMISSION OF RITCHIE COUNTY,
Sitting as Board of Equalization and Review,

Respondents.

FILED
2017 MAR 17 P 2:19
ROSE ELLEN COX
CLERK CIRCUIT COURT
RITCHIE COUNTY, WV

COMPLAINT OF PETITIONER ANTERO RESOURCES CORPORATION

I. INTRODUCTION

Antero Resources Corporation ("Antero") is a producer of natural gas throughout the state of West Virginia, with 45 Marcellus wells located in Ritchie County.

Those wells are appraised by the West Virginia Department of Revenue, State Tax Department, Property Tax Division (the "Tax Department" or "State") based on a mass appraisal system, state-wide. Certain variables are used by the State to value producing oil and natural gas wells, including, notably for this Brief, operating expenses. Specifically, the Tax Department periodically circulates a survey by which it solicits data from oil and natural gas producing taxpayers regarding operating expenses for their wells, and based on that, the Tax Department determines the operating expense variables used in its mass appraisal system. The amount of

operating expenses applied to a well using the mass appraisal system is based on a percentage of the well's gross receipts not to exceed a maximum amount, and the percentage and maximum vary by the type of well (typical or conventional, Marcellus, etc.). The operating expense calculations are included in a natural resources "valuation variables" document that the Tax Department releases annually.

In addition to the valuation variables document, the Tax Department releases an annual administrative notice that lists the percentages and maximum amounts for operating expense calculations. In prior years, the Tax Department invited taxpayers to submit actual operating expenses that exceed the percentages and maximum amounts listed in the valuation variables document. The 2016 and 2017 administrative notices, unlike administrative notices from 2000 through 2015, however, did not include language that invites taxpayers to submit actual expenses, despite no changes to the West Virginia Code or the Tax Department's Legislative Rule that governs the valuation of producing natural gas wells.

In this matter, Antero evaluated its actual operating expenses for calendar year 2015, and determined that for Marcellus wells in the county, the amount of operating expenses that it was incurring significantly exceeded the percentages and maximum amounts set by the State. For property tax purposes, the operating expense data from calendar year 2015 is used to value the wells for tax year 2017.

When the Tax Department valued Antero's gas well values for tax year 2017, it failed to adhere to its own regulations that direct how it is to consider actual operating expenses. Antero, like many mineral producers, generally reports its operating expenses to the Tax Department on a state-wide basis. For 2015, Antero's average operating expense per well was 36% of revenue,

or \$817,000, which includes all operating expenses, gathering and compression expenses, processing expenses, and transportation expenses, necessary to get the gas to the point of sale. Antero reports its gross receipts based on the point of sale, and the allowed operating expenses should reflect the expenses incurred to get the gas to the point of sale. The goal of the State's calculation is to determine the value of the reserves. Under the current system, if two producers have the same production/reserves but one sells at the wellhead and the other sells to a market further away, the reserves of the producer who sells to a further market are valued substantially higher, which undermines the goal of the State's calculation.

For tax year 2017, the Tax Department calculates operating expenses at the lesser of 20% of gross receipts or \$175,000 for Marcellus wells (the "maximum amount" of \$175,000 of operating expenses per Marcellus well will be referred to alternatively throughout this complaint as the "maximum amount" or "cap"). This cap unduly restricts the amount of operating expenses that should be allowed for each well, and the imposition of a "cap" is not supported by the Tax Department's legislative rule regarding the valuation of producing oil and natural gas properties. The legislative rule, instead, requires that the Tax Department use "average annual industry operating expenses per well" in valuing producing wells, and does not authorize the Tax Department to "cap" operating expenses at a certain amount. In sum, the Tax Department incorrectly and unfairly ignored the actual operating expenses and instead relied on the maximum calculations found in its valuation variables document and administrative notice. By failing to consider Antero's actual operating expenses, the Tax Department overvalued Antero's wells and did not assess them at their true and actual value.

On February 17, 2017, Antero protested the Tax Department's valuation (as adopted by the Ritchie County Assessor) to the Ritchie County Commission sitting as the Ritchie County Board of Equalization and Review (the "Board"). Antero presented clear and convincing evidence that the Tax Department failed to consider Antero's actual operating expenses in determining the valuation for the wells assessed for Ritchie County. Antero also presented a complete analysis of its actual operating expenses from the state and local tax firm Altus Group US, Inc. ("Altus"), supported by testimony from an Altus Senior Consultant, Kirsten Evans, that correctly applies the approach to arrive at allowable operating expenses. Antero also proved by clear and convincing evidence that the State erroneously calculated average operating expenses at the lesser of 20% of gross receipts or \$175,000. Antero demonstrated that it is the largest producer in West Virginia, at 40% of market share, and that its actual operating expenses per well are 36% of gross receipts or \$817,000. Under these circumstances, it is not mathematically possible for the average operating expenses for the industry to be \$175,000. The Board, however, made no adjustment to the Tax Department's valuation.

Antero timely petitioned the Court for appeal of the Board's decision. As explained below, the Tax Department has abused its discretion by failing to consider Antero's actual and allowable operating expenses in a manner contrary to the statutes, regulations and official releases from the Tax Department governing valuation of personal property. Moreover, the Tax Department has failed to support its valuation with substantial evidence. Antero, on the other hand, presented clear and convincing evidence for its allowable operating expenses to be used in valuing its wells for tax year 2017.

II. FACTUAL BACKGROUND

A. Antero's Property.

Antero owns 45 Marcellus wells in Ritchie County. (Certified Transcript of February 17, 2017 Hearing before the Ritchie County Board of Equalization and Review, See Exhibit A, p. 7 (hereinafter "Hr'g Tr.")). Antero pays significant taxes to Ritchie County for its oil and gas wells.

B. Antero's 2015 Operating Expenses.

Antero completed the Tax Department's survey related to operating expenses. (Hr'g Exhibit 6). Phil Yoo of Antero testified, however, that the survey asked for expenses related to lifting the gas out of the ground only, not gathering and compression, transportation, or processing costs, which are necessary to get the gas to the market. (Hr'g Tr., p. 62:5-62:13; Hr'g Exh. 6). The Tax Department's survey information for horizontal Marcellus wells pertained almost solely to typical lease operating expenses and was based on prior surveys used for conventional wells. No line items were included for gathering and compression, processing or transportation. (Hr'g Tr. at 62:5-63:20). If such expense categories had been included in the survey, Antero would have calculated and listed those substantial expenses, and the Tax Department's calculations would have been substantially different, given that Antero is the largest producer for Marcellus wells in West Virginia and represents approximately 40% of the Marcellus well production statewide. (Hr'g Tr. at 62:5-63:20; Hr'g Tr. at 36:23-37:17; Hr'g Tr. Exh. 11). Altus demonstrated that it would be mathematically impossible to get a weighted average of \$175,000 in operating expenses for the industry if Antero's average operating expense of \$817,000 per well is taken into consideration. (Hr'g Tr. at 36:23-37:17; Hr'g Tr. Exh. 11).

Accordingly, the State's cap of \$175,000 in operating expenses does not truly represent the average operating expenses for the industry, as shown by the market share that Antero holds and its operating expenses of \$817,000.

For the 2017 tax year, the Tax Department increased the allowed operating expenses cap from \$150,000 to \$175,000 based on public comments received in 2016. The State's calculation remains erroneous, however, because it relies on data from the faulty 2014 survey, and because the State disregarded the operating expenses of Antero (the largest operator in the State) in calculating the new "average" operating expense.¹

Furthermore, the Tax Department does not attempt to differentiate between different business models in its survey, administrative notice, or the legislative rule. As a result, certain producers are penalized through an understated amount of operating expenses.

As required by the State Tax Department, Antero reports its gross receipts based on the point of sale, and the allowed operating expenses should reflect the expenses incurred to get the gas to the point of sale. Requiring gross receipts to be reported based on the point of sale, while not recognizing the substantial expenses incurred to get the gas to the point of sale, results in overvaluation of the produced natural gas.

Antero submitted proof of its actual operating expenses from 2015 to the Tax Department and the Board for consideration for tax year 2017. (*See* Hr'g Tr., pp. 9-77; Hr'g Exhibits 2, 3, 4, 5, 7, 11, 12, 13, 14, 15). Antero's average operating costs for Marcellus wells is approximately 36% of gross receipts, or \$817,000. (Hr'g Tr. at p. 14:2-14:8). Ultimately, neither the Tax

¹ The State testified that Antero's operating expenses were thrown out because Antero asserted that it did not include all operating expenses in its survey response. (Hr'g Tr. at pp. 86:8-86:10).

Department nor the Board adjusted the operating expenses used to value Antero's wells in Ritchie County for tax year 2017.

C. The Tax Department's Calculation of Antero's Operating Expenses.

The Tax Department prepares annual natural resource property valuation variables for appraising oil and gas. Further, the Tax Department makes determination of those valuation variables pursuant to Series 1J of Title 110, a legislative rule of the Tax Department, promulgated pursuant to W. Va. Code §§ 11-1C-5(b), 11-1C-5a, and 11-1C-10(d). In order to determine the amount of Antero's operating expenses, and, in turn, the value of Antero's oil and gas wells, the Tax Department further is governed by Administrative Notices.

In the past, the Tax Department included a statement in its Administrative Notices indicating that it was willing to consider actual operating expenses if a taxpayer thought that the value of their wells was overstated. (Hr'g Tr. at pp. 20:11-21:3). In 2016, the Tax Department decided that it would no longer consider actual operating expenses, despite no change in the law. (Hr'g Tr. at pp. 20:11-21:3).

The State calculates the allowed operating expenses at the lesser of 20% of gross receipts, or \$175,000, for Marcellus Wells. (Hr'g Tr. at pp. 13:14-14:8; Hr'g Tr. Exh. 8). Antero's operating expenses for Marcellus wells are on average \$817,000. Due to the State's failure to take into account Antero's actual operating expenses, the value of Antero's wells is significantly overstated. The State valued Antero's wells in Ritchie County at \$178 million, whereas Antero, using the State's mass appraisal model and Antero's actual operating expenses, appraised them at \$85.5 million. (Hr'g Tr. Exh. 1; Hr'g Tr. at pp. 37:22-38:8). Antero also hired Hein &

Associates to appraise the true and actual value of the wells. Hein & Associates appraised the wells at \$53 million. (*See* Hr'g Tr.41:10-41:12; Hr'g Tr. Exh. 13).

Antero timely noticed the Ritchie County Commission with its Notice of Protest on January 19, 2017. (Hr'g Tr. Exh. 1). The Ritchie County Commission, sitting as the Ritchie County Board of Equalization and Review, held a hearing on February 17, 2017.

At the hearing, the Tax Department offered no credible evidence as the basis for its refusal to accept Antero's calculation of its operating expenses, except to argue that the State's current procedures are in accordance with the legislative rules and the law, and that the Tax Department was unsure of the point of sale of the gas, despite the abundance of documentation Antero presented. (Hr'g Tr. at pp. 77-91).

D. Antero's Expert Analysis and Testimony.

Antero's expert, Altus, a leading independent state and local tax firm, by Senior Consultant Kirsten Evans, testified before the Board on February 17, 2017, and showed that a correct application of the allowable operating expenses demonstrated that the Tax Department had erred by failing to allow the operating expenses documented by Antero. (*See* Hr'g Tr., pp. 9-61). Detailed charts and documentation of actual operating expenses, with numbers specific to Ritchie County, were also submitted to the Board. (*See* Hr'g Exhibits 2, 3, 4, 5, 7, 11, 12, 13, 14, 15).

Altus explained that by artificially capping operating expenses at \$175,000, which is not permitted by the legislative rule, the State is grossly overvaluing the fair market value of Antero's wells. (Hr'g Tr., at pp. 10:5-14:8). The State also does not take into account Antero's point-of-sale, and the operating expenses incurred to get the gas downstream to market. (Hr'g

Tr. at pp. 29:8-32:19). Altus testified that Antero volumetrically represented 40% of horizontal production in West Virginia, and that its average operating expense was \$817,000 per well. (Hr'g Tr., p. 41:10-42:12). Altus explained that, under these circumstances, it would be mathematically impossible to get to an average of \$175,000 in operating expenses for the industry if Antero's average operating expenses of \$817,000 per well is taken into consideration. (Hr'g Tr., pp. 36:23-37:17).

Ms. Evans also testified that Antero hired Hein & Associates to appraise its wells in Ritchie County. (See Hr'g Tr., at pp. 38:9-40:8; Hr'g Tr. Exh. 13). Ms. Evans explained that Hein & Associates found that the Tax Department's valuation did not properly account for the decline rate or actual operating costs of the wells at issue, and used a different discount rate than the rate used by the Tax Department. Hein & Associates appraised the fair market value of Antero's Ritchie County wells at \$53 million, while the State valued them at \$178 million. (See Hr'g Tr., at pp. 41:-1-41:12; Hr'g Tr. Exh. 13).

Finally, Altus testified that, while Hein & Associates' valuation is the fair market value of the wells, an alternative approach would be to calculate operating costs as 20% of gross production, without any cap. Altus stressed that this method would still overstate the fair market value of the wells, but that 20%, without a cap, is a reasonable resolution. (Hr'g Tr., pp. 40:9-41:19, Hr'g Tr. Exh. 12). This approach would value Antero's wells at approximately \$125 million. (Hr'g Tr., pp. 40:9-41:19, Hr'g Tr. Exh. 12).

E. Antero's Protest to the Ritchie County Board of Equalization and Review.

On January 19, 2017, Antero submitted to the Ritchie County Assessor and the Ritchie County Commission sitting as the Board of Equalization and Review an Application for Review

of Property Assessment with regard to its gas wells, and Antero appeared on February 17, 2017, by counsel, before the Board. (*See* W. Va. Code § 11-3-24). Antero hired a third-party court reporter to produce a certified transcript of the hearing at which it presented the evidence discussed above. Exhibits introduced at the hearing and provided to the Board will be transmitted to the Court within thirty (30) days, as provided by West Virginia Code § 11-3-25. The original transcript of the proceeding was attached to Antero's Petition as Exhibit A. (*See* W. Va. Code § 58-3-4.)

By February 22, 2017 Order, the Board determined to make no adjustment to the State Tax Department's valuation of Antero's gas wells for the 2017 tax year. (*See* Ex. B to Antero's Petition). Antero timely petitions this Court for relief from the Board's erroneous determination within thirty (30) days of the adjournment of the Board. (*See* W. Va. Code § 11-3-25).

III. ANALYSIS

A. Applicable Legal Standards.

All property in the State of West Virginia is required to "be assessed annually at its true and actual value" W. Va. Code § 11-3-1. The West Virginia State Tax Commissioner² is charged with determining "the fair market value of all natural resource property in the State" and then providing the values to county assessors to use in assessing the property. W. Va. Code § 11-1C-10(d).

² Elsewhere in Brief, the Tax Commissioner is variously referred to as the Tax Department or simply the State. All terms refer to the same entity.

Pursuant to this responsibility to value producing mineral property and reserves, the Tax Commissioner promulgated Title 110, Series 1J of the West Virginia Code of State Rules, which explains the mechanisms to be utilized in valuing taxable property.

To determine the fair market value of producing oil and natural gas property, the Tax Department applies “a yield capitalization model to the net receipts (gross receipts less royalties paid less operating expenses) for the working interest. . . .” W. Va. Code R. § 110-1J-4.1. The methodology set forth in § 110-1J-4.1 is reflected in Tax Department’s 2017 Administrative Notice, in which the Tax Commissioner states that the Tax Department primarily relies upon the income approach in valuing producing oil and gas property.

The Tax Department should consider actual operating expenses to offset the presumed valuation of expenses for each well. According to the Tax Department’s legislative rule, the Tax Commissioner considers “operating expenses” to be “the “ordinary expenses which are directly related to the maintenance of production of natural gas and/or oil. These expenses do not include extraordinary expenses, depreciation, ad valorem taxes, capital expenditures, or expenditures relating to vehicles or other tangible personal property not permanently used in the production of natural gas or oil.” Section 3.16 of Series 1J, Title 110 State Tax Department Legislative Rule for Valuation of Producing and Reserve Oil & Natural Gas for Ad Valorem Property Tax Purposes. Based on the testimony of Antero’s expert, Altus, the report of Hein & Associates, and the documents submitted to the Tax Department and the Board, the operating expenses submitted by Antero are those contemplated in Section 3.16.

Antero’s burden before the Board was to show by clear and convincing evidence that the Tax Department’s valuation (and, hence, the County’s assessment) of its gas well operating

expenses was erroneous. Syl. pts. 5-6, *Stone Brooke*, 224 W. Va. 691, 688 S.E.2d 300. On appeal to this Court, the Court relies on the record developed before the Board and determines whether the challenged property valuation is supported by substantial evidence.³ See W. Va. Code § 58-3-4; syl. pts. 1-2, *Stone Brooke*, 224 W. Va. 691, 688 S.E.2d 300.

In this case, the Tax Department failed to apply the demonstrated actual operating expenses supplied by Antero in both informal and formal testimony. Accordingly, Antero now petitions this Court to find (1) that the Board incorrectly made no changes to the Tax Department's valuation, (2) that the State's "cap" of \$175,000 in operating expenses be removed, and (3) that the value of Antero's Ritchie County gas wells for the 2017 tax year be set at \$125 million, based on the compromise value calculated by applying the State's 20% average annual industry operating expense percentage by Antero's gross receipts.⁴

B. The Tax Department Failed to Consider the Actual Operating Expenses of Antero's Gas Wells and, Thus, Failed to Correctly Value that Property; Antero, on the Other Hand, Introduced Clear Evidence of the Allowable Operating Expenses.

While the State Tax Department has discretion to select the appraisal method that it determines should provide the most accurate valuation of personal property, once it chooses a method, it must correctly apply the method.

³ Furthermore, "[p]ursuant to *In Re Pocahontas Land Co.*, 172 W. Va. 53, 61, 303 S.E.2d 691, 699 (1983), once a taxpayer makes a showing that tax appraisals are erroneous, the Assessor is then bound by law to rebut the taxpayer's evidence." *Mountain Am., LLC v. Huffman*, 224 W. Va. 669, 786 n.23, 687 S.E.2d 768, 785 n.23 (2009). While the Court in *In Re Pocahontas Land Co.* suggested that a county assessor could meet that burden by introducing the State Tax Department's valuation, in this case, Antero showed that the State Tax Department's valuation itself is incorrect, so it was incumbent on the State Tax Department to rebut Antero's evidence.

⁴ Antero asserts, however, that in order to calculate the fair market value of the Marcellus wells, as is required of the Tax Commissioner under W. Va. Code § 11-1C-10(d), actual operating expenses must be considered.

For Antero's Marcellus wells in Ritchie County, the Tax Department has not followed its own rules regarding average industry operating expenses, as set forth in Antero's Exhibits and expert testimony at the hearing before the Board on February 17, 2017, and the Tax Department has, therefore, failed to properly calculate the fair market value of Antero's Marcellus wells. It is also improper for the Tax Department to place a cap on operating expenses, another factor resulting in an inflated value for Antero's Marcellus wells. As demonstrated at the hearing, the survey used by the Tax Department to calculate average industry operating expenses for Marcellus wells was poorly drafted and misleading and resulted in the Tax Department calculating an operating expense "cap" well below the amount of operating expenses actually required to operate a Marcellus well. Antero avers that not only is a "cap" not supported by law, but that the Tax Department also calculated a wildly inaccurate "cap."

Additionally, by calculating the allowed operating expenses at the lesser of 20% of gross receipts or \$175,000, the Tax Department treats similarly situated tax payers differently in violation of United States Constitution and the West Virginia Constitution, as the "cap" of \$175,000 only adversely affects tax payers that have wells with gross receipts over a certain threshold.

Finally, the Tax Department's valuation of Antero's wells did not properly account for the decline rate or discount rate. As a result, Antero's wells were overvalued.

IV. CONCLUSION

WHEREFORE, Antero Resources Corporation respectfully requests that the Court:

(i) Find that the Ritchie County Board of Equalization and Review incorrectly upheld the valuation of Antero's Ritchie County gas wells by the West Virginia Department of Revenue, State Tax Department, Property Tax Division for the 2017 tax year;

(ii) Fix the value of Antero's Ritchie County gas wells for the 2017 tax year at \$125,000,000, based on the compromise value calculated by applying the State's 20% average annual industry operating expense percentage by Antero's gross receipts; and

(iii) Order such other relief as the Court deems appropriate.

ANTERO RESOURCES CORPORATION,

By Counsel

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EXHIBIT

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1 IN RE: 2 3 ALTUS GROUP/ANTERO CORPORATION 4 ASSESSMENT APPEAL 5 RITCHIE COUNTY 6 7 8 9 * * * 10 HEARING 11 BEFORE: Ritchie County Board of Equalization & Review 12 DATE: Friday, February 17, 2017 13 TIME: 2:17 p.m. - 4:15 p.m. 14 * * * 15 16 Ritchie County Courthouse 17 109 East North Street 18 Harrisville, West Virginia 26362 19 20 * * * 21 22 Whereupon, the above-entitled matter came on 23 for hearing and the proceedings were as follows: 24	1 APPEARANCES: 2 3 On behalf of the Antero Resources: 4 CRAIG A. GRIFFITH, Esquire 5 Steptoe & Johnson, PLLC, 707 Virginia Street, East, 6 17th Floor, Charleston, West Virginia 25301 7 Telephone: (304) 353-8000 8 Fax: (304) 353-8180 9 E-mail: craig.griffith@steptoe-johnson.com 10 11 12 On behalf of the State of West Virginia, 13 State Tax Department, Property Tax Division: 14 JAN P. MUDRINICH, Esquire 15 State of West Virginia, State Tax Department, 1124 Smith 16 Street, Second Floor, Charleston, West Virginia 25301 17 Telephone: (304) 558-3940 18 Fax: (304) 558-1843 19 E-mail: Jan.P.Mudrinich@wv.gov 20 21 22 23 24
Page 3	Page 4
1 APPEARANCES (Continued): 2 3 ALSO PRESENT: 4 Stephen C. Worden, Ritchie County Commissioner 5 Samuel C. Rogers, Ritchie County Commissioner 6 Casey Lee, Executive Assistant to 7 Ritchie County Commission 8 9 Kirsten Evans, Senior Consultant, Altus Group 10 11 Phil Yoo, Vice President - Accounting, Chief 12 Accounting Officer, Corporate Controller, 13 Antero Resources 14 15 Cynthia R. Hoover, Tax & Revenue Manager, 16 West Virginia State Tax Department 17 Other individuals in the audience 18 Connie M. Nichols, Court Reporter 19 20 21 22 23 24	1 INDEX 2 PAGE 3 Opening Statement by Mr. Griffith 6 4 WITNESS PAGE 5 KIRSTEN EVANS 6 Direct Examination By Mr. Griffith 9 7 Cross-Examination By Mr. Mudrinich 42 8 Redirect Examination By Mr. Griffith 57 9 Recross-Examination By Mr. Mudrinich 59 10 PHIL YOO 11 Direct Examination By Mr. Griffith 61 12 Cross-Examination By Mr. Mudrinich 68 13 CYNTHIA HOOVER 14 Direct Examination By Mr. Mudrinich 77 15 Cross-Examination By Mr. Griffith 83 16 Redirect Examination By Mr. Mudrinich 91 17 Recross-Examination By Mr. Griffith 91 18 19 EXHIBITS 20 PAGE 21 Exhibit No. 1 -- 22 (NOTE: Exhibit No. 1 was given to the Reporter, by the 23 West Virginia Tax Department, at the end of the 24 Hearing. All other Exhibits, that were mentioned in the Hearing, were premarked and were retained by Antero Corporation.)

1 (Pages 1 to 4)

Page 5 1 * * * 2 P R O C E E D I N G S 3 * * * 4 MR. WORDEN: We'll go ahead and proceed 5 with Antero Resource's presentation. 6 If you'd stand, state your name and who you 7 are with, for the minutes, and we'll proceed. I think 8 we've probably got everybody's name. I recognize 9 everyone. 10 MR. GRIFFITH: I'm Craig Griffith, with 11 Steptoe, representing Antero. 12 MS. EVANS: I'm Kirsten Evans with Altus 13 Group, representing Antero. 14 MR. YOO: And I'm Phil Yoo, with Antero 15 Resources. 16 MR. MUDRINICH: And I'm Jan Mudrinich, the 17 attorney for the State Tax Department. 18 MS. HOOVER: Cindi Hoover, tax and revenue 19 manager, State Tax Department. 20 MS. HAYNES: Seanya Haynes, tax audit 21 clerk, senior. 22 MR. GRIFFITH: We'll have two witnesses. 23 Do we want to swear them in now, maybe all three, just 24 do it at the top.	Page 6 1 COMMISSIONER WORDEN: Okay, that will be 2 fine. 3 THE COURT REPORTER: Do you solemnly swear 4 to tell the truth, the whole truth and nothing but the 5 truth, so help you God? 6 ALL WITNESSES (in unison): I do. 7 MR. GRIFFITH: I can make a brief 8 statement, and then I'll make Kirsten stand up here the 9 rest of the time. 10 COMMISSIONER WORDEN: Okay. 11 * * * 12 O P E N I N G S T A T E M E N T 13 * * * 14 BY MR. GRIFFITH: 15 As I said, my name is Craig Griffith, I'm with 16 Steptoe & Johnson, out of our Charleston office, here on 17 behalf of Antero Resources. 18 I think at least -- I think both of you have 19 heard -- actually -- 20 COMMISSIONER WORDEN: I have, he hasn't. 21 BY MR. GRIFFITH: 22 Yeah, you weren't present in October. But 23 similar arguments to what were made during the October 24 hearing, really, to address the Tax Department's
Page 7 1 methodology that they use for appraising Antero's 2 producing Marcellus wells here in Ritchie County. 3 They have 45 wells here in the county. And 4 really the crux of the case is the operating expenses 5 that are applied to their gross revenue or gross 6 receipts amounts that they report statewide to the Tax 7 Department. 8 Antero feels that their actual expense that 9 they incur in connection with these wells are much 10 higher than the average annual industry operating 11 expenses that the Tax Department releases each year and 12 applies to producing Marcellus wells. For tax year 13 2017, the average used by the Tax Department is 14 20 percent of gross receipts, with what they deem the 15 maximum amount of \$175,000 per well. And Antero will 16 have testimony here today that their actual expenses 17 that they incur for each of these wells is \$817,000 per 18 well. 19 We feel like this affects Antero 20 disproportionately. Just the way that Antero is set up 21 and operates, they sell their gas miles away -- most of 22 their gas -- miles away from where it's actually 23 produced. Some is sold near the MarkWest -- the 24 Sherwood facility in Doddridge County. A lot of it is	Page 8 1 sold in other points, some still in West Virginia, but 2 120 miles or so from Ritchie County. Some in Tennessee, 3 some in Louisiana. And then shipped to different parts 4 of the country. 5 As part of that, Antero typically gets a 6 higher price per Mcf or MMBTU for gas that they sell, 7 but they incur a lot of expense to get it that point. 8 And we don't feel like the numbers that the Tax 9 Department are using gets to a fair market value. 10 COMMISSIONER WORDEN: The 175,000, that has 11 increased since your last presentation. 12 BY MR. GRIFFITH: 13 It went up \$25,000 in 2017. So it is 150,000. 14 There was some -- and there will be testimony during the 15 hearing, but there was some public comments submitted by 16 a couple of trade groups, WVONGA being one of them, 17 West Virginia Oil and Natural Gas Association. Antero 18 submitted information as part of the public comment. 19 And then they followed up with some other -- some 20 information after the original public comments, with -- 21 changed their numbers a little bit because they feel 22 like some of the information they had when they 23 originally did the public comments weren't exactly 24 right. So about three weeks later they provided new

2 (Pages 5 to 8)

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1 information to the Tax Department. Which were pretty
2 much in line with what WVONGA was calculating and
3 reporting.

4 I think WVONGA was at \$720,000 per well.
5 Antero was at 817. And part of that is just the way
6 that Antero is structured a little bit differently than
7 some of the other producers. So that explains that
8 difference.

9 COMMISSIONER WORDEN: Thank you.

10 * * *

11 KIRSTEN EVANS

12 being previously duly sworn, was examined and testified
13 as follows:

14 * * *

15 DIRECT EXAMINATION

16 BY MR. GRIFFITH:

17 Q. Kirsten, if you could state your name for the
18 record and describe your experience with property tax
19 and natural resource valuation issues.

20 A. My name is Kirsten Evans. I work at the Altus
21 Group. I have spent the past 15 years specializing in
22 state and local taxes, specifically property taxes. And
23 the last 10 of that doing oil and gas properties.

24 Q. And I think most of the folks in the room are

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1 aware of who Antero is and their presence in the count
2 But if you could just give a brief background of their
3 operations in West Virginia, and then kind of slide into
4 why Antero decided to appeal these 2017 values.

5 A. So Antero is producing natural gas in the
6 state of West Virginia. They also have operations in
7 Ohio. And we're here to discuss the Marcellus wells
8 specifically in Ritchie County and the reason why we
9 appealed those values.

10 A little bit of background, the model used to
11 value these wells is a discounted cash flow income
12 approach. So you report the gross revenue of a well, to
13 the State. The State uses their template to determine
14 what that income stream would be worth in the future.

15 In determining the income stream, they use an
16 average, with they'll call an average, to determine the
17 operating expense allowances for the working-interest
18 piece. So we're here to discuss the working-interest
19 piece of the tax valuation model.

20 Why we appealed is -- there's a couple
21 different things going on. The first one is we believe
22 the State is acting outside of their legal authority in
23 administering their legislative rule. So the tax code
24 we'll talk about, that you're supposed to get to fair

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1 market value of an asset, and that's the basis for tax
2 in West Virginia, for property. In support of that,
3 there's this legislative rule which talks about how you
4 get to fair market value in a mass appraisal system. So
5 you take the revenue -- the gross revenue, and you
6 calculate the operating expenses. And they'll talk
7 about the average operating expense.

8 Well, the State is calculating two different
9 averages for an operating expense. They say it's
10 20 percent for Marcellus well, but it's also 175,000.
11 And they're using that 175,000 as a cap. And we think
12 that cap is wrong. We think the way that the State went
13 about determining that cap is erroneous, and that if
14 they used actual data from the industry, that that cap
15 would be much higher -- if they are, in fact, allowed to
16 use a cap.

17 We also think that 20 percent would be much
18 higher if you used actual operating expense from the
19 industry.

20 You know, this model was developed many, many
21 years ago, before Marcellus wells. So that's the other
22 issue going on, is that you're using kind of an
23 antiquated model. It was designed at a time where most
24 of the wells were vertical, they were conventional,

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1 typical producing wells. And most of the producers sold
2 that gas right out of the -- right at the wellhead. So
3 they didn't incur the cost of gathering and compression
4 processing. Probably wasn't wet gas, or there wasn't
5 much of it, so there wasn't the processing expense of
6 getting the NGLs out before you could sell the natural
7 gas.

8 So the system that the State is using --
9 they've tried to catch up and they've increased the
10 operating expenses up to the \$175,000 limit we're
11 talking about now. But it fails to account for a lot of
12 different things going on in the industry. Which is
13 where the -- you know, there's different producers out
14 there. There's ones who are fully integrated, they own
15 100 percent of their gathering and compression system.
16 They are not paying a third party. Or they are selling
17 it right out of the wellhead. Or maybe they're
18 producing dry gas and they don't have the processing
19 expenses. Maybe they're selling all their gas at the
20 back of Doddridge, the Sherwood facility, which is a
21 lower price than if you decide to transport it and sell
22 it at TCO or in the Henry Hub or, you know, any other
23 place.

24 So we're going to present at lot of evidence

3 (Pages 9 to 12)

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1 around that and kind of talk about what that does to the
2 valuation that's assigned to the Antero wells in Ritchie
3 County.

4 Q. And we can move on to some of the exhibits
5 now. I mentioned that some operating expense
6 information had been provided to the Tax Department.
7 We'll start with Exhibit 2, which was in response to the
8 Property Tax Division Director requesting additional
9 information pursuant to the public comments that were
10 received as part of the tentative valuation process.

11 Discuss what was provided in that document,
12 and then we'll move on to Exhibit 3, where additional
13 operating expense information was provided.

14 A. So in the past, in working with the State,
15 they requested actual operating expense data by well.
16 And that is what, on August 25, we provided that to Jeff
17 Amburgey at the State Department. And the letter kind
18 of breaks down the average operating expense as a
19 percentage of revenue, and the average operating expense
20 per well for the different types of wells that Antero
21 operates. What we're talking about today is just the
22 first line, which is the Marcellus horizontal wells.
23 And just some numbers to kind of, in comparison.
24 So the State is allowing 20 percent and 175.

Page 15

1 we filed on the returns, and compared them to the
2 variables that were being used, and noticed that they
3 weren't including any additional deduction for the
4 operating expenses that we had submitted. So this is
5 just a response back to the State saying: You know, we
6 realize that you are using your tentative values still,
7 the 20 percent and the 175, and we still disagree with
8 them.

9 And we're saying we still disagree with them
10 because there had been two previous times we formally
11 wrote the State and told them we disagree with them. So
12 the next page here is the August 1 letter, which was the
13 first time that Antero responded to the tentative
14 values. You'll notice that the numbers on that letter
15 are a little bit higher than the 817 and the 36 percent
16 we're talking about. There was an error in the data.
17 So when we resubmitted the data on August 25, we
18 corrected the error and gave them the 817 and
19 36 percent.

20 COMMISSIONER WORDEN: Can I question: What
21 was the error, the data error?

22 THE WITNESS: So there were expenses
23 related to the Marcellus wells that were not related to
24 revenue in West Virginia, our expenses in West Virginia.

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1 And they've determined that that is the industry
2 average. Antero, who is the largest producer of
3 horizontal Marcellus wells in the state of
4 West Virginia, provided information stating that their
5 average operating expenses of percentage of revenue was
6 actually 36 percent and, on average, \$817,000 per well.
7 So much different than the State's allowances that are
8 given in the tentative variables.

9 Q. Let's look at the --

10 A. And then the next pages are just all that
11 information by well.

12 Q. And let's move on to Exhibit 3. This was in
13 response to the tentative values that were provided to
14 Antero by the Tax Department, includes some e-mailed
15 information from December 7, and then also the actual
16 public comment letter that had been provided to the Tax
17 Department back in August of -- August 1, 2016.

18 Discuss what was included specifically in this
19 e-mail and what the intent was behind the material.

20 A. So this e-mail from December of 2016 was just
21 our kind of final response to the tentative values once
22 they were issued. So we received copies of all the
23 assessments issued for the wells that Antero has working
24 interest in. And we looked at those, compared to what

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1 So they were expenses that didn't get pushed down to
2 West Virginia wells, that shouldn't have been, that were
3 included in the data that we were capturing.

4 COMMISSIONER WORDEN: Okay. Thank you.
5 BY MR. GRIFFITH:

6 Q. And moving on to -- let's discuss the
7 valuation process. And we've done this through a sample
8 well in Exhibit 4, the first page. And there's a second
9 page of that document which discusses the impact of the
10 gas price and valuation process and the cap. If we
11 could start with the first sheet, the sample well, and
12 how that -- just have you walk us through that and how a
13 value per well is calculated.

14 A. So I'll go through this quick.

15 This is a template provided by the State
16 Department on their website, and it allows you to just
17 type in the numbers that go on a return for a well, the
18 type of well -- which determines the decline rate, and
19 it goes through the calculation of the discounted cash
20 flow to determine value.

21 So the numbers up at the top, in blue, are
22 what are determined from the return, the gross revenue
23 for working interest and royalty interest that's
24 reported on the return, for the whole well. And then

4 (Pages 13 to 16)

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1 the decline rates, which are determined by the
2 formation. So in this case we're using the 59/29/23,
3 which is the Marcellus decline in Ritchie County.

4 And so what that does is it takes that income
5 and it projects it forward 18 months, to say that's
6 Year 1. Because by the time this assessment comes
7 around and the tax bills come out, you're 18 months into
8 the future. So Year 1 is projected forward 18 months.
9 And then based off of that, working interest cost is
10 determined. So you take that Year 1, and you multiply
11 it by 20 percent, and if that number is less than 175,
12 then your working cost is 20 percent of the working
13 interest income. If it's greater than 175, you get the
14 175.

15 Those two numbers net together is your net
16 income. And then that is put through a discounted cash
17 flow calculation to determine what the value is. So the
18 present value of a future income stream is what this is
19 basically doing, in a nutshell.

20 So that's just walking through what the State
21 does.

22 The second page in here gives some scenarios
23 that walks through the problem with that calculation.
24 There's a couple problems with that calculation. The

Page 18

1 first is the State is basing operating expense on
2 revenue, not production. So how much does it cost to
3 get 600 Mcf units out of the ground? Well, the State
4 would say that in 2013, when the average gas price was
5 \$3.99, that it costs an operator \$236,000 to get that
6 revenue stream. And they were going to allow \$150,000
7 on the operating expense calculation. Which is about
8 13 percent.

9 Actual operating expenses are about \$601,000.
10 So if we fast-forward to 2015, when the gas prices
11 dropped to \$2.25, revenue on that same well that's
12 producing the same amount is 1.3 million --
13 1.347 million. The State says to produce that same
14 amount of volume in 2015 versus 2013 actually takes
15 100,000 less. And they're going to give you 100,000
16 less of an operating expense in their calculation, just
17 because the gas price dropped.

18 And so what we're here to talk about is that
19 those expenses don't drop when the revenue drops. And
20 by basing operating expenses on revenue, there's a
21 fundamental flaw in the calculation.

22 So the second grouping of assets talks about
23 what happens when the State -- so that talks about the
24 20 percent, how that 20 percent needs to change as gas

Page 19

1 prices change. Right? So if gas price goes down, that
2 20 percent needs to go up, because it's talking about
3 as a percentage of revenue.

4 So last year we were here talking about
5 Antero's operating expenses, and we said operating
6 expenses is a percentage of revenue, or about
7 22 percent. Well, this year, if you look -- nothing
8 else has changed with the company. Operating expenses,
9 as a percentage of revenue, are now 36 percent. Because
10 the gas price went down a good 50 percent. So that
11 alone, when the gas price changes, that percentage of
12 revenue changes. So when the State doesn't adjust, it
13 causes a problem in a value calculation.

14 The second problem is with the cap. So the
15 State will refer to this as their average industry
16 operating expense. But they use it as a maximum of
17 operating expenses.

18 So if I have a well that is producing a
19 million dollars in working-interest revenue, the State
20 is going to allow me 20 percent of that, the equivalent
21 of \$119,000 as my allowable operating expense. But if I
22 have a well that's producing \$7 million in
23 working-interest receipts, the State's only going to
24 allow me \$175,000 in operating expense. Which is the

Page 20

1 equivalent of 4 percent. You can't operate a Marcellus
2 well for 4 percent of revenue.

3 So they are treating taxpayers differently,
4 similarly situated taxpayers differently by placing this
5 cap, this artificial limit to operating expenses.

6 Q. The State, on the returns, don't allow
7 taxpayers to take or deduct operating expenses; is that
8 right?

9 A. No, the rule -- the legislative rule states
10 gross needs to be reported, the gross revenues.

11 Q. The Tax Department, through their
12 administrative notices -- at least for a 15-year period,
13 maybe longer than that -- invited taxpayers to submit
14 actual operating expense information if it was different
15 from the average as calculated by the Tax Department.

16 A. Yes. So in the legislative -- I'm sorry -- on
17 the return instructions in the administrative rule,
18 that's published in January to early February each year,
19 they actually had wording that allowed producers to
20 submit operating expense data, as long as it was done
21 per well.

22 Q. And that changed in 2016?

23 A. That's correct.

24 Q. Okay.

5 (Pages 17 to 20)

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1 Any change in the law that you're aware of
2 that would have precipitated that?

3 A. No.

4 Q. And Antero tracks both their revenue and
5 expenses at the well level, correct?

6 A. That's correct.

7 Q. Let's take a look at Exhibit 5, which is a
8 diagram that was put together, which is really helpful
9 to kind of walk us through where the revenue comes into
10 play, where this gas is sold, the natural gas is sold,
11 and any expense information at the bottom, that shows
12 you where these expenses are incurred along the line to
13 produce those revenues. Just walk us through that
14 diagram, starting with revenue information first and
15 then moving on to the operating expenses.

16 A. Sure.

17 So the revenue that's reported to the State
18 can be broken down into two buckets. There's NGL
19 revenue, which is from the processing of wet gas.
20 There's a by-product of natural gas liquids, and that
21 has a revenue stream. The other revenue stream is from
22 the natural gas itself. So the combination of those two
23 is shown in the upper right-hand corner at \$967 million.
24 What's shown below, in the red numbers, is the

Page 22

1 expenses it takes to get that revenue.

2 So the State's calculation, again, is at
3 20 percent. And we're showing here that it's really
4 36 percent.

5 And the revenue is broken down into four
6 different buckets. So you have the LOE and workover
7 cost, which is the same as like a lifting expense. It's
8 what's incurred to actually get the gas up out of the
9 ground. And if you were to sell your gas right at the
10 wellhead, that's all you would incur.

11 Q. Okay. We can pause there for a second and
12 kind of compare that calculation with what we had in
13 Exhibit 6, the survey that was submitted to the Tax
14 Department by Antero back in 2014, just to compare the
15 average expenses on that survey to that \$41,000 number.

16 A. So in 2013, there's a -- there was a survey
17 submitted by Antero, and it showed 771 million --
18 \$776 million in revenue, and that their average
19 operating expense per well was around \$33,000.

20 So it looks like the revenue is, you know,
21 kind of on track with what we're talking about. You
22 know, clearly they've increased the number of wells and
23 production over the last two years. But those numbers
24 seem somewhat in line. What doesn't seem in line is the

Page 23

1 total operating expenses reported at 33,000. So we
2 believe there's a mistake on this survey, where it's
3 only showing the LOE and workover. Because if you
4 looked at the average expense just to lift the gas out
5 of the ground, we're at \$41,000. This survey is at
6 33,000. So it seems in line.

7 Q. And that survey really doesn't try to break it
8 down by wet gas producers versus dry gas producers.
9 They're just all kind of lumped in together, is that
10 right?

11 A. Yes. And that survey was designed to be used
12 when most of the production in West Virginia was from
13 typical producing and CBM wells. And it hasn't changed
14 since then, other than the column at the top saying
15 "vertical Marcellus" or "horizontal Marcellus."

16 So the types of expenses the State is asking
17 for hasn't changed. They also don't ask anybody to
18 differentiate about where their point of sale is or
19 whether they have wet gas or dry gas, or whether they
20 sell -- where they sell their gas.

21 COMMISSIONER ROGERS: The wet gas, though,
22 it produces its own revenue. So, therefore, does that
23 not offset the expenses for wet gas compared to the dry
24 gas?

Page 24

1 THE WITNESS: It's not net zero. No,
2 they're still at a net revenue stream from that. In
3 some cases the NGL process is net negative. But in this
4 case we had net positive 46 million.

5 COMMISSIONER ROGERS: I would just --
6 because you're talking about additional expenses because
7 of the wet, and that's what I wanted to clarify.

8 THE WITNESS: Right. So -- but because you
9 have to report gross, I'm reporting the gross revenue of
10 that NGL stream. So I should be able to report -- I
11 should get the benefit of the expense it takes me to get
12 that revenue stream.

13 COMMISSIONER ROGERS: Okay. I understand
14 what you're saying.

15 BY MR. GRIFFITH:

16 Q. In other hearings, and probably what we'll
17 hear today, the Tax Department has given a simple
18 example of two wells with high operating expenses, two
19 wells with low operating expenses, and then ask what the
20 average of that.

21 What happens when you average a -- when you do
22 a simple example like that, with two wells with very
23 high operating expenses and two with low operating
24 expenses? How does that affect producers?

6 (Pages 21 to 24)

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1 A. Well, what's happening in the industry and
2 though the survey is that you're averaging everyone
3 together. So someone who sells at the wellhead and
4 somebody who transports it to Louisiana, and you average
5 it together to determine the average industry operating
6 expense, without taking into consideration other
7 factors. So someone who has higher revenue and higher
8 expenses is getting a way lower valuation than they
9 should, and somebody who sells it at the wellhead is
10 getting the benefit of a higher allowance on operating
11 expenses that they probably shouldn't.

12 Q. We can start moving on to gathering and
13 compression, just have you continue to walk us down the
14 line there of expenses, and discuss exactly what those
15 are and what the amounts are.

16 A. So past the lifting, you know, once the gas is
17 out of the ground, you have to gather and compress it to
18 move it along the pipelines. On average, that costs
19 Antero \$250,000 per well. Then if your gas is wet, you
20 have to process it. Those expenses, on average, are
21 68,000 per well. I will note that that number is low,
22 because of the law of averages, right. There's some --
23 the wells that produce no wet gas would have zero, and
24 then the wells that do have wet gas would have a higher

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1 number. And then when we average them together, it
2 creates this middle number.

3 But this was for, kind of, illustration
4 purposes of how far off we are from the 175,000.

5 Transportation costs are next, and this has to
6 do with where are you selling your gas. Are you selling
7 it at the back of the Sherwood facility? Or are you
8 selling it farther downstream -- or up stream?
9 Downstream. Oh, I got it right.

10 And those are where the transportation costs
11 some into play. And we'll talk a little bit more about
12 that later. But on average it's \$178,000 per well.
13 And, again, you know, there's some that incur none and
14 there's some that incur a lot more. But -- so we're
15 looking at \$544,000 per well. And the reason that's
16 different than the 817 that we keep talking about is
17 because this is as a whole operation in West Virginia.
18 So there's a lot of conventional wells, there's a few
19 vertical Marcellus wells in here that are bringing that
20 average down. But it's just for illustration purposes.

21 COMMISSIONER ROGERS: Another question.

22 In West Virginia -- and we've been dealing
23 just with Marcellus -- it is now that the producers are
24 actually charging back to royalty owners for that cost

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1 of transportation. So how does that come into play into
2 figuring up your expenses towards that, those expenses,
3 when you're turning around and charging back to the
4 royalty owner?

5 THE WITNESS: So that's not the case on
6 every single lease. That is not taken into
7 consideration in these numbers. The other side of that
8 is, as a royalty owner -- and we're not here to talk
9 about royalty calculations -- but I would be upset if
10 the rule is gross and I'm not allowed any operating
11 expense. And you're not. But we're here to talk about
12 working interest. So what I would say to that is, I
13 have \$817,000, on average, operating expense. At most
14 my royalty is what, 12-1/2 percent. Right?

15 COMMISSIONER ROGERS: It could be 15, you
16 know, it just depends.

17 THE WITNESS: Call it 20.

18 COMMISSIONER ROGERS: I understand.

19 THE WITNESS: So if you look at that -- so
20 even if we're 817 and take 87-1/2 percent of that, we're
21 still in the 700,000 average operating expense compared
22 to the State's 175.

23 So I hear what you're saying. There's
24 still a huge issue regardless. And there's no mechanism

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1 for allowing that operating expense that is incurred to
2 go to the royalty owner. So there is a benefit to the
3 royalty owner valuation by including it in the working
4 interest. Because it shortens the life, and then the
5 royalty value stops there. But that's a whole different
6 discussion.

7 BY MR. GRIFFITH:

8 Q. How does Antero keep track of their expenses
9 Just discuss their record keeping process for us.

10 A. In the past we discussed with the State and,
11 you know, one of the major issues that the State has
12 brought up is that producers do not track these expenses
13 on a well-by-well basis, that a producer will capture it
14 by a region or by a pad, and then allocate it down.

15 And, you know, the contention was: Well, how do you
16 allocate it? And is it based on production? And if you
17 have road maintenance, is that really a -- does that
18 really change, based on production?

19 So Antero actually tracks all of their
20 expenses by well. So there's no allocations being done
21 on our part to get expenses to a well.

22 Q. We can probably move on to Exhibit 7 now.
23 This is -- the front part of that references transaction
24 confirmations between Antero, and I think we've got

7 (Pages 25 to 28)

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1 three purchasers that are included in there. And then
2 also the last two pages of that exhibit are an affidavit
3 from one of those purchasers. Start with the
4 transaction confirmations, what those show, in terms of
5 different points for this gas. And then what the
6 arrangements typically are between -- pursuant to the
7 affidavit -- between purchasers and Antero.

8 A. So in discussions with the State in previous
9 years, one of the items that they brought up was, you
10 know: What are these transportation costs and how do we
11 know where you're selling your gas?

12 So we had provided some transaction
13 confirmations to the State that showed where the
14 delivery points of the gas are. So in the three
15 different, or four different ones that were provided, it
16 specifically says where this gas is being delivered to.
17 And the transaction confirmations that were provided to
18 the State had pricing details, but that's been redacted
19 out just for confidentiality reasons of the hearing.

20 The affidavit speaks to whether or not the
21 purchaser of the gas is responsible for any of the
22 expenses that Antero was incurring. One of the State's
23 questions revolved around: How do I know that the
24 purchaser isn't reimbursing Antero for some of the

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1 expenses incurred?

2 So this is just an affidavit from one of the
3 sellers just saying that there is no free on-board
4 shipping point, they don't take ownership or assume
5 responsibility of the natural gas prior to the stated
6 delivery point, that Antero is delivering us a saleable
7 product, that nothing else needs to happen to in order
8 to go into a distribution line.

9 Q. If you notice in the affidavit for NextEra,
10 that some of the gas they purchased is purchased in
11 Doddridge County, near the MarkWest or the Sherwood
12 processing facility. That varies from producer to
13 producer, correct?

14 A. That's correct, there are a lot of
15 different --

16 Q. Or purchaser to purchaser.

17 A. Purchaser to purchaser, yes.

18 So there are a lot of different delivery
19 points, depending on the contracts. And we pulled
20 together an exhibit --

21 Q. Exhibit 15, that shows different delivery
22 points and how that affects pricing for these
23 purchasers. If you want to flip to that and walk us
24 through that document.

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1 A. So what this is is showing a summary of the
2 purchaser, the location at which the gas -- and this is
3 all 2015 sales -- the purchaser, the location that it
4 was delivered it, where that location is located, like
5 what state is it in. And then the index at which the
6 pricing was determined, how much was sold, and then the
7 price at which it was sold.

8 Now, there's a lot of data in here. So if you
9 go to page 2, we summarized it to show the price that
10 Antero is receiving for their gas, depending on where
11 you're delivering it to. So if you sell -- if Antero
12 sells their gas at the Sherwood facility in Doddridge
13 County, they are getting \$1.51 per unit. Where if they
14 transport it to the TCO Pool, which is southern
15 West Virginia, they are getting almost \$1 more at 2.48 a
16 unit. So those transportation expenses are leading to a
17 larger amount of revenue to the State of West Virginia,
18 to use in their income approach, but they're not
19 recognizing that it takes -- if we go back to our
20 diagram on Exhibit 5 -- that it takes \$117 million in
21 transportation costs to realize that extra dollar per
22 unit in gas -- or \$0.50 unit in gas, depending which
23 pool it's being delivered to.

24 An interesting calculation with the numbers is

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1 if we took all the gas that Antero sold, and
2 recalculated their sales price at Doddridge County,
3 they'd have almost \$300 million less in revenue. They'd
4 have a whole lot less in expenses too. They'd have
5 117 million less in expenses. But -- so it's not a
6 wash.

7 Back to your question of, you now: Is it a --
8 yeah, you get extra revenue, but there's also this added
9 expense. It's not a -- it's not a one-for-one. They're
10 not doing it, you know, just because they felt like
11 transporting it.

12 COMMISSIONER ROGERS: They're making money.

13 A. But that revenue stream and that net revenue
14 stream is being included in the value calculations the
15 State of West Virginia is doing. So it makes sense to
16 include the expense. Because if I was to go out and buy
17 Antero's working interest in a well, I'd surely want to
18 know what my exact expenses are. I wouldn't say: Oh,
19 it's going to be \$175,000.

20 BY MR. GRIFFITH:

21 Q. I hate to flip around so much, but the
22 material became fluid after a while, so we did do a
23 little bit of flipping from exhibit to exhibit. But
24 back to Exhibit 8, which includes both the final and the

8 (Pages 29 to 32)

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1 tentative valuation variables released by the Tax
2 Department for 2017 -- we've referenced these numbers
3 If you go back about 15 or 16 pages, there's a
4 document -- or a page titled Industry Operating Expense
5 Survey Results, and it's got a Marcellus/Utica category
6 there, what the calculations are for horizontal wells.

7 A. So for 2017, those numbers were updated to
8 20 percent and 175,000, which were the numbers that we
9 have been talking about. Prior to that it was
10 20 percent, with a cap of 150,000.

11 Q. And this fall -- and I know we've referenced
12 this as well -- there were some public comments and
13 discussions with industry. That increase of \$25,000
14 followed some of those discussions, correct?

15 A. That's correct. So they were tentatively
16 issued at 20 percent, \$150,000. There was some industry
17 comment back and forth, and then that got raised to
18 175,000.

19 Q. But you don't know exactly how that was
20 calculated?

21 A. I don't. So the State has said -- and I
22 believe it was also written in the administrative notice
23 that came out, that for the typical producing wells,
24 that the reason was the gas price change. And so

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1 because of the gas price change, they took the
2 conventional wells from 30 to 45 percent. So they
3 changed the percentage. But for Marcellus wells, even
4 though we've talked about how, you know, when gas prices
5 drop, it changes that percent. For Marcellus wells,
6 even though gas prices dropped for Marcellus wells too,
7 they didn't change the percentage and they changed the
8 cap.

9 So it seems to be a big difference in how
10 they're handling the two types of wells.

11 Q. And I was going to ask some questions about
12 that variance, between the 36 percent and 20 percent,
13 but I think you've covered it by now.

14 Have you received any feedback from the Tax
15 Department about the categories of expenses that are
16 being claimed by Antero here? Or what's the feedback
17 been from them? Have they objected to these being
18 considered operating expenses? Or do you think this is
19 driven mostly by claiming expenses in excess of the
20 average amounts that the Tax Department uses?

21 A. There's been no specific question other than,
22 you know, in the hearing process, to the operating
23 expense data that has been provided. So I can only
24 assume that the reason it's denied is because it's just

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1 too large of a number.

2 Q. And let's look at Exhibit 9. These are the
3 two documents that were submitted by the -- or two trade
4 organizations, primarily trade organizations, the state
5 oil and gas and IOGA. And that's the first letter. But
6 more pertinent for our purposes is the WVONGA letter,
7 with Spilman Thomas & Battle letterhead.

8 Talk about that letter, if it's consistent --
9 the discussion of the unchanged variables in that
10 letter, on page 1, if that's consistent with what Antero
11 has seen, what Altus Group has seen, the discussion of
12 the decrease in prices since 2008, both in the first
13 page of that letter.

14 A. So they talk about the price of natural gas
15 having decreased 66 percent since the Marcellus well
16 categories were added, in terms of the operating expense
17 differentiation between conventional and Marcellus. And
18 since that time, they -- the State hadn't adjusted those
19 variables. And, you know, in -- I guess they go on to
20 say that it includes a 28 percent decline since 2012.

21 So all those gas prices, the decline in gas
22 price, I think everybody knows has declined since 2010
23 or 2008 production. So that's consistent with what
24 we're seeing.

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1 Q. And that's shown in Exhibit 10. We've got a
2 document from the US Energy Information Administration.

3 A. Uh-huh.

4 And the EIA uses Henry Hub pricing, which is a
5 little different than, you know, if you sold into the
6 Dominion pipeline. But it's pretty consistent with the
7 TCO pipeline. So the pricing you see in there --

8 Q. And a huge drop in 2015.

9 A. Uh-huh. Yeah, you'll see the same drop but
10 not the exact same gas prices.

11 Q. Page 2 of the WVONGA letter has a chart, which
12 shows average WVONGA participating operating expenses
13 and percentage of revenue at 38 percent. And then
14 average of actual expense of \$720,000.

15 That's consistent with Antero's calculations,
16 correct?

17 A. That's correct.

18 Q. And I think, as we mentioned, the differential
19 between the 817 calculated by Antero and the 720 by
20 WVONGA is just kind of a reflection of the different
21 structures of the entities that report to WVONGA?

22 A. That's correct.

23 Q. Let's look at Exhibit 11. This is a DEP
24 exhibit. Well, the comments in blue were pulled from

9 (Pages 33 to 36)

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1 the DEP website, and then you add the two columns on the
2 right. Discuss what that document shows.

3 A. So, you know, we're kind of at a loss as to
4 how --

5 COMMISSIONER ROGERS: Small print.

6 A. Kind of at a loss as to how the State came up
7 with an average industry operating expense of 20 percent
8 and 175,000. Antero has the nurober -- you can't read it
9 because it's so small -- of a 40 percent -- 39 percent
10 market share in West Virginia of horizontal -- gas
11 produced out of horizontal wells. And this is straight
12 from the DEP website, the production reported to the DEP
13 for West Virginia.

14 So if you have 40 percent of the market share,
15 and your average operating expense is \$817,000, it's
16 mathematically impossible to get to \$175,000 as the
17 average for the industry.

18 BY MR. GRIFFITH:

19 Q. Would one of the only ways to do that would be
20 to throw out Antero's results?

21 A. Yes.

22 Q. Let's look at Exhibit I, this is Ritchie
23 County-specific information. I think we can look mostly
24 at the spreadsheet on there that shows the difference in

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1 the State's appraised value and what Antero calculated,
2 \$178 million by the State and \$85.5 million by Antero.
3 That's all driven by the operating expense information
4 we've discussed at length, correct?

5 A. It is. So it's putting -- instead of using 20
6 percent, it's using the 36 percent. And it's taking
7 away the maximum limitation of the operating expenses
8 but then using the same template that the State uses.

9 Q. Let's flip to Exhibit 13. This is an
10 appraisal that was done on behalf of Antero by Hein &
11 Associates. And I know you weren't involved in the
12 drafting of this. We had these folks here in October to
13 testify. They are not here to testimony today. But I
14 think you have a general understanding of the
15 methodology used by Hein.

16 What are the variances between what Hein did
17 in their valuation and what the State does through their
18 model?

19 A. So the State will assert that they are bound
20 by the mass appraisal system. But like any property
21 that gets valued, sometimes mass appraisal systems don't
22 work. They don't arrive at the appropriate fair market
23 value. So Hein & Associates was asked to -- independent
24 of the State of West Virginia's methodology -- to place

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1 a value on these gas wells, to look at their income
2 stream, to look at the operating expenses, to look at
3 what the industry operating expenses and the
4 participants are, what are the decline rates in Ritchie
5 County specifically. And value these wells. The same
6 as you would, you know, ask an appraiser to value your
7 home if you disagreed with the county's assessment of
8 it.

9 So Hein looked at all of those factors. They
10 looked at Antero's operating expenses, and then they
11 surveyed market participants, to make sure that Antero's
12 operating expenses were appropriate and not including
13 anything that, you know, other participants in the
14 market would. And I think there's some information on
15 the last page about market participants they looked at.

16 They used a slightly different cap rate than
17 the State does. And in their testimony for 2016, you
18 know, they describe the difference between their cap
19 rate and the State's cap rate as they considered the
20 volatility of the oil and gas market, where the State
21 uses a general cap rate. And then they also looked at
22 how wells are declining in Ritchie County.

23 And on page -- let's see if I can find the
24 page. In their report they show the decline they use

Page 40

1 versus the decline that the county uses.

2 Q. I think it's smaller than the other writing we
3 were looking at.

4 A. So -- and in general the decline is more
5 aggressive in the first two years -- let me find it.
6 But in the third year, they use a more conservative
7 number, because they average the tail end of the years
8 rather than the third year.

9 Q. Finally, the last document we'll have you
10 speak on is Exhibit 12, which is --

11 COMMISSIONER ROGERS: They don't expect us
12 to read it.

13 BY MR. GRIFFITH:

14 Q. Again, similar with the October bearing, this
15 is a compromised value that was calculated on behalf of
16 Antero by Altus. Discuss how those calculations were
17 done and what -- how that fits into the State's model.

18 A. So -- and I think this is similar, this is
19 similar to last year in that, you know, there's two
20 different things going on. There's the percentage
21 that's wrong and then there's a cap, which we don't
22 think is legally allowable, based on the legislative
23 rule, that you shouldn't be able to place a maximum on
24 operating expenses.

10 (Pages 37 to 40)

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Page 41 1 So -- and that being the biggest issue. The 2 36 percent, that change in percentage relates to gas 3 price and economic obsolescence, where the cap relates 4 to we just don't believe the State is legally allowed to 5 do that. So the different scenarios in this last one is 6 you have the State appraised value, which is at -- I 7 have it in my notes -- the State's appraised value, 8 which is \$178 million. The value on the appeal was 9 85 million. 10 Just for reference, the Hein third-party 11 fair-market value appraisal was 53 million for the same 12 assets. 13 But to kind of compromise is if we just take 14 the cap off, so we leave it at 20 percent operating 15 expenses -- even though we feel that that doesn't 16 include all of the operating expenses -- but we remove 17 that maximum that's artificially limiting the operating 18 expenses, the value would be \$125 million on all the 19 wells. 20 MR. GRIFFITH: That's all I have. 21 * * * 22 23 24	Page 42 1 CROSS - EXAMINATION 2 BY MR. MUDRINICH: 3 Q. Kirsten, you're familiar with the legislative 4 rule? 5 A. I am. 6 Q. Do you know of any provision in there that 7 allows the State to substitute the industry average 8 operating expense for a producer's alleged actual 9 expenses? 10 A. I do not. It was on the administrative 11 notices and the return, and the State has a history of 12 accepting actual operating expenses. But it is not in 13 the legislative rule. 14 Q. And average industry operating expenses -- and 15 I'm going to have to be repetitive -- I think you've 16 already expressed if you have four people submit an 17 expense survey, two for 200,000, two for 100,000, that 18 the average number is 150,000, correct? Mathematical 19 average -- number. 20 A. That is correct. 21 Q. Let's turn to the survey that Antero 22 submitted. That's exhibit -- 23 MR. MUDRINICH: Is that 6? 24 MR. GRIFFITH: Yes.
Page 43 1 BY MR. MUDRINICH: 2 Q. Antero, as you stated, is one of the 3 largest -- probably the largest player in Marcellus in 4 West Virginia. They submitted this survey, and they 5 came up with average operating expenses per well of 6 \$32,994; is that correct? 7 A. That is what is on this survey, correct. 8 Q. And we're here today -- and I'll be delving 9 into this in a little more detail -- that basically, 10 from Exhibit 5, the diagram -- you're claiming that you 11 were entitled to an operating expense reduction for all 12 this stuff post-well 1, well 2, and the termination of 13 that little well line. All this other stuff. 14 A. I'm claiming that if you were going to use the 15 revenue, the point at which it is sold, in your income 16 calculation, then you also need to include all of the 17 expenses to arrive at that revenue. 18 Q. Now, you understand that what we're talking -- 19 what the value is based on is -- we're trying to come up 20 with a value of the personal property, that being the 21 well itself, and trying to figure out that through the 22 income method. 23 A. Through an income approach, correct. 24 Q. And the definition of the personal property,	Page 44 1 and the direct expenses that logically flow from it, 2 personal property used in oil and natural gas production 3 means machinery and equipment in or about the well and 4 all other tangible personal property used in the oil 5 and/or natural gas production from the well to the field 6 line point of sale. 7 So if I'm following this document right, 8 Antero's field line extends to Louisiana, if that's 9 where the purchaser is. 10 A. So field line isn't defined. So we have to 11 use where the gas is sold. So the only place it's sold. 12 So my only revenue number I have is where it's sold. So 13 field line point of sale is kind of like an antiquated 14 term at this point. 15 Q. The term is still in there, and you're 16 basically claiming that your field line extends to 17 wherever you sell the gas. 18 A. My field line point of sale is where I sell 19 the gas. It's the only point it's sold. 20 Q. Let's talk about this -- stay on this diagram 21 for a while. 22 Antero owns the wells, correct? 23 A. They do. 24 Q. Gathering line, who owns that?

11 (Pages 41 to 44)

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1 A. Sometimes Antero does and sometimes third
2 parties.

3 Q. So has there been any analysis done of how
4 much Antero charges itself versus what they pay third
5 parties? Is there a difference in the amounts there?

6 A. Yes. So Antero is not allowed to charge
7 itself the equivalent of third-party rates. So what's
8 included in the gathering and compression number, where
9 Antero is using its own line, are the expenses to run
10 the line, not what someone else would pay Antero to use
11 the line.

12 Q. Not the expenses to get the gas out of the
13 ground, but the expenses to get the gas moving through
14 the line.

15 A. Correct.

16 Q. And this natural gas processing plant at
17 Sherwood, that's not owned by Antero?

18 A. That's a MarkWest facility.

19 Q. And all the big transmission lines to the end
20 user, none of that is owned by --

21 A. Antero doesn't own the transmission lines.

22 Q. Has there been any analysis done in connection
23 with these numbers to show what burden the royalty
24 owner -- let me rephrase that different.

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1 Has there been an analysis of your leases to
2 see how much the royalty owners share in the cost of
3 this post-production expense?

4 A. There has not, but we talked about that a
5 little bit earlier. And even if -- even if we assume
6 that every royalty owner shares in 100 percent of the
7 post-production cost, and you're at 15 percent, you
8 would be at still in the 700,000s on the average
9 operating expense per well. So while I understand the
10 point, we still have a big discrepancy between what the
11 State is allowing and what the working interest
12 operating expense would be.

13 Q. But this average operating expense on this
14 sheet is saying 544,000 per well.

15 A. It does, and that's because of the
16 conventional and vertical Marcellus wells are averaged
17 in.

18 Q. And with conventional wells, stuff like that
19 wouldn't be going through this processing plant, would
20 it? You don't usually get NGLs from shallows wells.

21 A. No. But I mean this was just for illustration
22 purposes. So when we took the total operating expense,
23 we just divided by the total number of wells to get to
24 544. So, yes, I mean if we wanted to redo this diagram

Page 47

1 we could take LOE and divide it by the total number of
2 wells, gathering, compression -- you could mess with the
3 numbers, but ...

4 Q. But we don't know -- we know the actual amount
5 that has been credited out of the royalty payments. So
6 these are the gross expenses, and there may be -- some
7 of this may have been recouped?

8 A. There may be a small portion, correct.

9 Q. But we don't know what that portion is. We
10 haven't had an analysis of it.

11 A. It would be --

12 Q. We don't have a number?

13 A. I don't have a number. I could tell you what
14 number it would be less than.

15 Q. Do you know anything in the rule that allows a
16 producer to deduct these post-production processing
17 costs and various things? Anything specific in there?

18 A. Because this rule was written prior to the
19 Marcellus, I have to assume that the intention was that
20 if you're going to take revenue -- which is gross
21 revenue -- and to develop an income stream out of it,
22 that you take all the expenses that are associated with
23 that. This rule was written before Marcellus came into
24 play. So I don't think it contemplates it.

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1 Q. Direct expenses. Of course, you wouldn't be
2 taking the overhead involved with -- back at the office
3 with respect to including these --

4 A. No. There's no --

5 Q. -- gas, to the end user or anything like that.

6 A. There's no SG&A or overhead included in these
7 numbers.

8 Q. This -- you explained about that you track
9 expenses to a well level. I'm curious to how that is
10 done. Is there an exhibit which -- I think I've seen
11 it, I don't recall what exhibit number it was.

12 In your response to the tentatives.

13 A. Oh, where we show the expenses per well?

14 Q. Uh-huh.

15 A. 2? 6?

16 I think it's 2, page two.

17 MR. GRIFFITH: Yeah, it's 2.

18 BY MR. MUDRINICH:

19 Q. Turn to these expenses. I want to talk about
20 the Marcellus.

21 A. Page 5 starts the horizontal.

22 Q. I just want to make sure I've got my columns
23 right, what you're claiming.

24 Gathering and compression, that's this part of

12 (Pages 45 to 48)

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Page 49 1 the diagram, over here? 2 A. Yes. Yes, before the cylinder. 3 Q. Processing is the cylinder? 4 A. Yes. 5 Q. Transportation is this stuff, to the end user. 6 A. Yes. 7 Q. And on some of these Marcellus -- and, again, 8 you've got another exhibit that shows some of the gas is 9 sold at the Sherwood plant, some is sold in Louisiana, 10 to get these different prices. 11 How do we know that the expenses -- I guess 12 since you don't, when it's coming out of the ground, you 13 might not necessarily know what contract it's destined 14 to fill; is that correct? That particular gas. It's 15 coming out of the ground in Ritchie County, do we know 16 beforehand that that gas is going to go into -- to be 17 sold at the Sherwood facility or sold down, farther down 18 the road? 19 A. I think that's a question for Phil. I'm 20 not ... 21 Q. But the expenses for the well, that's what's 22 striking to me, is how you can compute the actual -- 23 these post-production costs. I can maybe understand 24 your -- although we differ on whether you get these	Page 50 1 gathering line expenses -- but the transportation 2 expense, how that can be tracked back down to the 3 individual well? You say Phil would be the better one 4 to talk about that? 5 A. Since he's nodding his head, I'm going to say 6 yes. I'm not -- for the 2016 tax year or -- yeah, for 7 the 2016 tax year, we walked the State through how those 8 expenses tracked back to the wells, from the invoice -- 9 Q. But we didn't allow any of these expenses that 10 I just -- 11 A. We walked the State through the invoice level 12 back to the well expense. That is not in these. I will 13 just say that Antero is a publicly traded company, that 14 there are rules about how you do this. And they are 15 audited. And it's beyond my expertise how their 16 internal accounting system works. 17 Q. But it's still probably a pretty fair 18 statement to say, when you're looking at the value of 19 that well, you can't pinpoint the transportation cost 20 associated with that well without doing some allocation. 21 A. They pinpoint the transportation costs back to 22 the well. 23 Q. I'm talking about what's being transported to 24 Louisiana, that gets pinpointed back to the well.
Page 51 1 A. They charge it back to the well, yes. 2 Q. And possibly charge it back to the -- some of 3 it, to the royalty owner. 4 A. Yes. 5 Q. In Exhibit 15, those numbers that you show for 6 average price, based on delivery points. 7 A. Yes. 8 Q. Is that net of NGLs? Is NGLs included 9 anywhere in those numbers? 10 A. I believe that's just natural gas -- or 11 just -- 12 Q. Natural gas? 13 A. Yes. 14 There's two different markets -- 15 Q. So if I wanted to look at our tax -- the tax 16 return you filed for the well, and it includes both NGLs 17 and gas, the numbers I average out, when I look at what 18 you're reporting, gross proceeds and volume, is 19 different than that. 20 A. Yes, because it has -- the wells with NGLs 21 would have a different number, yes. 22 Q. Go to Exhibit 7. 23 A. (Witness complies.) 24 Q. That's the transaction confirmations and	Page 52 1 accompanying affidavit. 2 Again, but the price details have been 3 removed, so we don't have the whole contract to look at, 4 is that correct? 5 A. You do not. 6 Q. And we did the affidavits. But just basically 7 that person's understanding, interpretation of the 8 contract without the actual contract? 9 A. You do not have the contract. 10 Q. And the Hein appraisal, that's Exhibit No. 13. 11 The person who performed that appraisal is not 12 here today. 13 A. They are not. 14 Q. To testify or for cross-examination. 15 A. No. 16 Q. So I can't ask him any questions about how he 17 derived his -- 18 A. No. 19 Q. Give me a minute, and I may be done. 20 Just one more thing, based on the survey. 21 Go back to the exhibit, the survey, where they 22 reported 32,000. 23 A. Uh-huh. 24 Q. And these expenses you're claiming are direct

13 (Pages 49 to 52)

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1 expenses today, they didn't list them as an "other"
2 expense or anything like that, simply they're allowable?
3 They're not listed under -- nothing listed under
4 "other," you feel these expenses didn't fit a particular
5 category.

6 A. So I didn't fill out this form. But, no, it
7 doesn't appear that anything is listed as "other." But
8 the State used this -- I find it kind of questionable
9 that the State used this survey, and knowing that you
10 can't produce that much -- I mean they didn't look at
11 this and say: Huh, there's an error there.

12 Q. Well --

13 A. There's something wrong with this number.
14 Because you can't produce \$771 million revenue
15 for \$7 million in expenses. And just averaged it right
16 in with everybody else, who clearly would have been
17 higher, because you came to an average of \$150,000.

18 Q. A sophisticated company filled it out.

19 A. It was a mistake. People make mistakes.

20 Q. One more thing.

21 Just if we -- just to reiterate, when I read
22 that definition of personal property, which it said
23 field line point of sale.

24 A. Yes.

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1 on a fair market value. How do you value a well? It's
2 a series of pipes in the ground. What's it worth? What
3 is somebody going to pay you for a well? Well, they're
4 going to pay you what the income stream is. The net
5 income stream. I've never seen somebody buy a well for
6 the gross income stream.

7 So, yes, I understand that you're trying to
8 value the property. But the property is pipes in the
9 ground, so you have to do that through an income
10 approach.

11 Q. And that's what we do, we give the people the
12 opportunity to submit their actual operating expenses,
13 through a survey. People did that. We crunched the
14 numbers and came out with 150. And she'll testify
15 briefly as to why it went up to 175.

16 But now you're basically asking to go away
17 from that survey, go away from that mass appraisal
18 approach, and look at every individual operator, see
19 where their point of sale is, give them all up to
20 theirs, stop some people at their point of sale. So
21 we're out of the mass appraisal environment and we're
22 back to basically fee appraisals, for lack of a better
23 term.

24 A. I'm asking you to assess these assets at their

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1 Q. Field line, you admit, is not further
2 subdefined.

3 A. No, there's no definition of field line.

4 Q. But according to the expenses you're claiming
5 you should be allowed all expenses up to the point of
6 sale, which basically means the word "field line" is
7 meaningless.

8 A. I'm claiming that if you're going to base an
9 income calculation on my gross revenue, that is to a
10 point -- wherever that point is, that all the expenses
11 to that point need to be included in the revenue
12 calculation.

13 Q. And all the -- back to the diagram. If there
14 wasn't -- if there were no wells, you wouldn't have any
15 of these other facilities and pipelines, correct?

16 If you didn't have these two wells, all this
17 other property -- all this other property probably
18 wouldn't exist, if there weren't wells.

19 A. I suppose it would be worthless property if
20 there were no wells.

21 Q. What we're trying to come up with is a value
22 of tangible personal property, that is the well. That's
23 what the State of West Virginia is about.

24 A. Right, based on what that asset would sell for

Page 56

1 fair market value.

2 Q. But that would, obviously, if you believe
3 Antero sells theirs so far down the line, they should
4 get more expenses, somebody else should get less
5 expenses. So basically we're out -- we're no longer in
6 the average expense in the mass appraisal, but we're
7 looking at each individual taxpayer, for umpteen
8 thousand wells we have in the state, each particular
9 well.

10 A. The State's legislative rule contradicts
11 itself. It wants gross revenue, but then it wants an
12 average operating expense to the field line point of
13 sale, which does not exist. I'm asking that you
14 consider what the true income stream is for these well,
15 and use that.

16 Q. But, again, there's nothing in the rule about
17 post-production expenses or anything, it's just that,
18 which we dealt with, the field line point of sale.

19 A. Yes. There is nothing.

20 MR. MUDRINICH: I have nothing further.

21 * * *

14 (Pages 53 to 56)

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Page 57 1 REDIRECT EXAMINATION 2 BY MR. GRIFFITH: 3 Q. So the rule doesn't define or discuss 4 gathering and compression, processing or transportation, 5 correct? Specifically. 6 A. No, it talks about direct operating to -- 7 Q. Does it talk about Marcellus? 8 A. It does not. 9 Q. Utica? 10 A. No. 11 Q. Natural gas liquids? 12 A. It does not. 13 Q. Horizontal wells? 14 A. No. 15 Q. So it's fair to say that this rule reflects 16 what the industry -- how the industry was structured in 17 2005, when that rule was promulgated, correct? 18 A. That's correct. 19 Q. Any definition of -- and we've covered this -- 20 field line point of sale in the code of state rules and 21 the West Virginia state code? 22 A. No. 23 Q. Has the Tax Department provided any 24 alternative field line point of sale or point of sale	Page 58 1 that a taxpayer can use other than where they actually 2 sell this gas? 3 A. They have not 4 Q. So what else could you do as a -- Altus Group 5 do, as a company that administers taxes on behalf of 6 producers, other than use the actual point of sale for 7 the gas? 8 A. Right, if we take it to a field line point of 9 sale, where the States wants to take it. If they say it 10 doesn't include transportation and processing, then I'm 11 not following the legislative rule, because that's not 12 the gross receipts. Right? So that would not include 13 NGL revenue. It wouldn't include the higher price. 14 So, yeah, I either provide gross receipts and 15 argue that you need to include operating expenses, or 16 don't follow the rules and report something that isn't 17 gross. 18 Q. And the legislative rule requires the Tax 19 Department to calculate those averages at least every 20 five years, and they do that through a survey, correct? 21 A. That's correct. 22 Q. But they're not prevented, through the public 23 comment process, for their valuation variables that they 24 do annually, to update that. And that's reflected in
Page 59 1 2017 values, correct, where they increased percentages 2 for conventional wells, and then the maximum amount for 3 Marcellus wells, correct? 4 A. Right, they're not bound by the survey. 5 MR. GRIFFITH: That's all I have. 6 * * * 7 RE CROSS-EXAMINATION 8 BY MR. MUDRINICH: 9 Q. The rule does require us to use an average 10 industry operating expense, though, correct? 11 A. But then you calculate an average and call it 12 a maximum, in your variables. 13 Q. The rule says "average industry operating 14 expense," correct? 15 A. It says "average industry operating expense," 16 which you come up with two numbers and then call one of 17 them a maximum, and use them both. 18 Q. And I'm not going to repeat, but we talked 19 about mathematical average, and you just prefer 20 percentage average, even though the percentage average 21 may not directly reflect the actual expenses to get the 22 gas out of the ground to wherever we decide the field 23 line is. That just because somebody produces more, it's 24 going to be a direct percentage, but maybe -- there's no	Page 60 1 engineer here to tell me that it costs -- that you need 2 X amount of additional pump grease or whatever to get 3 something out, to produce this much versus that much 4 So you're directly increasing your percent -- 5 you're proportionately increasing your expense 6 percentage based on gross -- the selling -- the lower 7 selling price, correct? And we already talked 8 percentages. 9 A. I'm not sure I'm following your question. 10 Q. You said since the price of gas has gone down 11 that the expenses -- the amount of operating expenses 12 as a percentage of revenue, has gone up. 13 A. Correct. 14 Q. We don't have anybody here, basically, to -- 15 that's based on a percentage comparison, but it 16 doesn't -- nobody's here to actually say it actually 17 costs more dollarwise to produce X amount versus how 18 much it costs dollarwise to produce Y amount. 19 A. So transportation, processing, gathering and 20 compression are a unit-based fee. So, yes, they go up 21 as production goes up. 22 Q. And those are the fees that we're arguing 23 about whether they're allowed or not. 24 A. Yes.

15 (Pages 57 to 60)

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1 MR. MUDRINICH: Nothing further.
 2 MR. GRIFFITH: I don't have anything
 3 further.
 4 We have one more witness, Phil Yoo, from
 5 Antero.
 6 * * *
 7 PHIL YOO
 8 being previously duly sworn, was examined and testified
 9 as follows:

* * *

DIRECT EXAMINATION

BY MR. GRIFFITH:

13 Q. Phil, if you could state your name for the
 14 record and discuss what you do at Antero.

15 A. Sure.

16 My name is Phil Yoo, I'm a VP accounting and
 17 chief accounting officer at Antero. I have been a
 18 professional accountant for about 25 years.

19 Q. And we've discussed at length, I think
 20 everyone in the room may have heard enough about this
 21 survey at this point, but we'll have you -- because your
 22 name actually shows up on this document. We'll have you
 23 walk us through that.

24 When this was submitted by Antero in 2014,

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1 were you aware of precisely how the information sought
 2 in that document would be used by the Tax Department?

3 A. No, I was not aware that it was going to be
 4 used the way it is now, that I know it's being used.

5 Q. And from your review of the survey now and
 6 then, did it appear that what was being sought was
 7 typical lifting expenses that are associated with the
 8 wells?

9 A. Yeah. So I agree with that. I think what the
 10 survey and the types of categories, the costs that are
 11 listed are -- were being requested were lifting expenses
 12 or lease operating expenses, as we refer to them in the
 13 industry.

14 Q. If there had been specific line items on this
 15 document for gathering and compression, for
 16 transportation, for processing, I'm assuming that would
 17 have been completed and filled in by Antero, correct?

18 A. Absolutely.

19 So the survey, as I mentioned, the types of
 20 costs that are listed really -- we kind of tie that to
 21 Exhibit 5 in the diagram, to see -- what I was referring
 22 to is LOE and workover or lifting expenses. That
 23 average on that diagram is 41,000 now, compared to the
 24 33. And that's really what we were looking at.

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1 If we were to list all the other expenses,
 2 like the gathering, the processing and the
 3 transportation, that would have actually been
 4 substantially more.

5 This survey shows that we generated
 6 \$772 million worth of revenue from \$7.7 million in
 7 costs. And, unfortunately, we don't make that kind of
 8 money in our business. So, yeah.

9 Q. And you didn't look at that "other expenses"
 10 category at the bottom and think: Well, we'll lump in
 11 an additional \$800 million expense.

12 A. Yeah, I mean it would have been -- it's just
 13 not something that occurred --

14 Q. That was an overstatement. I mean 800,000.
 15 Anyway, go ahead.

16 A. Well, 800,000 per well now.

17 So, really, it would have been about 6 or
 18 7 hundred million dollars in expenses that we would have
 19 listed in "other," which would have been a really odd
 20 thing to do in a survey that, you know ...

21 Q. And let's take a look at Exhibit 7. These are
 22 the transaction confirmations that we discussed earlier,
 23 and the affidavit as well. The affidavit -- let's focus
 24 on the affidavit. That indicates -- NextEra indicates

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1 in that affidavit that they -- that Antero does not
 2 provide free on-board shipping point.

3 Is that consistent with contracts with -- that
 4 Antero makes with other purchasers?

5 A. Yes. So most of these contracts are standard
 6 form contracts, under what we call -- some of the
 7 transaction confirmation documents refer to these as
 8 N-A-E-S-B or NAESB contracts. Those have standard terms
 9 and conditions, kind of industrywide. And they provide
 10 that we deliver the gas to the sales point. We pay all
 11 the costs to get the gas there.

12 Q. Okay.

13 And can you comment on the fact that this
 14 affidavit, at least NextEra, pursuant to the transaction
 15 confirmation that we're talking about, they take the
 16 possession of this gas near the Sherwood processing
 17 facility in Doddridge County, they are, obviously, with
 18 other purchasers, there are different delivery points,
 19 depending on the purchaser, correct?

20 A. Yeah. And so this specific contract or
 21 transaction confirmation was with Doddridge County. If
 22 you go back to Exhibit 15, you'll actually see that
 23 NextEra Energy actually buys gas from us at several
 24 different points. So near the bottom of that first

16 (Pages 61 to 64)

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1 page, you'll see NextEra Energy listed. They buy gas
2 from us at Doddridge County, at TCO Pool and under other
3 transaction confirmations, as well as the M2 Pool. And
4 those all have different prices.

5 Q. Have you ever presented at any other audits,
6 severance tax audit or any other audit the Tax
7 Department has performed on Antero, had your point of
8 sale questioned by anyone within the Tax Department?

9 A. No. So the State of West Virginia's severance
10 tax is levied based on a -- under that -- when we
11 calculate a payer's severance tax, we take our gross
12 sales, and we're actually allowed to deduct all the
13 gathering and transportation costs, in order to
14 determine the tax that we pay.

15 So the State actually came in to our offices,
16 reviewed our contracts, performed an audit. And they
17 took no exception of any of the costs that we were
18 deducting.

19 Q. Finally, one final document that we haven't
20 looked at is Exhibit 14, which is Antero's fiscal year
21 2015 SEC Form 10-K. Pages 46 and 47 talk about lease
22 operating expenses, and compare those to gathering,
23 compression and processing and transportation. And the
24 income statement is included in there as well. It's not

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1 the entire 10-K, it's just an excerpt from it, because
2 it's a big document.

3 But just discuss the difference between those
4 expenses for Antero and how those were reflected on the
5 income statement.

6 A. Yeah, so the 10-K is a public document that we
7 file publicly with the SEC, being a public company. And
8 in that we're required to describe the principal
9 components of our cost structure. Lease operating
10 expenses here -- and I'll talk about how there are in
11 the income statement -- are described as our day-to-day
12 lifting costs, or what we refer to in the diagram as
13 lease operating expenses. And in the survey, what we
14 filled out in Exhibit 6, as our lifting costs. And
15 that's the average of the 33,000. So that's typically
16 the cost just to get the gas out of the ground.

17 The next line item that we talk about are
18 principal components of our cost structure. Gathering
19 and compression, processing and transportation, that's
20 everything else.

21 So on the diagram on page 5, it's really
22 basically lease operating expenses are equivalent to the
23 41,000. Gathering, transportation and processing is
24 everything else on that diagram.

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1 So if you look at page F4, F5, of our 10-K, we
2 actually show here, for 2015 -- if you look kind of at
3 halfway down under "operating expenses," you'll see
4 lease operating expense, we incurred about \$36 million
5 for the year.

6 And now this also includes -- this is the
7 company's consolidated results, so it does include the
8 results for our Ohio wells as well. Gathering,
9 compression, processing and transportation,
10 \$659 million. If you look at the relationship of those
11 costs, that's kind of similar to the relationship of the
12 costs that we're talking about here in Exhibit 5 and
13 elsewhere.

14 And, again, so that \$36 million, when we
15 filled out that survey, we filled out that survey
16 because it more or less specifically asked for lease
17 operating costs. What's really a question are the
18 gathering and transportation, processing and compression
19 costs that we want to deduct as well.

20 MR. GRIFFITH: That's all the questions I
21 have for Phil.

22 COMMISSIONER ROGERS: Clarify something.

23 You talked about the severance taxes. Clarify
24 that that severance tax also gets passed on to some of

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1 the royalty owners, as far as in that severance tax,
2 besides the --

3 THE WITNESS: It does. Yeah, it does.

4 COMMISSIONER ROGERS: Okay.

5 * * *

6 CROSS - EXAMINATION

7 BY MR. MUDRINICH:

8 Q. I'll start talking about severance tax. You
9 don't know of anything in the severance tax statute or
10 the legislative rule dealing with evaluation of the
11 wells for personal property tax purposes that makes a
12 direct correlation that the expenses you get for
13 severance tax are allowed to be deducted for property
14 tax?

15 A. No.

16 Q. It's different taxes on --

17 A. They are different taxes.

18 Q. And that they're trying to value the gas at
19 the wellhead. That's where the point of the privilege
20 ends in West Virginia?

21 A. Uh-huh.

22 Q. And doesn't include any of the value added by
23 processing?

24 A. Uh-huh.

17 (Pages 65 to 68)

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1 Q. Let's go to the survey you filled out.

2 A. Uh-huh.

3 Q. And that was for calendar year 2013. So this
4 would be one of the ones that were sent to everybody,
5 all the players, to get -- in 2014, for their 2013
6 expenses. And that would then go into the 2015 values
7 we use.

8 A. Uh-huh.

9 Q. When you filled out this survey, you're
10 claiming all these additional expenses today. You
11 didn't list any of these expenses under the "other
12 expenses not in the above"?

13 A. No, based on the category -- or the types of
14 expenses that were listed, we thought the survey was
15 asking specifically for lease operating expenses.
16 And -- I mean it would have been highly unusual for us
17 to, you know, when we had \$7.7 million in expenses to
18 list another 600,000 million in the "other" line, I
19 think. And so we really didn't think the survey was
20 asking us for gathering and compression and processing
21 costs.

22 Q. But nobody took a look at the West Virginia
23 legislative regulation and saying: Hey, wait a minute,
24 we should be entitled to include all these up to our

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1 point of sale, and thrown those down there at the time.

2 A. No, we didn't know that the survey was going
3 to be used that way.

4 Q. And the survey also has the definition of
5 operating expenses up there, and you just figured -- you
6 believe it was directly related to the maintenance and
7 production. You had the opportunity to include it, but
8 you did not.

9 A. Yeah, the way operating expenses is defined
10 there, again, and the types of costs that are listed,
11 alludes to specifically asking only for the lease
12 operating expenses.

13 Q. And so these -- your survey would have come in
14 and been used for the 2015 tax year.

15 A. Correct.

16 Q. So that was another one of those years that
17 was in \$150,000 of allowable expenses, in part because
18 of the inclusion of your survey and some of the other
19 surveys. You didn't contest the values in 2015?

20 A. No, we did not.

21 Q. So you just recently became aware that you
22 were -- should have been entitled to claim a lot more?

23 A. We chose not to appeal the 2015 tax
24 assessments. Obviously, our production has been growing

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1 quite significantly, as a gap in the property value has
2 grown quite significantly. In 2015 we made a business
3 decision not to appeal these returns.

4 Q. Something I asked Kirsten about, and she said
5 you would be the better witness. Is by tracking these
6 expenses to a per-well basis, and we went over with her
7 the columns -- and these were columns that we're in
8 dispute -- I'm just curious to see how you figure out
9 the transportation expenses on a per-well basis, given
10 all these varying points of sales and different
11 transportation costs, how you can track that down to a
12 particular well.

13 A. Yeah. So obviously we can't track every
14 molecule of gas that comes out of every well and figure
15 out where it's sold and what price it got. So what
16 happens is, based on the actual plumbing of our wells,
17 we know where gas from each well is sold. Most of the
18 gas physically, actually comes into the Sherwood plant.
19 And in that case, it's all calculated into what we call
20 the West Virginia weighted average sales price. And
21 that is actually the detail that's provided in
22 Exhibit 15.

23 So the schedule itself is actually called
24 Weighted Average Sales Price. The WAVG stands for

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1 weighted average sales price. We allocate that price
2 back to each individual well. And we allocate the
3 transportation cost associated with getting our gas to
4 these markets also back to every well. All on a
5 per-unit basis.

6 So we do that in order to make sure that our
7 royalty owners are all paid appropriately.

8 Q. So there is an allocation involved.

9 A. Absolutely. It's all done on a per-unit
10 basis, per MMBTU.

11 Q. One last -- I ask you, because you mentioned
12 the royalty owners. We don't know how much of, for
13 instance, those expenses that we were looking at that
14 are allocated to transportation and that, on the
15 per-unit basis. We don't know how much of that is also
16 being borne or getting recouped from the royalty owners.
17 do we? We don't have that information here today?

18 A. I'm not really sure what you're asking. Like
19 are you asking --

20 Q. Well, you're claiming, for instance, on
21 there -- we'll just say you got a million dollars in
22 transportation expenses associated with a particular
23 well. Just throw that out.

24 A. Okay.

18 (Pages 69 to 72)

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Page 73 1 Q. We don't know if that million is actually a 2 lesser number because the royalty owner actually also 3 shared in that expense and that was deducted out of his 4 or her check? 5 A. So when we look at our financial statements, 6 as shown in Exhibit 14 there, all those numbers are net 7 of what we recover from royalty owners. So, for 8 example, this \$659 million in gathering, compression, 9 processing and transportation, that would be the cost to 10 us after -- so let's say we paid \$700 million in 11 gathering, processing and transportation in total, but 12 we recovered, in this example, \$41 million from royalty 13 owners, because that was their share, we actually only 14 show the \$659 million. 15 Q. Where does it show that you paid royalties on 16 this? 17 A. It doesn't. All these numbers are net of 18 royalties and net of royalty owners' share of costs. 19 Q. So we don't know how much -- these are your 20 net numbers here. But we're talking about the so-called 21 actual expenses you want to deduct, to come up with the 22 value of the well. We don't know how much of that comes 23 out of the royalty owners? 24 A. My understanding of the way that the numbers	Page 74 1 are presented for ad valorem tax purposes is that 2 everything is done at a gross basis. So it's -- the 3 well is valued based on gross revenue and gross costs. 4 So royalty interest costs shouldn't really matter. 5 So, in other words, if we're generating a 6 million dollars in revenue on a well, even though 7 Antero's share is only 88 -- or 800 thousand, assuming 8 20 percent royalty interest, we're using the million 9 dollars to value the well. And if we incur a million 10 dollars in transportation costs, we're paying a million 11 dollars -- or there's a million dollars in 12 transportation costs associated with that well, not 13 800,000 or -- regardless of whether we pay it or whether 14 the royalty interest owner pays it, my understanding is 15 that property valuations are done on the gross value of 16 the well. 17 Q. They are. 18 But you also -- I mean I just wanted to see, 19 since you're claiming to use actual numbers, whether 20 these are true actual numbers, in that the amount that 21 was taken from the royalty owner is gone to reduce your 22 actual number. 23 A. Okay, so now I understand your question. 24 So when we allocate costs down to a well
Page 75 1 level, all those costs are allocated at a gross level, 2 down to each, individual well. So the numbers that 3 we're reporting to you for cost per well are all actual 4 gross numbers, they're not net of any royalty numbers. 5 Q. And I don't know if you know the answer to 6 that. I'm curious, when you look at -- is it some kind 7 of federal rule that you can -- that you don't report 8 what royalties you pay out on gas that you pay -- 9 A. Yeah, that's -- 10 Q. I don't know why they would do that. 11 A. Yeah, that's the standard for the industry. 12 We report all our royalties net -- or revenues net of 13 royalty. So if you were to look through the rest of the 14 10-K, which isn't included in this exhibit, but is 15 available on line or in our SEC filings, it actually -- 16 we have a footnote that states that all our revenues are 17 stated net of royalties. And that's a common industry 18 practice. 19 Q. And just out of curiosity, it's not 20 uncommon -- it's rare, kind of, but sometimes the 21 producer will actually own the reserves. 22 A. Yes. 23 Q. And so if -- I don't know if Antero has any 24 that they own, but they would be reporting on this 10-K	Page 76 1 a number net of what they already paid themselves in 2 royalties? Is that how this 10-K works? 3 A. No. Because we would be paying -- in the few 4 cases where we own the mineral rights, there is no 5 royalty to pay, because we'd be paying ourselves, and 6 that doesn't make any sense, so. 7 Q. Okay. Give me a second, I might be done. 8 MR. MUDRINICH: I have no further 9 questions. 10 MR. GRIFFITH: Nothing further. 11 We will ask -- we're finished with witnesses, 12 but to the extent these exhibits we discussed, if we 13 make sure they're all submitted into the record. 14 MR. MUDRINICH: I don't have an objection. 15 But I'm going to point out the same thing I pointed out 16 in the other three hearings we've had. With respect to 17 the exhibit about sales confirmations and that, I want 18 to point out we don't have the actual contract in there 19 to -- we just have the affidavit, and that goes to the 20 weight. 21 And also with the Hein appraisal, we don't 22 have the appraiser here to question about the work he 23 did. I just want that noted for the record. But I have 24 no objection to enclosing all the exhibits.

19 (Pages 73 to 76)

Page 77 1 Are we ready for the State's case or do we 2 need a break for a couple minutes? 3 COMMISSIONER WORDEN: Five minutes. 4 * * * 5 (Brief break) 6 * * * 7 COMMISSIONER WORDEN: We'll go ahead and 8 proceed. 9 MR. MUDRINICH: We'll call Cindi Hoover. 10 * * * 11 CYNTHIA HOOVER 12 being previously duly sworn, was examined and testified 13 as follows: 14 * * * 15 DIRECT EXAMINATION 16 BY MR. MUDRINICH: 17 Q. Please state your name for the record. 18 A. Cynthia Hoover. 19 Q. And what's your position with the Tax 20 Department? 21 A. Tax and revenue manager, special property 22 section, primarily involved in the valuation of oil and 23 gas property. 24 Q. And you're the one ultimately responsible for	Page 78 1 the appraisals that are being contested here today? 2 A. That is correct. 3 Q. First thing I want to ask you: Do we have any 4 housekeeping, like we've had in -- 5 A. Just a small bit. 6 It's in the front of your package that I've 7 laid up here for the county commission -- 8 THE WITNESS: And in the front of yours 9 also, Craig. 10 BY MR. MUDRINICH: 11 Q. Just briefly explain what the housekeeping is. 12 A. On the second page, there's a couple wells 13 which Antero shares working interest ownership with. So 14 there are protested numbers included in the total 15 working interest value, and this gives a breakdown of 16 what is their portion and what may belong to someone 17 else. 18 Q. So if Antero would prevail, the other people 19 have not protested their values, so only Antero's 20 portion of that particular well would be subject to a 21 decrease in the numbers they presented here today with 22 the total working interest, which included these other 23 people. Just a little housekeeping there, that needs to 24 be part of the record.
Page 79 1 And, Cindi, before I ask you some general 2 questions, this is about -- the dispute here basically 3 seems to deal with what is allowable expenses and/or the 4 amount thereof. 5 A. Correct. 6 Q. And you're familiar with -- we allow average 7 industry operating expenses based on a survey? 8 A. That is correct. 9 Q. And you participated in these surveys in the 10 past? 11 A. Yes. The surveys come into our office. I 12 gather the information, and then give it to Jeff. 13 Q. So what we basically do is look at the highs 14 and lows, and get a mathematical average? 15 A. Correct. We look at what their average -- it 16 asks for the average operating expenses. So you would 17 take the total expenses, divided by the number of wells 18 and that would give you your -- for that company -- 19 their average. And then you would look at all the 20 averages from everyone that responded. And then it also 21 looks at the expenses divided into the receipts, to see 22 what percentage of their income. That is so that when 23 you're doing your average operating expenses, if you 24 have a well that if, for instance, on a conventional	Page 80 1 well, if it was a \$4,000 well, and our average operating 2 expense is 5,000, you would use your percentage, so that 3 that well would have a value. 4 Q. But what they like to characterize as a cap is 5 the mathematical average; is that correct? 6 A. Right. When you look at a set of numbers and 7 you get an average, you come up with a number. 8 Q. I'm sure Craig will ask you more detail, but 9 do you know anything about the increase from the 10 previous year of 150,000 as an average operating expense 11 on Marcellus, to the 175,000 that was given this year? 12 A. Yes, when we were looking at tax year 2017, 13 the last survey was done in '15. In talks with Antero 14 and other companies, we had looked -- we pulled their 15 survey, to see, number one, if they responded, and to 16 see if the numbers they were coming to us was different 17 And we were seeing a difference. So when we looked at 18 '17, we took out any outliers. 19 Q. Highs and lows? 20 A. Highs and lows. And that is what created the 21 increase to the 175,000. 22 Q. Okay. 23 Do you know of anything in the legislative 24 rule that allows a person to submit actual operating

20 (Pages 77 to 80)

Page 81	Page 82
1 expenses in lieu of the property being priced according 2 to the industry average? 3 A. No. 4 Q. Have we done that -- allowed that to be done 5 in the past? 6 A. Yes. 7 Q. But it's not in the rule. 8 A. No. 9 Q. And we're no longer doing it? 10 A. That is correct. 11 Q. And if you were required to look at 12 everybody -- everybody that submitted actual operating 13 expenses, you'd have to go through them, what kind of a 14 burden would that put on the administration? 15 A. We would not have the time or the personnel 16 to, A, do it with the staff that we have or with the 17 time allotted. 18 Q. So we use a mass appraisal system? 19 A. That is correct. 20 Q. And under any mass appraisal system, somebody 21 may come in a little high, somebody may come in a little 22 low. You're not going to get exact values when you use 23 a mass appraisal system. 24 A. Correct.	1 But according to the guidelines and the 2 legislative rule, they're being valued under that 3 guideline. 4 Q. So true and actual expenses probably would 5 give you a more accurate result, but the administrative 6 costs of doing that would probably cost the taxpayers 7 more in the long run, that they'd have to pay for the 8 administration of taxes. 9 A. That is correct. 10 Q. Did you review these appraisals? 11 A. Yes. 12 Q. And did you -- is it your belief that the 13 appraisals are true and accurate, it records the 14 legislative rule, dealing with the mass appraisal of oil 15 and gas wells? 16 A. Yes. 17 Q. And from everything you can tell, all these 18 appraisals were performed in accordance with that 19 legislative rule, and the accompanying variables were 20 filed with the Secretary of State? 21 A. That is correct. 22 Q. And that was consistent for all wells? 23 A. Yes. 24 Q. And all Marcellus wells throughout the state
Page 83	Page 84
1 are valued the same way? 2 A. Yes. 3 Q. Industry average, 175,000? 4 A. Yes. 5 Q. Or 20 percent -- 6 A. If it's a horizontal, yes. 7 MR. MUDRINICH: Nothing further. 8 MR. GRIFFITH: Just a few questions, and 9 we'll let everyone get started on a three-day weekend. 10 MR. MUDRINICH: We have another hearing 11 after this. 12 MR. GRIFFITH: I'm going to take my time 13 then. 14 * * * 15 CROSS - EXAMINATION 16 BY MR. GRIFFITH: 17 Q. Cindi, we've talked a little bit about the 18 average industry -- in fact, a lot about the average 19 annual industry operating expense per well. Does it 20 talk anywhere in the legislative rule about a maximum 21 amount being applied in that context? 22 A. No, it just mentions an average. 23 Q. And we've discussed this at length today. 24 You're aware that producers, we've heard testimony about	1 the fact that producers in West Virginia sell their gas 2 at varying places, between the wellhead and -- it could 3 be at the wellhead, it could be transmission lines 4 outside of West Virginia. You agree with that, correct? 5 A. Yes. 6 Q. So some conventional producers may sell right 7 at the wellhead. Some horizontal producers, like 8 Antero, may either sell near the Sherwood facility or 9 they may sell at different points across the state or 10 outside the state, correct? 11 A. That is correct. 12 Q. And you would agree that as you get farther 13 along -- farther away from the wellhead itself, that 14 operating expenses would increase in order to get that 15 gas to that point of sale, correct? 16 A. We would think. 17 Q. And we discussed the field line point of sale. 18 That's not defined anywhere in the legislative rule, 19 correct? 20 A. Correct. 21 Q. So what is your interpretation or how does the 22 Tax Department approach it in notifying and providing 23 guidance to the taxpayers as to what field line point of 24 sale they are supposed to use for reporting purposes?

21 (Pages 81 to 84)

Page 85	Page 86
1 A. Gross receipts. 2 Q. Where it's sold. Which is what Antero has 3 done, correct? 4 A. As far as we know. 5 Q. And you don't have any reason to doubt that 6 that's where they're reporting. 7 A. We just are unsure of what their point of sale 8 is for their individual wells. 9 Q. But we've provided evidence here today about 10 that, correct? 11 A. Not specifically for each well, where the 12 point of sale was, no. 13 Q. Calculation of that \$175,000 maximum, let's 14 talk about that just briefly again. 15 So in response to -- the recalculation was in 16 response to public comments received from WVONGA, Antero 17 and other producers, correct? 18 A. Correct. 19 Q. And when you saw Antero's numbers, and they 20 are relatively consistent with WVONGA's numbers, how do 21 you explain the calculation of only going up \$25,000, 22 when the largest producer in the state was reporting 23 expenses four or five times the \$175,000 per well? 24 A. The WVONGA was just a number, it didn't have	1 any documentation. Which I believe Jeff asked for 2 documentation. He received something that was not -- he 3 didn't feel like it could be used. Or I believe you 4 mentioned also that it came in pretty late and there 5 wasn't time -- most of it was not substantial enough to 6 have created a difference. And Antero's was not used 7 because we still disagreed with the point of sale. 8 And the 32,000 that you had filed on your 9 survey, we threw that out, because you definitely, in 10 meetings, had said that that was not correct. 11 Q. So where did the -- where was the response 12 that you disagreed with the point of sale when Antero 13 provided that information in August? Did you reach back 14 out to them and figure out what the point of sale was? 15 A. I believe Jeff testified that it was August 25 16 when that was provided, and at that time there was no 17 additional data requested. 18 Q. Did you indicate -- I think the first that 19 Antero heard any kind of arguments regarding the point 20 of sale was in October of last year. 21 A. In our meetings in the spring, we had 22 discussed that. 23 Q. Was evidence provided to the Tax Department 24 based on those conversations?
Page 87	Page 88
1 A. Not that we agreed on point of sale, no. 2 Q. Okay. 3 Let's talk about the survey. Any line on -- 4 the 2013 survey -- 2014 survey, I apologize. 5 A. That's okay. 6 Q. Actually, it is 2013. 7 A. It was 2013. 8 Q. Calendar year 2013. 9 A. Yes. 10 Q. Any line items on there for gathering and 11 compression, processing or transportation? 12 A. No. 13 Q. Separate sheets were provided for conventional 14 and Marcellus wells, correct? 15 A. That is correct. 16 Q. Is it fair to say that the 2013 survey was 17 based on a survey that was circulated in 2008? 18 A. Yes. 19 Q. And that 2008 survey included only 20 conventional wells, correct? 21 A. Right. 22 That Marcellus -- the Marcellus was also done 23 in 2012 for 2014. We repeated it again in 2015, because 24 we wanted to get the conventional ones in the same	1 cycle. 2 Q. Calendar year 2012, correct? 3 A. Right. 4 Q. Fair to say that the 2013 survey, because it 5 basically just took the 2008 survey information and 6 added some columns for Marcellus, was based on typical 7 lifting expenses for wells? 8 A. The categories were, but there was another 9 line to add anything. And the cover sheet indicated 10 that these would be used to set our variables. 11 Q. Why weren't gathering and compression, 12 processing or transportation included on there? 13 A. That's not something that I can answer. 14 Q. Okay. 15 Does the survey make an effort to determine 16 whether a producer is reporting NGL revenue separately 17 from gas revenue? Does it make any kind of 18 differentiation between wet gas and dry gas being sold? 19 A. On the survey, no. 20 Q. Any kind of point of sale information included 21 on that survey? 22 A. No, there is not. 23 Q. Okay. 24 So is it fair to say that the survey that was

22 (Pages 85 to 88)

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1 submitted in 2014 had responses from some producers that
 2 maybe were producing dry gas and selling that gas near
 3 the wellhead, other producers who had wet gas and had to
 4 gathering and compress that gas and have it processed
 5 and then sell it farther away from the wellhead?
 6 A. Correct, there would be some that had just
 7 dry, some that had wet, and some that had both.
 8 Q. Can you explain how that information was
 9 averaged together, to get the 150 for 2016 and 175 for
 10 2017.
 11 A. It was only given as one number. So that
 12 would have been the number that was used, based on
 13 whether it was vertical or horizontal.
 14 Q. So likely some producers had large numbers,
 15 some had much smaller numbers, correct?
 16 A. Yes.
 17 Q. So what happens when you average those larger
 18 numbers with the smaller numbers?
 19 A. You're going to be in the middle.
 20 Q. Right.
 21 So for the larger producers, they're getting
 22 probably less than what they're actually incurring, and
 23 some of the smaller producers are getting more than what
 24 should be allocated to them, correct?

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1 REDIRECT EXAMINATION
 2 BY MR. MUDRINICH:
 3 Q. Cindi, there was some discussion about not
 4 notifying them about our disagreement with the point of
 5 sale, et cetera. When you did the tentative values,
 6 basically got to 175,000.
 7 A. That is correct.
 8 Q. So right there would be your response to the
 9 allowance of any additional expenses beyond there.
 10 A. Correct.
 11 Q. So we denied --
 12 A. Correct.
 13 Q. -- any additional expenses, and simply used
 14 the industry average that you applied?
 15 A. That is correct.
 16 Q. To all Marcellus operators.
 17 A. Correct.
 18 MR. MUDRINICH: Nothing further.
 19 * * *
 20 RE CROSS-EXAMINATION
 21 BY MR. GRIFFITH:
 22 Q. I'll just address. I think this was addressed
 23 in 2016, and we don't have the exhibits here today as
 24 part of that. But there were -- there was documentation

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1 A. Correct.
 2 Q. On the survey, you know, I know you indicate
 3 that it's circulated every five years. But the Tax
 4 Department has the authority to change that more
 5 frequently, correct, based on --
 6 A. That is correct.
 7 Q. -- public comments.
 8 Which is why it was done for 2017. So you're
 9 not totally married to that 2013 survey for a five-year
 10 period, correct?
 11 A. Correct.
 12 Q. Okay.
 13 Finally, on the admin notices for 2015, the
 14 Tax Department did invite producers to approach with
 15 actual operating expense information, if it varied from
 16 the average that's provided by the Tax Department.
 17 A. Prior to, correct.
 18 Q. Okay.
 19 And what precipitated the change in 2016,
 20 2017? Any change to the law that would have caused
 21 that?
 22 A. No.
 23 MR. GRIFFITH: That's all I have.
 24 * * *

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1 provided for gathering and compression in 2016, correct?
 2 A. For the expenses themselves.
 3 Q. And for the processing, the MarkWest expenses
 4 was provided as part of the 2016 hearings?
 5 A. Correct.
 6 Q. As were some of the transportation expenses,
 7 those transaction confirmations. That was all provided.
 8 A. Correct.
 9 Q. So I think the focus -- again, I don't want to
 10 editorialize here, but I think the focus for 2016 was
 11 less the point of sale and more on what are not -- what
 12 the amounts of some of these expenses that were incurred
 13 by Antero, the fact that Antero was actually bearing
 14 those costs, rather than point of sale issues. I think
 15 that was first really raised during the 2016 October
 16 hearing.
 17 A. And?
 18 Q. That's not a question. It's the end of a long
 19 day.
 20 MR. GRIFFITH: That's all I have.
 21 MR. MUDRINICH: Nothing further.
 22 COMMISSIONER ROGERS: All right.
 23 MR. MUDRINICH: What I want to do now is
 24 move that the State's appraisals and that housekeeping

23 (Pages 89 to 92)

Page 93 1 document be made a part of the record, along with the 2 standard administrative notices and legislative rule 3 that's in the packet. 4 Craig, any objection? 5 MR. GRIFFITH: No objection. 6 MR. LEE: We'll make it part of the record. 7 COMMISSIONER WORDEN: This concludes the 8 hearing. The Commission will put this on the agenda to 9 make a ruling at our March 9 meeting. 10 MR. MUDRINICH: You've got to decide this 11 prior to adjourning, as the BRE. 12 COMMISSIONER WORDEN: Oh, okay. 13 MR. GRIFFITH: Yeah, I think you have until 14 the end of the month. 15 MR. MUDRINICH: So whenever you decide, you 16 have to make that decision, as you're sitting as the 17 BRE. 18 COMMISSIONER WORDEN: You mean this is our 19 last BRE scheduled? Is that right, Arlene? 20 We've got to do it today then. Or do it at a 21 separate meeting? 22 Well, then I have a few questions, and we 23 might be able to wrap this up today. 24 Is the State following all the rules,	Page 94 1 administrative notices in the taxation of these wells? 2 MS. HOOVER: Yes. 3 COMMISSIONER WORDEN: Okay. 4 MR. GRIFFITH: No. 5 COMMISSIONER WORDEN: Okay, I guess I need 6 some clarification on that then. Are you here disputing 7 the rules, not the way they enacted them, applied the 8 rules? 9 MR. GRIFFITH: I think we're disputing more 10 how they're applying the rule. There's some things that 11 were argued about with the rule, like the maximums, 12 whether those are allowed. I think the biggest issue is 13 how they're applying that rule. 14 COMMISSIONER WORDEN: The interpretation of 15 the rule. 16 MR. GRIFFITH: Through their calculation 17 of -- yes, of operating expenses. 18 COMMISSIONER WORDEN: So this is -- you 19 know, we sit here as a Board of Appeals, and it's more a 20 State issue. Correct? 21 Our assessments are determined by the way the 22 State applies the rules or the administrative notice. 23 MR. GRIFFITH: Correct, the assessor is 24 just taking those appraisals and applying the 60 percent
Page 95 1 to come up with an assessment. 2 COMMISSIONER WORDEN: Right. 3 MR. GRIFFITH: Based on that. 4 COMMISSIONER WORDEN: Right. 5 So, to me, being a simple guy -- if you want 6 to put that in, I guess -- the problem is at the State 7 tax level versus the county commission level; true or 8 false? 9 MR. GRIFFITH: Well, I think you're 10 analyzing this from what the Tax Department is doing, 11 correct, rather than what the county -- now, you still 12 have the authority to look at what the State is doing 13 and say: We think you're strained, but ... 14 You know, that's up to you. That's a decision 15 for you to make. 16 COMMISSIONER WORDEN: Right. 17 So for the Tax Department, are mass appraisals 18 done in other industries or other areas? 19 MR. MUDRINICH: Yes, coal. 20 COMMISSIONER WORDEN: Coal. 21 What else? 22 MR. MUDRINICH: I would imagine timberlands 23 is mass appraisal. 24 COMMISSIONER WORDEN: Timberlands. Okay.	Page 96 1 And they use similar -- to come up with, say, 2 a timberland value, you use the same -- 3 MR. MUDRINICH: The methods -- 4 COMMISSIONER WORDEN: -- methods? 5 MR. MUDRINICH: The methods are different 6 but the concept is the same, and it's mass appraisal. 7 Like, I better -- because managed timberlands discount 8 true and actual value anyhow, that's just basically 9 coming up with a formula to get a preferred value. 10 Coal is easier to explain. They've got a 11 reserve model that determines what the quality of the 12 coal is. And good coal might be \$500 an acre. Bad coal 13 may be \$5 an acre. Intermediate coal may be \$100 an 14 acre. And that's based on the known geology and all 15 that. It's put into a mass appraisal system that way. 16 COMMISSIONER WORDEN: Okay. 17 MR. GRIFFITH: And we think -- this is my 18 personal opinion -- I think it's a rule, I don't know if 19 you can make an argument for Marcellus wells that you 20 don't -- you can make a better argument for Marcellus 21 wells than conventional wells, or coal, for a nonmass 22 appraisal model. Because you're talking about 2,200 23 wells statewide. Whereas you're talking about tens of 24 millions of tens of coal statewide, hundreds of

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1 thousands of conventional wells. You could make an 2 argument that -- I know the Tax Department has budget 3 issues, I completely understand that. I think they 4 would be a little more able to address the Marcellus 5 wells on a well-by-well basis than the other ones. I 6 understand that from some of the other arguments they've 7 made. 8 COMMISSIONER ROGERS: But the Marcellus is 9 just starting, it's not -- 10 MR. GRIFFITH: Yeah. 11 COMMISSIONER ROGERS: It's not to its end 12 point, as far as how many wells will actually be, 13 eventually. 14 MR. GRIFFITH: That's true. Yeah, that's 15 true. We'll see how many more get drilled. 16 MR. MUDRINICH: And the Utica and the 17 Rogersville. Rogersville is coming. 18 COMMISSIONER ROGERS: Right. So we'll be 19 adding those. 20 COMMISSIONER WORDEN: So this would refer 21 back to the managed timberland. When a property owner 22 sells timber, where is the end point of sale for the 23 value of that timber? Is it at the value at the land 24 when the trees are removed? Or is it when the cabinet	1 is sold at the hardware store or home improvement store? 2 MR. MUDRINICH: Well, for selling timber, 3 it's not the same as managed timberlands. The tax 4 preference thing is based on how much -- what the soil 5 is like, anticipate how much timber you'd get off of it 6 in 80 years. 7 COMMISSIONER WORDEN: But if a property 8 owners sells \$10,000 worth of timber off his land, he's 9 taxed on that 10,000, right? 10 COUNTY ASSESSOR MOSSER: Not county taxes, 11 no. 12 MR. GRIFFITH: Are we talking severance tax 13 here? Or are you talking property tax? 14 COMMISSIONER WORDEN: I'm trying to get the 15 end point of sale. 16 MR. GRIFFITH: Yeah. 17 Jan, you'll recall this. 18 I worked -- I was a tax commissioner, so I 19 know Jan well. We had a case, remember the timber case, 20 severance case, kiln-dried lumber. 21 MR. MUDRINICH: Yeah. 22 MR. GRIFFITH: And the question -- and that 23 was a major point of this case. 24 It was a severance tax case, correct?
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1 MR. MUDRINICH: It was severance tax. But 2 you see they, where they -- because we used to have the 3 tax on the privilege of severing the timber, by its own 4 terms, excluded the value at -- some of the value added 5 outside, turning it into -- 6 MR. GRIFFITH: There were safe harbors, 7 there were percentages they could use if, for instance, 8 if they sold it at the floor, they would be taxed on 9 100 percent of the value. But if they were moving it 10 down the line a little bit, they would get a little bit 11 of that taken off to account for the fact that they were 12 incurring additional expense. And then -- but it cut 13 off at some point where there was no longer a safe 14 harbor for kiln dry. So they were adding this expense, 15 and they were getting taxed on that. And they didn't 16 like that very well. And they lost because the 17 legislative rule said what it said. 18 MR. MUDRINICH: Then the legislature 19 removed the severance tax off timber, with the exception 20 of a little bit for Workers' Comp. 21 MR. GRIFFITH: Yeah. 22 MR. LEE: Do I have any motion? 23 COMMISSIONER ROGERS: The question is: Do 24 we want to go ahead and hear the last one and then come	1 back and finish up? 2 COMMISSIONER WORDEN: Do we have another 3 one? 4 COUNTY ASSESSOR MOSSER: Mr. Langford. 5 MR. GRIFFITH: Appreciate your time. Thank 6 you. 7 * * * 8 (Whereupon, this proceeding was concluded 9 at 4:15 p.m.) 10 * * *

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1 THE STATE OF :
2 WEST VIRGINIA :
3 : SS: CERTIFICATE
4 COUNTY OF OHIO :

5 I, CONNIE M. NICHOLS, Registered Professional
6 Reporter and Notary Public within and for the State of
7 West Virginia, duly commissioned and qualified, do
8 hereby certify that the witnesses herein were first duly
9 sworn to testify to the truth, the whole truth and
10 nothing but the truth in the cause aforesaid; and the
11 testimony then given by the witnesses was by me reduced
12 to stenotype; afterwards reduced to Computer Aided
13 Transcription under my direction and control; that the
14 foregoing is a true and correct transcription of the
15 proceedings.

16 I do further certify that these proceedings
17 were taken at the time and place in the foregoing
18 caption specified, and were completed.

19 I do further certify that I am not a relative,
20 counsel or attorney of either party, or otherwise
21 interested in the event of this action.

22 I, to the best of my ability, do further
23 certify that the attached transcript meets the
24 requirements set forth within Article 27, Chapter 47 of
the West Virginia Code.

IN WITNESS THEREOF, I have hereunto set my
hand and affixed my seal of office at Wheeling,
West Virginia, on the 10th day of March, 2017.



Connie M. Nichols

CONNIE M. NICHOLS, RPR
Notary Public within and for
the State of West Virginia

My commission expires:
October 16, 2021

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January 19, 2017

VIA FACSIMILE/CERTIFIED MAIL TO FOLLOW

Tracy McDonald
Clerk of the Ritchie County Commission
115 East Main Street, Room 201
Harrisville, West Virginia 26326

Re: Antero Resources Corporation
Notice of Protest and Election to have matter heard by the Board of Equalization and
Review Tax Year 2017

Dear Ms. McDonald:

This firm serves as West Virginia tax counsel to Antero Resources Corporation ("Antero"). Attached for filing on behalf of Antero please find the company's Tax Year 2017 Notice of Protest and Election to have matter heard by the Board of Equalization and Review. Antero is filing protests in Doddridge, Harrison, Ritchie and Tyler counties. If coordination of hearings among the four counties is feasible, it would be appreciated greatly. Due to the complexity of the matter, we request a hearing time of no less than 60 minutes to allow for all testimony to be presented. If possible, please avoid scheduling the hearings for February 21, 2017 through February 23, 2017.

Please contact me if you have any questions regarding this matter or if any further information or actions is required to lodge this appeal and secure a hearing date in February.

A copy of this filing is also being provided to the Assessor and to the Tax Commissioner as indicated below:

Tracy McDonald
January 19, 2017
Page 2

Thank you for your assistance.

Very truly yours,
Stepbe & Johnson PLLC


Craig A. Griffith

CC: Arlene Mossor
Dale Steager
Jeff Amburgey
Jan Mudrinich
Todd Workman
Kirsten Evans
Nancy Sitton
Elizabeth Burg



Antero Resources
1615 Wynkoop Street
Denver, CO 80202
Office 303.357.7310
Fax 303.357.7315

January 20, 2017

VIA FACSIMILE/CERTIFIED MAIL TO FOLLOW

Tracy McDonald
Clerk of the Ritchie County Commission
115 East Main Street, Room 201
Harrisville, WV 26326

Re: Antero Resources Corporation
Notice of Protest and Election to have matter heard by the Board of Equalization and Review
Tax Year 2017

Dear Ms. McDonald:

In accordance with W.Va. Code §§ 11-3-23a, 11-3-24 and 11-6K-6, Antero Resources Corporation hereby protests the assessment of its property identified on the attached spreadsheet.

Generally stated, the primary reason for Antero Resources Corporation's filing of this notice of protest is that the assessments of the properties at issue do not reflect the true and actual value of the properties due to the use of inaccurate operating expenses. The Property Tax Division uses an outdated average operating expense that does not represent actual operating expenses for Antero, or the industry as a whole. Furthermore, they are unlawfully applying a maximum operating expense in their value calculation. These two issues combined results in an appraised value that significantly understates actual operating expenses incurred and as a result, the assessed value for the wells is significantly overstated.

Antero Resources Corporation reserves the right to raise additional grounds during the appeal process, including, but not limited to, the ground that the assessment of the properties at issue are not based on the fair market value of the properties. Please note that with respect to each property identified on the attached spreadsheet, the State Appraised Value, the Taxpayer's Value and the Value the Taxpayer Believes to be in Controversy are all indicated.

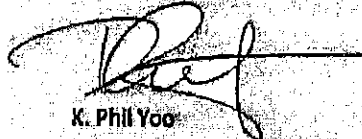
January 20, 2017
Page 2

Ms. McDonald

Furthermore, please be advised that Antero Resources Corporation elects to have this matter heard in February of 2017 when the County Commission sits as the Board of Equalization and Review.

A copy of this letter is also being provided to the County Assessor and State Tax Commissioner.

Best regards,
Antero Resources Corporation



K. Phil Yoo
Vice President of Accounting and Chief
Accounting Officer

CC: Ariene Mossor
Dale Steagen
Jeff Amburgey
Jan Mudrinich
Todd Workman
Kirsten Evans
Nancy Sittom
Elizabeth Burg

Antero Resources Corporation
Tax Year 7/1/18 - 6/30/19
Richie County, WV

Accounts #	# of Wells	API#	API# for Second Well (if applicable)	Property Description	State Appraised Value	Taxpayer Value	Value the Taxpayer Believes to be in Controversy
1020149960	1	085-09960		NICHOLSON UNIT 2H (102074)	1,618,803	871,317	745,288
1020150002	1	085-10002		KUHN UNIT 1H (10724.1)	1,525,487	848,280	697,227
1010150023	1	085-10023		CONSTABLE UNIT 1H (10326)	3,764,692	1,713,697	1,050,333
1020159961	1	085-09961		NICHOLSON UNIT 1H (10267)	1,310,944	505,068	615,939
1010159964	1	085-09964		O'HEIL UNIT 1H (10275.1)	1,987,315	1,037,112	930,203
1020159986	1	085-09986		O'HEIL UNIT 2H (10276.1)	1,483,711	788,374	695,337
1020159970	1	085-09970		PRUNTY UNIT 1H (10268.1)	2,954,601	1,742,708	1,111,893
1010159978	1	085-09978		PULLMAN UNIT 2H (10361.1)	1,158,720	611,602	545,118
1010160005	1	085-10005		RELAND UNIT 1H (10738.1)	5,711,251	2,279,973	3,311,279
1020160017	1	085-10017		ALLSTATE UNIT 1H (10424.1)	2,887,050	1,315,202	1,561,748
1020160019	1	085-10019		MCCABE UNIT 3H (16423.1)	4,620,823	2,035,284	2,585,549
1020160048	1	085-10048		LINGFORD UNIT 2H (10368.1)	8,472,297	2,359,873	5,118,424
1020160046	1	085-10046		RUFUS UNIT 1H (10298.1)	8,636,376	3,447,349	5,189,027
1020168996	1	085-09996		SNOODGRASS UNIT 1H (10535)	3,418,033	1,581,441	1,834,592
1020168999	1	085-09999		DEBERBY UNIT 1H (10296.1)	6,017,811	1,585,969	3,831,842
1020170044	1	085-10044		LANDFORD UNIT 1H (10392.1)	4,721,174	2,282,017	2,439,157
1020170102	1	085-10102		DUCKWORTH UNIT 1H (10318)	1,662,098	1,445,713	1,216,388
1010170103	1	085-10103		DUCKWORTH UNIT 3H (10529)	2,107,018	1,234,640	972,378
1010170138	1	085-10138		STALNAKER UNIT 1H (10330)	1,937,025	1,144,440	792,585
1010170139	1	085-10139		STALNAKER UNIT 1H (10381)	1,824,180	1,096,905	718,055
0320150026	1	085-10026		BLANCHE UNIT 1H (10758.1)	2,382,883	1,241,480	1,041,383
0320159963	1	085-09963		ANNA UNIT 2H (10223.1)	1,247,845	784,733	468,116
0310160027	1	085-10027		BELLE UNIT 1H (10351.1)	7,104,341	3,381,083	3,813,258
0210160028	1	085-10028		BELLE UNIT 2H (10528.1)	5,423,100	2,836,968	2,786,135
0310160029	1	085-10029		BELLE UNIT 3H (10440.1)	6,930,946	3,267,124	3,663,812
0310160060	1	085-10060		HENDERSHOT UNIT 1H (10524)	5,999,210	2,887,167	3,092,049
0310160062	1	085-10062		HORNET UNIT 1H (10942.1)	7,056,688	3,653,074	4,197,823
0310160063	1	085-10063		HORNET UNIT 2H (10982.1)	6,724,801	3,185,294	3,539,467
0320160081	1	085-10081		HENDERSHOT UNIT 2H (10525)	6,406,284	3,059,376	3,221,908
0320170013	1	085-10013		CAIRO-ANNA UNIT 3HRB (105)	3,178,708	1,456,066	1,522,643
0320170041	1	085-10041		BLANCHE UNIT 3H (10442.1)	3,088,298	1,608,418	1,458,840
0320170042	1	085-10042		SCHMIDLE UNIT 1H (10689.1)	2,394,085	1,537,893	1,058,230
0320170087	1	085-10087		CHANDOS UNIT 2H (10523.1)	5,715,460	1,874,071	1,841,386
0320170082	1	085-10082		MYRTLE UNIT 2H (10938.1)	4,952,046	2,396,696	2,595,350
0120170105	1	085-10105		MULVAY UNIT 1H (10636.1)	3,587,293	1,820,982	1,756,511
0320170108	1	085-10108		MULVAY UNIT 2H (10637.1)	3,518,284	1,793,478	1,722,786
0110170145	1	085-10145		ERICSON UNIT 2H (10854.1)	6,125,229	1,881,710	3,241,519
0110170144	1	085-10144		ERICSON UNIT 3H (10898.1)	4,134,653	1,814,621	1,310,032
0310170146	1	085-10146		BOW UNIT 1H (11416.1)	2,826,828	1,511,884	1,315,144
0310170157	1	085-10157		BOW UNIT 2H (10870.1)	3,844,850	1,937,413	1,907,137
0320170163	1	085-10163		MUSGRAVE UNIT 1H (10886.1)	4,075,385	2,031,030	1,044,335
0320170164	1	085-10164		NOLAND UNIT 1H (10887.1)	1,489,783	1,363,933	1,106,260
0310170183	1	085-10183		PAIGE UNIT 1H (10869.1)	3,066,045	1,615,882	1,450,183
0320170191	1	085-10191		MUSGRAVE UNIT 2H (10889.1)	4,150,858	2,062,547	2,088,309
0310179961	1	085-09961		CAIRO-ANNA UNIT 1H (10588)	3,071,306	1,612,579	1,458,807
					178,137,150	85,551,894	92,585,258

TAB

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Craig Griffith

From: Kirsten Evans
Sent: Thursday, August 25, 2016 1:07 PM
To: Amburgey, Jeff A.
Cc: Nancy Sifton
Subject: RE: Comments
Attachments: Antero Resources Corporation 2017 TY Operating Expenses.xlsx

Jeff,

Attached please find Antero's 2015 calendar year operating expenses by well and expense type. As previously discussed, Antero reports its expenses at the well level. Also, the transportation costs provided by well reflect only utilized transportation. Antero does not push down its unutilized transportation to the well level in its reporting.

Antero's response to the 2017 tax year valuation variables, dated 8/1/16, provided the average operating expenses as a percent of revenue and the average operating expense per well for certain wells types. Please note that some of the numbers have changed based on further review of the information (see updated summary below). These updates do not change Antero's position that the State's allowance percentages should be increased and the maximum operating expense should be removed.

Well Type	Average Operating Expense as Percent of Revenue	Average Operating Expense per Well
Marcellus, Horizontal Wells	36%	\$817,000
Marcellus, Vertical Wells	73%	\$25,000
Horizontal Wells (Other than Marcellus)	47%	\$382,000
Typical Producing Wells	Operating at a loss	\$6,100

Please let me know if you have any questions.

Kirsten

From: Amburgey, Jeff A [<mailto:Jeff.A.Amburgey@wv.gov>]
Sent: Friday, August 12, 2016 10:17 AM
To: Kirsten Evans
Subject: Comments

Kirsten – Public comments on behalf of Antero Resources have been reviewed by this office. In order to evaluate your proposals we must see any and all back-up documentation. As the Final Variables are due September 1, in order to receive any consideration, I ask that this documentation be in my office by August 25.

County	NAA	AP#	Total MCF	Total Oil Receipt	Total Gas Receipt	Total Receipts	Well Type	LOE & WDE	Gathering and Compression	Processing	Transportation	Total Expenses
43	0318159639	4701705453	1,529	-	2,554	2,554	Conventional	5,853	335	0	0	5,708
08	0520105465	4701705465	1,756	-	2,822	2,822	Conventional	10,310	384	13	13	10,696
09	0518184666	4701705466	2,112	-	3,390	3,390	Conventional	7,362	437	16	16	7,835
08	0520105467	4701705467	1,497	-	2,428	2,428	Conventional	17,384	310	13	13	17,819
17	1818184652	4703304652	1,159	-	1,732	1,732	Conventional	17,384	310	13	13	17,819
17	1818184653	4703304653	3,040	-	4,888	4,888	Conventional	30,479	659	8	8	31,152
09	0520105506	4701705506	1,388	-	2,284	2,284	Conventional	4,862	287	14	14	5,171
09	0520105506	4701705506	2,434	-	3,308	3,308	Conventional	7,018	503	18	18	7,551
09	0520105531	4701705531	1,346	-	2,154	2,154	Conventional	4,963	279	10	10	5,268
09	0520105532	4701705532	2,659	-	4,174	4,174	Conventional	6,523	548	16	16	7,147
09	0520105532	4701705532	4,167	-	6,776	6,776	Conventional	17,370	862	17	17	18,192
09	0520105532	4701705532	3,126	-	4,931	4,931	Conventional	5,445	594	23	23	5,934
09	0520105532	4701705532	6,987	-	16,909	16,909	Conventional	7,154	771	21	21	7,906
17	1820105548	4703304648	783	-	1,824	1,824	Conventional	4,844	70	5	5	5,030
09	0520105548	4701705548	3,464	-	5,342	5,342	Conventional	4,511	728	18	18	5,288
09	0518185043	4701705503	1,583	-	3,832	3,832	Conventional	6,530	230	21	21	7,043
09	0520105504	4701705504	16,118	-	38,171	38,171	Conventional	5,911	2,470	234	234	10,963
09	0518185420	4701705420	2,585	-	5,857	5,857	Conventional	20,708	408	70	70	21,458
09	0520105530	4701705530	1,459	-	2,855	2,855	Conventional	5,556	220	7	7	5,788
09	0520105535	4701705535	783	-	1,210	1,210	Conventional	3,472	162	8	8	3,640
09	0518185466	4701705466	143	-	214	214	Conventional	6,690	70	0	0	6,630
09	0518185469	4701705469	63	-	184	184	Conventional	5,265	6	-	-	5,341
09	0518185500	4701705500	1,159	-	3,190	3,190	Conventional	5,172	302	-	-	5,341
09	0520105501	4701705501	61	-	259	259	Conventional	4,734	5	-	-	4,781
09	0520105502	4701705502	1,537	-	3,523	3,523	Conventional	5,433	226	55	55	5,885
09	0520105503	4701705503	187	-	441	441	Conventional	4,433	21	2	2	4,455
09	0520105504	4701705504	3,466	-	21,347	21,347	Conventional	9,570	1,518	106	106	9,777
09	0518185529	4701705529	678	-	8,059	8,059	Conventional	5,334	573	5	5	5,910
09	0518185507	4701705507	753	-	1,470	1,470	Conventional	5,310	168	5	5	5,504
09	0518185508	4701705508	996	-	1,903	1,903	Conventional	5,332	245	5	5	5,645
09	0518185520	4701705520	11,164	-	19,825	19,825	Conventional	7,177	2,490	169	169	10,075
09	0520105505	4701705505	88	-	182	182	Conventional	6,578	8	-	-	6,666
09	0618185431	4701705431	1,132	-	1,872	1,872	Conventional	7,429	257	-	-	7,886
09	0518185435	4701705435	3,612	-	6,844	6,844	Conventional	6,442	485	2	2	7,060
09	0520105516	4701705516	109	-	267	267	Conventional	5,506	18	2	2	5,641
09	0520105517	4701705517	622	-	1,510	1,510	Conventional	5,514	88	6	6	5,721
09	0520105518	4701705518	4,445	-	7,041	7,041	Conventional	4,659	340	17	17	5,068
09	0518185450	4701705450	6,234	-	14,681	14,681	Conventional	7,327	674	24	24	7,994
09	0518185451	4701705451	1,505	-	3,232	3,232	Conventional	4,403	152	10	10	4,659
09	0520105452	4701705452	3,188	-	7,848	7,848	Conventional	7,296	421	64	64	8,065
09	0520105506	4701705506	35	-	112	112	Conventional	4,885	8	3	3	4,899
09	0520105511	4701705511	35,537	-	59,007	59,007	Conventional	14,940	6,254	202	202	24,670
09	0518185514	4701705514	2,976	-	6,924	6,924	Conventional	7,729	301	25	25	8,280
09	0518185502	4701705502	176	-	451	451	Conventional	53	62	3	3	119
09	0520105503	4701705503	15,994	-	37,171	37,171	Conventional	12,452	1,706	253	253	14,588
09	0520105505	4701705505	15,850	-	39,347	39,347	Conventional	15,038	1,967	304	304	17,334
09	0600875001	4701703109	476	-	906	906	Conventional	5,085	116	5	5	5,257
09	0600875001	4701703109	1	-	1	1	Conventional	4,679	0	-	-	4,680
09	0518185448	4701704448	2,480	-	4,504	4,504	Conventional	2,655	530	30	30	3,015
09	0518185452	4701705452	2,625	-	4,125	4,125	Conventional	5,092	578	23	23	5,693
09	0518185453	4701704453	1,640	-	2,989	2,989	Conventional	2,863	362	16	16	3,294
09	0518185524	4701705524	2,139	-	3,355	3,355	Conventional	5,188	471	22	22	5,681
09	0518185471	4701704471	4,678	-	13,246	13,246	Conventional	7,984	1,189	30	30	9,900
09	0518185481	4701704481	2,420	-	7,215	7,215	Conventional	3,399	567	85	85	3,971
09	0517174932	4701704932	1,980	-	5,449	5,449	Conventional	3,919	477	-	-	4,399
09	0600875001	4701703178	901	-	2,698	2,698	Conventional	2,863	244	32	32	3,139
09	0600875002	4701703178	1,465	-	2,770	2,770	Conventional	3,565	353	22	22	3,938
09	0600875001	4701703131	1,715	-	5,087	5,087	Conventional	3,965	406	13	13	4,592
09	0600875002	4701703131	2,767	-	7,045	7,045	Conventional	5,474	669	28	28	6,192
09	0317171697	4701701697	629	-	2,045	2,045	Conventional	5,465	165	47	47	5,754
09	0300510012	4701701698	153	-	436	436	Conventional	2,526	38	-	-	2,569
09	0300510012	4701701698	159	-	471	471	Conventional	5,200	30	1	1	5,251
09	0300510012	4701701698	13	-	49	49	Conventional	2,548	30	1	1	2,651
09	0300510012	4701701698	439	-	1,704	1,704	Conventional	4,461	125	65	65	4,953

39	0420176670	4701706640	3,493	3,589,748	3,693,129	Hor. Marcellus	27,756	1,254,652	106,168	342,320	1,750,903
40	0420176671	4701706641	2,071,184	4,124,465	4,211,159	Hor. Marcellus	82,130	1,434,746	112,051	1,571,453	1,978,431
41	0930176645	4701706645	4,773	2,206,538	2,230,106	Hor. Marcellus	82,130	1,434,746	112,051	1,571,453	1,978,431
42	0930176646	4701706646	5,114	2,330,106	2,350,161	Hor. Marcellus	77,516	1,317,800	93,804	1,430,444	1,790,444
43	0930176647	4701706647	58,131	3,851,870	3,950,161	Hor. Marcellus	517,593	3,517,986	201,547	3,819,444	4,719,444
44	0705020159	4705020159	51,082	4,400,408	4,492,356	Hor. Marcellus	918,235	4,141,179	91,904	4,333,553	5,164,739
45	4705020158	4705020158	27,533	4,004,432	4,097,356	Hor. Marcellus	61,064	605,633	86,683	934,558	1,164,739
46	0705020157	4705020157	26,457	3,776,744	3,802,901	Hor. Marcellus	56,442	572,814	88,245	1,095,355	1,377,719
47	4705020156	4705020156	214,145	4,333,916	4,408,063	Hor. Marcellus	30,344	294,205	375,421	1,051,334	1,381,334
48	0705020155	4705020155	3,930,729	4,530,729	4,604,968	Hor. Marcellus	48,312	278,273	188,137	380,726	355,683
49	0705020154	4705020154	39,342	1,005,127	1,044,444	Hor. Marcellus	2,122	27,618	74,712	251,482	266,732
50	0705020153	4705020153	74,605	581,962	632,775	Hor. Marcellus	1,159	9,459	27,183	104,937	130,333
51	0705020152	4705020152	19,384	2,201,598	2,303,160	Hor. Marcellus	2,159	58,368	140,031	246,395	293,594
52	0705020151	4705020151	130,641	2,201,598	2,303,160	Hor. Marcellus	27,381	131,827	120,939	214,405	255,552
53	0705020150	4705020150	167,160	2,201,598	2,303,160	Hor. Marcellus	138,085	138,376	234,905	581,900	681,900
54	0705020149	4705020149	42,438	4,016,258	4,078,648	Hor. Marcellus	60,432	655,996	91,536	381,446	418,413
55	0705020148	4705020148	80,411	4,021,086	4,102,151	Hor. Marcellus	60,432	655,996	91,536	381,446	418,413
56	0705020147	4705020147	80,411	4,021,086	4,102,151	Hor. Marcellus	60,432	655,996	91,536	381,446	418,413
57	0705020146	4705020146	221,016	3,956,178	4,104,764	Hor. Marcellus	62,728	138,358	167,761	234,467	284,467
58	0705020145	4705020145	108,152	2,019,086	2,186,614	Hor. Marcellus	12,491	149,252	164,946	242,481	284,467
59	0705020144	4705020144	165,619	1,828,169	1,981,552	Hor. Marcellus	12,491	149,252	164,946	242,481	284,467
60	0705020143	4705020143	153,784	2,221,703	2,397,669	Hor. Marcellus	4,087	149,252	164,946	242,481	284,467
61	0705020142	4705020142	148,460	1,870,038	1,979,669	Hor. Marcellus	36,350	217,291	217,291	305,219	305,219
62	0705020141	4705020141	238,207	3,251,044	3,501,578	Hor. Marcellus	33,133	216,080	247,105	317,637	317,637
63	0705020140	4705020140	238,207	3,251,044	3,501,578	Hor. Marcellus	33,133	216,080	247,105	317,637	317,637
64	0705020139	4705020139	221,016	4,259,538	4,404,604	Hor. Marcellus	43,785	249,342	531,077	314,038	314,038
65	0705020138	4705020138	139,246	3,956,529	4,200,951	Hor. Marcellus	37,353	249,342	354,553	354,553	354,553
66	0705020137	4705020137	139,246	3,956,529	4,200,951	Hor. Marcellus	37,353	249,342	354,553	354,553	354,553
67	0705020136	4705020136	139,246	3,956,529	4,200,951	Hor. Marcellus	37,353	249,342	354,553	354,553	354,553
68	0705020135	4705020135	139,246	3,956,529	4,200,951	Hor. Marcellus	37,353	249,342	354,553	354,553	354,553
69	0705020134	4705020134	139,246	3,956,529	4,200,951	Hor. Marcellus	37,353	249,342	354,553	354,553	354,553
70	0705020133	4705020133	139,246	3,956,529	4,200,951	Hor. Marcellus	37,353	249,342	354,553	354,553	354,553
71	0705020132	4705020132	139,246	3,956,529	4,200,951	Hor. Marcellus	37,353	249,342	354,553	354,553	354,553
72	0705020131	4705020131	139,246	3,956,529	4,200,951	Hor. Marcellus	37,353	249,342	354,553	354,553	354,553
73	0705020130	4705020130	139,246	3,956,529	4,200,951	Hor. Marcellus	37,353	249,342	354,553	354,553	354,553
74	0705020129	4705020129	139,246	3,956,529	4,200,951	Hor. Marcellus	37,353	249,342	354,553	354,553	354,553
75	0705020128	4705020128	139,246	3,956,529	4,200,951	Hor. Marcellus	37,353	249,342	354,553	354,553	354,553
76	0705020127	4705020127	139,246	3,956,529	4,200,951	Hor. Marcellus	37,353	249,342	354,553	354,553	354,553
77	0705020126	4705020126	139,246	3,956,529	4,200,951	Hor. Marcellus	37,353	249,342	354,553	354,553	354,553
78	0705020125	4705020125	139,246	3,956,529	4,200,951	Hor. Marcellus	37,353	249,342	354,553	354,553	354,553
79	0705020124	4705020124	139,246	3,956,529	4,200,951	Hor. Marcellus	37,353	249,342	354,553	354,553	354,553
80	0705020123	4705020123	139,246	3,956,529	4,200,951	Hor. Marcellus	37,353	249,342	354,553	354,553	354,553
81	0705020122	4705020122	139,246	3,956,529	4,200,951	Hor. Marcellus	37,353	249,342	354,553	354,553	354,553
82	0705020121	4705020121	139,246	3,956,529	4,200,951	Hor. Marcellus	37,353	249,342	354,553	354,553	354,553
83	0705020120	4705020120	139,246	3,956,529	4,200,951	Hor. Marcellus	37,353	249,342	354,553	354,553	354,553
84	0705020119	4705020119	139,246	3,956,529	4,200,951	Hor. Marcellus	37,353	249,342	354,553	354,553	354,553
85	0705020118	4705020118	139,246	3,956,529	4,200,951	Hor. Marcellus	37,353	249,342	354,553	354,553	354,553
86	0705020117	4705020117	139,246	3,956,529	4,200,951	Hor. Marcellus	37,353	249,342	354,553	354,553	354,553
87	0705020116	4705020116	139,246	3,956,529	4,200,951	Hor. Marcellus	37,353	249,342	354,553	354,553	354,553
88	0705020115	4705020115	139,246	3,956,529	4,200,951	Hor. Marcellus	37,353	249,342	354,553	354,553	354,553
89	0705020114	4705020114	139,246	3,956,529	4,200,951	Hor. Marcellus	37,353	249,342	354,553	354,553	354,553
90	0705020113	4705020113	139,246	3,956,529	4,200,951	Hor. Marcellus	37,353	249,342	354,553	354,553	354,553
91	0705020112	4705020112	139,246	3,956,529	4,200,951	Hor. Marcellus	37,353	249,342	354,553	354,553	354,553
92	0705020111	4705020111	139,246	3,956,529	4,200,951	Hor. Marcellus	37,353	249,342	354,553	354,553	354,553
93	0705020110	4705020110	139,246	3,956,529	4,200,951	Hor. Marcellus	37,353	249,342	354,553	354,553	354,553
94	0705020109	4705020109	139,246	3,956,529	4,200,951	Hor. Marcellus	37,353	249,342	354,553	354,553	354,553
95	0705020108	4705020108	139,246	3,956,529	4,200,951	Hor. Marcellus	37,353	249,342	354,553	354,553	354,553
96	0705020107	4705020107	139,246	3,956,529	4,200,951	Hor. Marcellus	37,353	249,342	354,553	354,553	354,553
97	0705020106	4705020106	139,246	3,956,529	4,200,951	Hor. Marcellus	37,353	249,342	354,553	354,553	354,553
98	0705020105	4705020105	139,246	3,956,529	4,200,951	Hor. Marcellus	37,353	249,342	354,553	354,553	354,553
99	0705020104	4705020104	139,246	3,956,529	4,200,951	Hor. Marcellus	37,353	249,342	354,553	354,553	354,553
100	0705020103	4705020103	139,246	3,956,529	4,200,951	Hor. Marcellus	37,353	249,342	354,553	354,553	354,553

17	0720124357	4703305358	245,328	-	493,089	439,069	Hor. Marcellus	127,015	6,170	108,275	775,685
17	0720124358	4703305359	541,457	-	1,089,453	1,089,463	Hor. Marcellus	261,746	13,476	198,254	549,608
17	1420123561	4703305361	372,775	-	730,493	730,503	Hor. Marcellus	194,017	9,207	154,765	383,334
17	1820125303	4703305362	327,448	-	680,304	680,314	Hor. Marcellus	172,464	7,436	114,403	305,805
17	1420123566	4703305363	441,143	-	880,304	880,314	Hor. Marcellus	228,874	11,388	199,090	483,405
17	0720123567	4703305364	315,802	-	630,105	630,115	Hor. Marcellus	163,347	8,143	139,922	318,371
17	1420123568	4703305365	300,667	-	627,453	627,463	Hor. Marcellus	158,280	7,824	137,897	340,340
17	0720123569	4703305366	470,618	-	943,909	943,919	Hor. Marcellus	244,415	12,027	206,676	486,188
17	0720123570	4703305367	708,298	-	1,414,850	1,414,860	Hor. Marcellus	366,120	17,513	310,258	715,505
17	1820123582	4703305368	545,116	-	1,157,480	1,157,490	Hor. Marcellus	288,460	12,286	189,344	523,796
17	1810123589	4703305369	478,858	-	1,094,582	1,094,592	Hor. Marcellus	27,380	10,579	178,131	466,276
17	0720124551	4703305370	682,783	-	1,371,328	1,371,338	Hor. Marcellus	15,835	354,736	299,638	687,335
17	0720124552	4703305371	574,695	-	1,160,321	1,160,331	Hor. Marcellus	17,421	299,054	253,547	585,029
17	0720124553	4703305372	913,072	-	1,848,165	1,848,175	Hor. Marcellus	25,662	474,343	431,340	928,951
17	1820124554	4703305373	577,194	-	1,225,722	1,225,732	Hor. Marcellus	50,111	302,766	202,692	566,229
17	1820123591	4703305374	657,659	-	1,405,143	1,405,153	Hor. Marcellus	348,877	14,877	294,584	640,289
17	0720123597	4703305375	375,456	-	656,080	656,090	Hor. Marcellus	321,153	6,218	148,761	353,838
17	1420123584	4703305376	438,168	-	1,057,346	1,057,356	Hor. Marcellus	24,449	227,889	594,145	594,145
17	1420123587	4703305377	488,022	-	984,965	984,975	Hor. Marcellus	253,854	12,552	215,449	501,330
17	1420123588	4703305378	423,791	-	848,766	848,776	Hor. Marcellus	219,397	10,740	186,066	435,878
17	0720123590	4703305379	361,875	-	734,514	734,524	Hor. Marcellus	188,872	9,381	180,774	458,947
17	0720123591	4703305380	461,545	-	915,120	915,130	Hor. Marcellus	25,305	11,619	232,601	585,232
17	0720123592	4703305381	306,467	-	642,505	642,515	Hor. Marcellus	219,735	6,617	107,719	292,789
17	1820123593	4703305382	574,608	-	1,230,722	1,230,732	Hor. Marcellus	161,516	13,536	204,132	555,309
17	1820123594	4703305383	567,709	-	1,208,334	1,208,344	Hor. Marcellus	300,205	11,170	297,094	646,211
17	1420123595	4703305384	447,501	-	893,706	893,716	Hor. Marcellus	292,734	11,319	257,994	655,432
17	0820123548	4703305385	421,978	-	846,590	846,600	Hor. Marcellus	27,539	10,857	185,346	442,882
17	0720123549	4703305386	431,768	-	861,701	861,711	Hor. Marcellus	213,142	9,789	150,941	416,098
17	1820123550	4703305387	429,341	-	905,515	905,525	Hor. Marcellus	225,511	9,638	170,845	391,020
17	0720123551	4703305388	392,144	-	780,314	780,324	Hor. Marcellus	159,883	16,618	187,232	674,302
17	0720123552	4703305389	641,793	-	1,313,007	1,313,017	Hor. Marcellus	335,689	14,760	253,625	591,276
17	0720123553	4703305390	567,697	-	1,168,589	1,168,599	Hor. Marcellus	297,093	16,312	272,855	659,455
17	1420123554	4703305391	616,894	-	1,247,331	1,247,341	Hor. Marcellus	321,062	4,471	77,048	234,512
17	0720123555	4703305392	173,333	-	348,570	348,580	Hor. Marcellus	50,489	12,441	206,872	487,767
17	0720123556	4703305393	473,170	-	948,517	948,527	Hor. Marcellus	22,777	245,676	206,872	487,767
17	0720123557	4703305394	632,186	-	1,287,138	1,287,148	Hor. Marcellus	29,716	15,940	282,336	658,380
17	1420123558	4703305395	576,595	-	1,168,154	1,168,164	Hor. Marcellus	300,121	15,432	255,055	607,841
17	0720123559	4703305396	653,115	-	1,338,664	1,338,674	Hor. Marcellus	14,832	16,564	293,388	666,951
17	0720123560	4703305397	737,759	-	1,513,427	1,513,437	Hor. Marcellus	342,167	16,544	381,803	764,710
17	1420123561	4703305398	520,758	-	1,032,591	1,032,601	Hor. Marcellus	386,589	15,723	285,030	548,062
17	2020123566	4703305399	484,280	-	942,825	942,835	Hor. Marcellus	224,533	11,872	197,713	493,286
17	2020123567	4703305400	646,491	-	1,315,902	1,315,912	Hor. Marcellus	224,533	14,840	248,892	562,900
17	2020123568	4703305401	452,716	-	934,222	934,232	Hor. Marcellus	233,622	13,315	205,539	468,159
17	2020123569	4703305402	499,608	-	1,024,339	1,024,349	Hor. Marcellus	14,594	256,872	224,805	509,401
17	2020123570	4703305403	335,323	-	735,561	735,571	Hor. Marcellus	183,431	9,244	151,774	367,518
17	2020123571	4703305404	535,765	-	1,153,139	1,153,149	Hor. Marcellus	12,645	15,096	151,516	567,485
17	2020123572	4703305405	645,025	-	1,342,801	1,342,811	Hor. Marcellus	289,219	17,602	283,358	683,684
17	1820123573	4703305406	725,838	-	1,515,975	1,515,985	Hor. Marcellus	337,835	17,602	283,358	683,684
17	1820123574	4703305407	683,630	-	1,377,676	1,377,686	Hor. Marcellus	347,342	17,683	302,270	699,147
17	1820123575	4703305408	146,548	-	306,769	306,779	Hor. Marcellus	14,651	29,592	93,940	784,422
17	2020123576	4703305409	650,683	-	1,351,844	1,351,854	Hor. Marcellus	78,752	4,277	66,765	162,511
17	2020123577	4703305410	533,677	-	1,107,666	1,107,676	Hor. Marcellus	340,134	17,683	286,292	668,300
17	0720123578	4703305411	744,479	-	1,512,906	1,512,916	Hor. Marcellus	278,078	14,590	242,608	550,659
17	0720123579	4703305412	512,531	-	1,022,758	1,022,768	Hor. Marcellus	344,383	14,578	332,384	789,103
17	0720123580	4703305413	522,352	-	1,045,985	1,045,995	Hor. Marcellus	265,417	13,082	223,918	534,682
17	1820123581	4703305414	576,457	-	1,101,811	1,101,821	Hor. Marcellus	277,329	11,462	227,859	594,629
17	2020123582	4703305415	306,352	-	639,210	639,220	Hor. Marcellus	15,517	8,430	140,088	323,287
17	2020123583	4703305416	620,085	-	1,291,500	1,291,510	Hor. Marcellus	15,562	16,735	263,219	651,919
17	2020123584	4703305417	560,857	-	1,123,151	1,123,161	Hor. Marcellus	320,827	14,874	245,142	574,659
17	0720123585	4703305418	628,697	-	1,297,784	1,297,794	Hor. Marcellus	325,489	16,463	224,766	631,111
17	0720123586	4703305419	746,108	-	1,508,074	1,508,084	Hor. Marcellus	297,304	13,772	224,014	784,750
17	0720123587	4703305420	437,850	-	890,445	890,455	Hor. Marcellus	225,360	11,084	94,798	467,291
17	0720123588	4703305421	651,106	-	1,342,128	1,342,138	Hor. Marcellus	20,548	17,759	294,205	661,090
17	2020123589	4703305422	689,692	-	1,412,980	1,412,990	Hor. Marcellus	339,723	13,282	310,301	717,387
17	2020123590	4703305423	1,159,159	-	2,404,241	2,404,251	Hor. Marcellus	15,522	32,484	525,251	1,177,510
17	1820123591	4703305424	570,741	-	1,214,143	1,214,153	Hor. Marcellus	302,381	12,734	289,126	569,211
17	1820123592	4703305425	634,634	-	1,336,577	1,336,587	Hor. Marcellus	334,351	24,143	223,248	620,578

[illegible]

03	0320156255	4701706255	677,383	5,367	1,467,577	1,476,944	Hor. Marcellus	28,355	219,926	59,811	136,177	459,069
03	0320156256	4701706256	689,216	9,664	1,507,120	1,515,784	Hor. Marcellus	148,753	226,134	60,100	136,177	461,692
03	0420156257	4701706257	1,678,989	3,195	3,726,534	3,727,729	Hor. Marcellus	339,893	1,110,184	148,421	172,617	1,726,187
03	0420156258	4701706258	1,365,260	57,343	2,655,249	2,716,593	Hor. Marcellus	68,435	357,405	106,915	257,548	816,433
09	0320156259	4701706259	1,896,760	181,404	4,862,627	5,047,031	Hor. Marcellus	116,796	354,203	436,915	1,342,276	1,342,276
09	0320156260	4701706260	97,942	1,724,981	2,511,914	2,594,856	Hor. Marcellus	139,442	204,550	99,888	255,657	689,487
09	0320156261	4701706261	166,176	1,571,278	2,506,648	2,569,024	Hor. Marcellus	91,171	598,146	427,778	456,457	1,574,341
09	0320156262	4701706262	4,166	1,134,273	2,541,666	2,545,065	Hor. Marcellus	57,432	755,848	116,527	240,069	1,169,024
09	0320156263	4701706263	100	1,589,497	3,460,854	3,480,554	Hor. Marcellus	64,345	1,062,581	152,574	326,699	1,605,399
09	0420156264	4701706264	85	1,589,497	2,789,125	2,793,210	Hor. Marcellus	62,853	853,511	124,853	258,327	1,269,324
09	0420156265	4701706265	66	1,589,497	2,235,065	2,237,531	Hor. Marcellus	65,492	675,640	98,151	209,512	1,062,786
09	0420156266	4701706266	7,319	1,021,348	2,530,190	2,537,219	Hor. Marcellus	98,836	785,106	111,725	234,383	1,229,680
09	0420156267	4701706267	6,644	1,021,348	2,271,977	2,274,922	Hor. Marcellus	97,311	672,321	689,338	460,268	1,067,952
09	0420156268	4701706268	418,726	1,857,079	3,511,094	3,529,781	Hor. Marcellus	125,305	171,644	70,666	146,672	1,446,755
43	0320156269	4701706269	699,140	2,723	1,542,105	1,544,361	Hor. Marcellus	32,320	461,331	58,179	132,027	710,089
09	0420156270	4701706270	1,440,334	2,006,199	2,009,002	2,009,002	Hor. Marcellus	32,308	610,362	80,702	167,308	518,679
09	0420156271	4701706271	245,478	3,181,037	2,744,878	2,744,878	Hor. Marcellus	116,824	246,286	194,834	309,466	866,412
09	0420156272	4701706272	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156273	470305723	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156274	470305724	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156275	470305725	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156276	470305726	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156277	470305727	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156278	470305728	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156279	470305729	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156280	470305730	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156281	470305731	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156282	470305732	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156283	470305733	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156284	470305734	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156285	470305735	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156286	470305736	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156287	470305737	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156288	470305738	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156289	470305739	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156290	470305740	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156291	470305741	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156292	470305742	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156293	470305743	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156294	470305744	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156295	470305745	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156296	470305746	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156297	470305747	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156298	470305748	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156299	470305749	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156300	470305750	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156301	470305751	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156302	470305752	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156303	470305753	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156304	470305754	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156305	470305755	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156306	470305756	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156307	470305757	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156308	470305758	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156309	470305759	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156310	470305760	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156311	470305761	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156312	470305762	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156313	470305763	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156314	470305764	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156315	470305765	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156316	470305766	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156317	470305767	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156318	470305768	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156319	470305769	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156320	470305770	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156321	470305771	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156322	470305772	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156323	470305773	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156324	470305774	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156325	470305775	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156326	470305776	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156327	470305777	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156328	470305778	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,409,110
17	1820156329	470305779	1,783	3,716,725	3,716,725	3,716,725	Hor. Marcellus	183,304	654,192	322,306	746,568	1,4

03	0120165283	4701706283	825,093	153,456	2,395,397	2,452,782	Hor. Marcellus	23,467	137,944	239,510	260,303	601,224
03	0120165289	4701706289	851,051	165,415	2,700,574	2,967,988	Hor. Marcellus	36,375	148,411	322,137	331,828	733,751
03	0120165294	4701706294	1,093,600	169,081	2,847,232	2,796,293	Hor. Marcellus	20,933	184,565	194,113	243,789	641,244
03	0220165316	4701706316	36,274	3,476,688	3,512,771	3,512,771	Hor. Marcellus	67,528	511,280	114,615	345,678	1,039,073
03	0220165318	4701706318	630,509	24,132	1,795,390	1,778,482	Hor. Marcellus	55,587	390,640	45,676	177,137	589,110
03	0220165319	4701706319	958,729	5,351,345	5,351,345	5,351,345	Hor. Marcellus	106,640	387,154	666,773	449,137	1,362,750
03	0220165323	4701706323	909,566	16,701	2,084,526	2,105,227	Hor. Marcellus	104,466	304,466	104,466	205,023	671,377
03	0220165327	4701706327	1,127,772	7,546	2,537,559	2,565,666	Hor. Marcellus	61,275	386,567	111,690	239,898	785,430
03	0220165328	4701706328	854,914	18,209	1,940,554	1,951,663	Hor. Marcellus	60,768	253,069	94,133	189,056	597,826
03	0220165344	4701706344	678,685	14,895	1,548,048	1,569,949	Hor. Marcellus	60,707	205,513	74,530	150,338	485,788
03	0220165445	4701706445	1,477,452	3,298	3,498,157	3,412,497	Hor. Marcellus	59,069	988,314	172,788	322,749	1,587,886
03	0220165359	4701706359	2,394,449	128,780	3,450,459	3,450,459	Hor. Marcellus	113,500	771,447	245,728	593,732	1,486,022
03	0220165394	4701706394	1,731,435	12,264	4,084,539	4,096,808	Hor. Marcellus	107,818	470,381	151,355	385,531	1,144,985
03	0220165404	4701706404	1,134,214	182,516	2,660,516	2,660,516	Hor. Marcellus	184,104	154,678	207,107	264,984	784,854
03	0420165422	4701706422	2,391,388	1,670	5,775,271	5,777,440	Hor. Marcellus	74,983	1,793,109	277,280	344,487	2,628,834
03	0420165435	4701706435	1,293,698	1,725	4,514,562	4,515,657	Hor. Marcellus	72,865	1,346,582	214,157	417,686	2,050,066
03	0420165443	4701706443	2,671,176	44,204	6,244,755	6,268,859	Hor. Marcellus	97,810	719,015	283,765	587,882	1,688,552
03	0420165454	4701706454	1,749,957	1,178	3,813,444	3,814,723	Hor. Marcellus	78,255	1,176,576	196,770	356,836	1,808,376
03	0420165464	4701706464	2,298,777	1,679	5,137,033	5,139,502	Hor. Marcellus	78,153	1,536,479	250,321	488,061	2,342,015
03	0420165490	4701706490	4,615	3,493,759	3,496,725	3,496,725	Hor. Marcellus	84,728	1,494,432	289,448	595,591	2,845,380
03	0420165512	4701706512	115	3,459,705	3,459,705	3,459,705	Hor. Marcellus	70,983	1,152,615	194,355	356,361	1,774,494
03	0420165518	4701706518	119	3,459,705	3,459,705	3,459,705	Hor. Marcellus	82,466	1,081,744	189,908	319,286	1,590,696
03	0420165520	4701706520	939,288	1,504	2,047,456	2,049,865	Hor. Marcellus	82,466	216,333	89,243	184,534	572,567
03	0420165539	4701706539	1,341,423	56,186	3,143,744	3,149,390	Hor. Marcellus	59,236	217,890	145,821	258,132	721,079
03	0420165602	4701706602	1,891,114	107,249	4,578,256	4,685,469	Hor. Marcellus	55,940	364,439	319,954	420,980	1,162,313
03	0420165630	4701706630	70,297	2,943,085	2,943,085	2,943,085	Hor. Marcellus	91,119	170,639	228,872	262,547	753,171
03	0420165641	4701706641	1,085,125	2,693,223	2,693,223	2,693,223	Hor. Marcellus	95,465	165,545	247,780	250,734	759,653
03	0420165642	4701706642	1,231,573	59,338	3,194,505	3,194,505	Hor. Marcellus	91,170	186,676	260,775	284,883	822,651
03	0420165643	4701706643	1,615,474	180,456	4,912,080	4,912,080	Hor. Marcellus	126,809	298,149	589,150	895,393	1,329,038
03	0420165644	4701706644	1,718,434	276,690	4,654,124	4,654,124	Hor. Marcellus	134,009	281,079	554,418	424,169	1,368,464
03	0420165645	4701706645	1,416,250	312,991	4,312,827	4,312,827	Hor. Marcellus	119,327	133,772	549,318	352,942	1,153,459
03	0420165646	4701706646	1,038,795	533,698	2,623,878	2,623,878	Hor. Marcellus	130,473	78,846	219,737	248,345	677,401
03	0420165647	4701706647	931,510	6,986,791	6,986,791	6,986,791	Hor. Marcellus	259,714	180,411	604,499	593,387	1,578,904
03	0420165648	4701706648	4,540	4,242,126	4,242,126	4,242,126	Hor. Marcellus	57,126	1,259,510	216,610	349,228	1,831,265
03	0420165649	4701706649	11,541	4,780,269	4,780,269	4,780,269	Hor. Marcellus	103,493	511,793	228,460	493,804	1,277,424
03	0420165650	4701706650	273,105	1,062,162	1,062,162	1,062,162	Hor. Marcellus	44,065	156,890	364,561	351,959	951,929
03	0420165651	4701706651	11,497	1,351,668	1,351,668	1,351,668	Hor. Marcellus	41,896	279,243	14,271	231,377	582,586
03	0420165652	4701706652	708,185	18	1,461,621	1,461,621	Hor. Marcellus	51,685	280,102	94,688	222,552	653,037
03	0420165653	4701706653	875,045	22	1,894,041	1,894,041	Hor. Marcellus	51,425	472,761	140,032	728,446	1,403,822
03	0420165654	4701706654	724,094	19	1,511,982	1,512,001	Hor. Marcellus	45,430	577,008	173,511	873,261	1,731,511
03	0420165655	4701706655	500,592	225,655	1,309,344	1,594,969	Hor. Marcellus	132,655	476,322	53,595	141,716	726,627
03	0420165656	4701706656	612,585	36	1,278,415	1,278,415	Hor. Marcellus	43,633	465,411	53,637	120,599	897,505
03	0420165657	4701706657	733,514	9,979	1,652,690	1,652,690	Hor. Marcellus	30,874	169,267	67,206	139,523	466,468
03	0420165658	4701706658	890,597	4,516	2,035,510	2,020,026	Hor. Marcellus	43,478	217,991	62,037	187,822	536,728
03	0420165659	4701706659	1,254,511	-	2,685,742	2,685,742	Hor. Marcellus	50,508	669,451	36,362	583,243	1,339,565
03	0420165660	4701706660	1,695,416	-	3,425,280	3,425,280	Hor. Marcellus	47,998	850,246	43,070	740,821	1,887,135
03	0420165661	4701706661	1,679,725	-	3,389,744	3,589,744	Hor. Marcellus	27,016	855,399	42,719	484,425	1,409,559
03	0420165662	4701706662	1,521,359	-	3,244,700	3,244,700	Hor. Marcellus	15,960	774,407	38,283	438,388	1,277,018
03	0420165663	4701706663	1,824,384	-	3,313,404	3,513,404	Hor. Marcellus	26,551	930,435	46,440	528,729	1,532,249
03	0420165664	4701706664	1,515,656	879,732	4,006,460	4,006,460	Hor. Marcellus	221,852	236,913	415,785	378,065	1,862,613
03	0420165665	4701706665	77,488	3,952,652	3,952,652	3,952,652	Hor. Marcellus	116,975	365,665	230,569	334,990	629,504
03	0420165666	4701706666	10,938	1,199,750	1,199,750	1,199,750	Hor. Marcellus	106,518	186,518	44,404	136,113	545,839
03	0420165667	4701706667	571,275	1,309,731	1,309,731	1,309,731	Hor. Marcellus	59,363	185,545	30,736	127,988	420,277
03	0420165668	4701706668	864,093	11,899	1,877,765	1,893,874	Hor. Marcellus	259,120	85,257	182,460	585,511	1,815,334
03	0420165669	4701706669	866,552	16,109	2,403,812	2,403,812	Hor. Marcellus	33,025	595,849	33,089	520,751	1,182,708
03	0420165670	4701706670	1,121,884	-	1,894,715	1,894,715	Hor. Marcellus	465,149	27,385	495,845	931,583	1,024,188
03	0420165671	4701706671	876,364	-	2,061,726	2,061,726	Hor. Marcellus	36,157	512,523	27,901	447,600	1,018,188
03	0420165672	4701706672	966,133	-	2,061,726	2,061,726	Hor. Marcellus	52,481	914,237	106,384	796,155	1,815,334
03	0420165673	4701706673	1,449,645	35	2,486,774	2,486,774	Hor. Marcellus	91,796	784,670	106,384	725,039	1,188,469
03	0420165674	4701706674	580,157	198,931	1,356,579	1,356,579	Hor. Marcellus	222,279	106,517	222,279	165,572	548,783

[illegible]

TAB 3

Melissa Beane

From: Nancy Sitton
Sent: Wednesday, December 07, 2016 2:48 PM
To: 'Krista.M.Lawrence@wv.gov'
Cc: 'Hoover, Cindi R'; Kirsten Evans; Elizabeth Burg
Subject: Antero Resources Corporation - TY17 Tentative Values
Attachments: Antero 7-1-16 New well support.xlsx; 2017 TY valuation variables response signed.pdf;
RE: Comments

Krista,

Please see comments below regarding Antero's TY17 tentative appraisal values.

- **Year 1 wells** – We are requesting that the appraised values reflect the actual receipts for the first twelve months rather than annualized estimates based on reported receipts for the 2015 calendar year (see attached). The actual receipts (both WI and royalty) have been provided in columns N-Q. Please note that twelve months of receipts is not yet available for some first year wells. Where twelve months of data is not available, we have also included data for these wells because 8-11 months of data (annualized) provides a more accurate estimate of receipts for the first year than 1-4 months of reported production. Please let me know if there is any additional information we can provide that will save you time in processing this request. I can provide an e-file with updated receipts if that would be helpful.
- **Operating Expenses:**
The tentative values issued reflect the State's variables for operating expenses, which are understated compared to the company's actual operating expenses and result in a total appraised value that exceeds fair market value. Antero previously addressed this concern in its response to the 2017 tax year operating expense variables (attached). Antero also provided the State with back-up documentation for its operating expense as requested in August 2016 (attached). The final valuation variables issued by the State in September 2016 included changes to certain operating expense variables but the variables continue to be understated compared to Antero's actual operating expenses. Additionally, it is our understanding that the State has reversed its long held position of considering actual operating expenses in its appraisals based on language removed from the administrative notice regarding operating expenses and the producer return. As a result, the tentative values for Antero's horizontal Marcellus wells are significantly overstated.

Please let me know if you have any questions or would like to have a call to discuss further.

Thank you,
Nancy

Nancy Sitton, CPA
Manager, State & Local Tax and Advisory, Altus Group US Inc.

D: 410.568.0771 T: 410.568.0800 ext 3771 M: 703.999.3780 F: 410.568.0801
910 Ridgebrook Road, Suite 200, Sparks, Maryland, 21152 USA



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CY	NRA Acct #	API	County	Initial Production Date	Days in Production	2015 Gas		2015 Oil Working Interest as Reported by Antero	2015 Gas Receipts as Reported by Antero	Actual Gas Working Interest for First 12 months for Available To Date if Less Than 12 Months	# of Production Days Included in Working Interest	Actual Oil Working Interest Receipts - Actual First 12 Months for Available	Gas Working Interest Receipts - Actual First 12 Months for Available	Oil Working Interest Receipts - Actual First 12 Months for Available	Gas Royalty Interest Receipts - Actual First 12 Months for Available	Oil Royalty Interest Receipts - Actual First 12 Months for Available	W %
						Receipts as Reported by Antero	2015 Gas Receipts as Reported by Antero										
43	0320170042	4708510042	Richie	12/15/2015	17	309,290	20,552	6,511,815	441,284	2,222,995	106,013	261	169,054	2,955,708	149,054	32,236	82%
43	0320170042	4708510164	Richie	12/15/2015	17	316,295	26,665	578,510	578,510	2,212,391	169,013	261	169,013	2,943,722	149,013	32,236	82%
43	0320170043	4708510164	Richie	12/14/2015	18	355,400	30,360	7,206,722	798,139	3,188,407	271,709	262	271,709	4,354,615	352,781	74,222	83%
43	0320170043	4708510161	Richie	12/14/2015	18	364,818	43,907	7,397,698	820,059	3,271,423	280,855	262	280,855	4,422,772	353,021	74,222	83%
43	0320170043	4708510139	Richie	11/27/2015	18	484,208	32,137	5,185,883	315,143	1,910,253	280,585	279	280,585	2,528,938	127,633	44,201	85%
43	0320170043	4708510138	Richie	11/23/2015	39	525,233	15,464	4,815,942	154,088	1,931,858	92,711	283	116,748	2,477,748	430,904	20,706	85%
48	0320172003	4708500203	Tyler	11/23/2015	39	704,420	35,680	6,592,549	305,851	2,844,949	139,336	283	139,336	3,463,448	704,317	31,711	85%
43	0320170042	4708500203	Richie	11/18/2015	44	830,934	32,435	6,073,896	289,063	2,942,382	197,534	288	217,840	3,134,007	667,425	48,392	82%
48	0320170042	4708500202	Tyler	11/18/2015	44	830,934	32,435	6,073,896	289,063	2,942,382	197,534	288	217,840	3,134,007	667,425	48,392	82%
43	0320170043	4708500203	Richie	11/13/2015	49	646,392	74,249	4,807,512	458,164	2,065,981	275,251	293	268,503	3,505,303	712,828	29,958	83%
48	0320172001	4708500201	Tyler	11/13/2015	49	646,392	74,249	4,807,512	458,164	2,065,981	275,251	293	268,503	3,505,303	712,828	29,958	83%
48	0320172001	4708500200	Tyler	11/13/2015	49	646,392	74,249	4,807,512	458,164	2,065,981	275,251	293	268,503	3,505,303	712,828	29,958	83%
48	0320172001	4708500201	Tyler	11/13/2015	49	646,392	74,249	4,807,512	458,164	2,065,981	275,251	293	268,503	3,505,303	712,828	29,958	83%
48	0320172001	4708500200	Tyler	11/13/2015	49	646,392	74,249	4,807,512	458,164	2,065,981	275,251	293	268,503	3,505,303	712,828	29,958	83%
48	0320172001	4708500201	Tyler	11/13/2015	49	646,392	74,249	4,807,512	458,164	2,065,981	275,251	293	268,503	3,505,303	712,828	29,958	83%
48	0320172001	4708500201	Tyler	11/13/2015	49	646,392	74,249	4,807,512	458,164	2,065,981	275,251	293	268,503	3,505,303	712,828	29,958	83%
48	0320172001	4708500201	Tyler	11/13/2015	49	646,392	74,249	4,807,512	458,164	2,065,981	275,251	293	268,503	3,505,303	712,828	29,958	83%
48	0320172001	4708500201	Tyler	11/13/2015	49	646,392	74,249	4,807,512	458,164	2,065,981	275,251	293	268,503	3,505,303	712,828	29,958	83%
48	0320172001	4708500201	Tyler	11/13/2015	49	646,392	74,249	4,807,512	458,164	2,065,981	275,251	293	268,503	3,505,303	712,828	29,958	83%
48	0320172001	4708500201	Tyler	11/13/2015	49	646,392	74,249	4,807,512	458,164	2,065,981	275,251	293	268,503	3,505,303	712,828	29,958	83%
48	0320172001	4708500201	Tyler	11/13/2015	49	646,392	74,249	4,807,512	458,164	2,065,981	275,251	293	268,503	3,505,303	712,828	29,958	83%
48	0320172001	4708500201	Tyler	11/13/2015	49	646,392	74,249	4,807,512	458,164	2,065,981	275,251	293	268,503	3,505,303	712,828	29,958	83%
48	0320172001	4708500201	Tyler	11/13/2015	49	646,392	74,249	4,807,512	458,164	2,065,981	275,251	293	268,503	3,505,303	712,828	29,958	83%
48	0320172001	4708500201	Tyler	11/13/2015	49	646,392	74,249	4,807,512	458,164	2,065,981	275,251	293	268,503	3,505,303	712,828	29,958	83%
48	0320172001	4708500201	Tyler	11/13/2015	49	646,392	74,249	4,807,512	458,164	2,065,981	275,251	293	268,503	3,505,303	712,828	29,958	83%
48	0320172001	4708500201	Tyler	11/13/2015	49	646,392	74,249	4,807,512	458,164	2,065,981	275,251	293	268,503	3,505,303	712,828	29,958	83%
48	0320172001	4708500201	Tyler	11/13/2015	49	646,392	74,249	4,807,512	458,164	2,065,981	275,251	293	268,503	3,505,303	712,828	29,958	83%
48	0320172001	4708500201	Tyler	11/13/2015	49	646,392	74,249	4,807,512	458,164	2,065,981	275,251	293	268,503	3,505,303	712,828	29,958	83%
48	0320172001	4708500201	Tyler	11/13/2015	49	646,392	74,249	4,807,512	458,164	2,065,981	275,251	293	268,503	3,505,303	712,828	29,958	83%
48	0320172001	4708500201	Tyler	11/13/2015	49	646,392	74,249	4,807,512	458,164	2,065,981	275,251	293	268,503	3,505,303	712,828	29,958	83%
48	0320172001	4708500201	Tyler	11/13/2015	49	646,392	74,249	4,807,512	458,164	2,065,981	275,251	293	268,503	3,505,303	712,828	29,958	83%
48	0320172001	4708500201	Tyler	11/13/2015	49	646,392	74,249	4,807,512	458,164	2,065,981	275,251	293	268,503	3,505,303	712,828	29,958	83%
48	0320172001	4708500201	Tyler	11/13/2015	49	646,392	74,249	4,807,512	458,164	2,065,981	275,251	293	268,503	3,505,303	712,828	29,958	83%
48	0320172001	4708500201	Tyler	11/13/2015	49	646,392	74,249	4,807,512	458,164	2,065,981	275,251	293	268,503	3,505,303	712,828	29,958	83%
48	0320172001	4708500201	Tyler	11/13/2015	49	646,392	74,249	4,807,512	458,164	2,065,981	275,251	293	268,503	3,505,303	712,828	29,958	83%
48	0320172001	4708500201	Tyler	11/13/2015	49	646,392	74,249	4,807,512	458,164	2,065,981	275,251	293	268,503	3,505,303	712,828	29,958	83%
48	0320172001	4708500201	Tyler	11/13/2015	49	646,392	74,249	4,807,512	458,164	2,065,981	275,251	293	268,503	3,505,303	712,828	29,958	83%
48	0320172001	4708500201	Tyler	11/13/2015	49	646,392	74,249	4,807,512	458,164	2,065,981	275,251	293	268,503	3,505,303	712,828	29,958	83%
48	0320172001	4708500201	Tyler	11/13/2015	49	646,392	74,249	4,807,512	458,164	2,065,981	275,251	293	268,503	3,505,303	712,828	29,958	83%
48	0320172001	4708500201	Tyler	11/13/2015	49	646,392	74,249	4,807,512	458,164	2,065,981	275,251	293	268,503	3,505,303	712,828	29,958	83%
48	0320172001	4708500201	Tyler	11/13/2015	49	646,392	74,249	4,807,512	458,164	2,065,981	275,251	293	268,503	3,505,303	712,828	29,958	83%
48	0320172001	4708500201	Tyler	11/13/2015	49	646,392	74,249	4,807,512	458,164	2,065,981	275,251	293	268,503	3,505,303	712,828	29,958	83%
48	0320172001	4708500201	Tyler	11/13/2015	49	646,392	74,249	4,807,512	458,164	2,065,981	275,251	293	268,503	3,505,303	712,828	29,958	83%
48	0320172001	4708500201	Tyler	11/13/2015	49	646,392	74,249	4,807,512	458,164	2,065,981	275,251	293	268,503	3,505,303	712,828	29,958	83%
48	0320172001	4708500201	Tyler	11/13/2015	49	646,392	74,249	4,807,512	458,164	2,065,981	275,251	293	268,503	3,505,303	712,828	29,958	83%
48	0320172001	4708500201	Tyler	11/13/2015	49	646,392	74,249	4,807,512	458,164	2,065,981	275,251	293	268,503	3,505,303	712,828	29,958	83%
48	0320172001	4708500201	Tyler	11/13/2015	49	646,392	74,249	4,807,512	458,164	2,065,981	275,251	293	268,503	3,505,303	712,828	29,958	83%
48	0320172001	4708500201	Tyler	11/13/2015	49	646,392	74,249	4,807,512	458,164	2,065,981	275,251	293	268,503	3,505,303	712,828	29,958	83%
48	0320172001	4708500201	Tyler	11/13/2015	49	646,392	74,249	4,807,512	458,164	2,065,981	275,251	293	268,503	3,505,303	712,828	29,958	83%
48	0320172001	4708500201	Tyler	11/13/2015	49	646,392	74,249	4,807,512	458,164	2,065,981	275,251	293	268,503	3,505,303	712,828	29,958	83%
48	0320172001	4708500201	Tyler	11/13/2015	49	646,392	74,249	4,807,512	458,164	2,065,981	275,251	293	268,503	3,505,303	712,828	29,958	83%
48	0320172001	4708500201	Tyler	11/13/2015	49	646,392	74,249	4,807,512	458,164	2,065,981	275,251	293	268,503	3,505,303	712,828	29,958	83%
48	0320172001	4708500201	Tyler	11/13/2015	49	646,392	74,249	4,807,512	458,164	2,065,981	275,251	293	268,503	3,505,303	712,828	29,958	83%
48	0320172001	4708500201	Tyler	11/13/2015	49	646,392	74,249	4,807,512	458,164	2,065,981	275,251	293	268,503	3,505,303	712,828	29,958	83%
48	0320172001	4708500201	Tyler	11/13/2015	49	646,392	74,249	4,807,512	458,164	2,065,981	275,251	293	268,503	3,505,303	712,828	29,958	83%
48	0320172001	4708500201	Tyler	11/13/2015	49	646,392	74,249	4,807,512	458,164	2,065,981	275,251	293	268,503	3,505,303	712,828	29,958	83%
48	0320172001	4708500201	Tyler	11/13/2015	49	646,392	74,249	4,807,512	458,164	2,065,981	275,251	293	268,503	3,505,303	712,828	29,958	83%
48	0320172001	4708500201	Tyler	11/13/2015	49	646,392	74,249	4,807,512	458,164	2,065,981	275,251	293					

[illegible]

Note > The first twelve months of working interest receipts for wells that began production during 2015 is provided below (columns L and M). We are requesting that the values reflect actual working interest receipts for the first twelve months rather than annualized estimates based on working interest reported for the 2015 calendar year. Please note that twelve months of working interest receipts is not yet available for some first year wells. Where twelve months of data is not available, we have also included data for these wells because < 11 months of data (annualized) provides a more accurate estimate of working interest receipts for the first year than 1-4 months of reported receipts. For wells that began producing during the first 6 months of 2015, the last month of WV revenue provided reflects only the portion needed to get to a full 12 months of data.

CY	NRA Act #	API	County	Initial Production Date	Days in Production	2015 Gas Working Interest Receipts, as Reported by Antero	2015 Oil Working Interest Receipts, as Reported by Antero	Actual Gas Working Interest for First 12 months (or Available To Date if Less Than 12 Months)	Actual Oil Working Interest for First 12 months (or Available To Date if Less Than 12 Months)	# of Production Days Included in Total (if Less Than 12 Months Available)	Gas Working Interest Receipts - Actual First 12 Months (or Annualized if Less Than 12 Months Available)	Oil Working Interest Receipts - Actual First 12 Months (or Annualized if Less Than 12 Months Available)	Gas Royalty - Actual First 12 Months (or Annualized if Less Than 12 Months Available)	Oil Royalty - Actual First 12 Months (or Annualized if Less Than 12 Months Available)	WV %
9	0120176371	4701706271	Doddridge	2/18/2015	327	3,682,809	179,487	4,110,771	200,245	187,357	3,916,909	197,357	756,706	36,177	84%
9	0220176388	4701706388	Doddridge	2/17/2015	328	5,748,381	103,129	5,840,424	114,762	106,009	5,649,306	106,009	890,127	15,703	86%
9	0320176375	4701706375	Doddridge	2/17/2015	328	4,608,284	169,975	5,120,121	189,149	175,246	4,910,340	176,246	952,495	34,187	87%
9	0320176270	4701706270	Doddridge	2/5/2015	330	3,713,724	36,089	4,107,615	39,377	37,422	3,980,691	37,422	569,435	5,353	87%
9	0520176312	4701706312	Doddridge	2/4/2015	331	3,299,706	34,621	3,638,649	38,177	36,147	3,498,294	36,147	732,084	8,069	82%
9	0920176487	4701706487	Doddridge	2/4/2015	331	3,932,765	4,402	2,131,297	4,854	4,953	2,061,981	4,953	402,812	968	84%
9	0120176370	4701706370	Doddridge	2/7/2015	333	2,756,418	182,892	3,023,491	200,467	186,851	2,909,017	186,851	561,705	36,079	84%
9	0820176317	4701706317	Doddridge	1/29/2015	337	4,048,205	42,328	4,394,554	45,643	43,706	4,280,420	43,706	843,414	8,612	84%
9	0220176218	4701706218	Doddridge	1/28/2015	338	2,697,278	28,091	2,912,741	30,535	28,674	2,823,979	28,674	509,324	5,172	85%
9	0120176464	4701706464	Doddridge	1/26/2015	340	3,565,234	104,588	3,827,584	108,559	108,348	3,663,977	108,348	713,565	36,690	84%
9	0320176274	4701706274	Doddridge	1/24/2015	342	4,895,177	101,753	5,235,025	108,596	102,783	5,114,347	102,783	831,649	16,754	86%
9	0320176355	4701706355	Doddridge	1/23/2015	343	3,375,664	33,454	3,806,007	35,590	34,338	3,763,346	34,338	678,746	6,153	86%
9	0120176465	4701706465	Doddridge	1/18/2015	348	3,184,842	189,551	3,340,423	199,811	193,692	3,255,808	193,692	694,091	37,723	84%
9	0420176376	4701706376	Doddridge	1/16/2015	350	4,998,853	2,402	5,213,080	2,505	2,402	5,178,056	2,402	973,741	452	84%
9	0320176400	4701706400	Doddridge	1/13/2015	353	4,905,283	107,217	5,071,983	110,867	109,016	5,024,697	109,016	839,632	16,217	86%
43	3020176004	4708510044	Wetzel	1/11/2015	355	4,531,950	606,157	4,660,618	604,901	673,738	4,607,938	673,738	1,013,630	148,205	82%
9	0520176403	4701706403	Doddridge	1/7/2015	364	3,173,705	5,092	3,137,287	5,108	5,092	3,130,210	5,092	657,488	1,070	83%

First twelve months of 12 calendar year. Please list wells for the first year of production.																
NRA Acct #	Jan. 2015 Gas WT Revenue	Feb. 2015 Gas WT Revenue	Mar. 2015 Gas WT Revenue	Apr. 2015 Gas WT Revenue	May 2015 Gas WT Revenue	June 2015 Gas WT Revenue	July 2015 Gas WT Revenue	August 2015 Gas WT Revenue	Jan. 2016 Oil WT Revenue	Feb. 2016 Oil WT Revenue	Mar. 2016 Oil WT Revenue	Apr. 2016 Oil WT Revenue	May 2016 Oil WT Revenue	June 2016 Oil WT Revenue	July 2016 Oil WT Revenue	August 2016 Oil WT Revenue
0120176371	195,055	41,052							4,895	3,031						
0320176398	339,900	61,075							2,531	549						
0320176375	259,274	42,783							5,374	897						
0320176270	239,379	27,569							1,177	205						
0320176332	227,434	21,164							1,294	232						
0320176487	114,600	20,616							514	37						
0120176570	145,253	4,340							3,638	320						
0320176327	232,215								1,378							
0320176464	98,743								543							
0320176218	126,701								3,400							
0320176274	213,570								1,030							
0320176355	167,682								884							
0120176465	70,965								4,141							
0420176376	179,203															
0320176400	213,454								1,799							
1020170044	75,009								7,601							
0520176103	5,505															

August 1, 2016

West Virginia State Tax Department
Property Tax Division
Attention: Jeff Amburgey
P.O. Box 2389
Charleston, West Virginia 25328-2389



Antero Resources
1615 Wynkoop Street
Denver, CO 80202
Office: 303.357.7310
Fax: 303.357.7315

RE: Public Comment Concerning Property Valuation Variables for the 2017 Tax Year

Dear Mr. Amburgey:

Pursuant to the letter from Mr. Matkovich to Secretary Tennant dated June 30, 2016, this letter serves to provide you with our comments on the tentative natural resource property valuation variables specifically related to gas wells for the 2017 tax year.

Specifically, our concerns regarding these variables relate to the following:

Operating Expenses: Based on a detailed review of actual operating expenses incurred in West Virginia by Antero Resources during the 2015 calendar year, we believe that the tentative maximum operating expenses per well, as well as the percentage of revenue allowances as published by the State of West Virginia are understated. Actual annualized operating expenses incurred as a percentage of revenue, and as an average per well are as follows:

Well Type	Average Operating Expense as Percent of Revenue	Average Operating Expense per Well
Marcellus, Horizontal Wells	44%	\$1,153,000
Horizontal Wells (Other than Marcellus)	73%	\$25,000
Typical Producing Wells	Operating at a loss	\$6,100

Consistent with recent discussions regarding the 2016 tax year, we believe that the State's use of actual operating expenses is the most accurate method of valuing the tax wells. Absent the ability to use actual data, at minimum the State's allowance percentages should be increased to be more consistent with actual data provided, and the maximum operating expense should be removed entirely. Without adjustment of these variables, the State is drastically overstating the value of Antero's property in West Virginia.

We respectfully request that the State modify these variables based on the information provided above, for use in its appraisal of gas wells for property tax purposes for the 2017 tax year. We would be happy to discuss our comments with and/or provide additional information that the State may need. Please feel free to contact our tax agent, Kirsten Evans at (410) 568-0733.

Sincerely,
Antero Resources Corporation

A handwritten signature in dark ink, appearing to read "Alvin A. Schopp".

Alvin A. Schopp, SVP, Treasurer and Chief Administrative Officer

cc: Kirsten Evans, Altus Group US, Inc.

TAB

4

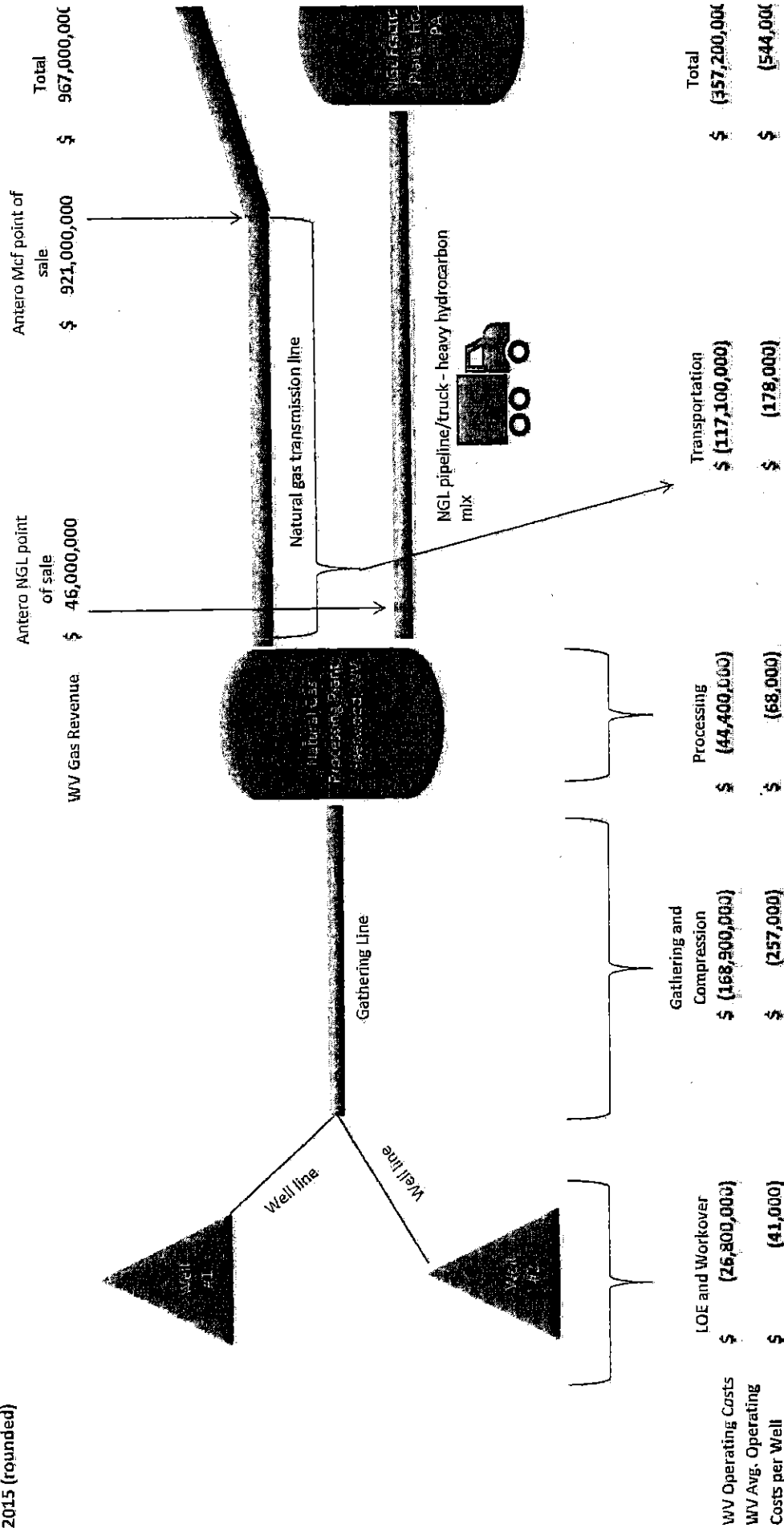
WV Tax Department's Value Calculation for Year 2 Well
2017 Tax Year

NATURAL OIL/GAS DEMONSTRATION APPRAISAL.....FLUSH WELL (Year 2)									
	DECLINE RATES		2015	GAS INCOME	OIL INCOME		GAS CAP IN	OIL CAP INC	
YR 1	66%		WRK INT	\$ 3,000,000	\$		\$ 1,785,000	\$ -	
YR 2	29%		ROY INT	\$ 500,000	\$		\$ 297,500	\$ -	
YR3+	23%								
TY2017 WORKING INT					TY2009 ROYALTY INT				
YEAR	WRK INT INC	WRK COST	NET INC	% FCTR(16.0)	DIS INC	YEAR	ROY INT INC	% FCTR(16.0)	DIS INC
1	\$ 1,785,000	\$ 175,000	\$ 1,610,000	0.928477	\$ 1,494,848	1	\$ 297,500	0.928477	\$ 278,222
2	\$ 1,374,450	\$ 175,000	\$ 1,199,450	0.800411	\$ 960,053	2	\$ 229,075	0.800411	\$ 183,354
3	\$ 1,058,327	\$ 175,000	\$ 883,327	0.690009	\$ 809,503	3	\$ 178,386	0.690009	\$ 121,709
4	\$ 814,911	\$ 175,000	\$ 639,911	0.594836	\$ 580,842	4	\$ 135,818	0.594836	\$ 90,790
5	\$ 627,482	\$ 175,000	\$ 452,482	0.512789	\$ 432,028	5	\$ 104,560	0.512789	\$ 53,828
6	\$ 483,181	\$ 175,000	\$ 308,181	0.442080	\$ 286,228	6	\$ 80,627	0.442080	\$ 35,598
7	\$ 372,034	\$ 175,000	\$ 197,034	0.381088	\$ 175,087	7	\$ 62,006	0.381088	\$ 23,629
8	\$ 286,466	\$ 175,000	\$ 111,466	0.328522	\$ 106,819	8	\$ 47,744	0.328522	\$ 15,665
9	\$ 220,579	\$ 175,000	\$ 45,579	0.283209	\$ 12,608	9	\$ 36,763	0.283209	\$ 10,412
10	\$ 169,846	\$ 175,000	\$ -	0.244146	\$ -	10	\$ 28,308	0.244146	\$ -
11	\$ 130,781	\$ 175,000	\$ -	0.210470	\$ -	11	\$ 21,797	0.210470	\$ -
12	\$ 100,702	\$ 175,000	\$ -	0.181440	\$ -	12	\$ 15,784	0.181440	\$ -
13	\$ 77,540	\$ 175,000	\$ -	0.158414	\$ -	13	\$ 12,923	0.158414	\$ -
14	\$ 59,708	\$ 175,000	\$ -	0.134840	\$ -	14	\$ 9,951	0.134840	\$ -
15	\$ 45,974	\$ 175,000	\$ -	0.116241	\$ -	15	\$ 7,862	0.116241	\$ -
16	\$ 35,400	\$ 175,000	\$ -	0.100206	\$ -	16	\$ 5,900	0.100206	\$ -
17	\$ 27,258	\$ 175,000	\$ -	0.088388	\$ -	17	\$ 4,543	0.088388	\$ -
18	\$ 20,986	\$ 175,000	\$ -	0.074471	\$ -	18	\$ 3,498	0.074471	\$ -
19	\$ 16,161	\$ 175,000	\$ -	0.064199	\$ -	19	\$ 2,694	0.064199	\$ -
20	\$ 12,444	\$ 175,000	\$ -	0.055344	\$ -	20	\$ 2,074	0.055344	\$ -
21	\$ 9,582	\$ 175,000	\$ -	0.047710	\$ -	21	\$ 1,597	0.047710	\$ -
22	\$ 7,378	\$ 175,000	\$ -	0.041129	\$ -	22	\$ 1,230	0.041129	\$ -
23	\$ 5,681	\$ 175,000	\$ -	0.035488	\$ -	23	\$ 947	0.035488	\$ -
24	\$ 4,374	\$ 175,000	\$ -	0.030588	\$ -	24	\$ 729	0.030588	\$ -
25	\$ 3,368	\$ 175,000	\$ -	0.026350	\$ -	25	\$ 561	0.026350	\$ -
26	\$ 2,594	\$ 175,000	\$ -	0.022715	\$ -	26	\$ 432	0.022715	\$ -
27	\$ 1,997	\$ 175,000	\$ -	0.019582	\$ -	27	\$ 333	0.019582	\$ -
28	\$ 1,538	\$ 175,000	\$ -	0.016881	\$ -	28	\$ 258	0.016881	\$ -
29	\$ 1,164	\$ 175,000	\$ -	0.014553	\$ -	29	\$ 197	0.014553	\$ -
30	\$ 912	\$ 175,000	\$ -	0.012548	\$ -	30	\$ 152	0.012548	\$ -
31	\$ 702	\$ 175,000	\$ -	0.010815	\$ -	31	\$ 117	0.010815	\$ -
32	\$ 541	\$ 175,000	\$ -	0.009323	\$ -	32	\$ 90	0.009323	\$ -
33	\$ 416	\$ 175,000	\$ -	0.008037	\$ -	33	\$ 69	0.008037	\$ -
34	\$ 321	\$ 175,000	\$ -	0.006929	\$ -	34	\$ 53	0.006929	\$ -
35	\$ 247	\$ 175,000	\$ -	0.005973	\$ -	35	\$ 41	0.005973	\$ -
36	\$ 190	\$ 175,000	\$ -	0.005149	\$ -	36	\$ 32	0.005149	\$ -
37	\$ 146	\$ 175,000	\$ -	0.004439	\$ -	37	\$ 24	0.004439	\$ -
38	\$ 113	\$ 175,000	\$ -	0.003827	\$ -	38	\$ 19	0.003827	\$ -
39	\$ 87	\$ 175,000	\$ -	0.003299	\$ -	39	\$ 14	0.003299	\$ -
40	\$ 67	\$ 175,000	\$ -	0.002844	\$ -	40	\$ 11	0.002844	\$ -

Note > State allowed operating expenses for Horizontal Marcellus Wells for 2017 Tax Year are 20% of Revenue capped at \$175,000. By capping the allowed operating expenses at the lesser of 20% of working interest revenue of \$175,000, the Tax Department treats similarly situated tax payers differently. The cap of \$175,000 only adversely affects tax payers that have wells over a certain revenue threshold.

TAB 5

Antero Resources Corporation
Simple Diagram of Natural Gas Sales including Natural Gas Liquid Processing & Fractionation
2015 (rounded)



Note: All of the amounts are based on the original TY2017 WV Oil and Gas Return and do not contemplate annualization for new wells. The average operating cost per well is a straight overage cost based on the WV Oil and Gas Return for Antero.

TAB 6



STATE OF WEST VIRGINIA

Department of Revenue
State Tax Department

Earl Ray Tomblin
Governor

Mark W. Matkovich
State Tax Commissioner

April 10, 2014

Producers of Marcellus and/or other Horizontal Wells

RE: Marcellus and/or other Horizontal Wells Operating Expenses Survey

As you are aware, each summer prior to August 1st, your office is required to file a West Virginia Oil and Gas Producer/Operator Return for the wells that you have in West Virginia. The production and income data involved in these returns is utilized to arrive at an appraised value for each of the royalty owner's interest in the oil/gas rights and for your working interests.¹ In determining the appraised value for the working interest for each well, this office reduces the working interest income that you identify by an estimated² operating expenses amount. Presently that amount for Marcellus wells is 30% of your working interest income (maximum \$30,000 per well) for vertical wells and 20% of your working interest income (maximum \$150,000 per well) for horizontal wells. The remaining amount is then capitalized over the remaining life of the well³ which creates the working interest appraisal.

In order to update the above mentioned operating expense rate(s) that will be applied to your wells for the upcoming Tax Year 2015 appraisals (which involves the income and production for calendar year 2013) this office has attached a copy of the Oil & Gas Operating Expenses Survey for Calendar Year 2013.

I would like to request that you review this survey and provide us with the necessary information on your wells. Please note, that for use in the TY 2015 appraisals, this office must receive copies of the completed survey on or before May 16, 2014.

¹ Under Legislative Rule Title 110, Series 13, Section 3.15, this value involves not only your interest in the remaining oil/gas but the machinery and equipment in and about the well and all other personal property used in oil/gas production from the well to the field-line point of sale.

² If you have supplied operating expenses for those wells in the required format, that data will be considered.

³ Life of well is determined annually and is influenced by income of the well and the decline rate for the formation(s) involved in production.

Producers of Marcellus and other horizontal wells

April 10, 2014

Page Two

Please mail, email or fax the completed survey to:

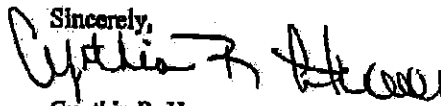
Address: West Virginia State Tax Department
Property Tax Division
Special Properties Section
P. O. Box 1345
Charleston, WV 25325-1345.

Email: cindi.r.hoover@wy.gov

FAX: 304-558-1843

Should you have any questions, please feel free to contact me at any of the above or at 304-558-1077.

Sincerely,



Cynthia R. Hoover
Tax & Revenue Manager
Special Properties Section
Property Tax Division

CRH/ch

Attachments (2)
Survey Form
Instructions

Hoover, Cindi R

From: Phil Yoo <pyoo@anteroresources.com>
Sent: Thursday, May 15, 2014 5:08 PM
To: Hoover, Cindi R
Subject: West Virginia Oil & Gas Operating Expenses Survey
Attachments: SAccounting14051515031.pdf; SAccounting14051515030.pdf

Ms. Hoover,

Please find attached our response to your Oil & Gas Operating Expenses Survey.

Please contact me if you have any questions. Thank you.

K. Phil Yoo, CPA
Chief Accounting Officer & Corporate Controller
Antero Resources
1615 Wynkoop Street
Denver, CO 80202
Work: (303)357-7364
Mobile: (720) 239-3916
www.anteroresources.com

Confidential

Marcellus Vertical and Horizontal and Other Horizontal
for Calendar Year 2013

Please submit information to:

Special Properties Section
WV Dept. of Revenue
Property Tax Division
PO Box 1345
Charleston, WV 25325-1345

Company Name: Antero Resources Corporation Contact Person: Paul Yoo

For Series 13, Title 110, State Tax Commission Legislative Rule for Valuation of Producing & Reserve Oil & Natural Gas for Ad Valorem Property Tax Purposes:

3.14: "Operating Expenses" means only those ordinary expenses which are directly related to the maintenance and production of natural gas and/or oil. These expenses do not include extraordinary expenses, depreciation, ad valorem taxes, capital expenditures, or expenditures relating to vehicles or other tangible personal property not permanently used in the production of natural gas or oil."

	Vertical Marcellus	Horizontal Marcellus	Horizontal Other-Please list and
Annual Revenue Net of Royalties:	542,359.9	771,737.28	
Annual Expenses:			
Direct Expenses:			
Well Tending Costs:	779,246	2,150,545	
Additional Supplies:	169,075	669,149	
Charing:	76,274	769,637	
Compressor/Pumping Costs:	8,562		
Electrical Costs:	67,037		
Other Expenses:	23,634	152,541	
Other Operating (3rd Party?) Costs:	111,516.8	308,091.2	
Swabbing, Service Rig		6247	
Waste Disposal (e.g. Prod. Fluid)	205,934	3,816,613	
Roadway-Maint. & ROW	316,134	552,588	
Pipeline-Maint. & ROW			
Indirect Operating Costs:	522,088	437,568.2	
Environmental/Safety Costs:	114,939	242,473	
Insurance:			
Bookkeeping/Revenue Distrib.			
Overhead:			
Other Expenses Not in the above:	163,725.6	73,561,590	
List:			
Total Annual Expenses for the Year:	1,752,096	7,739,063	
Plug & Abandonment Expenses/Well			
Number of Wells in above data:	241	226	
**Send if horizontal and different than Marcellus			

Suggestion: Show totals for all wells. Direct Expenses above are based on a per well situation.

6273 32,994

nothing
given

TAB

7



GAS TRANSACTION CONFIRMATION

Date Generated: February 22, 2013

Contract: ARAC011111G

1. BUYER: EDF Trading North America, LLC	SELLER: Antero Resources Appalachian Corporation	BASE CONTRACT DATE: January 11 2011	TRADE DATE: February 22 2013

2. TRANSACTION DETAILS:

Transaction	Start Date	End Date	Quantity	Commodity Price (Settle in US Dollars)	Service Quality (Int., Firm, or EFP)	Del. Point	Del. Point
1778686 / 2076678	January 01 2014	December 31 2015	30,000 MMBTU Daily	See Section 3.1	Firm	Altoona	Altoona

3. SPECIAL PROVISIONS, INCLUDING PRICE DETAILS (if any):

3.1

(1) New York Mercantile Exchange, Inc. Henry Hub Natural Gas Last Day Financial Future

* pricing details removed

4. CONTACT INFORMATION:

EDF Trading North America, LLC ("Company")
4700 W. Sam Houston Pkwy N
Suite 250
Houston, Texas
U.S.A. 77041

Attention: Gas Confirmations
Telephone No. 281-553-1763
Fax No. 281-553-1034

Marketing Rep: Welch, Jeff

Antero Resources Appalachian Corporation ("Customer")
1821 17th Street, Suite 300
Denver, Colorado
U.S.A. 80202

Attention: Sherry Anderson
Telephone No. 303-357-7145
Fax No. 31035323113

Marketing Rep: Justin Fowler

E. Please sign this Confirmation and return it to EDF Trading North America, LLC via fax or email (see invoice@edftrading.com). This Confirmation is subject to the Base Contract between Buyer and Seller referenced above. The terms of this Transaction Confirmation are binding unless disputed in writing within 2 Business Days of receipt unless otherwise specified in the Base Contract.

EDF Trading North America, LLC

Antero Resources Appalachian Corporation

Russell Schneider, VP and Treasurer

2/27/13
Authorized Signature

This Fax is intended only for the addressee and may contain information that is legally privileged, confidential and/or exempt from disclosure under applicable law. Any review, reproduction, dissemination or other use of, or taking of any action in reliance upon, this information by persons or entities other than the intended recipient is prohibited. If you have received this communication in error, or are not the named recipient(s), please immediately notify the sender.

4700 W. Sam Houston Pkwy N
Suite 250, Houston, Texas 77041, U.S.A.
281-553-1763 Fax 281-553-1034



*pages not related to delivery
pt were removed.
Pricing also removed

TRANSACTION CONFIRMATION

This Transaction Confirmation (the "Confirmation") is by and between **NextEra Energy Power Marketing, LLC ("NEPM")** and Antero Resources Corporation ("Antero"). NEPM and Antero shall be referred to individually as a "Party" and together as the "Parties". This Confirmation confirms the terms and conditions of the transaction (the "Transaction") entered into between the Parties on the Trade Date specified below. The terms of this Transaction are as follows:

Trade Date: July 26, 2013

Buyer: NEPM

Seller: Antero

Effective Date: The date on which Buyer notifies Seller in writing that it has the necessary Gas transportation capacity (the "Transportation") to move the Gas. It is Buyer's intention to procure all transportation at the earliest possible time. However, it is understood by the Parties that the procurement of Gas Transportation by Buyer is a necessary precondition to this Confirmation coming into effect. Buyer is actively pursuing the acquisition of such Transportation and will use commercially reasonable efforts to secure all such Transportation within ninety (90) days of the Trade Date (the "Transportation Acquisition Date"). The Parties understand that state and/or federal regulatory approval and other matters might delay the acquisition of the Transportation and agree that the Transportation Acquisition Date shall be extended as reasonably needed.



Beginning Date:

November 1, 2013

Termination Date:

October 31, 2016

Term:

The period of time between the Beginning Date and the Termination Date

Commodity:

Natural Gas

Transactions Type:

Firm Purchase and Sale

Total Daily Quantity:

100,000 Dth/Day

Delivery Point(s):

Dominion Transmission, Inc. ("Dominion") Meter EB 360 (also known as ETC Northeast Pipeline [TL-360]) located in Doddridge County, West Virginia ("Delivery Point 1"). All Gas shall be delivered to Delivery Point 1 during the Term, unless Buyer and Seller mutually agree in writing by amending this Confirmation to include Delivery Point 2 (as described below) and the use of Delivery Point is approved by Dominion.

~~Delivery Point shall be Dominion Meter EB 095 (also known as Sherwood [TL-360]).~~

Price:

The Price shall be the price per MMBtu quoted for the relevant month in *Platts Inside FERC's Gas Market Report* under the headings "Prices of Spot Gas Delivered to Pipelines, [Month] 1 (\$/MMBtu)," "Dominion Transmission Inc.," "Appalachia," and "Index" (the "Dominion South Point Index")



**NEXTERA ENERGY POWER
MARKETING, LLC**

By: [Signature]
Name: _____
Title: _____
Mark Palamian
Vice President
Asst. Secretary
Nexera Energy
Power Marketing, LLC

**ANTERO RESOURCES
CORPORATION**

By: [Signature]
Name: Steven P. Woodward
Title: V.P. Business Development JBF
MDM



Transaction Confirmation

This Transaction Confirmation(Confirmation) is entered into the 15th day of November, 2013 as a supplement to the NAESB executed by South Jersey Resources Group, LLC (Buyer) and Antero Resources Appalachian Corporation ("Seller" or "Antero") on 10/1/2010. This Confirmation shall serve as Exhibit A to the NAESB and unless specifically revised herein, the terms of the NAESB shall remain in full force and effect.

Terms

Delivery Period: January 1, 2014 thru December 31, 2014

~~CONFIDENTIAL~~

Volume: 50,000 Dth/d

Service: Seller may nominate gas as daily priced or first of the month priced gas and will do so monthly at least 5 working days before the start of the month. Buyer will nominate from these delivery points on a secondary basis.

* pricing details removed

<u>Pricing:</u> For first of the month gas, gas, gas as daily priced or first of the month priced as set forth above, all gas for the applicable month shall be deemed as priced	and for daily priced In the event that the seller fails to timely nominate

Credit Support: South Jersey Industries Parental Guarantee for South Jersey Resources Group. Antero Credit with NAESB standards if required.

Antero Resources Appalachian Corp.

By: Mark D. Mauz

Name: Mark D. Mauz

Vice President

Title: _____

Date: 11-15-2013

South Jersey Resources Group, LLC

By: Greg Nuzzo

Name: Greg Nuzzo

Title: SVP

Date: 11/15/13

**TRANSACTION CONFIRMATION
FOR IMMEDIATE DELIVERY**Date: 20-May-13
Transaction Confirmation #: 305298

This Transaction Confirmation is Subject to the Base Contract between Seller and Buyer dated

The terms of this Transaction Confirmation are binding unless disputed in writing within 2 Business Days
of receipt unless otherwise specified in the base contract.

BUYER South Jersey Resources Group 2350 Airport Freeway Suite 505 Bedford, TX 76022 Attn: Ken Barr Phone: 809-561-9000 Fax: 809-704-1304	SELLER Antero Resources Appalachian Resour 1625 17th Street Suite 300 Denver CO 80202 Attn: Sherry Anderson Phone: Fax: 303-825-3112
Price per DTH: * pricing details removed	
Delivery Period: Begin: 1/1/2014 End: 1/31/2014	
Contract Type: Firm	
Contract Quantity: 50000 MMBtus/Day	
Delivery Point: ~~Feo~~ ~~Co~~ Rank Gas	
Special Conditions: Details contained in Signed confirmation This confirmation is a complete and binding agreement between the parties to the transaction. In the case of any conflict between the terms of the master buy/sell agreement (if any) and this confirmation, the terms set forth in this confirmation shall take precedence. Both parties understand that commitments and/or expenditures are being made in reliance upon agreement to this transaction. Absent written notice to the contrary within two (2) business days, these terms will be deemed to correctly reflect your agreement to this transaction. This transaction confirmation will be sufficient for all purposes to evidence a binding agreement between the parties.	
BUYER Nick Turner By: Title: Date:	SELLER Sherry Anderson By: Title: Date:

AFFIDAVIT

STATE OF FLORIDA,
COUNTY OF PALM BEACH, TO WIT:

Michael Toal, being first duly sworn, deposes and says:

1. On August 11, 2011, Antero Resources Corporation ("Antero") and NextEra Energy Power Marketing, LLC (now known as NextEra Energy Marketing, LLC and hereinafter referred to as "NEM") entered into a Base Contract for Sale and Purchase of Natural Gas (the "Contract") pursuant to which Antero agrees to sell natural gas to NEM.
2. In connection with the Contract, Antero and NEM occasionally enter into "Transaction Confirmations."
3. The "Transaction Confirmations" include information pertaining to the delivery period, quantity of gas to be delivered, delivery point and pricing.
4. The attached "Transaction Confirmation," dated July 26, 2013, demonstrates that the delivery period is November 1, 2013 through October 31, 2016, the quantity to be delivered is 100,000 Dth/day, and that the delivery points are the Dominion Transmission, Inc. Meter EB 360 (also known as ETC Northeast Pipeline), or the Dominion Transmission, Inc. Meter EB 095 (also known as the Sherwood Processing Facility), both located in Doddridge County, West Virginia. The pricing details are redacted, since that information is proprietary as between Antero and NEM.
5. The Contract does not provide for Free on Board Shipping Point, and NEM does not take ownership of or assume responsibility for the natural gas prior to the stated delivery points.
6. Pursuant to the Contract and the attached "Transaction Confirmation," the EB 360 or EB 095 delivery points are the points of sale for the natural gas, and NEM takes ownership of and assumes responsibility for the natural gas at the EB 360 or EB 095 delivery points.
7. The price that NEM agrees to pay for the natural gas reflects the purchase price for a saleable product, i.e., Antero has incurred all expenses that are necessary to get the gas to

the delivery points, including gathering and compression, processing and transportation
(as necessary).

And further the affiant saith naught.

Michael Toal
NextEra Energy Marketing, LLC
Name Michael Toal
Title Vice President



Taken, subscribed and sworn to before me this 29th day of January, 2017. My
commission expires: _____

Linda Carol Jones
Notary Public

(NOTARIAL SEAL)



TAB 8



STATE OF WEST VIRGINIA

Department of Revenue
State Tax Department

Earl Ray Tomblin
Governor

Mark W. Matkovich
State Tax Commissioner

September 1, 2016

The Honorable Natalie Tennant
Secretary of State
Building 1, Suite 157-K
State Capitol
Charleston, West Virginia 25305

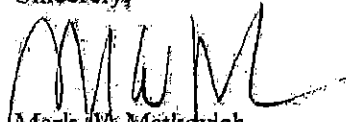
Dear Secretary Tennant:

Attached are final natural resource property valuation variables for the 2017 Tax Year that have been developed by the State Tax Department for use in appraising oil and gas, managed timberland, coal and other natural resource properties for ad valorem tax purposes.

In accordance with requirements of §§ 110 CSR 1-I, 1-J, and 1-K, tentative variables were made available for public comments on June 30, 2016. The Department received nine comments on the tentative variables. One comment related to the valuation of coal and three comments related to reserve oil and gas values and 5 related to the expenses allowed in the valuation of producing oil and gas wells. The information supplied for coal and reserve oil and gas did not result in any change to the tentative variables. The oil and gas comments resulted in adjustments to the operating expenses allowed in the valuation of producing oil and gas wells. Additionally, the prices for Metallurgical and Steam coal were updated based upon information that was unavailable on June 30.

The final valuation variables are being filed for inclusion in the State Register.

Sincerely,


Mark W. Matkovich
State Tax Commissioner

MWM/jaj

Attachment

cc: All County Assessors.

FILED

SEP 1 4 5 16

RECEIVED

OIL AND GAS PROPERTIES ANALYSIS

Tax Year 2017

September 1, 2016
Mark W. Matkovich
State Tax Commissioner
Department of Revenue

OIL AND GAS

TY 2017

Capitalization Rate Analysis and Results

In developing a capitalization rate for use in valuing specific income-producing properties consideration is given to the three approaches generally employed in estimating a discount rate. As a matter of practicality, the Bands-of-Investment and Summation Technique approaches are utilized in establishing discount rates for producing oil and gas properties. Data for analysis has been derived in accordance with current Legislative Rule Title 110, Series 11.

Safe Rate (3-Month Constant Maturity Interest Rates)

January December 2016

0.063%

Risk Rate (Interest differential between Loan Rates and 3-Month Constant Maturity Interest Rates)Loan Rates

2016

5.260%

Risk Rate

5.207%

Prime plus .2%

Equity (Differential between Equity Rates and 3-Month Constant Maturity Interest Rates)Equity Rates

2016

 $(12.25\% / (1 - .37)) - 0.063\%$ Risk Rate

19.391%

*** Value Line Investment Survey Analysis

Composite Risk Rate Loan and Equity Rates weighted by industry estimated capital structureEquity Rate

2016

12.8042%

Debt Rate

1.822%

Composite Risk

15.185%

Notes Debt/Equity Ratio

Debt

35%

Equity

65%

*** Effective severance tax adjustment

0.96

Non Liquidity Rate Interest differential between 3-month Constant Maturity Interest Rates and a 1 year Constant Maturity Interest Rates which reflects a reasonable time necessary to sell active property.

January December 2016

1yr T Bill

0.322%

90 day T Bill

0.061%

Non Liquidity Rate

0.269%

Management Rate Charges for the management of investment portfolios

Fixed Rate (by Rule)

0.500%

Property Tax Rate Sixty percent (60%) of State average Class III property tax rate

2016

60% of 2.19

1.314%

Inflation Rate

January December 2016

0.730%

Capitalization Rate

Since the valuation of oil and gas property is predicated on a three year production, the capitalization rate will be considered in a similar manner:

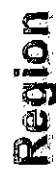
	2016	2014	2013
Inflation Rate	-0.730%	-0.790%	-1.500%
Safe Rate	0.059%	0.033%	0.059%
Composite Risk Rate	15.189%	14.388%	14.814%
Non-Liquidity Rate	0.289%	0.088%	0.074%
Management Rate	0.500%	0.500%	0.500%
Property Tax Rate	1.314%	1.314%	1.314%
Total	16.592%	16.864%	16.060%
	50.000%	33.333%	16.667%
	3.298%	5.188%	2.613%
			15.997%

Capitalization Rate Rounded to:

16.00%

MULTIPLIERS FOR 16.0% MID-YEAR LIFE (ANNUALLY)

YEAR		YEAR	
1	0.928477	21	0.047710
2	0.800411	22	0.041129
3	0.690009	23	0.035468
4	0.594838	24	0.030588
5	0.512782	25	0.026389
6	0.442058	26	0.022719
7	0.381086	27	0.019582
8	0.328522	28	0.016881
9	0.283209	29	0.014553
10	0.244148	30	0.012548
11	0.210470	31	0.010812
12	0.181440	32	0.009329
13	0.156414	33	0.008037
14	0.134840	34	0.006929
15	0.116241	35	0.005973
16	0.100208	36	0.005149
17	0.086386	37	0.004432
18	0.074471	38	0.003827
19	0.064189	39	0.003299
20	0.055346	40	0.002844

[illegible]

1500

10

Decline Rates for Natural Gas and Oil Formations - Central				
Central: Braxton, Clay, Fayette, Nicholas, Webster				
Code	Formation	Year 1	Year 2	Year 3 +
12	Alexander, Bensort	-0.31	-0.20	-0.10
14	Benson	-0.48	-0.08	-0.08
16	Benson, Balltown*	-0.45	-0.16	-0.12
17	Gordon*	-0.30	-0.07	-0.07
18	Big Injun	-0.34	-0.13	-0.13
19	Big Injun, Big Lime	-0.36	-0.13	-0.13
22	Big Lime	-0.34	-0.34	-0.13
26	Ravencloft	-0.40	-0.40	-0.25
93	4th Sand	-0.42	-0.32	-0.08
94	50 Foot	-0.34	-0.26	-0.07
95	Injun/Weir	-0.51	-0.26	-0.09
96	Maxton	-0.70	-0.27	-0.08
109	Trenton/Deeper*	-0.41	-0.22	-0.09
110	Marcellus*	-0.41	-0.22	-0.09
9	Exception: (Median)	-0.41	-0.22	-0.09
10	Non-Filer	-0.30	-0.07	-0.07

* New Formation(s) involved in recent production. These will be valued with the Exception Rates until decline information is available.

Decline Rates for Natural Gas and Oil Formations: East				
East: Berkeley, Grant, Greenbrier, Hampshire, Hardy, Jefferson, Mineral, Monroe, Morgan, Pendleton, Pocahontas, Preston, Randolph, Summers, Tucker				
Code	Formation	Year 1	Year 2	Year 3 +
1	Oriskany	-0.30	-0.30	-0.19
14	Benson	-0.31	-0.17	-0.12
20	Benson +	-0.44	-0.20	-0.08
21	Benson, Fifth	-0.29	-0.28	-0.09
32	Brallier +	-0.48	-0.20	-0.05
33	Elk, Benson	-0.39	-0.21	-0.08
34	Elk, Benson, Riley	-0.53	-0.19	-0.05
35	Elk, Benson, Riley +	-0.36	-0.19	-0.11
36	Elk, Benson, Balltown	-0.34	-0.18	-0.11
37	Elk, Alexander, Benson	-0.50	-0.07	-0.07
38	Elk, Alexander, Benson +	-0.40	-0.16	-0.16
39	Hunterville	-0.31	-0.31	-0.14
40	Fox, Haverly	-0.36	-0.21	-0.15
93	4th Sand	-0.42	-0.32	-0.08
94	50 Foot	-0.34	-0.26	-0.07
95	Injun/Weir	-0.51	-0.26	-0.09
96	Maxton	-0.70	-0.27	-0.08
110	Marcellus	-0.59	-0.22	-0.17
111	Utica*	-0.59	-0.22	-0.17
9	Exception (Median)	-0.41	-0.22	-0.10
10	Non-Filler	-0.29	-0.07	-0.05

*New Formation(s) involved in recent production. These will be valued with the Marcellus Rates until decline information is available.

Decline Rates for Natural Gas and Oil Formations - North				
North: Brooke, Hancock, Marshall, Ohio, Tyler, Wexel				
Code	Formations	Year 1	Year 2	Year 3
11	Gordon	-0.47	-0.31	-0.09
13	Alexander, Benson, Riley	-0.28	-0.16	-0.15
15	Benson, Riley	-0.18	-0.16	-0.06
93	4th Sand	-0.42	-0.32	-0.08
94	50 Foot	-0.34	-0.26	-0.07
96	Injun/Weir	-0.51	-0.26	-0.09
96	Maxton	-0.70	-0.27	-0.08
97	Coalbed Methane (Vertical)	-0.23	-0.08	-0.05
110	Marcellus	-0.52	-0.23	-0.18
111	Utica*	-0.52	-0.23	-0.18
9	Exception (Median)	-0.39	-0.23	-0.08
10	Non-Filer	-0.18	-0.16	-0.06

*New Formation(s) involved in recent production. These will be valued with the Marcellus Rates until decline information is available.

Decline Rates for Natural Gas and Oil Formations: North Central				
North Central: Barbour, Doddridge, Glimmer, Harrison, Lewis, Marion, Monongalia, Taylor, Upshur				
Code	Formation	Year 1	Year 2	Year 3
11	Gordon	-0.41	-0.14	-0.12
12	Alexander, Benson	-0.37	-0.19	-0.11
13	Alexander, Benson, Riley	-0.40	-0.28	-0.05
14	Benson	-0.31	-0.17	-0.12
15	Benson, Riley	-0.34	-0.17	-0.14
18	Big Injun	-0.38	-0.16	-0.13
21	Benson, Fifth	-0.31	-0.20	-0.14
28	Weir	-0.34	-0.34	-0.07
29	Weir*	-0.28	-0.28	-0.23
33	Elk, Benson	-0.34	-0.16	-0.11
34	Elk, Benson, Riley	-0.42	-0.27	-0.08
37	Elk, Alexander, Benson	-0.49	-0.23	-0.08
38	Elk, Alexander, Benson *	-0.38	-0.20	-0.12
40	Fox, Haverly	-0.46	-0.16	-0.08
50	Rhinstreet	-0.28	-0.03	-0.03
57	Alexander, Benson, Balltown	-0.39	-0.26	-0.08
58	Alexander	-0.35	-0.20	-0.10
59	Alexander *	-0.39	-0.22	-0.10
60	Alexander, Benson, Riley *	-0.39	-0.35	-0.12
61	Balltown	-0.38	-0.20	-0.10
62	Balltown, Speechley	-0.28	-0.22	-0.10
63	Balltown, Speechley *	-0.30	-0.13	-0.10
64	Benson, Balltown, Speechley	-0.28	-0.22	-0.09
65	Benson, Bradford	-0.37	-0.20	-0.10
66	Benson, Balltown	-0.29	-0.23	-0.11
67	Benson, Riley *	-0.38	-0.14	-0.10
68	Benson, Speechley	-0.30	-0.22	-0.14
69	Brallier, Elk	-0.42	-0.20	-0.13
70	Brallier	-0.40	-0.22	-0.15
71	Deeper/Onondaga or Otiskany/Helderberg	-0.24	-0.24	-0.03
72	Elk, Alexander	-0.42	-0.22	-0.09
73	Elk, Benson *	-0.38	-0.20	-0.12
74	Elk	-0.43	-0.12	-0.10
75	Elk, Riley	-0.60	-0.35	-0.17
76	Fox *	-0.46	-0.18	-0.09
77	Haverly, Elk, Benson (No Alexander)	-0.36	-0.16	-0.16
78	Haverly	-0.45	-0.15	-0.15
79	Riley	-0.44	-0.22	-0.10
80	Speechley	-0.30	-0.18	-0.09
81	Alexander, Benson, Speechley	-0.39	-0.24	-0.10
82	Haverly, Elk, Alexander	-0.47	-0.14	-0.14
85	Fifth, Oil	-0.45	-0.25	-0.22
87	Bayard, All	-0.30	-0.20	-0.05
88	Fifth	-0.29	-0.18	-0.12
89	Fifth *	-0.25	-0.15	-0.13
90	Gordon, Injun, All	-0.41	-0.23	-0.23
91	Squaw	-0.37	-0.31	-0.06
92	Injun *	-0.34	-0.22	-0.22
93	4th Sand	-0.42	-0.32	-0.08
94	50 Foot	-0.34	-0.28	-0.07
95	Injun, Weir	-0.51	-0.26	-0.09
96	Maxton	-0.70	-0.27	-0.08
97	Coalbed Methane (Vertical)	-0.23	-0.08	-0.05
98	Coalbed Methane (Horizontal)	-0.05	-0.05	-0.32
109	Trenton/Deeper *	-0.38	-0.21	-0.11
110	Marcellus	-0.59	-0.29	-0.23
111	Utica**	-0.59	-0.29	-0.23
9	Exception (Median)	-0.38	-0.21	-0.11
10	Non-Filer	-0.23	-0.03	-0.03

*New Formation(s) involved in recent production. These will be valued with the Exception Rates until decline information is available.

**New Formation(s) involved in recent production. These will be valued with the Marcellus Rates until decline information is available.

Decline Rates for Natural Gas and Oil Formations: North West				
North West: Pleasant, Ritchie, Wood				
Code	Formation	Year 1	Year 2	Year 3**
2	Huron, Rhinestreet	-0.41	-0.26	-0.07
4	Huron	-0.42	-0.24	-0.14
5	Huron, Shales above Huron	-0.39	-0.25	-0.14
8	Berea	-0.31	-0.15	-0.15
11	Gordon	-0.38	-0.10	-0.10
12	Alexander, Benson (No Riley)	-0.34	-0.23	-0.10
13	Alexander, Benson, Riley	-0.32	-0.20	-0.10
14	Benson	-0.19	-0.19	-0.10
44	Rhinestreet, Huron, Shallow Shale	-0.43	-0.28	-0.11
47	Alexander, Riley, (No Benson)	-0.41	-0.05	-0.05
48	Rhinestreet, Alexander, Benson, Riley	-0.31	-0.24	-0.10
49	Weir, Squaw, Big Injun	-0.27	-0.17	-0.07
50	Rhinestreet	-0.40	-0.27	-0.27
51	Rhinestreet*	-0.36	-0.21	-0.10
52	All Upper Devonian (Undiv)	-0.46	-0.33	-0.19
53	Huron, Chemung	-0.35	-0.11	-0.09
54	Huron, Hampshire, Pocono	-0.12	-0.12	-0.11
55	Upper Devonian (Above Huron)	-0.46	-0.33	-0.23
56	Chemung, Sands, Riley, Bradford, Baltown, Speechley, Warren (No Benson or Alexander)	-0.28	-0.18	-0.10
83	Huron Oil	-0.74	-0.44	-0.40
93	4th Sand	-0.42	-0.32	-0.08
94	50 Foot	-0.34	-0.26	-0.07
95	Injun/Weir	-0.51	-0.26	-0.09
96	Maxton	-0.70	-0.27	-0.08
109	Trenton/Deeper*	-0.39	-0.23	-0.13
110	Marcellus	-0.46	-0.29	-0.23
111	Utica**	-0.46	-0.29	-0.23
9	Exception (Median)	-0.39	-0.23	-0.13
10	Non-Filer	-0.12	-0.05	-0.05

*New Formation(s) involved in recent production. These will be valued with the Exception Rates until decline information is available.

**New Formation(s) involved in recent production. These will be valued with the Marcellus Rates until decline information is available.

Decline Rates for Natural Gas and Oil Formations - South				
South: McDowell, Mercer, Raleigh, Wyoming				
Code	Formation	Year 1	Year 2	Year 3 +
8	Berea	-0.34	-0.15	-0.15
22	Big Lime	-0.31	-0.19	-0.07
23	Big Lime, Maxton	-0.31	-0.19	-0.07
24	Big Lime, Ravencloft	-0.29	-0.29	-0.17
25	Berea *	-0.37	-0.12	-0.08
26	Ravencloft	-0.40	-0.08	-0.07
28	Weir	-0.44	-0.20	-0.10
29	Weir *	-0.28	-0.21	-0.08
30	Weir, Big Lime	-0.37	-0.19	-0.13
42	Maxton, Ravencloft	-0.40	-0.08	-0.07
93	4th Sand	-0.42	-0.32	-0.08
94	50 Foot	-0.34	-0.28	-0.07
95	Injun/Weir	-0.51	-0.28	-0.09
96	Maxton	-0.27	-0.13	-0.09
97	Coalbed Methane (Vertical)	0.03	0.10	-0.05
98	Coalbed Methane (Horizontal)	-0.05	-0.05	-0.32
110	Marcellus *	-0.36	-0.19	-0.09
9	Exception (Median)	-0.36	-0.19	-0.09
10	Non-Filer	-0.23	-0.08	-0.05

* New Formation(s) Involved in recent production. These will be valued with the Exception Rates until decline information is available.

Decline Rates for Natural Gas and Oil Formations: South Central				
South Central: Boone, Kanawha				
Code	Formation	Year 1	Year 2	Year 3
3	Devonian Shale	-0.23	-0.08	-0.05
4	Huron	-0.31	-0.15	-0.04
8	Berea	-0.23	-0.14	-0.09
18	Big Injun	-0.29	-0.25	-0.12
27	Huron, Shales above Huron	-0.21	-0.08	-0.05
28	Weir	-0.30	-0.21	-0.14
29	Weir +	-0.31	-0.25	-0.09
31	Devonian Shales +	-0.27	-0.07	-0.05
86	Big Injun-Oil	-0.19	-0.18	-0.10
93	4th Sand	-0.42	-0.32	-0.08
94	50 Foot	-0.34	-0.26	-0.07
95	Injun/Weir	-0.51	-0.26	-0.09
96	Maxton	-0.70	-0.27	-0.08
109	Trenton/Deeper*	-0.33	-0.19	-0.08
110	Marcellus*	-0.33	-0.19	-0.08
9	Exception (Median)	-0.33	-0.19	-0.08
10	Non-Filer	-0.19	-0.07	-0.04

* New Formation(s) involved in recent production. These will be valued with the Exception Rates until decline information is available.

Decline Rates for Natural Gas and Oil Formations: South West				
South West: Cabell, Lincoln, Logan, Mingo, Wayne				
Code	Formation	Year 1	Year 2	Year 3
3	Devonian Shale	-0.31	-0.15	-0.04
8	Berea	-0.36	-0.11	-0.11
18	Big Injun	-0.38	-0.22	-0.04
22	Big Lime	-0.19	-0.19	-0.19
43	Berea, Big Lime	-0.18	-0.18	-0.18
93	4th Sand	-0.42	-0.32	-0.08
94	50 Foot	-0.34	-0.26	-0.07
95	Injun/Welt	-0.51	-0.26	-0.09
96	Maxton	-0.70	-0.27	-0.08
109	Trenton/Deeper*	-0.38	-0.22	-0.10
110	Marcellus*	-0.38	-0.22	-0.10
9	Exception (Median)	-0.38	-0.22	-0.10
10	Non-Filer	-0.18	-0.11	-0.04

* New Formation(s) involved in recent production. These will be valued with the Exception Rates until decline information is available.

Decline Rates for Natural Gas and Oil Formations: West Central				
West Central: Calhoun, Roane, Wirt				
Code	Formation	Year 1	Year 2	Year 3+
2	Huron, Rhinestreet	-0.49	-0.11	-0.06
4	Huron	-0.33	-0.22	-0.14
27	Huron, Shales above Huron	-0.42	-0.23	-0.12
44	Rhinestreet, Huron, Shallow Shale	-0.51	-0.14	-0.11
45	Devonian Shale, Pocono	-0.25	-0.17	-0.12
48	Pocono	-0.29	-0.25	-0.12
84	Big Injun, Oil	-0.41	-0.41	-0.11
93	4th Sand	-0.42	-0.32	-0.08
94	50 Foot	-0.34	-0.26	-0.07
95	Injun/Weir	-0.51	-0.26	-0.09
96	Maxton	-0.70	-0.27	-0.08
109	Trenton/Deeper*	-0.42	-0.24	-0.10
110	Marcellus*	-0.42	-0.24	-0.10
9	Exception (Median)	-0.42	-0.24	-0.10
10	Non-Filer	-0.25	-0.11	-0.06

* New Formation(s) involved in recent production. These will be valued with the Exception Rates until decline information is available.

Decline Rates for Natural Gas and Oil Formations: West				
West: Jackson, Mason, Putnam				
Code	Formation	Year 1	Year 2	Year 3+
1	Oriskany	-0.40	-0.40	-0.29
2	Huron, Rhinestreet	-0.13	-0.12	-0.03
3	Devonian Shale	-0.31	-0.15	-0.04
4	Huron	-0.29	-0.14	-0.05
5	Huron, Shales above Huron	-0.38	-0.15	-0.06
6	Huron, Berea	-0.29	-0.08	-0.08
7	Berea, Devonian Shale	-0.08	-0.08	-0.03
8	Berea	-0.36	-0.18	-0.18
93	4th Sand	-0.42	-0.32	-0.08
94	50 Foot	-0.34	-0.26	-0.07
95	Injun/Weir	-0.51	-0.26	-0.09
96	Maxton	-0.70	-0.27	-0.08
109	Trenton/Daeper *	-0.35	-0.20	-0.09
110	Marcellus *	-0.35	-0.20	-0.09
9	Exception (Median)	-0.35	-0.20	-0.09
10	Non-Filer	-0.08	-0.08	-0.03

* New Formation(s) involved in recent production. These will be valued with the Exception Rates until decline information is available.

Industry Operating Expense Survey and Results

This component was determined through a review of responses to a survey distributed by the State Tax Department to producers of all oil and natural gas wells producing in West Virginia and through use of other market data.

GAS

- % Working Interest Expenses for Typical Producing Well	=	45%
- Maximum Operating Expenses	=	\$5,000
- Coal Bed Methane, Vertical Wells Expenses	=	\$9,000

OIL

- % Working Interest Expenses for Typical Producing Well	=	35%
- Maximum Operating Expenses	=	\$5,750
- Maximum Enhanced Operating Expenses	=	\$9,000

MARCELLUS/UTICA

- % Working Interest Expenses for Vertical Producing Well	=	30%
- Maximum Operating Expenses	=	\$30,000
- % Working Interest Expenses for Horizontal Producing Well	=	20%
- Maximum Operating Expenses	=	\$175,000

HORIZONTAL WELLS (OTHER THAN MARCELLUS/UTICA AND COAL BED METHANE)

- % Working Interest Expenses for Horizontal Producing Well	=	30%
- Maximum Operating Expenses	=	\$20,000

Minimum Working Interest Appraisal = \$500 per well

Flat Rate Royalty Multiplier = 5.75

Home Use Only Wells:

Appraised at \$500 per well

Industrial Use Only Wells:*

MCF usage: X \$ 2.62/MCF

BBL usage: X \$48.66/BBL

*(Also includes Department of Environmental Protection reported wells.)

Non-Filer Valuations:

Working Interest = 150% of previous year's appraisal

Royalty Interest = 90% of previous year's appraisal

Valuation:

The previously discussed variables are used to establish a future income stream converted to present worth through application of a capitalization rate. The sum of the discounted future net income per year represents a reasonable estimate of market value.

Lease Rate/Term Survey and Results

The non-producing property value for each county is determined by multiplying the average delay rental by a factor, which represents the average lease term under present economic conditions.

As a result of higher lease terms being inversely proportional to the value of oil and gas (thus counties with little leasing or production activities reflect inflated values) and with the volatile nature of county activity, necessary adjustments in the review have been made.

A compilation of lease terms produced a statewide average of 5 years. This term (5 years) was applied to all county lease rates and compared to the appraisal rates derived from calculations using individual county data as well as regional data. The resulting calculations were reviewed and considered in the assignment of an appraisal rate per acre.

The appraisal rate/acre amounts shown on the next page are preliminary figures, which may change if additional lease data is received. These rates have been applied to all county magisterial districts with either producing wells, lease activity within the past 5 years or both. Tax districts void of activity within the past 5 years have been assigned the minimum value per acre.

OIL & GAS RESERVE RATES FOR TY 2017			
COUNTY	CO #	DISTRICT #	TY2017 \$/AC
BARBOUR	1	1	\$80.00
		2	\$1.00
		3	\$80.00
		4	\$80.00
		5	\$60.00
		6	\$1.00
		7	\$60.00
		8	\$60.00
		9	\$60.00
		10	\$80.00
		11	\$80.00
BERKELEY	2	1	\$1.00
		2	\$1.00
		3	\$1.00
		4	\$1.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$1.00
BOONE	3	1	\$20.00
		2	\$1.00
		3	\$1.00
		4	\$20.00
		5	\$20.00
		6	\$20.00
		7	\$1.00
		8	\$20.00
		9	\$1.00
BRAXTON	4	1	\$20.00
		2	\$1.00
		3	\$1.00
		4	\$1.00
		5	\$20.00
		6	\$20.00
		7	\$20.00
		8	\$1.00
BROOKE	5	1	\$1.00
		2	\$1.00
		3	\$100.00
		4	\$100.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$1.00

OIL & GAS RESERVE RATES FOR TY 2017			
COUNTY	CO #	DISTRICT #	TY2017 \$/AC
CABELL	6	1	\$25.00
		2	\$1.00
		3	\$25.00
		4	\$25.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$25.00
		9	\$1.00
		10	\$25.00
CALHOUN	7	1	\$30.00
		2	\$1.00
		3	\$30.00
		4	\$30.00
		5	\$30.00
		6	\$30.00
CLAY	8	1	\$20.00
		2	\$1.00
		3	\$20.00
		4	\$20.00
		5	\$20.00
		6	\$20.00
DODDORIDGE	9	1	\$90.00
		2	\$90.00
		3	\$90.00
		4	\$90.00
		5	\$90.00
		6	\$90.00
		7	\$90.00
		8	\$90.00
		9	\$1.00
FAYETTE	10	1	\$20.00
		2	\$20.00
		3	\$20.00
		4	\$1.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$1.00
		9	\$1.00
		10	\$1.00
		11	\$1.00
		12	\$1.00
		13	\$1.00

OIL & GAS RESERVE RATES FOR TY 2017			
COUNTY	CO #	DISTRICT #	TY2017 \$/AC
GILMER	11	1	\$25.00
		2	\$25.00
		3	\$25.00
		4	\$1.00
		5	\$1.00
		6	\$25.00
GRANT	12	1	\$1.00
		2	\$1.00
		3	\$1.00
		4	\$1.00
		5	\$1.00
GREENBRIER	13	1	\$1.00
		2	\$1.00
		3	\$1.00
		4	\$1.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$1.00
		9	\$1.00
		10	\$1.00
		11	\$1.00
		12	\$1.00
		13	\$1.00
		14	\$1.00
		15	\$1.00
		16	\$1.00
		17	\$1.00
		18	\$1.00
HAMPSHIRE	14	1	\$1.00
		2	\$1.00
		3	\$1.00
		4	\$1.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$1.00
		9	\$1.00
		10	\$1.00
HANCOCK	15	1	\$25.00
		2	\$1.00
		3	\$25.00
		4	\$25.00
		5	\$1.00
		6	\$1.00

OIL & GAS RESERVE RATES FOR TY 2017			
COUNTY	CO #	DISTRICT #	TY2017 \$/AC
HARDY	16	1	\$1.00
		2	\$1.00
		3	\$1.00
		4	\$1.00
		5	\$1.00
		6	\$1.00
HARRISON	17	1	\$90.00
		2	\$1.00
		3	\$1.00
		4	\$1.00
		5	\$90.00
		6	\$1.00
		7	\$90.00
		8	\$1.00
		9	\$90.00
		10	\$1.00
		11	\$90.00
		12	\$90.00
		13	\$1.00
		14	\$90.00
		15	\$90.00
		16	\$1.00
		17	\$1.00
		18	\$90.00
		19	\$1.00
		20	\$90.00
		21	\$1.00
JACKSON	18	1	\$40.00
		2	\$40.00
		3	\$1.00
		4	\$40.00
		5	\$1.00
		6	\$40.00
		7	\$40.00
JEFFERSON	19	1	\$1.00
		2	\$1.00
		3	\$1.00
		4	\$1.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$1.00
		9	\$1.00
		10	\$1.00

OIL & GAS RESERVE RATES FOR TY 2017			
COUNTY	CO #	DISTRICT #	TY2017 \$/AC
KANAWHA	20	1	\$30.00
		2	\$1.00
		3	\$30.00
		4	\$1.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$1.00
		9	\$1.00
		10	\$1.00
		11	\$1.00
		12	\$1.00
		13	\$1.00
		14	\$1.00
		15	\$30.00
		16	\$30.00
		17	\$1.00
		18	\$1.00
		19	\$30.00
		20	\$1.00
		21	\$1.00
		22	\$1.00
		23	\$30.00
		24	\$30.00
		25	\$30.00
		26	\$1.00
		27	\$1.00
		28	\$30.00
		29	\$1.00
		30	\$1.00
		31	\$1.00
LEWIS	21	1	\$35.00
		2	\$35.00
		3	\$35.00
		4	\$35.00
		5	\$1.00
		6	\$35.00
		7	\$1.00
		8	\$1.00
		9	\$1.00
LINCOLN	22	1	\$25.00
		2	\$25.00
		3	\$1.00
		4	\$25.00
		5	\$25.00
		6	\$25.00
		7	\$25.00
		8	\$25.00
		9	\$25.00
		10	\$1.00

OIL & GAS RESERVE RATES FOR TY 2017			
COUNTY	CO #	DISTRICT #	TY2017 \$/AC
LOGAN	23	1	\$15.00
		2	\$15.00
		3	\$15.00
		4	\$15.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$15.00
		9	\$1.00
MARION	24	1	\$1.00
		2	\$90.00
		3	\$1.00
		4	\$1.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$1.00
		9	\$90.00
		10	\$1.00
		11	\$90.00
		12	\$90.00
		13	\$1.00
		14	\$1.00
		15	\$1.00
		16	\$90.00
		17	\$1.00
		18	\$90.00
		19	\$90.00
		20	\$1.00
		21	\$1.00
		22	\$1.00
MARSHALL	25	1	\$1.00
		2	\$1.00
		3	\$100.00
		4	\$100.00
		5	\$100.00
		6	\$1.00
		7	\$100.00
		8	\$1.00
		9	\$100.00
		10	\$1.00
		11	\$1.00
		12	\$100.00
		13	\$100.00
		14	\$100.00
		15	\$100.00
		16	\$1.00

OIL & GAS RESERVE RATES FOR TY 2017			
COUNTY	CO #	DISTRICT #	TY2017 \$/AC
MASON	26	1	\$1.00
		2	\$25.00
		3	\$25.00
		4	\$25.00
		5	\$25.00
		6	\$25.00
		7	\$1.00
		8	\$1.00
		9	\$1.00
		10	\$25.00
		11	\$1.00
		12	\$1.00
		13	\$1.00
		14	\$25.00
		15	\$25.00
		16	\$25.00
MCDOWELL	27	1	\$20.00
		2	\$1.00
		3	\$20.00
		4	\$20.00
		5	\$1.00
		6	\$20.00
		7	\$1.00
		8	\$1.00
		9	\$1.00
		10	\$1.00
		11	\$20.00
		12	\$1.00
		13	\$20.00
		14	\$1.00
		15	\$1.00
		16	\$1.00
MERGER	28	1	\$1.00
		2	\$15.00
		3	\$1.00
		4	\$1.00
		5	\$1.00
		6	\$15.00
		7	\$1.00
		8	\$1.00
		9	\$15.00
		10	\$1.00
		11	\$15.00

OIL & GAS RESERVE RATES FOR TY 2017			
COUNTY	CO #	DISTRICT #	TY2017 \$/AO
MINERAL	29	1	\$1.00
		2	\$1.00
		3	\$1.00
		4	\$1.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$1.00
		9	\$1.00
		10	\$1.00
		11	\$1.00
MINGO	30	1	\$1.00
		2	\$1.00
		3	\$20.00
		4	\$20.00
		5	\$20.00
		6	\$20.00
		7	\$20.00
		8	\$1.00
		9	\$20.00
		10	\$20.00
		11	\$20.00
		12	\$1.00
MONONGALIA	31	1	\$30.00
		2	\$1.00
		3	\$30.00
		4	\$30.00
		5	\$30.00
		6	\$1.00
		7	\$30.00
		8	\$30.00
		9	\$1.00
		10	\$1.00
		11	\$1.00
		12	\$1.00
		13	\$1.00
		14	\$1.00
		15	\$1.00
		16	\$1.00
		17	\$1.00
		18	\$30.00
		19	\$1.00

OIL & GAS RESERVE RATES FOR TY 2017			
COUNTY	CO #	DISTRICT #	TY2017 \$/AG
MONROE	32	1	\$1.00
		2	\$1.00
		3	\$1.00
		4	\$1.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$1.00
		9	\$1.00
MORGAN	33	1	\$1.00
		2	\$1.00
		3	\$1.00
		4	\$1.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$1.00
NICHOLAS	34	1	\$1.00
		2	\$15.00
		3	\$15.00
		4	\$15.00
		5	\$1.00
		6	\$1.00
		7	\$15.00
		8	\$1.00
		9	\$1.00
OHIO	35	1	\$1.00
		2	\$1.00
		3	\$100.00
		4	\$100.00
		5	\$1.00
		6	\$100.00
		7	\$1.00
		8	\$1.00
		9	\$1.00
		10	\$1.00
PENDLETON	36	1	\$1.00
		2	\$10.00
		3	\$1.00
		4	\$1.00
		5	\$1.00
		6	\$1.00
		7	\$10.00

OIL & GAS RESERVE RATES FOR TY 2017			
COUNTY	CO #	DISTRICT #	TY2017 \$/AC
PLEASANT	37	1	\$45.00
		2	\$45.00
		3	\$45.00
		4	\$45.00
		5	\$45.00
		6	\$1.00
		7	\$45.00
		8	\$45.00
POCAHONTAS	38	1	\$1.00
		2	\$1.00
		3	\$1.00
		4	\$1.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$1.00
PRESTON	38	1	\$30.00
		2	\$30.00
		3	\$30.00
		4	\$30.00
		5	\$30.00
		6	\$30.00
		7	\$1.00
		8	\$30.00
		9	\$1.00
		10	\$30.00
		11	\$1.00
		12	\$1.00
		13	\$1.00
		14	\$1.00
		16	\$1.00
		16	\$1.00
		17	\$1.00
		18	\$1.00
		19	\$1.00
		20	\$1.00
PUTNAM	40	1	\$25.00
		2	\$25.00
		3	\$1.00
		4	\$25.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$25.00
		9	\$1.00
		10	\$25.00
		11	\$25.00
		12	\$25.00
		13	\$1.00

OIL & GAS RESERVE RATES FOR TY 2017			
COUNTY	CO. #	DISTRICT #	TY2017 \$/AC
RALEIGH	41	1	\$20.00
		2	\$20.00
		3	\$1.00
		4	\$1.00
		5	\$20.00
		6	\$1.00
		7	\$20.00
		8	\$20.00
		9	\$20.00
		10	\$1.00
		11	\$20.00
		12	\$20.00
RANDOLPH	42	1	\$20.00
		2	\$20.00
		3	\$1.00
		4	\$20.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$1.00
		9	\$1.00
		10	\$20.00
		11	\$20.00
		12	\$1.00
		13	\$1.00
		14	\$1.00
		15	\$1.00
		16	\$20.00
		17	\$1.00
		18	\$1.00
RITCHIE	43	1	\$70.00
		2	\$1.00
		3	\$70.00
		4	\$1.00
		5	\$70.00
		6	\$1.00
		7	\$70.00
		8	\$1.00
		9	\$1.00
		10	\$70.00

OIL & GAS RESERVE RATES FOR TY 2017			
COUNTY	CO #	DISTRICT #	TY2017 \$/AO
ROANE	44	1	\$35.00
		2	\$35.00
		3	\$35.00
		4	\$35.00
		5	\$1.00
		6	\$35.00
		7	\$35.00
		8	\$1.00
		9	\$35.00
SUMMERS	45	1	\$1.00
		2	\$1.00
		3	\$1.00
		4	\$1.00
		5	\$10.00
		6	\$1.00
		7	\$1.00
TAYLOR	46	1	\$1.00
		2	\$1.00
		3	\$90.00
		4	\$90.00
		5	\$90.00
		6	\$90.00
		7	\$90.00
TUCKER	47	1	\$20.00
		2	\$20.00
		3	\$1.00
		4	\$1.00
		5	\$20.00
		6	\$1.00
		7	\$1.00
		8	\$1.00
		9	\$20.00
		10	\$1.00
		11	\$20.00
		12	\$1.00

OIL & GAS RESERVE RATES FOR TY 2017			
COUNTY	CO #	DISTRICT #	TY2017 \$/AC
TYLER	48	1	\$90.00
		2	\$90.00
		3	\$1.00
		4	\$90.00
		5	\$90.00
		6	\$90.00
		7	\$1.00
		8	\$1.00
		9	\$1.00
		10	\$90.00
UPSHUR	49	1	\$70.00
		2	\$70.00
		3	\$1.00
		4	\$70.00
		5	\$70.00
		6	\$70.00
		7	\$70.00
WAYNE	50	1	\$20.00
		2	\$20.00
		3	\$1.00
		4	\$1.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$20.00
		9	\$20.00
		10	\$20.00
		11	\$1.00
		12	\$20.00
WEBSTER	51	1	\$1.00
		2	\$1.00
		3	\$1.00
		4	\$15.00
		5	\$15.00
		6	\$15.00
		7	\$1.00

OIL & GAS RESERVE RATES FOR TY 2017			
COUNTY	CO. #	DISTRICT #	TY2017 \$/AC
WETZEL	52	1	\$90.00
		2	\$90.00
		3	\$90.00
		4	\$90.00
		5	\$90.00
		6	\$1.00
		7	\$1.00
		8	\$90.00
		9	\$1.00
		10	\$1.00
		11	\$1.00
		12	\$90.00
		13	\$1.00
WIRT	53	1	\$35.00
		2	\$35.00
		3	\$35.00
		4	\$1.00
		5	\$35.00
		6	\$35.00
		7	\$35.00
		8	\$35.00
WOOD	54	1	\$40.00
		2	\$40.00
		3	\$40.00
		4	\$40.00
		5	\$1.00
		6	\$40.00
		7	\$40.00
		8	\$40.00
		9	\$40.00
		10	\$1.00
		11	\$40.00
		12	\$40.00
		13	\$1.00
		14	\$1.00
WYOMING	55	1	\$20.00
		2	\$20.00
		3	\$20.00
		4	\$20.00
		5	\$20.00
		6	\$1.00
		7	\$20.00
		8	\$1.00
		9	\$1.00
		10	\$20.00

**MANAGED TIMBER
PROPERTY ANALYSIS**

Tax Year 2017

September 1, 2016
Mark W. Matkovich
State Tax Commissioner
Department of Revenue

MANAGED TIMBERLAND APPRAISAL RATES **TAX YEAR 2017**

(based on market 2011-2015)

Rates Per Acre

Class II Parcels

	<u>Grade 1</u>	<u>Grade 2</u>	<u>Grade 3</u>
Region 1	\$205	\$140	\$60
Region 2	\$200	\$140	\$50
Region 3	\$265	\$175	\$50
Region 4	\$270	\$185	\$55
Region 5	\$205	\$140	\$50

Class III/IV Parcels

	<u>Grade 1</u>	<u>Grade 2</u>	<u>Grade 3</u>
Region 1	\$225	\$160	\$75
Region 2	\$225	\$150	\$75
Region 3	\$240	\$155	\$75
Region 4	\$245	\$165	\$75
Region 5	\$225	\$150	\$75

Region 1 = Brooke, Cabell, Hancock, Jackson, Marshall, Mason, Ohio, Pleasants, Putnam, Tyler, Wetzel, and Wood Counties

Region 2 = Braxton, Calhoun, Clay, Doddridge, Gilmer, Harrison, Lewis, Marion, Monongalia, Ritchie, Roane, Taylor, and Wirt Counties

Region 3 = Barbour, Greenbrier, Monroe, Nicholas, Pendleton, Pocahontas, Preston, Randolph, Tucker, Upshur, and Webster Counties

Region 4 = Berkeley, Grant, Hampshire, Hardy, Jefferson, Mineral and Morgan Counties

Region 5 = Boone, Fayette, Kanawha, Lincoln, Logan, McDowell, Mercer, Mingo, Raleigh, Summers, Wayne, and Wyoming Counties

Harvest Volumes per Acre

Harvest Interval:
Grades

1 - Site Index 75 or more

	<u>35 yrs.</u>	<u>45 yrs.</u>	<u>55 yrs.</u>	<u>80 yrs.</u>		<u>Total</u>
4.6 cords	--	2.8 cords	3.3 cords			10.5 cords
1.5 Mbf	--	4.4 Mbf	8.6 Mbf			14.6 Mbf
3.3 cords	--	7.0 cords	4.6 cords			14.9 cords
1.0 Mbf	--	3.2 Mbf	6.5 Mbf			9.7 Mbf
--	3.1 cords	--	15.4 cords			18.5 cords
--	0.8 Mbf	--	3.7 Mbf			4.5 Mbf

3 - Site Index less than 65

Managed Timberland Statistics

Estimation of Required Rate of Return: Class II Rates

A. Safe Rate of Return (5 Year T-Bill Rate)

Year	Rate	W/A %	W/A Rate
2015	1.5292	26.67%	0.4078
2014	1.6410	33.33%	0.5486
2013	1.1728	13.33%	0.1563
2012	0.7608	6.67%	0.0507
2011	1.8228	20.00%	0.3048

1.466 %

B. Nonliquidity Rate

(12 Month T-Bills vs. 3 Month T-Bills)

Year	Rate	W/A %	W/A Rate
2015	0.2683	33.33%	0.0894
2014	0.0883	26.67%	0.0236
2013	0.0733	20.00%	0.0147
2012	0.1292	13.33%	0.0172
2011	0.1817	6.67%	0.0121

0.167 %

C. Risk Rate (30 yr T-bills vs. 5 yr T-bills)

Year	Rate	W/A %	W/A Rate
2015	1.3117	13.33%	0.1748
2014	1.6992	26.67%	0.4532
2013	2.2758	20.00%	0.4562
2012	2.1600	33.33%	0.7198
2011	2.3883	6.67%	0.1583

1.962 %

D. Management Factor of 0.5%

0.500 %

E. Property Tax Component

(60% of Class II Rate)

Year	Rate	W/A %	W/A Rate
2015	0.714	33.33%	0.2380
2014	0.714	26.67%	0.1904
2013	0.708	20.00%	0.1416
2012	0.714	13.33%	0.0962
2011	0.708	6.67%	0.0472

0.712 %

F. Inflation Rate

(Bureau of Labor Statistics)

Year	Rate	W/A %	W/A Rate
2015	0.730	33.33%	0.2433
2014	0.760	26.67%	0.2027
2013	1.600	20.00%	0.3000
2012	1.700	13.33%	0.2286
2011	3.000	6.67%	0.2001

(1.173) %

TOTAL REQUIRED RATE OF RETURN (REAL)

3.628 %

LESS: PROPERTY TAX COMPONENT

(0.712)

TOTAL DISCOUNT COMPONENT

2.913 %

Stumpage Prices:

	<u>Sawtimber</u>	<u>Pulpwood</u>
Stumpage Price Adjustment Factor	0.00%	1.85%

<u>SAWTIMBER</u>	Current \$/MBF	1.0000 \$/MBF at age	1.0000 \$/MBF at age	1.0000 \$/MBF at age	1.0000 \$/MBF at age
		35	45	55	80
Region 1	181.34	181.34	181.34	181.34	181.34
Region 2	172.92	172.92	172.92	172.92	172.92
Region 3	239.28	239.28	239.28	239.28	239.28
Region 4	235.49	235.49	235.49	235.49	235.49
Region 5	190.59	190.59	190.59	190.59	190.59

<u>PULPWOOD</u>	\$/Cord	1.0996 \$/cord at age	2.2818 \$/cord at age	2.7407 \$/cord at age	4.3339 \$/cord at age
		35	45	55	80
Region 1	8.54	18.23	19.49	23.41	37.02
Region 2	8.73	12.79	15.36	18.46	29.18
Region 3	5.13	9.75	11.71	14.07	22.24
Region 4	8.10	15.39	18.49	22.21	36.12
Region 5	5.27	10.96	13.18	15.01	26.00

Management Costs:

Region	\$/acre (1)
1	3.17
2	3.17
3	3.17
4	3.17
5	3.17
State	

Tax Rates:

Effective Federal Income Tax Rate	35.00%
Effective WV State Income Tax Rate $(8.5\% * (1 - .35))$	4.23%
Effective WV Severance Tax Rate $(1.5\% * (1 - .35))$	0.98%

Yield (Volumes) (80 year rotation)

Timberland Productivity Grades	Site Index	Yield - MBF	Yield - Cords
Grade I	75 or more	14.6	10.5
Grade II	65-74	9.7	14.9
Grade III	less than 65	4.5	18.5

Managed Timberland Statistics

Estimation of Required Rate of Return: Class III & IV Blended Rates

A. Safe Rate of Return (5 Year T-Bill Rate)

Year	Rate	W/A %	W/A Rate
2015	1.5292	28.87%	0.4078
2014	1.6410	33.33%	0.5469
2013	1.1725	13.33%	0.1583
2012	0.7608	6.87%	0.0507
2011	1.6225	20.00%	0.3045

1.468 %

B. Nonliquidity Rate

(12 Month T-Bills vs. 3 Month T-Bills)

Year	Rate	W/A %	W/A Rate
2015	0.2683	33.33%	0.0894
2014	0.0883	28.87%	0.0235
2013	0.0733	20.00%	0.0147
2012	0.1292	13.33%	0.0172
2011	0.1817	6.87%	0.0121

0.167 %

C. Risk Rate (30 yr T-bills vs. 5 yr T-Bills)

Year	Rate	W/A %	W/A Rate
2015	1.3117	13.33%	0.1749
2014	1.6992	28.87%	0.4832
2013	2.2758	20.00%	0.4552
2012	2.1800	33.33%	0.7199
2011	2.3653	6.87%	0.1592

1.962 %

D. Management Factor of 0.5%

0.500 %

E. Property Tax Component

(80% of Blended III&IV Rates)

Year	Rate	W/A %	W/A Rate
2015	1.317	33.33%	0.4380
2014	1.314	28.87%	0.3504
2013	1.314	20.00%	0.2628
2012	1.325	13.33%	0.1768
2011	1.328	6.87%	0.0884

1.316 %

F. Inflation Rate

(Bureau of Labor Statistics)

Year	Rate	W/A %	W/A Rate
2015	0.730	33.33%	0.2433
2014	0.780	28.87%	0.2027
2013	1.500	20.00%	0.3000
2012	1.700	13.33%	0.2266
2011	3.000	6.87%	0.2001

(1.173) %

TOTAL REQUIRED RATE OF RETURN (REAL)

4.229 %

LESS: PROPERTY TAX COMPONENT

(1.316) %

TOTAL DISCOUNT COMPONENT

2.913 %

Stumpage Prices:

Stumpage Price Adjustment Factor: Sawtimber 0.00% Pulpwood 1.85%

SAWTIMBER:	Region	Current \$/MBF	1.0000	1.0000	1.0000	1.0000
			\$/MBF at age 35	\$/MBF at age 45	\$/MBF at age 55	\$/MBF at age 80
	Region 1	181.34	181.34	181.34	181.34	181.34
	Region 2	172.92	172.92	172.92	172.92	172.92
	Region 3	239.28	239.28	239.28	239.28	239.28
	Region 4	235.49	235.49	235.49	235.49	235.49
	Region 5	190.69	190.69	190.69	190.69	190.69

PULPWOOD:	Region	\$/Cord	1.8995	2.2816	2.7407	4.3339
			\$/cd at age 35	\$/cd at age 45	\$/cd at age 55	\$/cd at age 80
	Region 1	8.54	18.23	19.49	23.41	37.02
	Region 2	6.73	12.79	18.39	18.46	29.18
	Region 3	6.13	9.76	11.71	14.07	22.24
	Region 4	8.10	15.39	18.49	22.21	35.32
	Region 5	6.77	10.99	13.16	15.81	25.00

Management Costs:

Region	\$/acre (1)
1	3.17
2	3.17
3	3.17
4	3.17
5	3.17

State:

Tax Rates:

Effective Federal Income Tax Rate	35.00%
Effective WV State Income Tax Rate (6.6% * (1-.35))	4.23%
Effective WV Severance Tax Rate (1.5% * (1-.35))	0.98%

Yield (Volumes) (80 year rotation):

Timberland Productivity Grades	Site Index	Yield - MBF	Yield - Cord
Grade I	75 or more	14.8	18.5
Grade II	65-74	9.7	14.9
Grade III	less than 65	4.5	18.5

West Virginia Wgt/Avg Managed Timberland Stumpage Prices

REGION 1 - Sawtimber

Year	Volume	\$/MBF	W/A%	\$/MBF
2015	12,501.80	192.85	33.33%	84.28
2014	12,182.06	178.34	28.87%	47.02
2013	19,017.77	177.45	20.00%	35.48
2012	12,828.16	186.58	13.33%	24.87
2011	11,195.24	144.89	8.87%	9.58
	67,685.02			181.34

REGION 1 - Pulpwood

Year	Volume	\$/Cord	W/A%	\$/Cord
2015	7,218.90	16.03	33.33%	5.01
2014	484.40	8.40	28.87%	1.41
2013	6,102.20	2.98	20.00%	0.59
2012	45,987.00	6.42	13.33%	0.86
2011	48.10	9.67	8.87%	0.84
	59,220.60			8.54

REGION 2 - Sawtimber

Year	Volume	\$/MBF	W/A%	\$/MBF
2015	28,487.85	175.25	33.33%	58.42
2014	22,001.80	182.47	28.87%	48.88
2013	25,898.88	177.79	20.00%	38.86
2012	25,640.98	149.01	13.33%	19.87
2011	12,858.41	156.25	8.87%	10.42
	112,886.69			172.92

REGION 2 - Pulpwood

Year	Volume	\$/Cord	W/A%	\$/Cord
2015	42,863.30	6.97	33.33%	1.99
2014	2,188.10	5.04	28.87%	1.34
2013	119,279.40	12.83	20.00%	2.57
2012	22,847.40	2.86	13.33%	0.38
2011	5,235.20	6.78	8.87%	0.45
	192,193.40			5.73

REGION 3 - Sawtimber

Year	Volume	\$/MBF	W/A%	\$/MBF
2015	135,987.80	207.12	33.33%	88.04
2014	91,487.44	260.52	28.87%	74.81
2013	181,387.70	275.83	20.00%	60.13
2012	111,920.80	201.57	13.33%	28.58
2011	102,218.30	201.45	8.87%	13.43
	602,971.84			239.28

REGION 3 - Pulpwood

Year	Volume	\$/Cord	W/A%	\$/Cord
2015	184,907.30	3.85	33.33%	1.28
2014	170,738.30	3.57	28.87%	0.95
2013	153,187.40	7.78	20.00%	1.58
2012	183,132.60	8.39	13.33%	0.85
2011	159,040.70	7.34	8.87%	0.49
	851,014.30			5.13

REGION 4 - Sawtimber

Year	Volume	\$/MBF	WIA%	\$/MBF
2015	6,844.42	223.42	33.33%	74.47
2014	5,020.90	303.69	26.67%	81.04
2013	12,820.20	211.47	20.00%	42.28
2012	4,808.73	193.47	13.33%	25.80
2011	18,517.51	178.40	6.67%	11.88
	44,811.76			235.48

REGION 4 - Pulpwood

Year	Volume	\$/CORD	WIA%	\$/CORD
2015	8,137.40	7.22	33.33%	2.41
2014	7,785.20	8.18	26.67%	2.18
2013	15,488.60	8.32	20.00%	1.88
2012	7,382.20	9.81	13.33%	1.28
2011	21,074.10	8.64	6.67%	0.58
	57,847.50			8.10

REGION 5 - Sawtimber

Year	Volume	\$/MBF	WIA%	\$/MBF
2015	37,714.40	160.16	33.33%	53.38
2014	21,881.40	265.98	26.67%	70.92
2013	31,888.00	168.20	20.00%	39.84
2012	10,887.00	138.83	13.33%	18.48
2011	24,786.43	122.43	6.67%	8.16
	128,882.23			190.69

REGION 5 - Pulpwood

Year	Volume	\$/CORD	WIA%	\$/CORD
2015	2,889.60	4.06	33.33%	1.36
2014	10,191.40	6.18	26.67%	1.65
2013	18,282.60	7.13	20.00%	1.43
2012	8,296.30	8.83	13.33%	0.92
2011	6,432.30	8.28	6.67%	0.42
	48,102.10			5.77

COAL PROPERTIES ANALYSIS

Tax Year 2017

September 1, 2016
Mark W. Matkovich
State Tax Commissioner
Department of Revenue

COAL CAPITALIZATION RATE

Capitalization Rate Analysis and Results

In developing a capitalization rate for use in valuing specific income-producing properties, consideration is given to the three approaches generally employed in estimating a discount rate. As a matter of practicality, the Bands-of-Investment and Summation Technique approaches are utilized in establishing discount rates for active coal. Data for analysis has been derived in accordance with current Legislative Rule Title 110, Series 11.

Safe Rate	90 day Treasury Bill	Safe Rate
January - December	2016	0.053%
January - December	2014	0.033%
January - December	2013	0.058%

<u>Risk Rate</u>	<u>Interest differential between Loan Rate and 90-day Treasury Bill</u>	
<u>Loan Rate</u>		<u>Debt Risk Rate</u>
2015	5.26%	5.207%
2014	5.25%	5.217%
2013	5.25%	5.192%
	Prima plus 2%	

Equity	Differential between Equity Rate and 90 day Treasury Bill	Equity Risk Rate
Equity Rate		
2016	$[14.75\% / (1 - .30)] - 0.053$	21.038%
2014	$[15.60\% / (1 - .30)] - 0.033$	22.110%
2013	$[13.26\% / (1 - .30)] - 0.058$	18.871%
** Value Line Investment Survey Analysis		

<u>Composite Risk Rate</u>		Loan and Equity Rates weighted by industry estimated capital structure	
	Equity Rate	Debt Rate	Composite Rate
2016	13.675%	1.822%	15.497%
2014	15.477%	1.565%	17.042%
2013	11.322%	2.077%	13.399%
Notes: Debt/Equity Ratio:		Debt: 35%	Equity: 65%

Non Liquidity Rate: Interest differential between a 90 day Treasury Bill and a 1 year Treasury Bill which reflects a reasonable time necessary to sell active property.

			1yr T.Bill	90 d T.Bill	Non Liquidity Rate
January - December	2016		0.322%	0.053%	0.269%
January - December	2014		0.121%	0.033%	0.088%
January - December	2013		0.132%	0.058%	0.074%

Management Rate: Charges for the management of investment portfolios.
Fixed Rate (by Rule) 0.500%

<u>Inflation Rate</u>			
January - December	2016		0.730%
January - December	2014		0.760%
January - December	2013		1.500%

Capitalization Rate: Since the valuation of active coal property is predicated on a three year production average, the capitalization rate is considered in a similar manner:

	2016	2014	2013
Inflation Rate	0.730%	0.760%	1.500%
Safe Rate	0.053%	0.033%	0.058%
Composite Risk Rate	15.497%	17.042%	13.399%
Non Liquidity Rate	0.269%	0.088%	0.074%
Management Rate	0.500%	0.500%	0.500%
Total	15.588%	18.903%	12.531%

Three Yr Average 15.00% Rounded for 15.00%

CAPITALIZATION RATE - 15.0%			
MULTIPLIERS:			
	%		%
1YR	0.933	9YR	3.417
2YR	1.743	10YR	3.382
3YR	2.448	11YR	3.813
4YR	3.082	12YR	3.813
5YR	3.596	13YR	3.887
6YR	4.058	14YR	3.139
7YR	4.482	15YR	3.271
8YR	4.812		

COAL

Price and Royalty Rate Analysis:

The development of royalty rates for the various categories of mines and markets involves information collection and review from a variety of sources. Coal lease rates have been derived from transaction information provided by county producers, assessors, tax auditors, and by individual lessors/lessees involved in the specific transaction. The prices for mined coal, as per 110-CSR 11, have been calculated from information provided by the WV Public Service Commission and U.S. Energy Information Administration concerning power plant fuel purchases. Prices provided by producers as part of tax filing and from data obtained from market summaries are included for comparison. Because a large portion of the data used in this analysis is, by law, considered confidential, only a summary of the results are published.

COAL SALE PRICES CY2016 FOR TY2017 APPLICATION

GRAND SUMMARY ALL SOURCES 2017	STEAM- SPOT	STEAM- TERM	MET
PSO	\$54.82	\$54.03	
FERC	\$51.10	\$60.81	
Active Return Summary		\$52.05 52.1 MM Tons	\$74.80 23.6 MM Tons
Coal Market Publications (Platts)		\$48.08 CAPP (12/1/87) Barge	
		\$46.85 PGH (13/3) Rail	
			\$87.54 Low Vol HCC

STATE STEAM PRICE (SPOT Market)	\$58.18 FERC & PSO, 3-YR AVE
STATE MET PRICE	\$74.80 Active Return, 1-YR

2015 WV PSO Tons reported in millions: Spot Sales 8,112,303 Term Sales 13,281,889 Total 19,404,199

COAL TY2017 ROYALTY RATES	2016 1YR		2014 2YR		2013 3YR		2012 4YR		2011 5YR	
	%S	%D	%S	%D	%S	%D	%S	%D	%S	%D
TOTAL RECORDS	447	452	1,447	804	1,354	588	1,908	2,758	1,877	2,247
SUM OF PERCENT	2004.88	2327.88	8,888.07	4,885.25	8,087.34	3,313.93	11,881.68	14,883.02	8,824.28	11,181.08
STRAIGHT AVERAGE	6.50	5.15	6.13	5.19	5.97	5.53	6.23	5.32	5.32	4.99
MEDIAN	6.00	5.00	6.00	5.00	5.00	5.00	6.00	5.13	5.00	5.00
WEIGHTED AVERAGE (by Minsac)	8.80	5.10	6.94	5.49	6.68	5.84	6.46	6.28	6.27	5.72
TENTATIVE RATE DEEP (%)	5.89									
TENTATIVE RATE SURFACE (%)	6.81									
ROYALTY RATE CALCULATIONS:										
Lean Coal/Deep Mine	\$58.18	per ton X	5.89%	=	\$3.31	per ton				
Metallurgical Coal/Deep Mine	\$74.80	per ton X	5.89%	=	\$4.24	per ton				
Steam Coal/Surface Mines	\$68.13	per ton X	6.81%	=	\$3.84	per ton				
Metallurgical Coal/Surface Mines	\$74.80	per ton X	6.81%	=	\$4.93	per ton				

Explanation of Reserve Coal Valuation

The RCVM consists of a computer model, which utilizes a database consisting of coal beds and characteristics, property locations, mine locations, sales, transportation, etc., for the entire state. An extensive algorithm calculates in-place tonnage, expected time of mining and present value for all the mineable coal on every property.

There are, therefore, no set "rates" available on reserve coal under the Rule. The RCVM values on each property will not be available until all data has been entered, after October 15 of each year. Please refer to the State Register, Legislative Rules, Title 110, Series 11 for details of the process.

Title 110, Series 11
Valuation of Active and Reserve Coal Property for Ad Valorem Property Tax Purposes

The above Legislative Rule was modified during the 2005 Legislative Session requiring biennial (every other year) updating of the geostatistical basis for several valuation factors used in the Reserve Coal Valuation Model. To satisfy that requirement, maps and data files concerning the Market Interest Factor, the Market Mineability Factor, the Use Conflict Factor and the Environmental Factor have been revised for Tax Year 2015. Preliminary research has been conducted to determine the effects of the factors on coal valuation. The results are as follows:

Market Interest Factor

This is the relationship between transactions (sales, leases, prospects, permit applications, etc.) and mining as it relates to property location. Trans_Ct is the number of transactions counted within the radius.
Radius = 5 miles

If Trans_Ct >= 20 Then TransFactor = 20

If Trans_Ct < 20 And Trans_Ct >= 10 Then TransFactor = 40

Else TransFactor = 80

Market Mineability Factor

This is the relationship between property location and mining, through time. Determining feature is count of mines within the radius.
Radius = 2.5 miles

Surface Mines: Smines

Deep Mines: Dmines

Boom Mines: Bmines

Historic Mines: Omines

Current Mines: Cmines

To assign MineFactor

If Cmines > 0 Then MineFactor = 20

If Cmines = 0 And (Omines > 0 Or Bmines > 0) Then MineFactor = 40

Else MineFactor = 80

Use Conflict Factor

This is the relationship between oil & gas well drilling and mining as it relates to property location. WellDensity is in wells per square mile

WellDensity < 3 Then WellFactor = 0

WellDensity >= 3 And WellDensity < 10 Then WellFactor = 20

WellDensity >= 10 And WellDensity < 20 Then WellFactor = 40

WellDensity > 20 Then WellFactor = 80

Environmental Factor

This is the relationship of known environmental hazards and impediments to the likelihood of mining occurring at this location. The rates are compiled from maps and represent densities of problems mapped:

Envrate <= 20 or Null Then EnvFactor = 0

Envrate > 20 and Envrate <= 40 Then EnvFactor = 20

Envrate > 40 and Envrate < 80 Then EnvFactor = 40

Envrate >= 80 Then EnvFactor = 80

**OTHER MINED MINERAL
PROPERTY ANALYSIS**

Tax Year 2017

September 1, 2016
Mark W. Matkovich
State Tax Commissioner
Department of Revenue

OTHER MINED MINERALS CAPITALIZATION RATE

Capitalization Rate Analysis and Results

In developing a capitalization rate for use in valuing specific income-producing properties consideration is given to the three approaches generally employed in estimating a discount rate. As a matter of practicality, the Bands-of-Investment and Summation Technique approaches are utilized in establishing discount rates for active coal. Data for analysis has been derived in accordance with current Legislative Rule Title 110, Series 1k.

Safe Rate:	90-day Treasury Bills:	Safe Rate:
January-December	2015:	0.053%
January-December	2014:	0.033%
January-December	2013:	0.058%

Risk Rate:	Interest differential between Loan Rate and 90-day Treasury Bills:	Debt Risk Rate:
Loan Rate:		
2015:	5.26%	5.207%
2014:	5.25%	5.217%
2013:	5.25%	5.192%
	Prime plus 2%:	

Equity:	Differential between Equity Rates and 90-day Treasury Bills:	Equity Risk Rate:
Equity Rate:		
2015:	11.75%/(1-.30)-0.053%	18.733%
2014:	11.75%/(1-.30)-0.033%	18.763%
2013:	11.75%/(1-.30)-0.058%	18.728%
	** Value Line Investment Survey Analysis:	

Composite Risk Rate:	Loan and Equity Rates weighted by industry estimated capital structure:	
Equity Rate:	Debt Rate:	Composite Risk
2015:	10.040%	12.123%
2014:	10.032%	12.139%
2013:	10.037%	12.114%
Note: Debt/Equity Ratio:	Debt: 40%	Equity: 60%

Non Liquidity Rate:	Interest differential between 90-day Treasury Bills and a 1 Year Treasury Bill which reflects a reasonable time necessary to sell active property:	
	1Yr T.Bill:	90d T.Bill:
January-December	2015:	0.322%
January-December	2014:	0.121%
January-December	2013:	0.132%
		Non Liquidity Rate:
		0.289%
		0.088%
		0.074%

Management Rate:	Charges for the management of investment portfolio:
Fixed Rate (by Rule):	0.500%

Inflation Rate:	
January-December	2015:
January-December	2014:
January-December	2013:

Property Tax Rate:	Sixty percent (60%) of State average Class III property tax rate:
January-December	2015:
January-December	2014:
January-December	2013:

Capitalization Rate: Since the valuation of other mined mineral property is predicated on a three year production average, the capitalization rate is considered in a similar manner:

	2015:	2014:	2013:
Inflation Rate:	-0.730%	-0.780%	-1.600%
Safe Rate:	0.053%	0.033%	0.058%
Composite Risk Rate:	12.123%	12.139%	12.114%
Non Liquidity Rate:	0.209%	0.088%	0.074%
Management Rate:	0.500%	0.500%	0.500%
Property Tax Rate:	1.314%	1.314%	1.314%
Total:	13.528%	13.314%	12.560%

Three Yr Average: 13.134% Rounded to: **13.10%**

CAPITALIZATION RATE - 13.10%

MULTIPLIERS:	%	%
1YR:	0.940	5.437
2YR:	1.772	5.748
3YR:	2.607	6.022
4YR:	3.152	6.286
5YR:	3.731	6.480
6YR:	4.240	6.666
7YR:	4.688	6.837
8YR:	5.088	

OTHER MINED MINERALS

ROYALTY RATE SURVEY

The determination of royalty rates for other mined minerals within the state of West Virginia is dependent upon the availability of leasehold information. Since this information is limited, the Department has chosen to review data for the most recent thirty year period. A summary of this review is shown below in order to protect the confidentiality of parties involved.

RESOURCE	DATA SOURCES	AVERAGE ROYALTY	MEDIAN ROYALTY	TY2017 RATE
LIMESTONE	15	\$0.22	\$0.20	\$0.22
SANDSTONE	8	\$0.31	\$0.28	\$0.30
CLAY/SHALE	34	\$0.12	\$0.10	\$0.11
SAND/GRAVEL	10	\$0.35	\$0.40	\$0.40
SALT BRINE	1	N/A	N/A	\$0.10

RESERVE VALUES

	number of sales	\$/AC
LIMESTONE	5	\$3,000.00
SANDSTONE	8	\$2,300.00
CLAY/SHALE	16	\$850.00
SAND/GRAVEL	6	\$4,000.00
SALT	2	\$1,140.00



STATE OF WEST VIRGINIA

Department of Revenue

State Tax Department

Earl Ray Tomblin
Governor

Mark W. Matkovich
State Tax Commissioner

June 30, 2016

The Honorable Natalie Tennant
Secretary of State
Building I, Suite 157-K
State Capitol
Charleston, West Virginia 25305

FILED
JUN 30 4 11 12
JUN 30 2016
JUN 30 2016

Dear Secretary Tennant:

Attached are tentative natural resource property valuation variables for the 2017 Tax Year that have been developed by the State Tax Department for use in appraising coal, oil, natural gas, managed timberland and other natural resource properties for ad valorem tax purposes.

The State Tax Department will accept written public comments on all variables until August 1, 2016. Final valuation variables will be filed on or before September 1, 2016.

Public comments concerning the attached variables should be forwarded to the following address:

West Virginia State Tax Department
Property Tax Division
Attention: Jeff Amburgey
P. O. Box 2389
Charleston, West Virginia 25328-2389

Sincerely,

Mark W. Matkovich
State Tax Commissioner

MWM/ja/j

Attachment

FILED

2016 JUN 30 AM 11:12

STATE OF ARIZONA
DEPARTMENT OF REVENUE

OIL AND GAS PROPERTIES ANALYSIS

Tax Year 2017

June 30, 2016
Mark W. Matkovich
State Tax Commissioner
Department of Revenue

OIL AND GAS

TY 2017

Capitalization Rate Analysis and Results:

In developing a capitalization rate for use in valuing specific income-producing properties, consideration is given to the three approaches generally employed in estimating a discount rate. As a matter of practicality, the Bands-of-Investment and Summation Technique approaches are utilized in establishing discount rates for producing oil and gas properties. Data for analysis has been derived in accordance with current Legislative Rule Title 110, Series 1J.

Safe Rate (3-Month Constant Maturity Interest Rates)

January December 2015

0.053%Risk Rate (Interest differential between Loan Rate and 3-Month Constant Maturity Interest Rates)Loan Rate

2015 5.260%

Risk Rate

6.207%

*Prime plus 2%

Equity (Differential between Equity Rates and 3-Month Constant Maturity Interest Rates)Equity Rates

2015 (12.25%/(1-.37))-0.053%

Risk Rate

19.391%

** Value Line Investment Survey Analysis

Composite Risk Rate Loan and Equity Rates weighted by Industry estimated capital structureEquity Rates

2015 12.6042%

Debt Rates

1.822%

Composite Risk**15.186%**

Note: Debt/Equity Ratio

Debt

35%

Equity

65%

*** Effective severance tax adjustment

0.95

Non Liquidity Rate Interest differential between 3-month Constant Maturity Interest Rates and a 1-year Constant Maturity Interest Rates which reflects a reasonable time necessary to sell active property.

January December 2015

1yr T Bill

0.322%

90 day T Bill

0.053%

Non Liquidity Rate**0.289%**Management Rate Charges for the management of investment portfolios.

Fixed Rate (by Rule)

0.500%Property Tax Rate Sixty percent (60%) of State average Class III property tax rate

2015

60% of 2.19

1.314%Inflation Rate

January December 2015

0.730%

Capitalization Rate:

Since the valuation of oil and gas property is predicated on a three year production, the capitalization rate will be considered in a similar manner:

	2015	2014	2013
Inflation Rate:	-0.730%	-0.780%	-1.500%
Safe Rate:	0.053%	0.033%	0.088%
Composite Risk Rate:	15.188%	14.389%	14.934%
Non Liquidity Rate:	0.288%	0.088%	0.074%
Management Rate:	0.500%	0.500%	0.500%
Property Tax Rate:	1.314%	1.314%	1.314%
Total	16.592%	15.594%	15.080%
	50.000%	33.333%	16.667%
	8.298%	5.188%	2.513%
			16.997%

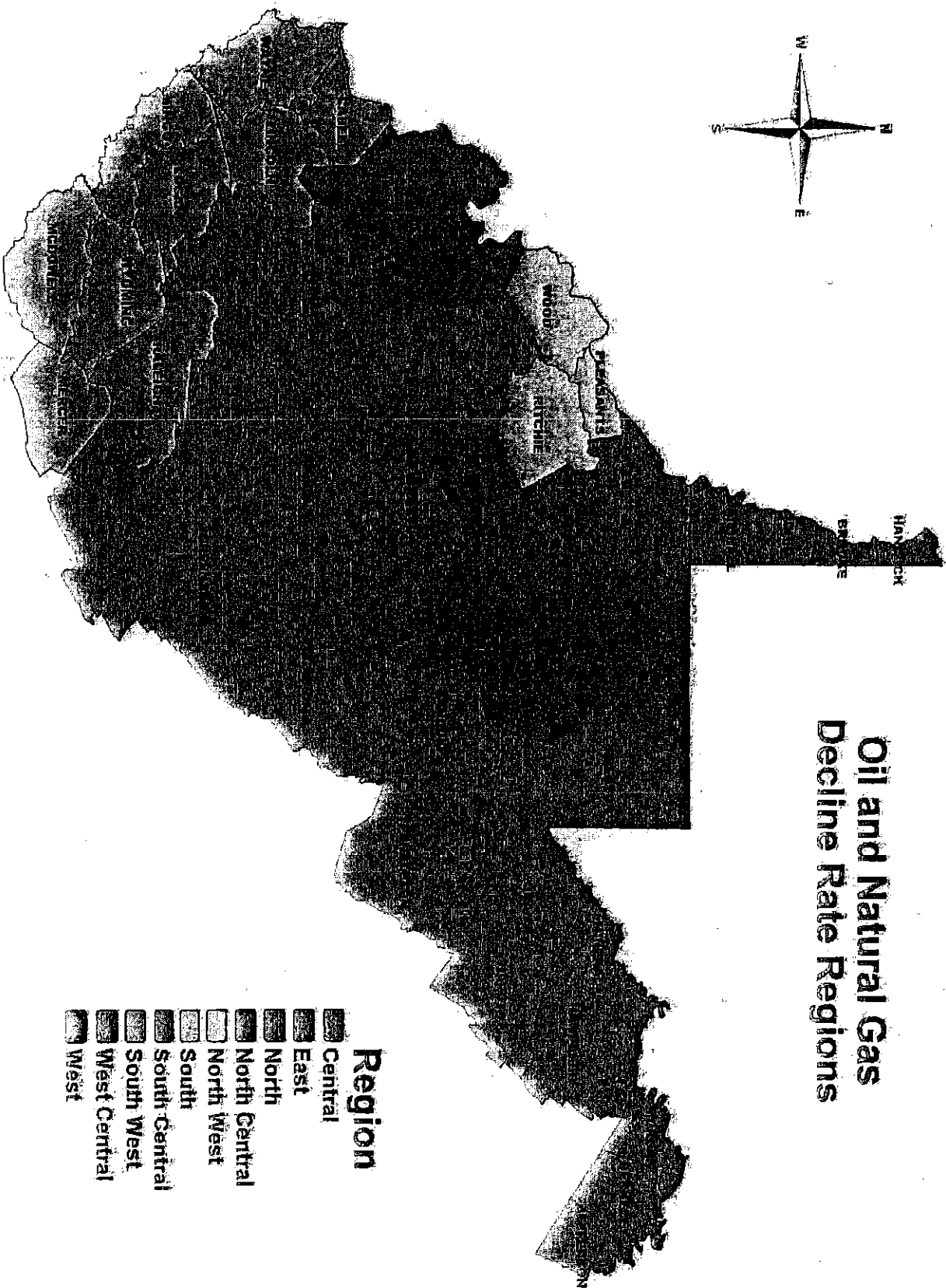
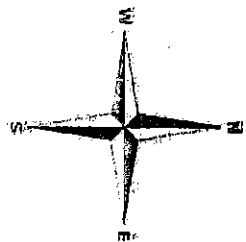
Capitalization Rate Rounded to:

16.00%

MULTIPLIERS FOR 16.0% MID-YEAR LIFE (ANNUALLY)

YEAR		YEAR	
1	0.928477	21	0.047710
2	0.800411	22	0.041128
3	0.690009	23	0.035466
4	0.594836	24	0.030568
5	0.512788	25	0.026360
6	0.442080	26	0.022746
7	0.381088	27	0.019582
8	0.328622	28	0.016861
9	0.283208	29	0.014553
10	0.244148	30	0.012546
11	0.210470	31	0.010815
12	0.181440	32	0.009323
13	0.156814	33	0.008037
14	0.134840	34	0.006929
15	0.116247	35	0.005973
16	0.100206	36	0.005148
17	0.086388	37	0.004439
18	0.074471	38	0.003827
19	0.064199	39	0.003299
20	0.056344	40	0.002844

Oil and Natural Gas Decline Rate Regions



- Region**
- Central
 - East
 - North
 - North Central
 - North West
 - South
 - South Central
 - South West
 - West Central
 - West

Decline Rates for Natural Gas and Oil Formations: Central				
Central: Braxton, Clay, Fayette, Nicholas, Webster				
Code	Formation	Year 1	Year 2	Year 3 *
12	Alexander, Benson	-0.31	-0.20	-0.10
14	Benson	-0.48	-0.08	-0.08
16	Benson, Balltown **	-0.48	-0.16	-0.12
17	Gordon **	-0.30	-0.07	-0.07
18	Big Injun	-0.34	-0.13	-0.13
19	Big Injun, Big Lime	-0.36	-0.13	-0.13
22	Big Lime	-0.34	-0.34	-0.13
26	Ravencloft	-0.40	-0.40	-0.25
93	4th Sand	-0.42	-0.32	-0.08
94	50 Foot	-0.34	-0.26	-0.07
95	Injun/Weir	-0.51	-0.26	-0.09
96	Maxton	-0.70	-0.27	-0.08
109	Trenton/Deeper *	-0.41	-0.22	-0.09
110	Marcellus *	-0.41	-0.22	-0.09
111	Utica *	-0.41	-0.22	-0.09
9	Exception (Median)	-0.41	-0.22	-0.09
10	Non-Filer	-0.30	-0.07	-0.07

* New Formation(s) involved in recent production: These will be valued with the Exception Rates until decline information is available.

Decline Rates for Natural Gas and Oil Formations: East				
East: Berkeley, Grant, Greenbrier, Hampshire, Hardy, Jefferson, Mineral, Monroe, Morgan, Pendleton, Pocahontas, Preston, Randolph, Summers, Tucker				
Code	Formation	Year 1	Year 2	Year 3 +
1	Oriskany	-0.30	-0.30	-0.19
14	Benson	-0.31	-0.17	-0.12
20	Benson +	-0.44	-0.20	-0.08
21	Benson, Fifth	-0.29	-0.28	-0.09
32	Brallier +	-0.48	-0.20	-0.05
33	Elk, Benson	-0.39	-0.21	-0.08
34	Elk, Benson, Riley	-0.53	-0.19	-0.05
35	Elk, Benson, Riley +	-0.36	-0.19	-0.11
36	Elk, Benson, Balltown	-0.34	-0.18	-0.11
37	Elk, Alexander, Benson	-0.50	-0.07	-0.07
38	Elk, Alexander, Benson +	-0.40	-0.16	-0.16
39	Huntermville	-0.31	-0.31	-0.14
40	Fox, Haverly	-0.36	-0.21	-0.15
93	4th Sand	-0.42	-0.32	-0.08
94	50 Foot	-0.34	-0.26	-0.07
95	Injun/Weir	-0.51	-0.26	-0.09
96	Maxton	-0.70	-0.27	-0.08
110	Marcellus	-0.59	-0.22	-0.17
111	Utica*	-0.59	-0.22	-0.17
9	Exception (Median)	-0.41	-0.22	-0.10
10	Non-Filer	-0.29	-0.07	-0.05

*New Formation(s) involved in recent production. These will be valued with the Marcellus Rates until decline information is available.

Decline Rates for Natural Gas and Oil Formations: North				
North: Brooke, Hancock, Marshall, Ohio, Tyler, Wetzel				
Code	Formation	Year 1	Year 2	Year 3 +
11	Gordon	-0.47	-0.31	-0.09
13	Alexander, Benson, Riley	-0.26	-0.16	-0.15
15	Benson, Riley	-0.18	-0.16	-0.06
93	4th Sand	-0.42	-0.32	-0.08
94	50 Foot	-0.34	-0.26	-0.07
95	Injun/Weir	-0.51	-0.26	-0.09
96	Maxton	-0.70	-0.27	-0.08
97	Coalbed Methane (Vertical)	-0.23	-0.08	-0.05
110	Marcellus	-0.52	-0.23	-0.18
111	Utica*	-0.52	-0.23	-0.18
9	Exception (Median)	-0.39	-0.23	-0.08
10	Non-Filer	-0.18	-0.16	-0.06

*New Formation(s) involved in recent production. These will be valued with the Marcellus Rates until decline information is available.

Decline Rates for Natural Gas and Oil Formations: North Central				
North Central: Barbour, Doddridge, Gilmer, Harrison, Lewis, Marion, Monongalia, Taylor, Upshur				
Code	Formation	Year 1	Year 2	Year 3
11	Gordon	-0.41	-0.14	-0.12
12	Alexander, Benson	-0.37	-0.19	-0.11
13	Alexander, Benson, Riley	-0.40	-0.28	-0.08
14	Benson	-0.31	-0.17	-0.12
15	Benson, Riley	-0.34	-0.17	-0.14
18	Big Injun	-0.36	-0.18	-0.13
21	Benson, Fifth	-0.31	-0.20	-0.14
28	Weir	-0.34	-0.34	-0.07
29	Weir +	-0.28	-0.28	-0.23
33	Elk, Benson	-0.34	-0.18	-0.11
34	Elk, Benson, Riley	-0.42	-0.27	-0.08
37	Elk, Alexander, Benson	-0.49	-0.23	-0.08
38	Elk, Alexander, Benson +	-0.38	-0.20	-0.12
40	Fox, Haverty	-0.48	-0.18	-0.08
50	Rhinestreet	-0.28	-0.03	-0.03
57	Alexander, Benson, Balltown	-0.39	-0.26	-0.08
58	Alexander	-0.35	-0.20	-0.10
59	Alexander +	-0.39	-0.22	-0.10
60	Alexander, Benson, Riley +	-0.39	-0.35	-0.12
61	Balltown	-0.35	-0.20	-0.10
62	Balltown, Speechley	-0.28	-0.22	-0.10
63	Balltown, Speechley +	-0.30	-0.13	-0.10
64	Benson, Balltown, Speechley	-0.28	-0.22	-0.08
65	Benson, Bradford	-0.37	-0.20	-0.10
66	Benson, Balltown	-0.29	-0.23	-0.11
67	Benson, Riley +	-0.38	-0.14	-0.10
68	Benson, Speechley	-0.30	-0.22	-0.14
69	Brallier, Elk	-0.42	-0.20	-0.13
70	Brallier	-0.40	-0.22	-0.15
71	Deeper/Onondaga or Oriskany/Helderberg	-0.24	-0.24	-0.08
72	Elk, Alexander	-0.42	-0.22	-0.09
73	Elk, Benson +	-0.38	-0.20	-0.12
74	Elk	-0.43	-0.12	-0.10
75	Elk, Riley	-0.60	-0.35	-0.17
76	Fox +	-0.46	-0.18	-0.09
77	Haverty, Elk, Benson (No Alexander)	-0.35	-0.16	-0.16
78	Haverty	-0.45	-0.15	-0.15
79	Riley	-0.44	-0.22	-0.10
80	Speechley	-0.30	-0.18	-0.09
81	Alexander, Benson, Speechley	-0.39	-0.24	-0.10
82	Haverty, Elk, Alexander	-0.47	-0.14	-0.14
85	Fifth, Oil	-0.45	-0.25	-0.22
87	Bayard All	-0.30	-0.20	-0.05
88	Fifth	-0.29	-0.18	-0.12
89	Fifth +	-0.25	-0.15	-0.13
90	Gordon, Injun All	-0.41	-0.23	-0.23
91	Squaw	-0.37	-0.31	-0.06
92	Injun +	-0.34	-0.22	-0.22
93	4th Sand	-0.42	-0.32	-0.08
94	50 Foot	-0.34	-0.26	-0.07
95	Injun/Weir	-0.61	-0.28	-0.09
96	Maxton	-0.70	-0.27	-0.08
97	Coalbed Methane (Vertical)	-0.23	-0.08	-0.05
98	Coalbed Methane (Horizontal)	-0.05	-0.05	-0.32
109	Trenton/Deeper +	-0.38	-0.21	-0.11
110	Marcellus	-0.59	-0.29	-0.23
111	Utica**	-0.59	-0.29	-0.23
9	Exception (Median)	-0.38	-0.21	-0.11
10	Non-Filter	-0.23	-0.03	-0.03

*New Formation(s) involved in recent production. These will be valued with the Exception Rates until decline information is available.

**New Formation(s) involved in recent production. These will be valued with the Marcellus Rates until decline information is available.

Decline Rates for Natural Gas and Oil Formations; North West				
North West: Pleasant, Ritchie, Wood				
Code	Formation	Year 1	Year 2	Year 3 +
2	Huron, Rhinestreet	-0.41	-0.26	-0.07
4	Huron	-0.42	-0.24	-0.14
5	Huron, Shales above Huron	-0.39	-0.25	-0.14
8	Berea	-0.31	-0.15	-0.15
11	Gordon	-0.38	-0.10	-0.10
12	Alexander, Benson (No Riley)	-0.34	-0.23	-0.10
13	Alexander, Benson, Riley	-0.32	-0.20	-0.10
14	Benson	-0.19	-0.19	-0.10
44	Rhinestreet, Huron, Shallow Shale	-0.43	-0.26	-0.11
47	Alexander, Riley, (No Benson)	-0.41	-0.05	-0.05
48	Rhinestreet, Alexander, Benson, Riley	-0.31	-0.24	-0.10
49	Weir, Squaw, Big Injun	-0.27	-0.17	-0.07
50	Rhinestreet	-0.40	-0.27	-0.27
51	Rhinestreet*	-0.36	-0.21	-0.10
52	All Upper Devonian (Undiv)	-0.48	-0.33	-0.19
53	Huron, Chemung	-0.35	-0.11	-0.09
54	Huron, Hampshire, Pocono	-0.12	-0.12	-0.11
55	Upper Devonian (Above Huron)	-0.46	-0.33	-0.23
56	Chemung Sands= Riley, Bradford, Balltown, Speechley, Warren (No Benson or Alexander)	-0.28	-0.18	-0.10
83	Huron Oil	-0.74	-0.44	-0.40
93	4th Sand	-0.42	-0.32	-0.08
94	50 Foot	-0.34	-0.26	-0.07
95	Injun/Weir	-0.51	-0.26	-0.09
96	Maxton	-0.70	-0.27	-0.08
109	Trenton/Deeper*	-0.39	-0.23	-0.13
110	Marcellus	-0.46	-0.29	-0.23
111	Utica**	-0.48	-0.29	-0.23
9	Exception (Median)	-0.39	-0.23	-0.13
10	Non-Filer	-0.12	-0.05	-0.05

*New Formation(s) involved in recent production. These will be valued with the Exception Rates until decline information is available.

**New Formation(s) involved in recent production. These will be valued with the Marcellus Rates until decline information is available.

Decline Rates for Natural Gas and Oil Formations: South				
South: McDowell, Mercer, Raleigh, Wyoming				
Code	Formation	Year 1	Year 2	Year 3 +
8	Berea	-0.34	-0.15	-0.15
22	Big Lime	-0.31	-0.19	-0.07
23	Big Lime, Maxton	-0.31	-0.19	-0.07
24	Big Lime, Ravencliff	-0.29	-0.29	-0.17
25	Berea +	-0.37	-0.12	-0.08
26	Ravencliff	-0.40	-0.08	-0.07
28	Weir	-0.44	-0.20	-0.10
29	Weir +	-0.28	-0.21	-0.08
30	Weir, Big Lime	-0.37	-0.19	-0.13
42	Maxton, Ravencliff	-0.40	-0.08	-0.07
93	4th Sand	-0.42	-0.32	-0.08
94	50 Foot	-0.34	-0.26	-0.07
95	Injun/Weir	-0.51	-0.26	-0.09
96	Maxton	-0.27	-0.13	-0.09
97	Coalbed Methane (Vertical)	0.03	0.10	-0.05
98	Coalbed Methane (Horizontal)	-0.05	-0.05	-0.32
110	Marcellus *	-0.36	-0.19	-0.09
111	Utica*	-0.36	-0.19	-0.09
9	Exception: (Median)	-0.36	-0.19	-0.09
10	Non-Filer	-0.23	-0.08	-0.05

* These rates are based on recent production. These will be valued with the Exception Rates until decline information is available.

Decline Rates for Natural Gas and Oil Formations: South Central				
South Central: Boone, Kanawha				
Code	Formation	Year 1	Year 2	Year 3 +
3	Devonian Shale	-0.23	-0.08	-0.05
4	Huron	-0.31	-0.15	-0.04
8	Berea	-0.23	-0.14	-0.09
18	Big Injun	-0.29	-0.25	-0.12
27	Huron, Shales above Huron	-0.21	-0.08	-0.05
28	Weir	-0.30	-0.21	-0.14
29	Weir +	-0.31	-0.25	-0.09
31	Devonian Shales +	-0.27	-0.07	-0.05
88	Big Injun-Oil	-0.19	-0.18	-0.10
93	4th Sand	-0.42	-0.32	-0.08
94	50 Foot	-0.34	-0.28	-0.07
95	Injun/Weir	-0.51	-0.26	-0.09
96	Maxton	-0.70	-0.27	-0.08
109	Trenton/Deeper*	-0.33	-0.19	-0.08
110	Marcellus*	-0.33	-0.19	-0.08
111	Utica*	-0.33	-0.19	-0.08
9	Exception (Median)	-0.33	-0.19	-0.08
10	Non-Filer	-0.19	-0.07	-0.04

* Areas Estimated (or Imputed) in recent production. These will be valued with the Exception Rates until decline information is available.

Decline Rates for Natural Gas and Oil Formations: South West				
South West: Cabell, Lincoln, Logan, Mingo, Wayne				
Code	Formation	Year 1	Year 2	Year 3
3	Devonian Shale	-0.31	-0.15	-0.04
8	Berea	-0.38	-0.11	-0.11
18	Big Injun	-0.38	-0.22	-0.04
22	Big Lime	-0.19	-0.19	-0.19
43	Berea, Big Lime	-0.18	-0.18	-0.18
93	4th Sand	-0.42	-0.32	-0.08
94	50 Foot	-0.34	-0.26	-0.07
95	Injun/Weir	-0.51	-0.26	-0.09
96	Maxton	-0.70	-0.27	-0.08
109	Trenton/Deeper *	-0.38	-0.22	-0.10
110	Marcellus *	-0.38	-0.22	-0.10
111	Utica*	-0.38	-0.22	-0.10
9	Exception (Median)	-0.38	-0.22	-0.10
10	Non-Filer	-0.18	-0.11	-0.04

* New Formation(s) involved in recent production: These will be valued with the Exception Rates until decline information is available.

Decline Rates for Natural Gas and Oil Formations: West Central				
West Central: Calhoun, Roane, Wirt				
Code	Formation	Year 1	Year 2	Year 3
2	Huron, Rhinestreet	-0.49	-0.11	-0.06
4	Huron	-0.33	-0.22	-0.14
27	Huron, Shales above Huron	-0.42	-0.23	-0.12
44	Rhinestreet, Huron, Shallow Shale	-0.51	-0.14	-0.11
45	Devonian Shale, Pocono	-0.25	-0.17	-0.12
46	Pocono	-0.29	-0.25	-0.12
84	Big Injun, Oil	-0.41	-0.41	-0.11
93	4th Sand	-0.42	-0.32	-0.08
94	50' Foot	-0.34	-0.26	-0.07
95	Injun/Weir	-0.51	-0.26	-0.09
96	Maxton	-0.70	-0.27	-0.08
109	Trenton/Deeper *	-0.42	-0.24	-0.10
110	Marcellus *	-0.42	-0.24	-0.10
111	Utica*	-0.42	-0.24	-0.10
9	Exception (Median)	-0.42	-0.24	-0.10
10	Non-Filer	-0.25	-0.11	-0.06

* New Formation(s) involved in recent production. These will be valued with the Exception Rates until decline information is available.

Decline Rates for Natural Gas and Oil Formations: West				
West: Jackson, Mason, Putnam				
Code	Formation	Year 1	Year 2	Year 3
1	Oriskany	-0.40	-0.40	-0.29
2	Huron, Rhinestreet	-0.13	-0.12	-0.03
3	Devonian Shale	-0.31	-0.15	-0.04
4	Huron	-0.29	-0.14	-0.05
5	Huron, Shales above Huron	-0.39	-0.15	-0.06
6	Huron, Berea	-0.29	-0.08	-0.08
7	Berea, Devonian Shale	-0.08	-0.08	-0.08
8	Berea	-0.36	-0.16	-0.16
93	4th Sand	-0.42	-0.32	-0.08
94	50' Foot	-0.34	-0.26	-0.07
95	Injun/Welr	-0.51	-0.26	-0.09
96	Maxton	-0.70	-0.27	-0.08
109	Trenton/Deeper *	-0.35	-0.20	-0.09
110	Marcellus *	-0.35	-0.20	-0.09
111	Utica *	-0.35	-0.20	-0.09
9	Exception (Median)	-0.35	-0.20	-0.09
10	Non-Filer	-0.08	-0.08	-0.03

Industry Operating Expense Survey and Results

This component was determined through a review of responses to a survey distributed by the State Tax Department to producers of all oil and natural gas wells producing in West Virginia and through use of other market data.

GAS

- % Working Interest Expenses for Typical Producing Well	=	30%
- Maximum Operating Expenses	=	\$5,000
- Coal Bed Methane, Vertical Wells Expenses	=	\$9,000

OIL

- % Working Interest Expenses for Typical Producing Well	=	35%
- Maximum Operating Expenses	=	\$5,750
- Maximum Enhanced Operating Expenses	=	\$9,000

MARCELLUS/UTICA

- % Working Interest Expenses for Vertical Producing Well	=	30%
- Maximum Operating Expenses	=	\$30,000

- % Working Interest Expenses for Horizontal Producing Well	=	20%
- Maximum Operating Expenses	=	\$150,000

HORIZONTAL WELLS (OTHER THAN MARCELLUS/UTICA AND COAL BED METHANE)

- % Working Interest Expenses for Horizontal Producing Well	=	30%
- Maximum Operating Expenses	=	\$20,000

Minimum Working Interest Appraisal = \$500 per well

Flat Rate Royalty Multiplier = 5.75

Home Use Only Wells:

Appraised at \$500 per well

Industrial Use Only Wells:*

MCF usage X \$2.62/MCF

BBL usage X \$48.66/BBL

*(Also includes Department of Environmental Protection reported wells.)

Non-Filer Valuations

Working Interest	=	150% of previous year's appraisal
Royalty Interest	=	90% of previous year's appraisal

Valuation

The previously discussed variables are used to establish a future income stream converted to present worth through application of a capitalization rate. The sum of the discounted future net income per year represents a reasonable estimate of market value.

Lease Rate/Term Survey and Results

The non-producing property value for each county is determined by multiplying the average delay rental by a factor, which represents the average lease term under present economic conditions.

As a result of higher lease terms being inversely proportional to the value of oil and gas (thus counties with little leasing or production activities reflect inflated values) and with the volatile nature of county activity, necessary adjustments in the review have been made.

A compilation of lease terms produced a statewide average of 5 years. This term (5 years) was applied to all county lease rates and compared to the appraisal rates derived from calculations using individual county data as well as regional data. The resulting calculations were reviewed and considered in the assignment of an appraisal rate per acre.

The appraisal rate/acre amounts shown on the next page are preliminary figures, which may change if additional lease data is received. These rates have been applied to all county magisterial districts with either producing wells, lease activity within the past 5 years or both. Tax districts void of activity within the past 5 years have been assigned the minimum value per acre.

OIL & GAS RESERVE RATES FOR TY 2017			
COUNTY	CO #	DISTRICT #	TY2017 \$/AC
BARBOUR	1	1	\$60.00
		2	\$1.00
		3	\$60.00
		4	\$60.00
		5	\$60.00
		6	\$1.00
		7	\$60.00
		8	\$60.00
		9	\$60.00
		10	\$60.00
		11	\$60.00
BERKELEY	2	1	\$1.00
		2	\$1.00
		3	\$1.00
		4	\$1.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$1.00
BOONE	3	1	\$20.00
		2	\$1.00
		3	\$1.00
		4	\$20.00
		5	\$20.00
		6	\$20.00
		7	\$1.00
		8	\$20.00
		9	\$1.00
BRAXTON	4	1	\$20.00
		2	\$1.00
		3	\$1.00
		4	\$1.00
		5	\$20.00
		6	\$20.00
		7	\$20.00
		8	\$1.00
BROOKE	5	1	\$1.00
		2	\$1.00
		3	\$100.00
		4	\$100.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$1.00

OIL & GAS RESERVE RATES FOR TY 2017			
COUNTY	CO #	DISTRICT #	TY2017 \$/AC.
CABELL	6	1	\$25.00
		2	\$1.00
		3	\$25.00
		4	\$25.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$25.00
		9	\$1.00
		10	\$25.00
CALHOUN	7	1	\$30.00
		2	\$1.00
		3	\$30.00
		4	\$30.00
		5	\$30.00
		6	\$30.00
CLAY	8	1	\$20.00
		2	\$1.00
		3	\$20.00
		4	\$20.00
		5	\$20.00
		6	\$20.00
DODDRIDGE	9	1	\$90.00
		2	\$90.00
		3	\$90.00
		4	\$90.00
		5	\$90.00
		6	\$90.00
		7	\$90.00
		8	\$90.00
		9	\$1.00
FAYETTE	10	1	\$20.00
		2	\$20.00
		3	\$20.00
		4	\$1.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$1.00
		9	\$1.00
		10	\$1.00
		11	\$1.00
		12	\$1.00
		13	\$1.00

OIL & GAS RESERVE RATES FOR TY 2017			
COUNTY	CD #	DISTRICT #	TY2017 \$/AC
GILMER	11	1	\$25.00
		2	\$25.00
		3	\$25.00
		4	\$1.00
		5	\$1.00
		6	\$25.00
GRANT	12	1	\$1.00
		2	\$1.00
		3	\$1.00
		4	\$1.00
		5	\$1.00
GREENBRIER	13	1	\$1.00
		2	\$1.00
		3	\$1.00
		4	\$1.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$1.00
		9	\$1.00
		10	\$1.00
		11	\$1.00
		12	\$1.00
		13	\$1.00
		14	\$1.00
		15	\$1.00
		16	\$1.00
		17	\$1.00
		18	\$1.00
HAMPSHIRE	14	1	\$1.00
		2	\$1.00
		3	\$1.00
		4	\$1.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$1.00
		9	\$1.00
		10	\$1.00
HANCOCK	15	1	\$25.00
		2	\$1.00
		3	\$25.00
		4	\$25.00
		5	\$1.00
		6	\$1.00

OIL & GAS RESERVE RATES FOR TY 2017			
COUNTY	CO. #	DISTRICT #	TY2017 \$/AC
HARDY	16	1	\$1.00
		2	\$1.00
		3	\$1.00
		4	\$1.00
		5	\$1.00
		6	\$1.00
HARRISON	17	1	\$90.00
		2	\$1.00
		3	\$1.00
		4	\$1.00
		5	\$90.00
		6	\$1.00
		7	\$90.00
		8	\$1.00
		9	\$90.00
		10	\$1.00
		11	\$90.00
		12	\$90.00
		13	\$1.00
		14	\$90.00
		15	\$90.00
		16	\$1.00
		17	\$1.00
		18	\$90.00
		19	\$1.00
		20	\$90.00
		21	\$1.00
JACKSON	18	1	\$40.00
		2	\$40.00
		3	\$1.00
		4	\$40.00
		5	\$1.00
		6	\$40.00
		7	\$40.00
JEFFERSON	19	1	\$1.00
		2	\$1.00
		3	\$1.00
		4	\$1.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$1.00
		9	\$1.00
		10	\$1.00

OIL & GAS RESERVE RATES FOR TY 2017			
COUNTY	CO.#	DISTRICT #	TY2017 \$/AC
KANAWHA	20	1	\$30.00
		2	\$1.00
		3	\$30.00
		4	\$1.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$1.00
		9	\$1.00
		10	\$1.00
		11	\$1.00
		12	\$1.00
		13	\$1.00
		14	\$1.00
		15	\$30.00
		16	\$30.00
		17	\$1.00
		18	\$1.00
		19	\$30.00
		20	\$1.00
		21	\$1.00
		22	\$1.00
		23	\$30.00
		24	\$30.00
		25	\$30.00
		26	\$1.00
		27	\$1.00
		28	\$30.00
		29	\$1.00
		30	\$1.00
		31	\$1.00
LEWIS	21	1	\$35.00
		2	\$35.00
		3	\$35.00
		4	\$35.00
		5	\$1.00
		6	\$35.00
		7	\$1.00
		8	\$1.00
		9	\$1.00
LINCOLN	22	1	\$25.00
		2	\$25.00
		3	\$1.00
		4	\$25.00
		5	\$25.00
		6	\$25.00
		7	\$25.00
		8	\$25.00
		9	\$25.00
		10	\$1.00

OIL & GAS RESERVE RATES FOR TY 2017			
COUNTY	CO.#	DISTRICT#	TY2017 \$/AC
LOGAN	23	1	\$15.00
		2	\$15.00
		3	\$15.00
		4	\$15.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$15.00
		9	\$1.00
MARION	24	1	\$1.00
		2	\$90.00
		3	\$1.00
		4	\$1.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$1.00
		9	\$90.00
		10	\$1.00
		11	\$99.00
		12	\$90.00
		13	\$1.00
		14	\$1.00
		15	\$1.00
		16	\$90.00
		17	\$1.00
		18	\$90.00
		19	\$90.00
		20	\$1.00
		21	\$1.00
		22	\$1.00
MARSHALL	25	1	\$1.00
		2	\$1.00
		3	\$100.00
		4	\$100.00
		5	\$100.00
		6	\$1.00
		7	\$100.00
		8	\$1.00
		9	\$100.00
		10	\$1.00
		11	\$1.00
		12	\$100.00
		13	\$100.00
		14	\$100.00
		15	\$100.00
		16	\$1.00

OIL & GAS RESERVE RATES FOR TY 2017			
COUNTY	CO #	DISTRICT #	TY2017 \$/AC
MASON	26	1	\$1.00
		2	\$25.00
		3	\$25.00
		4	\$25.00
		5	\$25.00
		6	\$25.00
		7	\$1.00
		8	\$1.00
		9	\$1.00
		10	\$25.00
		11	\$1.00
		12	\$1.00
		13	\$1.00
		14	\$25.00
		15	\$25.00
		16	\$25.00
MC DOWELL	27	1	\$20.00
		2	\$1.00
		3	\$20.00
		4	\$20.00
		5	\$1.00
		6	\$20.00
		7	\$1.00
		8	\$1.00
		9	\$1.00
		10	\$1.00
		11	\$20.00
		12	\$1.00
		13	\$20.00
		14	\$1.00
		15	\$1.00
		16	\$1.00
MERCER	28	1	\$1.00
		2	\$15.00
		3	\$1.00
		4	\$1.00
		5	\$1.00
		6	\$15.00
		7	\$1.00
		8	\$1.00
		9	\$15.00
		10	\$1.00
		11	\$15.00

OIL & GAS RESERVE RATES FOR TY 2017			
COUNTY	CO #	DISTRICT #	TY2017 \$/AC
MINERAL	29	1	\$1.00
		2	\$1.00
		3	\$1.00
		4	\$1.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$1.00
		9	\$1.00
		10	\$1.00
		11	\$1.00
MINGO	30	1	\$1.00
		2	\$1.00
		3	\$20.00
		4	\$20.00
		5	\$20.00
		6	\$20.00
		7	\$20.00
		8	\$1.00
		9	\$20.00
		10	\$20.00
		11	\$20.00
		12	\$1.00
MONONGALIA	31	1	\$30.00
		2	\$1.00
		3	\$30.00
		4	\$30.00
		5	\$30.00
		6	\$1.00
		7	\$30.00
		8	\$30.00
		9	\$1.00
		10	\$1.00
		11	\$1.00
		12	\$1.00
		13	\$1.00
		14	\$1.00
		15	\$1.00
		16	\$1.00
		17	\$1.00
		18	\$30.00
		19	\$1.00

OIL & GAS RESERVE RATES FOR TY 2017			
COUNTY	CO #	DISTRICT #	TY2017 \$/AC
MONROE	32	1	\$1.00
		2	\$1.00
		3	\$1.00
		4	\$1.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$1.00
		9	\$1.00
MORGAN	33	1	\$1.00
		2	\$1.00
		3	\$1.00
		4	\$1.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$1.00
NICHOLAS	34	1	\$1.00
		2	\$15.00
		3	\$15.00
		4	\$15.00
		5	\$1.00
		6	\$1.00
		7	\$15.00
		8	\$1.00
		9	\$1.00
OHIO	35	1	\$1.00
		2	\$1.00
		3	\$100.00
		4	\$100.00
		5	\$1.00
		6	\$100.00
		7	\$1.00
		8	\$1.00
		9	\$1.00
		10	\$1.00
PENDLETON	36	1	\$1.00
		2	\$10.00
		3	\$1.00
		4	\$1.00
		5	\$1.00
		6	\$1.00
		7	\$10.00

OIL & GAS RESERVE RATES FOR TY 2017			
COUNTY	CO #	DISTRICT #	TY2017 \$/AC
PLEASANTS	37	1	\$45.00
		2	\$45.00
		3	\$45.00
		4	\$45.00
		5	\$45.00
		6	\$1.00
		7	\$45.00
		8	\$45.00
POCAHONTAS	38	1	\$1.00
		2	\$1.00
		3	\$1.00
		4	\$1.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$1.00
PRESTON	39	1	\$30.00
		2	\$30.00
		3	\$30.00
		4	\$30.00
		5	\$30.00
		6	\$30.00
		7	\$1.00
		8	\$30.00
		9	\$1.00
		10	\$30.00
		11	\$1.00
		12	\$1.00
		13	\$1.00
		14	\$1.00
		15	\$1.00
		16	\$1.00
		17	\$1.00
		18	\$1.00
		19	\$1.00
		20	\$1.00
PUTNAM	40	1	\$25.00
		2	\$25.00
		3	\$1.00
		4	\$25.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$25.00
		9	\$1.00
		10	\$25.00
		11	\$25.00
		12	\$25.00
		13	\$1.00

OIL & GAS RESERVE RATES FOR TY 2017			
COUNTY	CO #	DISTRICT #	TY2017 \$/AG
RALEIGH	41	1	\$20.00
		2	\$20.00
		3	\$1.00
		4	\$1.00
		5	\$20.00
		6	\$1.00
		7	\$20.00
		8	\$20.00
		9	\$20.00
		10	\$1.00
		11	\$20.00
		12	\$20.00
RANDOLPH	42	1	\$20.00
		2	\$20.00
		3	\$1.00
		4	\$20.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$1.00
		9	\$1.00
		10	\$20.00
		11	\$20.00
		12	\$1.00
		13	\$1.00
		14	\$1.00
		15	\$1.00
		16	\$20.00
		17	\$1.00
		18	\$1.00
FITCHIE	43	1	\$70.00
		2	\$1.00
		3	\$70.00
		4	\$1.00
		5	\$70.00
		6	\$1.00
		7	\$70.00
		8	\$1.00
		9	\$1.00
		10	\$70.00

OIL & GAS RESERVE RATES FOR TY 2017			
COUNTY	CO #	DISTRICT #	TY2017 \$/AG
ROANE	44	1	\$35.00
		2	\$35.00
		3	\$35.00
		4	\$35.00
		5	\$1.00
		6	\$35.00
		7	\$35.00
		8	\$1.00
		9	\$35.00
SUMMERS	45	1	\$1.00
		2	\$1.00
		3	\$1.00
		4	\$1.00
		5	\$10.00
		6	\$1.00
		7	\$1.00
TAYLOR	46	1	\$1.00
		2	\$1.00
		3	\$90.00
		4	\$90.00
		5	\$90.00
		6	\$90.00
		7	\$90.00
TUCKER	47	1	\$20.00
		2	\$20.00
		3	\$1.00
		4	\$1.00
		5	\$20.00
		6	\$1.00
		7	\$1.00
		8	\$1.00
		9	\$20.00
		10	\$1.00
		11	\$20.00
		12	\$1.00

OIL & GAS RESERVE RATES FOR TY 2017			
COUNTY	CO #	DISTRICT #	TY2017 \$/AG
TYLER	48	1	\$90.00
		2	\$90.00
		3	\$1.00
		4	\$90.00
		5	\$90.00
		6	\$90.00
		7	\$1.00
		8	\$1.00
		9	\$1.00
		10	\$90.00
UPSHUR	49	1	\$70.00
		2	\$70.00
		3	\$1.00
		4	\$70.00
		5	\$70.00
		6	\$70.00
		7	\$70.00
WAYNE	50	1	\$20.00
		2	\$20.00
		3	\$1.00
		4	\$1.00
		5	\$1.00
		6	\$1.00
		7	\$1.00
		8	\$20.00
		9	\$20.00
		10	\$20.00
		11	\$1.00
		12	\$20.00
WEBSTER	51	1	\$1.00
		2	\$1.00
		3	\$1.00
		4	\$15.00
		5	\$15.00
		6	\$15.00
		7	\$1.00

OIL & GAS RESERVE RATES FOR TY 2017			
COUNTY	CO #	DISTRICT #	TY2017 \$/AC
WETZEL	52	1	\$90.00
		2	\$90.00
		3	\$90.00
		4	\$90.00
		5	\$90.00
		6	\$1.00
		7	\$1.00
		8	\$90.00
		9	\$1.00
		10	\$1.00
		11	\$1.00
		12	\$90.00
		13	\$1.00
WIRT	53	1	\$35.00
		2	\$35.00
		3	\$35.00
		4	\$1.00
		5	\$35.00
		6	\$35.00
		7	\$35.00
		8	\$35.00
WOOD	54	1	\$40.00
		2	\$40.00
		3	\$40.00
		4	\$40.00
		5	\$1.00
		6	\$40.00
		7	\$40.00
		8	\$40.00
		9	\$40.00
		10	\$1.00
		11	\$40.00
		12	\$40.00
		13	\$1.00
		14	\$1.00
WYOMING	55	1	\$20.00
		2	\$20.00
		3	\$20.00
		4	\$20.00
		5	\$20.00
		6	\$1.00
		7	\$20.00
		8	\$1.00
		9	\$1.00
		10	\$20.00

**MANAGED TIMBER
PROPERTY ANALYSIS**

Tax Year 2017

June 30, 2016:
Mark W. Matkovich
State Tax Commissioner
Department of Revenue

MANAGED TIMBERLAND APPRAISAL RATES **TAX YEAR 2017**

(based on market 2011-2015)

Rates Per Acre

Class II Parcels

	<u>Grade 1</u>	<u>Grade 2</u>	<u>Grade 3</u>
Region 1	\$205	\$140	\$50
Region 2	\$200	\$140	\$50
Region 3	\$265	\$175	\$50
Region 4	\$270	\$185	\$55
Region 5	\$205	\$140	\$50

Class III/IV Parcels

	<u>Grade 1</u>	<u>Grade 2</u>	<u>Grade 3</u>
Region 1	\$225	\$150	\$75
Region 2	\$225	\$150	\$75
Region 3	\$240	\$155	\$75
Region 4	\$245	\$165	\$75
Region 5	\$225	\$150	\$75

Region 1 =	Brooke, Cabell, Hancock, Jackson, Marshall, Mason, Ohio, Pleasants, Putnam, Tyler, Wetzel, and Wood Counties
Region 2 =	Braxton, Calhoun, Clay, Doddridge, Gilmer, Harrison, Lewis, Marion, Montgomery, Ritchie, Roane, Taylor, and Wirt Counties
Region 3 =	Barbour, Greenbrier, Monroe, Nicholas, Pendleton, Pocahontas, Preston, Randolph, Tucker, Upshur, and Webster Counties
Region 4 =	Berkeley, Grant, Hampshire, Hardy, Jefferson, Mineral and Morgan Counties
Region 5 =	Boone, Fayette, Kanawha, Lincoln, Logan, McDowell, Mercer, Mingo, Raleigh, Summers, Wayne, and Wyoming Counties

Harvest Volumes per Acre

Harvest Interval Grades

	<u>35 yrs.</u>	<u>45 yrs.</u>	<u>55 yrs.</u>	<u>80 yrs.</u>	<u>Total</u>
1 - Site Index 75 or more:	4.6 cords 1.5 Mbf	— —	2.6 cords 4.4 Mbf	3.3 cords 8.6 Mbf	10.5 cords 14.5 Mbf
2 - Site Index 65 - 75	3.3 cords 1.0 Mbf	— —	7.0 cords 3.2 Mbf	4.8 cords 5.5 Mbf	14.9 cords 9.7 Mbf
3 - Site Index less than 65:	— —	3.1 cords 0.8 Mbf	— —	15.4 cords 3.7 Mbf	18.5 cords 4.5 Mbf

Managed Timberland Statistics

Estimation of Required Rate of Return: Class II Rates

A. Safe Rate of Return (5 Year T-Bill Rate)

Year	Rate	W/A %	W/A Rate
2015	1.5292	26.67%	0.4078
2014	1.6410	33.33%	0.5489
2013	1.1725	13.33%	0.1563
2012	0.7808	6.67%	0.0507
2011	1.5225	20.00%	0.3045

1.468 %

B. Nonliquidity Rate

(12 Month T-Bills vs. 3 Month T-Bills)

Year	Rate	W/A %	W/A Rate
2015	0.2683	33.33%	0.0894
2014	0.0883	26.67%	0.0235
2013	0.0733	20.00%	0.0147
2012	0.1292	13.33%	0.0172
2011	0.1817	6.67%	0.0121

0.167 %

C. Risk Rate (30 yr T-bills vs 5 yr T-bills)

Year	Rate	W/A %	W/A Rate
2015	1.3117	13.33%	0.1748
2014	1.8992	26.67%	0.4832
2013	2.2758	20.00%	0.4552
2012	2.1600	33.33%	0.7188
2011	2.3881	6.67%	0.1593

1.962 %

D. Management Factor of 0.5%

0.500 %

E. Property Tax Component

(60% of Class II Rate)

Year	Rate	W/A %	W/A Rate
2015	0.714	33.33%	0.2380
2014	0.714	26.67%	0.1904
2013	0.708	20.00%	0.1416
2012	0.714	13.33%	0.0852
2011	0.708	6.67%	0.0472

0.712 %

F. Inflation Rate

(Bureau of Labor Statistics)

Year	Rate	W/A %	W/A Rate
2015	0.730	33.33%	0.2433
2014	0.780	26.67%	0.2027
2013	1.500	20.00%	0.3000
2012	1.700	13.33%	0.2266
2011	3.000	6.67%	0.2001

(1.173) %

TOTAL REQUIRED RATE OF RETURN (REAL)

3.625 %

LESS: PROPERTY TAX COMPONENT

(0.712)

TOTAL DISCOUNT COMPONENT

2.913 %

Stumpage Prices:

	<u>Sawtimber</u>	<u>Pulpwood</u>
Stumpage Price Adjustment Factor:	0.00%	1.85%

<u>SAWTIMBER</u>	Current \$/MBF	1.0000 \$/MBF at age:	1.0000 \$/MBF at age:	1.0000 \$/MBF at age:	1.0000 \$/MBF at age:
		35	45	55	80
Region 1	181.34	181.34	181.34	181.34	181.34
Region 2	172.92	172.92	172.92	172.92	172.92
Region 3	239.28	239.28	239.28	239.28	239.28
Region 4	235.49	235.49	235.49	235.49	235.49
Region 5	190.59	190.59	190.59	190.59	190.59

<u>PULPWOOD:</u>	\$/Cord	1.8895 \$/cd at age:	2.2818 \$/cd at age:	2.7407 \$/cd at age:	4.3339 \$/cd at age:
		35	45	55	80
Region 1	8.54	18.23	19.49	23.41	37.02
Region 2	8.74	12.79	15.86	19.45	29.18
Region 3	5.13	9.75	11.71	14.07	22.24
Region 4	8.10	15.39	18.49	22.21	35.12
Region 5	5.77	10.86	13.18	15.81	25.00

Management Costs:

Region	\$/acre (1)
1	3.17
2	3.17
3	3.17
4	3.17
5	3.17
State	

Tax Rates:

Effective Federal Income Tax Rate	35.00%
Effective WV State Income Tax Rate (6.5% * (1-35))	4.23%
Effective WV Severance Tax Rate (1.5% * (1-35))	0.98%

Yield (Volumes): (80 year rotation)

Timberland		Yield - MBF	Yield - Cords
Productivity Grade	Site Index		
Grade I	75 or more	14.5	10.5
Grade II	65-74	9.7	14.9
Grade III	less than 65	4.5	18.5

Managed Timberland Statistics

Estimation of Required Rate of Return: Class III & IV Blended Rates

A. Safe Rate of Return (5 Year T-Bill Rate)

Year	Rate	W/A %	W/A Rate
2015	1.5292	26.67%	0.4078
2014	1.6410	33.33%	0.5469
2013	1.1725	13.33%	0.1563
2012	0.7608	6.67%	0.0502
2011	1.5225	20.00%	0.3045

1.466 %

B. Nonliquidity Rate

(12 Month T-Bills vs. 3 Month T-Bills)

Year	Rate	W/A %	W/A Rate
2015	0.2883	33.33%	0.0894
2014	0.0883	26.67%	0.0235
2013	0.0733	20.00%	0.0147
2012	0.1292	13.33%	0.0172
2011	0.1817	6.67%	0.0121

0.157 %

C. Risk Rate (30 yr T-bills vs. 5 yr T-bills)

Year	Rate	W/A %	W/A Rate
2015	1.3117	13.33%	0.1746
2014	1.6902	26.67%	0.4532
2013	2.2768	20.00%	0.4552
2012	2.1600	33.33%	0.7189
2011	2.3883	6.67%	0.1593

1.962 %

D. Management Factor of 0.5%

0.500 %

E. Property Tax Component

(60% of Blended III&IV Rates)

Year	Rate	W/A %	W/A Rate
2015	1.314	33.33%	0.4380
2014	1.314	26.67%	0.3504
2013	1.314	20.00%	0.2628
2012	1.328	13.33%	0.1768
2011	1.328	6.67%	0.0884

1.316 %

F. Inflation Rate

(Bureau of Labor Statistics)

Year	Rate	W/A %	W/A Rate
2015	0.730	33.33%	0.2433
2014	0.790	26.67%	0.2027
2013	1.500	20.00%	0.3000
2012	1.700	13.33%	0.2266
2011	3.000	6.67%	0.2001

(1.173) %

TOTAL REQUIRED RATE OF RETURN (REAL)

4.229 %

LESS: PROPERTY TAX COMPONENT

(1.316)

TOTAL DISCOUNT COMPONENT

2.913 %

Stumpage Prices:

	<u>Sawtimber</u>	<u>Pulpwood</u>
Stumpage Price Adjustment Factor	0.00%	1.85%

		1,0000	1,0000	1,0000	1,0000
<u>SAWTIMBER</u>	Current	\$/MBF at age	\$/MBF at age	\$/MBF at age	\$/MBF at age
Region	\$/MBF	35	45	55	80
Region 1	181.34	181.34	181.34	181.34	181.34
Region 2	172.92	172.92	172.92	172.92	172.92
Region 3	239.28	239.28	239.28	239.28	239.28
Region 4	235.49	235.49	235.49	235.49	235.49
Region 5	190.59	190.59	190.59	190.59	190.59

		1,8995	2,2815	2,7407	4,3338
<u>PULPWOOD</u>		\$/cd at age	\$/cd at age	\$/cd at age	\$/cd at age
Region	\$/Cd at	35	45	55	80
Region 1	8.54	18.23	19.49	23.41	37.02
Region 2	6.73	12.79	15.38	18.45	29.18
Region 3	5.13	9.75	11.71	14.07	22.24
Region 4	8.10	15.39	18.49	22.21	35.12
Region 5	5.77	10.98	13.10	15.81	25.00

Management Costs:

Region	\$/acre (1)
1	3.17
2	3.17
3	3.17
4	3.17
5	3.17

State:

Tax Rates:

Effective Federal Income Tax Rate	35.00%
Effective WV State Income Tax Rate (6.5% * (1-.35))	4.23%
Effective WV Severance Tax Rate (1.5% * (1-.35))	0.98%

Yield (Volumes) (80 year rotation)

Productivity Grades	Site Index	Yield - MBF	Yield - Cords
Grade I	75 or more	14.6	10.5
Grade II	65-74	9.7	14.9
Grade III	less than 65	4.5	18.5

West Virginia Wgt/Avg Managed Timberland Stumpage Prices

REGION 1 - Sawtimber

Year	Volume	\$/MBF	W/A%	\$/MBF
2015	12,691.80	192.85	33.33%	64.28
2014	12,162.06	175.34	26.67%	47.02
2013	19,017.77	177.46	20.00%	35.49
2012	12,828.15	106.58	13.33%	24.67
2011	11,198.24	144.69	6.67%	9.68
	67,585.02			181.34

REGION 1 - Pulpwood

Year	Volume	\$/CORD	W/A%	\$/CORD
2015	7,218.90	15.03	33.33%	5.01
2014	464.40	5.40	26.67%	1.44
2013	6,102.20	2.95	20.00%	0.59
2012	45,367.00	5.42	13.33%	0.66
2011	40.10	9.67	6.67%	0.64
	59,220.60			8.54

REGION 2 - Sawtimber

Year	Volume	\$/MBF	W/A%	\$/MBF
2015	26,467.65	175.25	33.33%	58.42
2014	22,001.50	182.47	26.67%	48.66
2013	26,898.85	177.79	20.00%	35.56
2012	25,640.98	149.01	13.33%	19.87
2011	12,639.41	156.28	6.67%	10.42
	112,668.69			172.92

REGION 2 - Pulpwood

Year	Volume	\$/CORD	W/A%	\$/CORD
2015	42,068.00	6.97	33.33%	1.99
2014	2,168.10	5.04	26.67%	1.34
2013	119,278.40	12.83	20.00%	2.57
2012	22,847.40	2.66	13.33%	0.38
2011	5,236.20	6.78	6.67%	0.45
	192,193.40			6.73

REGION 3 - Sawtimber

Year	Volume	\$/MBF	W/A%	\$/MBF
2015	135,967.80	207.12	33.33%	69.04
2014	91,467.44	260.52	26.67%	74.84
2013	161,367.70	275.83	20.00%	55.13
2012	111,920.80	201.57	13.33%	26.84
2011	102,216.30	201.45	6.67%	13.43
	602,971.84			239.28

REGION 3 - Pulpwood

Year	Volume	\$/CORD	W/A%	\$/CORD
2015	184,907.30	3.88	33.33%	1.28
2014	170,736.30	3.57	26.67%	0.96
2013	153,197.40	7.78	20.00%	1.56
2012	163,132.80	6.39	13.33%	0.85
2011	159,040.70	7.34	6.67%	0.48
	851,014.30			5.13

REGION 4 - Sawtimber

Year	Volume	\$/MBF	W/A%	\$/MBF
2015	6,644.42	223.42	33.33%	74.47
2014	5,020.90	303.89	28.67%	81.04
2013	12,820.20	211.47	20.00%	42.29
2012	4,808.73	193.47	13.33%	25.80
2011	15,517.51	178.40	8.67%	11.89
	44,811.76			235.48

REGION 4 - Pulpwood

Year	Volume	\$/CORD	W/A%	\$/CORD
2015	6,137.40	7.22	33.33%	2.41
2014	7,765.20	8.18	28.67%	2.18
2013	15,488.60	8.32	20.00%	1.88
2012	7,382.20	9.61	13.33%	1.28
2011	21,074.10	8.84	6.67%	0.58
	57,847.50			8.10

REGION 5 - Sawtimber

Year	Volume	\$/MBF	W/A%	\$/MBF
2015	37,714.40	180.16	33.33%	53.38
2014	21,881.40	285.95	28.67%	70.92
2013	31,868.00	198.20	20.00%	39.64
2012	10,887.05	138.89	13.33%	10.48
2011	24,760.45	122.43	8.67%	8.18
	126,882.28			190.59

REGION 5 - Pulpwood

Year	Volume	\$/CORD	W/A%	\$/CORD
2015	2,889.60	4.05	33.33%	1.35
2014	10,191.40	6.19	28.67%	1.85
2013	18,292.60	7.13	20.00%	1.43
2012	8,298.30	8.83	13.33%	0.92
2011	6,432.30	6.28	6.67%	0.42
	48,102.10			5.77

COAL PROPERTIES ANALYSIS

Tax Year 2017

June 30, 2016
Mark W. Matkovich
State Tax Commissioner
Department of Revenue

COAL CAPITALIZATION RATE

Capitalization Rate Analysis and Results

In developing a capitalization rate for use in valuing specific income-producing properties, consideration is given to the three approaches generally employed in estimating a discount rate. As a matter of practicality, the Bands-of-Investment and Summation Technique approaches are utilized in establishing discount rates for active coal. Data for analysis has been derived in accordance with current Legislative Rule Title 110, Section 11.

Safe Rate: 90 day Treasury Bill			Safe Rate
January:	December:	2015	0.053%
January:	December:	2014	0.033%
January:	December:	2013	0.058%

Risk Rate: Interest differential between Loan Rate and 90 day Treasury Bill			Debt Risk Rate
Loan Rate			
2015	5.26%		5.207%
2014	5.25%		5.217%
2013	5.25%		5.192%
*Prime plus 2%			

Equity: Differential between Equity Rates and 90 day Treasury Bill			Equity Risk Rate
Equity Rate			
2015	$(14.76\% / (1 - .30)) - 0.053$		21.038%
2014	$(15.50\% / (1 - .30)) - 0.033$		22.110%
2013	$(13.25\% / (1 - .30)) - 0.058$		18.871%

** Value Line Investment Survey Analysis

Composite Risk Rates: Loan and Equity Rates weighted by industry estimated capital structure			Composite Risk
Equity Rate			Debt Rate
2015	13.675%		1.222%
2014	15.427%		1.585%
2013	11.322%		2.077%
Note: Debt/Equity Ratio			Debt: 35% Equity: 65%

Non-Liquidity Rate: Interest differential between a 90 day Treasury Bill and a 1 year Treasury Bill which reflects a reasonable time necessary to sell active property.

			1yr T Bill	90 day T Bill	Non-Liquidity Rate
January:	December:	2015	0.322%	0.053%	0.268%
January:	December:	2014	0.121%	0.033%	0.088%
January:	December:	2013	0.132%	0.058%	0.074%

Management Rate: Charges for the management of investment portfolios
Fixed Rate (by Rule) 0.500%

Inflation Rate			
January:	December:	2015	0.730%
January:	December:	2014	0.750%
January:	December:	2013	1.500%

Capitalization Rate: Since the valuation of active coal property is predicated on a three-year production average, the capitalization rate is considered in a similar manner:

	2015	2014	2013
Inflation Rate	-0.730%	-0.750%	1.500%
Safe Rate	0.053%	0.033%	0.058%
Composite Risk Rate	15.497%	17.042%	13.399%
Non-Liquidity Rate	0.268%	0.088%	0.074%
Management Rate	0.500%	0.500%	0.500%
Total:	15.588%	16.903%	12.531%

Three-Yr Average: 15.00% Rounded to: 15.00%

CAPITALIZATION RATE - 15.0%			
MULTIPLIERS:		%	
1YR	0.933	9YR	5.117
2YR	1.743	10YR	5.382
3YR	2.448	11YR	5.613
4YR	3.082	12YR	5.813
5YR	3.656	13YR	5.982
6YR	4.068	14YR	6.139
7YR	4.462	15YR	6.271
8YR	4.812		

COAL

Price and Royalty Rate Analysis

The development of royalty rates for the various categories of mines and markets involves information collection and review from a variety of sources. Coal lease rates have been derived from transaction information provided by county producers, assessors, tax auditors, and by individual lessors/lessees involved in the specific transaction. The prices for mined coal, as per 110-CGR-11, have been calculated from information provided by the WV Public Service Commission and U.S. Energy Information Administration concerning power plant (pl) purchases. Prices provided by producers as part of tax filing and from data obtained from market summaries are included for comparison. Because a large portion of the data used in this analysis is, by law, considered confidential, only a summary of the results are published.

* WVPSO Fuel Purchases for 2015 was not available at the time of this publication.

COAL SALE PRICES QY2015 FOR FY2017 APPLICATION

GRAND SUMMARY ALL SOURCES 2015	STEAM SPOT	STEAM TERM	MET
PSO	na	na	
FERC	\$51.10	\$60.61	
Active Return Summary		\$55.62 56.0 MM tons	\$67.66 9.1 MM Tons
Coal Market Publication (Platts)		\$48.08 CAPP (12/1.67) Barge	
		\$46.85 PGM (13/3) Rail	
			\$67.54 Low Vol HCC

STATE STEAM PRICE (SPOT Market)	\$58.88 FERC & PSO, 3 YR AVE
STATE MET PRICE	\$67.66 Active Return, 1 YR

2015 WVPSO Tons reported in millions	Spot Sales na	Term Sales na	Total na

COAL FY2017 ROYALTY RATES	2015 1YR		2014 2YR		2013 3YR		2012 4YR		2011 5YR	
	%S	%D	%S	%D	%S	%D	%S	%D	%S	%D
TOTAL RECORDS	447	152	1,447	909	1,354	599	1,908	2,758	1,877	2,241
SUM OF PERCENT	2804.89	2327.95	8,889.07	4,895.25	8,007.34	3,313.93	11,891.66	14,683.03	8,924.28	11,181.05
STRAIGHT AVERAGE	6.50	5.15	6.13	5.18	5.87	5.53	6.23	5.32	5.82	4.99
MEDIAN	3.00	5.00	6.00	5.00	5.00	5.00	6.00	6.13	5.00	5.00
WEIGHTED AVERAGE (by Mine)	6.80	5.10	6.94	5.49	6.58	5.84	6.45	6.28	6.27	5.72
TENTATIVE RATE DEEP (%)	5.68									
TENTATIVE RATE SURFACE (%)	6.81									

ROYALTY RATE CALCULATIONS

Steam Coal/ Deep Mine	\$58.88	per ton X	5.89%	=	\$3.35	per ton
Metallurgical Coal/ Deep Mine	\$67.66	per ton X	6.89%	=	\$4.66	per ton
Steam Coal/ Surface Mine	\$58.88	per ton X	6.61%	=	\$3.89	per ton
Metallurgical Coal/ Surface Mine	\$67.66	per ton X	6.61%	=	\$5.79	per ton

Explanation of Reserve Coal Valuation

The RGVM consists of a computer model, which utilizes a database consisting of coal beds and characteristics, property locations, mine locations, sales, transportation, etc., for the entire state. An extensive algorithm calculates in-place tonnage, expected time of mining and present value for all the mineable coal on every property.

There are, therefore, no set "rates" available on reserve coal under the Rule. The RGVM values on each property will not be available until all data has been entered, after October 15 of each year. Please refer to the State Register, Legislative Rules, Title 110, Series II for details of the process.

Title 110, Series 41

Valuation of Active and Reserve Coal Property for Ad Valorem Property Tax Purposes

The above Legislative Rule was modified during the 2005 Legislative Session requiring biennial (every other year) updating of the geostatistical basis for several valuation factors used in the Reserve Coal Valuation Model. To satisfy that requirement, maps and data files concerning the Market Interest Factor, the Market Mineability Factor, the Use Conflict Factor and the Environmental Factor have been revised for Tax Year 2015. Preliminary research has been conducted to determine the effects of the factors on coal valuation. The results are as follows:

Market Interest Factor

This is the relationship between transactions (sales, leases, prospects, permit applications, etc.) and mining as it relates to properties and locations. Trans_Ct is the number of transactions counted within the radius.
Radius = 6 miles

If Trans_Ct >= 20 Then TransFactor = 20

If Trans_Ct < 20 And Trans_Ct >= 10 Then TransFactor = 40

Else TransFactor = 80

Market Mineability Factor

This is the relationship between property location and mining, through time. Determining feature is count of mines within the radius.
Radius = 2.5 miles

Surface Mines Online

Deep Mines Online

Boom Mines Online

Historic Mines Online

Current Mines Online

To assign MineFactor

If Online > 0 Then MineFactor = 20

If Online = 0 And (Online > 0 Or Boom > 0) Then MineFactor = 40

Else MineFactor = 80

Use Conflict Factor

This is the relationship between oil & gas well drilling and mining as it relates to property location. Well density is in wells per square mile.

WellDensity < 5 Then WellFactor = 0

WellDensity >= 5 And WellDensity < 10 Then WellFactor = 20

WellDensity >= 10 And WellDensity < 20 Then WellFactor = 40

WellDensity >= 20 Then WellFactor = 80

Environmental Factor

This is the relationship of known environmental hazards and impediments to the likelihood of mining occurring at this location. The rates are compiled from maps and represent densities of problems mapped.

EnvRate < 20 or Null Then EnvFactor = 0

EnvRate > 20 and EnvRate < 40 Then EnvFactor = 20

EnvRate > 40 and EnvRate < 80 Then EnvFactor = 40

EnvRate >= 80 Then EnvFactor = 80

**OTHER MINED MINERAL
PROPERTY ANALYSIS**

Tax Year 2017

June 30, 2016
Mark W. Matkovich
State Tax Commissioner
Department of Revenue

OTHER MINED MINERALS CAPITALIZATION RATE

Capitalization Rate Analysis and Results

In developing a capitalization rate for use in valuing specific income-producing properties, consideration is given to the three approaches generally employed in estimating a discount rate. As a matter of practicality, the Bands-of-Investment and Summation Technique approaches are utilized in establishing discount rates for active coal. Data for analysis has been derived in accordance with current Legislative Rule Title 110, Series 1k.

Safe Rate	90 day Treasury Bill	Safe Rate
January: December:	2015:	0.053%
January: December:	2014:	0.033%
January: December:	2013:	0.058%

Risk Rate	Interest differential between Loan Rate and 90-day Treasury Bill	Debt Risk Rate
Loan Rate:		
2015:	5.28%	5.207%
2014:	5.25%	5.217%
2013:	5.25%	5.192%
	Prime plus 2%	

Equity	Differential between Equity Rates and 90-day Treasury Bill	Equity Risk Rate
Equity Rate:		
2015:	11.75%/(1-.30)=0.063	16.733%
2013:	11.75%/(1-.30)=0.033	16.753%
2012:	11.75%/(1-.30)=0.058	16.728%
	-- Value Line Investment Survey Analysis:	

Composite Risk Rate		Loan and Equity Rates weighted by industry estimated capital structure	
	Equity Rate	Debt Rate	Composite Risk
2015	10.640%	2.083%	12.123%
2014	10.632%	2.087%	12.139%
2013	10.037%	2.077%	12.114%
Note: Debt/Equity Ratio		Debt: 40%	Equity: 60%

<u>Non Liquidity Rate</u>			Interest differential between 90-day Treasury Bill and a 1 year Treasury Bill which reflects a reasonable time necessary to sell active property		
			1yr T Bill	90-day T Bill	Non Liquidity Rate
January	December	2015	0.322%	0.053%	0.280%
January	December	2014	0.121%	0.033%	0.088%
January	December	2013	0.132%	0.058%	0.074%

Management Rate	Charges for the management of investment portfolio:
Fixed Rate (by Rule):	0.500%

<u>Inflation Rate:</u>			
January:	December:	2015:	0.730%
January:	December:	2014:	0.760%
January:	December:	2013:	1.500%

<u>Property Tax Rate:</u>				
Sixty percent (60%) of State average Class 11 property tax rate.				
January:	December:	2015:	60% of 2.190 =	1.314%
January:	December:	2014:	60% of 2.190 =	1.314%
January:	December:	2013:	60% of 2.190 =	1.314%

Capitalization Rate:	Since the valuation of other mined mineral property is predicated on a three year production average, the capitalization rate is considered in a similar manner.		
	2015:	2014:	2013:
Inflation Rate:	0.730%	0.760%	1.500%
Safe Rate:	0.053%	0.033%	0.058%
Composite Risk Rate:	12.123%	12.139%	12.114%
Non Liquidity Rate:	0.280%	0.088%	0.074%
Management Rate:	0.500%	0.500%	0.500%
Property Tax Rate:	1.314%	1.314%	1.314%
Total:	13.329%	13.314%	12.560%

Three Yr Average: 13.134% Rounded to: 13.10%

CAPITALIZATION RATE: 13.10%

MULTIPLIERS	%	%
1YR	0.940	9YR 5.437
2YR	1.772	10YR 5.748
3YR	2.507	11YR 6.022
4YR	3.157	12YR 6.269
5YR	3.733	13YR 6.480
6YR	4.240	14YR 6.662
7YR	4.689	15YR 6.832
8YR	5.086	

OTHER MINED MINERALS

ROYALTY RATE SURVEY

The determination of royalty rates for other mined minerals within the state of West Virginia is dependent upon the availability of leasehold information. Since this information is limited, the Department has chosen to review data for the most recent thirty year period. A summary only of this review is shown below in order to protect the confidentiality of parties involved.

RESOURCE	DATA SOURCES	AVERAGE ROYALTY	MEDIAN ROYALTY	TY2017 RATE
LIMESTONE	15	\$0.22	\$0.20	\$0.22
SANDSTONE	8	\$0.31	\$0.25	\$0.30
CLAY/SHALE	34	\$0.12	\$0.10	\$0.11
SAND/GRAVEL	10	\$0.35	\$0.40	\$0.40
SALT BRINE	1	N/A	N/A	\$0.10

RESERVE VALUES

	number of sales	\$/AC
LIMESTONE	5	\$3,000.00
SANDSTONE	8	\$2,300.00
CLAY/SHALE	16	\$850.00
SAND/GRAVEL	6	\$4,000.00
SALT	2	\$1,140.00

TAB
9

August 1, 2016

West Virginia State Tax Department
Property Tax Division
Attention: Jeff Amburgey
P.O. Box 2389
Charleston, WV 25328-2389

Dear Mr. Amburgey:

The Independent Oil and Gas Association of West Virginia Inc. (IOGAWV) is hereby filing comments to the tentative natural resource property valuation variables for 2017 Tax Year.

West Virginia Code §11-3-1(a), as amended, states that: "All property, except public service businesses assessed pursuant to article six of this chapter, shall be assessed annually as of July 1 at sixty percent of its true and actual value; that is to say, at the price for which the property would sell if voluntarily offered for sale by the owner thereof, upon the terms as the property, the value of which is sought to be ascertained, is usually sold, and not the price which might be realized if the property were sold at a forced sale."

The Tax Commissioner has chosen the use of an "income approach" as the most appropriate method for the valuation of oil and natural gas properties as set forth in the Tax Commissioner's "Administrative Notice 2016-02, State Tax Commissioner's Statement Concerning Primary Reliance on the Income Approach to Value for Appraisals of Producing and Reserve Coal, Producing Oil and Gas, and Producing Other Mined Minerals Pursuant to §§ 110 CSR 11-4, 1J-4 and 1K-4". Administrative Notice 2016-02, states, in part, that, "The income approach to value is based upon the assumption that a property is worth the future income, discounted to present worth, that it will generate for a prospective buyer".

The use of the "income approach" to valuation requires the appraiser to consider realistic operating expenses to determine net cash flow as the basis for calculating "true and actual value". The method of calculating operating expenses for oil and gas wells as set forth in the State Tax Department's proposed valuation variables for Tax Year 2017 would result in grossly understated expenses, and further resulting in appraised values which would greatly exceed "true and actual value".

WV CSR §110-1J-4.1 of the Legislative Rule of the State Tax Department regarding Valuation of Producing and Reserve Oil and Natural Gas for Ad Valorem Property Tax Purposes, states that the value of oil and/or natural gas producing property shall be determined through the process of applying a yield capitalization model to the net receipts (gross receipts less royalties paid less operating expenses) for the working interest. Rule 4.1 would seem to require the deduction of actual operating expenses from the gross receipts. Rule 4.3 in that section does state that the Tax Commissioner shall every 5 years, determine the average industry operating expenses per well which will be deducted from working interest gross receipts.

The Tax Commissioner, in the last 10 years, has conducted surveys regarding operating expenses of all wells in 2007, 2009, 2013, and 2014. In addition, in 2013, a survey specifically for Marcellus wells was conducted and in 2014 a survey for Marcellus wells and horizontal wells other than Marcellus was conducted.

Although surveys have been used several times over the last 10 years, the State Tax Department continues its decades-old practice of basing annual operating expenses for conventional gas wells at

30% of gross revenues with a cap of \$5,000 and for oil wells at 35% with a cap of \$5,750. In the last 10 years natural gas and oil prices have been extremely volatile. That volatility resulted in the dramatic changes in allowable expenses under the current valuation procedures. Those allowable expenses are not reflective of actual operating expenses.

By way of demonstration, the following is a table of published index prices for Appalachian gas delivered to the two primary pipelines in West Virginia, Columbia Gas Transmission and Dominion Transmission, Inc., showing average annual gas prices and the allowable expense per mcf of produced gas utilizing the State Tax Department's proposed expense allowance:

Year	Columbia		Dominion *	
	Index \$/Mcf	Exp @ 30%	Index \$/Mcf	Exp @ 30%
2007	\$7.1242	\$2.1373	\$7.2200	\$2.1660
2008	\$9.3858	\$2.8158	\$9.5292	\$2.8588
2009	\$4.1758	\$1.2528	\$4.2692	\$1.2808
2010	\$4.5267	\$1.3580	\$4.5867	\$1.3760
2011	\$4.1367	\$1.2410	\$4.1983	\$1.2595
2012	\$2.7933	\$0.8380	\$2.7850	\$0.8355
2013	\$3.6525	\$1.0958	\$2.8867	\$0.8660
2014	\$4.3650	\$1.3095	\$2.7383	\$0.8215
2015	\$2.5533	\$0.7660	\$0.8842	\$0.2653

(* Note: The Dominion Index prices for 2013, 2014 and 2015 reflect deductions for "Gateway Firm", which most producers delivering to Dominion are obligated to pay.)

In years of peak prices (2007, 2008) excessive expenses were not a factor, due to the \$5,000 expense cap. However, as prices have cratered, the 30% methodology does not reflect actual operating expense. Whenever expenses are understated, appraised and assessed values are overstated, resulting in unfair property tax assessments.

To further demonstrate that the 30% expensed methodology is not appropriate, suppose a producer has two very similar wells that each produce 10 mcf/day, with one well delivering gas to Columbia and the other well delivering gas to Dominion, subject to Gateway transportation expenses. Using the proposed methodology, allowable expenses would be determined as follows:

	Columbia	Dominion
Mcf/Day	10	10
Days/Year	366	365
Annual Mcf	3650	3650
Gas Price - 2015	\$2.5533	\$0.8842
Total Revenues:	\$9,319.67	\$3,227.21
30% Expenses	\$2,795.90	\$968.16

It is simply impossible to operate any oil and gas well in West Virginia for \$968 per year (or \$80 per month). It would be extremely difficult to operate a well for \$2,795.90 per year (\$233 per month) unless the well produced no fluid and required very minimal maintenance. These expenses do not reflect real costs, and, therefore, cannot be used to determine "true and actual value" as required under West Virginia Code §11-3-1(a). The proposed methodology is flawed, and will result in inconsistent and incorrect calculations of expenses, and inaccurate appraised values.

Costs to operators for such things as wages, health insurance expenses, gasoline for trucks, etc., have dramatically increased since 2007. However, in 2007 and 2008 a well making 10 mcf/day would have

generated in excess of \$25,000 in gross revenues, and allowable expenses (\$7,500) would have been capped at \$5,000 for ad valorem tax calculation purposes. However, as demonstrated above, allowable expenses for that same well for Tax Year 2017 would be just \$2,795, if the well delivered gas on the Columbia system, and just \$968.16 if the well was connected to Dominion and subject to Gateway charges. This is not realistic.

The appropriate mechanism to provide for accurate deductions of well operating expenses is to allow the submission of actual operating expenses as Rule 4.1 seems to require. Rule 4.3 provides for a mechanism (an average based on survey results) that the Tax Department could use to estimate if and when a producer does not provide actual operating expenses in a suitable format to be used in a yield capitalization model.

The State Tax Department has issued Administrative Notices regarding the valuation variable of oil and gas operating expenses in 2014, 2015, and 2016. In 2014, the notice stated that if a producer's ordinary expenses exceeded the stated maximums, then the Tax Department would accept and review documentation on wells for the previous three years provided by the producer as long as submitted on or before August 1st. The 2015 Administrative Notice repeated that option for producer submission of three years of actual operating expenses. However, the 2016 Notice does not even mention that option and IOGAWV has been informed that the Tax Department will not consider or review actual expenses submitted due to lack of personnel to have that accomplished. Entering data from Producer/Operator returns into the State Tax Department's evaluation system is a significant task. It would appear that the average Producer/Operator return has at least 40 data items to enter. Some returns, with extensively fractured royalty ownership, have hundreds of data items (names, addresses, percentages, royalty revenue, etc.). Adding "operating expense" would add just one more data item (likely a four-digit integer), which would be insignificant when considered in the context of the entire data entry operation.

IOGAWV believes that the Tax Department is required by Rule 4.1 to deduct actual operating expenses if accurate verifiable data is provided by the producer. In the absence of such data, if expenses are to be based on a percentage of gross revenues, it would seem appropriate to have a "floor" on operating expenses, recognizing that many legitimate operating costs are not in any way related to gross revenues. To ensure the most accurate appraisal possible, IOGAWV requests the Tax Commissioner to only use actual expenses whenever possible and to only use estimated operating expenses when actuals are not timely submitted.

IOGAWV gathered some samples of well revenue and operating expenses and it showed that the only solution for non-conventional wells is to be able to submit actual operating costs for fair property tax valuation. The current formula at 20% of revenue limited to \$150,000 per year for operating costs does not fit for any non-conventional wells.

Based on the sample wells IOGAWV finds the following recommendations to be appropriate:

- Non-conventional wells be allowed to submit actual operating costs for proper valuation in all cases.
- Conventional wells with flush production be allowed to submit actual operating costs but that would have to be done for all flush production wells submitted in that year.
- Other conventional wells will be part of the normal valuation formula with operating costs at 30% and a maximum of \$5,000 for natural gas but be allowed a minimum in that formula of \$2,500 per year operating costs.
- The minimum value for property tax purposes for a well will be \$500 which is the value assessed for home use wells.

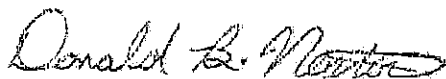
- Conventional Oil wells be allowed a minimum of \$7,500 per year operating costs and also be able to submit actual operating costs for flush production years.

The State Tax Department needs to recognize that during these times of historic low natural gas commodity prices (the lowest in history, when adjusted for inflation), many wells in the State will be operating at a loss until prices recover. Considering recent market conditions, it could be argued that such wells are a liability, not an income producing asset, and have no "true and actual value". Whenever it can be shown that actual allowable expenses exceed production revenues net of royalties, IOGAWV suggests that such wells should be valued at the Minimum Working Interest Appraisal Rate of \$500 (as stated in the 2017 valuation variables).

IOGAWV appreciates the opportunity to file comments on this important matter and looks forward to the response.

Respectfully,

IOGA OF WEST VIRGINIA



Donald B. Nestor, Member
Finance and Taxation Committee



SPILMAN THOMAS & BATTLE, PLLC

ATTORNEYS AT LAW

Dale W. Staeger

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July 29, 2016

RECEIVED

Via Hand-Delivery

JUL 29 2016

West Virginia State Tax Department
Property Tax Division
Attention Jeff Amburgey, Director, Property Tax Division
1124 Smith Street
Charleston, WV 25301

State Tax Department
Property Tax Division

Re: Tentative Natural Resource Property Valuation Variables for 2017 Tax Year

Dear Director Amburgey:

The West Virginia Oil and Natural Gas Association (WVONGA) appreciates the opportunity to comment on the Tentative Natural Resource Property Valuation Variables for the 2017 Tax Year dated June 30, 2016. Our comments are limited to the tentative variables affecting the oil and natural gas industry.

WVONGA is a trade association that serves West Virginia's extensive oil and gas industry. WVONGA members operate in virtually every county in West Virginia. Its members employ thousands of people across the state, having payrolls totaling hundreds of millions of dollars annually. Its members have a cumulative investment of nearly \$10 billion in West Virginia, own about 20,000 oil and gas wells, have more than 15,000 miles of pipeline crisscrossing the state, and provide oil and natural gas to roughly 300,000 West Virginia homes and businesses.

In response to the recently published variables, WVONGA surveyed its members as to their actual operating expenses incurred in West Virginia. Responses received cover 66% of the total gas production and approximately 11,000 of the over 40,000 active wells in West Virginia for the 2015 calendar year. WVONGA's primary concerns with the published variables relate to the Working Interest Expense Allowance and the Maximum Operating Expenses allowed for typically producing wells and horizontal-Marcellus wells.

Based on a review of the State's published variables, these two variables have remained unchanged, with the exception of the introduction of Marcellus/Utica and Horizontal well categories, since before tax year 2010 (2008 calendar year production). Conversely, the price of natural gas has decreased 66% during that same time period which includes a 28% decline since 2012 when the Marcellus group was added to the 2013 tax year variables.

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West Virginia

North Carolina

Pennsylvania

Virginia

West Virginia State Tax Department
Property Tax Division
Attention Jeff Amburgey, Director, Property Tax Division
July 29, 2016
Page 2

While revenue has been declining for the industry's producers, operating expenses have not. By calculating an allowance for operating expense using the same variables as when gas was at a higher rate per MCF, the State is significantly understating actual operating expenses for the working interest portion of the tax calculation.

It also appears the State's maximum operating expense allowance fails to acknowledge all expenses needed to get natural gas to a salable state. Allowable expenses should not only include lease operating expenses, but also gathering, compression, processing, and transportation charges. The processing charges are especially prevalent for the Marcellus wells where wet gas needs to be processed before it can be sold for distribution, and are incurred, on average, at 17% of revenue. Compression can be upwards of 30% of revenue, depending on whether a company is vertically integrated or otherwise owns its own system.

The data collected from WVONGA members related to operating expense as a percentage of revenue, and average expenditure per well has been aggregated below for your consideration:

Well Type	State Working Interest Expense Allowance	Average WVONGA Participant Operating Expense as % of Revenue
Marcellus/Utica, Horizontal Wells	20%	38%
Typical Producing Wells	30%	41%

Well Type	Allowed Expense	WVONGA Average of Actual Expense
Marcellus/Utica, Horizontal Wells	\$150,000	\$720,000

In the State's calculation, the expense allowance and the maximum work together to determine the appropriate operating expense allowance to use in the discounted cash flow calculation. Unless the State addresses both of these variables, the values assigned to the gas wells for the 2017 tax year will be grossly overstated.

Additionally, WVONGA requests that the State revise the operating expense calculation for wells where both oil and gas are produced. When wells reach the maximum operating expense allowances for oil and gas, the State applies a weighted average approach to the maximum operating expense allowance.

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As seen in the example provided below, a well that produces oil and gas at a level that reaches the maximum allowances is actually afforded a lesser operating expense allowance than a well that just produces gas at the same level. We suggest that, instead of a weighted average maximum, the State use a combined maximum in these cases.

Example:

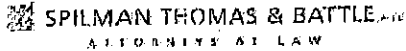
	Gas WI Revenue	Oil WI Revenue	State OpEx Allowance Prior to Maximums	State OpEx Maximum
Gas Only Well	900,000	0	180,000	150,000
Gas & Oil Well	900,000	100,000	275,000	135,575

As the above industry data indicates, the maximum allowances as a percentage of working interest revenue and fixed dollar caps being employed by the State in its valuations is inappropriate as neither adequately reflects actual expenses being incurred by the industry to get produced gas to its point of sale. Accordingly, we believe that both should be eliminated for purposes of property tax valuation.

WVONGA recognizes that under Article X, §1 of the Constitution, all property not exempt from taxation is subject to ad valorem property taxation that must be equal and uniform through the State and no one species of property from which a tax may be collected may be taxed higher than any other species of property of equal value, except as otherwise provided in the Constitution. This means that oil and natural gas property may not be subject to ad valorem property taxation policies and formulas that discriminate against, or in favor of, oil and natural gas real and personal property.

WVONGA is disappointed that the expense percentages and caps included in the 2017 tentative variable for oil and natural gas continue to be low when compared with actual expenses incurred by well operators. WVONGA realizes that the expense percentages and caps are determined by the State Tax Department from surveys of well operators conducted every five years and from other sources not known to WVONGA.

The last survey was made in 2014, and the next survey is scheduled to be made in 2019. This suggests that the survey made prior to the 2014 survey was made in 2009. The attached



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Property Tax Division
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spreadsheet shows that the expense percentages and caps on expenses have, except in the case of horizontal wells, remained the same since tax year 2009. Beginning with tax year 2014, Marcellus and Utica horizontal wells have been treated differently than vertically drilled wells. However, even these numbers are unrealistically low.

WVONGA and its members believe that the allowable expenses and the caps on expenses set forth in the tentative 2017 natural resource variables for oil and natural gas properties are unrealistically low and, unless appropriately adjusted, will result in oil and gas wells being over valued for 2017 ad valorem property taxation in violation of the "Equal and Uniform" taxation clause in Article X, § 1 of the Constitution.

We appreciate the opportunity to comment on the tentative variables. This response is intended to work with the State toward a more reasonable mass appraisal of gas producing properties for property tax purposes, but should not deny Taxpayers from being afforded an opportunity to further work with the State based on their individual facts and circumstances. We respectfully request the right to seasonably supplement the response with other information that may be of benefit to the Department and would be happy to discuss the issues with you at your convenience. Please do not hesitate to contact me if you have any questions about these comments or wish to discuss them.

Respectfully submitted,

Spilman Thomas and Battle, PLLC

A handwritten signature in dark ink, appearing to read 'Dale W. Steager'.

Dale W. Steager
Counsel for WVONGA

DWS/ljr
Enclosure

cc: Kevin Ellis, Chairman of WVONGA's Board of Directors

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OIL AND GAS VARIABLES FOR PROPERTY TAX PURPOSE

	Tentative 2017	Final 2016	Final 2015	Final 2014	Final 2013	Final 2012	Final 2011	Final 2010	Final 2009	
CAPITALIZATION RATE	16.00%	15.30%	14.80%	14.70%	14.70%	15.90%	16.05%	16.70%	15.10%	
GAS										
- % Working Interest Expenses For Typical Producing Well	= 30%	30%	30%	30%	30%	30%	30%	30%	30%	
- Maximum Operating Expenses	= \$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	
- Coal Bed Methane, Vertical Wells Expenses	= \$9,000	\$9,000	\$9,000	\$9,000	\$9,000	\$9,000	\$9,000	\$9,000	\$9,000	
OIL										
- % Working Interest Expenses for Typical Producing Well	= 35%	35%	35%	35%	35%	35%	35%	35%	35%	
- Maximum Operating Expenses	= \$5,750	\$5,750	\$5,750	\$5,750	\$5,750	\$5,750	\$5,750	\$5,750	\$5,750	
- Maximum Enhanced Operating Expenses	= \$9,000	\$9,000	\$9,000	\$9,000	\$9,000	\$9,000	\$9,000	\$9,000	\$9,000	
MARCELLUS/UTICA										
- % Working Interest Expenses for Vertical Producing Well	= 30%	30%	30%	30%	N/A	N/A	N/A	N/A	N/A	
- Maximum Operating Expenses	= \$30,000	\$30,000	\$30,000	\$30,000	\$30,000	N/A	N/A	N/A	N/A	
- % Working Interest Expenses for Horizontal Producing Well	= 20%	20%	20%	20%	N/A	N/A	N/A	N/A	N/A	
- Maximum Operating Expenses	= \$150,000	\$150,000	\$150,000	\$150,000	N/A	N/A	N/A	N/A	N/A	
HORIZONTAL WELLS (OTHER THAN MARCELLUS/UTICA AND COAL BED METHANE)										
- % Working Interest Expenses for Horizontal Producing Well	= 30%	30%	30%	N/A	N/A	N/A	N/A	N/A	N/A	
- Maximum Operating Expenses	= \$20,000	\$20,000	\$20,000	N/A	N/A	N/A	N/A	N/A	N/A	
Minimum Working Interest Appraisal	= \$400 per well	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	
Flat Rate Royalty Multiplier	= 5.75	5.75	5.75	5.75	5.75	5.75	5.75	5.75	5.75	
Home Use Only Wells,* Appraised at		\$500 per well	\$500	\$500	\$500	\$500	\$500	\$500	\$500/well	
Industrial Use Only Wells,* Appraised at		MCF usage X \$2.62/MCF X \$4.39/MCF X \$4.39/MCF X \$3.73/MCF X \$2.66/MCF X \$3.95/MCF X \$4.16/MCF X \$3.71/MCF X \$8.07/MCF X \$8.39/MCF	X \$4.39/MCF X \$4.39/MCF X \$3.73/MCF X \$2.66/MCF X \$3.95/MCF X \$4.16/MCF X \$3.71/MCF X \$8.07/MCF X \$8.39/MCF	X \$4.39/MCF X \$4.39/MCF X \$3.73/MCF X \$2.66/MCF X \$3.95/MCF X \$4.16/MCF X \$3.71/MCF X \$8.07/MCF X \$8.39/MCF	X \$4.39/MCF X \$4.39/MCF X \$3.73/MCF X \$2.66/MCF X \$3.95/MCF X \$4.16/MCF X \$3.71/MCF X \$8.07/MCF X \$8.39/MCF	X \$4.39/MCF X \$4.39/MCF X \$3.73/MCF X \$2.66/MCF X \$3.95/MCF X \$4.16/MCF X \$3.71/MCF X \$8.07/MCF X \$8.39/MCF	X \$4.39/MCF X \$4.39/MCF X \$3.73/MCF X \$2.66/MCF X \$3.95/MCF X \$4.16/MCF X \$3.71/MCF X \$8.07/MCF X \$8.39/MCF	X \$4.39/MCF X \$4.39/MCF X \$3.73/MCF X \$2.66/MCF X \$3.95/MCF X \$4.16/MCF X \$3.71/MCF X \$8.07/MCF X \$8.39/MCF	X \$4.39/MCF X \$4.39/MCF X \$3.73/MCF X \$2.66/MCF X \$3.95/MCF X \$4.16/MCF X \$3.71/MCF X \$8.07/MCF X \$8.39/MCF	X \$6.39/MCF X \$72.32/BBL X \$72.32/BBL
*Also includes Department of Environmental Protection reported wells.)										

* (Also includes Department of Environmental Protection reported wells.)

Non-Filer Valuations
Working interest = 150% of previous year's appraisal
Royalty interest = 90% of previous year's appraisal

Attachment to WYONGA letter of July 2, 2016

TAB

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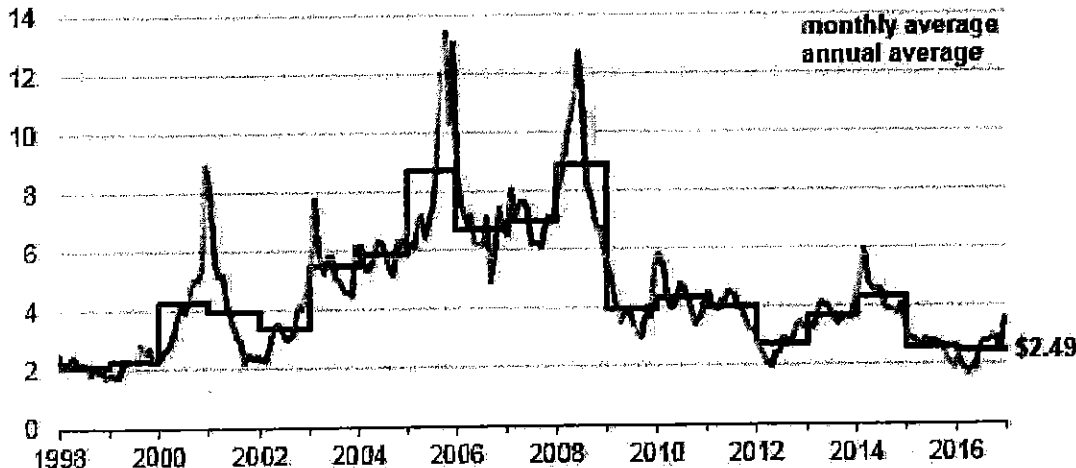
U.S. Energy Information
Administration

Today in Energy

January 13, 2017

Natural gas prices in 2016 were the lowest in nearly 20 years

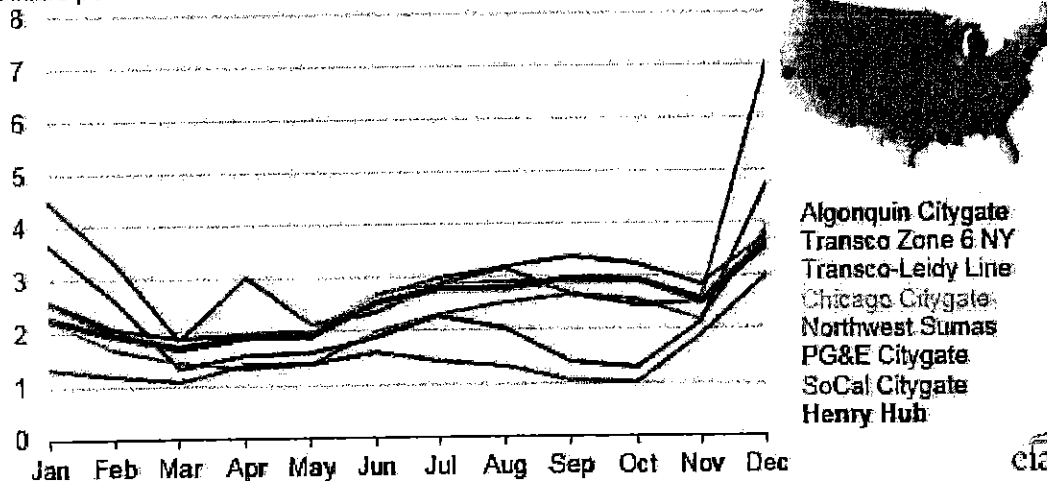
Monthly and annual average natural gas spot price at Henry Hub (1997–2016)
dollars per million British thermal unit



Source: U.S. Energy Information Administration, based on Natural Gas Intelligence

Natural gas spot prices in 2016 averaged \$2.49 per million British thermal units (MMBtu) at the national benchmark Henry Hub, the lowest annual average price since 1999. The monthly average price fell below \$2.00/MMBtu from February through May, but later increased, ending the year at an average of \$3.58/MMBtu in December. Warmer-than-normal temperatures for most of the year and changing natural gas demand were the main drivers of natural gas prices in 2016.

Monthly average natural gas spot prices at key trading hubs, 2016 dollars per million British thermal units



Source: U.S. Energy Information Administration, based on Natural Gas Intelligence

Natural gas prices in U.S. regional markets were volatile in 2016. In the first quarter of the year, much warmer-than-normal winter temperatures and large amounts of natural gas in storage caused prices to decrease. Prices began to gradually increase in late spring, with increased natural gas demand from multiple sectors and decreasing natural gas production, before sharply increasing at the end of the year with the onset of cold temperatures in mid-December.

1/13/2017

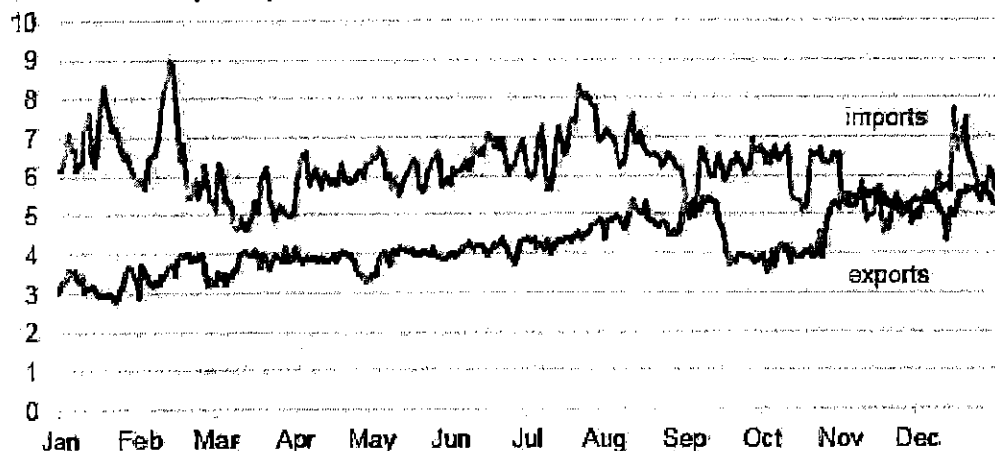
Natural gas prices in 2016 were the lowest in nearly 20 years - Today in Energy - U.S. Energy Information Administration (EIA)

In the Northeast, where natural gas pipeline capacity is often constrained, cold weather can cause monthly average prices at hubs such as Algonquin Citygate (near Boston) and Transco Zone 6 NY (New York) to spike. Although this happened in 2016, new pipeline capacity and increased natural gas production in the Appalachian Basin, along with warmer-than-usual winter weather, contributed to price spikes that were considerably lower than in previous years.

Because of warm weather, natural gas consumption in the residential and commercial sectors in 2016 declined 7% and 4%, respectively, from the previous year. Warmer winter temperatures also limited natural gas storage withdrawals. As a result, natural gas storage inventories were at or near record levels throughout most of the year and reached a record 4,047 billion cubic feet (Bcf) for the week ending November 11.

Despite the overall decrease in residential and commercial demand in 2016, late-year increases in these sectors and increased demand from other sources contributed to increasing natural gas prices later in the year. In 2016, natural gas surpassed coal as the primary fuel used for power generation in the United States, supplying an estimated 34% of the nation's electricity, compared with 30% for coal. Electric power generation in 2016 used an average of 27.6 billion cubic feet per day (Bcf/d), exceeding the previous high of 26.3 Bcf/d in 2015.

U.S. net imports and exports of natural gas in 2016 billion cubic feet per day



Source: U.S. Energy Information Administration, based on Point Logic Energy

In November 2016, the United States became a net exporter of natural gas on a monthly basis for the first time since 1957, based on data from PointLogic. This was supported by infrastructure improvements—including natural gas pipelines and facilities for liquefying natural gas for export—that enabled suppliers to meet increasing demand from foreign markets.

U.S. pipeline exports to Mexico continued to grow throughout 2016, making up 87% of all U.S. natural gas exports. In May 2016, the Sabine Pass liquefaction terminal began commercial operations in the Gulf Coast to export liquefied natural gas (LNG). The expansion of the Panama Canal in July 2016 further aided export ability by reducing time and transportation costs to key markets in Asia and the west coast of South America.

Despite growing demand in the electric power sector and export markets, low demand for space heating and low prices resulted in lower natural gas production in 2016. Based on preliminary data, EIA estimates natural gas marketed production to average 77.5 Bcf/d in 2016, 1.3 Bcf/d less than in 2015 and the first annual decline since 2005. The number of active natural gas drill rigs continued a multi-year decline, reaching 132 by the end of 2016, down 19% from the year-ago count. However, production has not fallen as sharply as the number of active rigs, as producers have continued to make gains in drilling efficiency.

Principal contributors: Kristen Tsai, Jason Upchurch

TAB

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DEP Production Report
2015 Calendar Year Production
Horizontal Wells Only

Horizontal Well Indicator	Horizontal				
Row Labels	Count of API	Sum of GAS PRODUCTION N TOTAL	Average Production per Well	% of Marcellus Production	Average Operating Expenses Per Well
ANTERO RESOURCES CORPORATION	458	439,302,636	965,500	39%	817,000
EQT PRODUCTION COMPANY	618	191,040,463	309,127		
SWN PRODUCTION COMPANY, LLC	289	116,258,698	402,279		
NOBLE ENERGY, INC.	122	99,157,024	812,762		
ASCENT RESOURCES-MARCELLUS, LLC	46	42,064,105	914,437		
STONE ENERGY CORPORATION	111	40,967,150	369,073		
JAY-BEE OIL & GAS	43	33,671,598	783,060		
CNX GAS COMPANY LLC	46	32,040,011	696,522	3%	630,000
GASTAR EXPLORATION INC.	77	24,299,343	315,576		
TRANS ENERGY, INC.	32	23,578,855	736,839		
MOUNTAINEER KEYSTONE, LLC	43	20,270,988	471,418		
NORTHEAST NATURAL ENERGY LLC	21	18,451,803	878,657		
STATOIL USA-ONSHORE PROPERTIES, INC.	22	13,614,301	618,832		
XTO ENERGY, INC.	36	10,941,782	303,938		
CHEVRON APPALACHIA, LLC	27	6,879,589	254,800		
PDC MOUNTAINEER LLC	4	5,796,218	1,449,055		
TRIANA ENERGY, LLC	11	4,916,632	446,967		
ANTERO RESOURCES BLUESTONE LLC	5	2,946,881	589,370		
CONSOL GAS COMPANY	18	2,235,221	124,179		
WACO OIL & GAS CO INC	11	1,400,009	127,274		
HARD ROCK EXPLORATION, INC.	54	1,139,587	21,103		
CHESAPEAKE APPALACHIA, L.L.C.	19	690,935	36,365		
MOUNTAIN V OIL & GAS, INC.	7	544,833	77,833		
ENERPLUS RESOURCES (USA) CORPORATION	3	443,012	147,671		
TENASKA RESOURCES, LLC	5	404,158	80,832		
ENERGY CORPORATION OF AMERICA	18	265,735	14,763		
EXCO RESOURCES (PA), LLC	12	181,504	15,125		
NYTIS EXPLORATION COMPANY, LLC	11	166,199	15,109		
CABOT OIL & GAS CORPORATION	18	107,645	5,980		
CUNNINGHAM ENERGY, LLC	6	61,405	10,234		
TUG FORK DEVELOPMENT	1	30,482	30,482		
NORTHSTAR ENERGY CORPORATION	2	24,123	12,062		
BUCKEYE OIL PRODUCING CO	4	18,228	4,557		
HORIZON ENERGY CORPORATION	2	9,167	4,584		
RESERVE OIL & GAS, INC.	2	8,812	4,406		
DOMINION TRANSMISSION INC	1	8,518	8,518		
DURST OIL & GAS CO., INC.	1	7,821	7,821		
BASE PETROLEUM, INC.	1	5,365	5,365		
STALNAKER ENERGY CORPORATION	2	4,634	2,317		
QUALITY NATURAL GAS, LLC	1	3,138	3,138		
TAPO ENERGY, INC.	1	2,983	2,983		
ABARTA OIL & GAS COMPANY	1	2,714	2,714		
TERM ENERGY CORP.	1	2,070	2,070		
LIPPIZAN PETROLEUM, INC.	2	1,936	968		
ENERVEST OPERATING L. L. C.	6	1,893	316		
HG ENERGY, LLC	2	1,391	696		
P & C OIL & GAS, INC.	1	1,251	1,251		
YOST HERITAGE INC.	1	98	98		
DIVERSIFIED RESOURCES, INC.	1	25	25		
EXCO RESOURCES (WV), INC.	3	-	-		
BRC OPERATING COMPANY, LLC	8	-	-		
COW RUN LTD LIABILITY COMPANY	1	-	-		
Grand Total	2,235	1,139,972,939			

TAB 12

Antero Resources Corporation
Tax Year 7/1/16 - 6/30/17
Ritchie County, WV

Account #	# of Wells	API#	API# for Second Well (If applicable)	Property Description	State Appraised Value	Taxpayer Value	Value the Taxpayer Believes to be in Controversy	Value if Operating Expense Cap Removed
1020149960	1	085-09960		NICHOLSON UNIT 2H (10207.1)	1,616,608	871,317	745,288	1,204,833
1020150002	1	085-10002		KUHN UNIT 1H (10724.1)	1,535,487	043,260	692,227	1,203,327
1020150023	1	085-10023		CONSTABLE UNIT 1H (10326.1)	3,764,632	1,713,697	2,050,935	2,439,033
1020159961	1	085-09961		NICHOLSON UNIT 1H (10267.1)	1,310,944	685,008	625,938	946,183
1020159964	1	085-09964		O'NEIL UNIT 1H (10275.1)	1,987,315	1,057,112	930,203	1,457,770
1020159966	1	085-09966		O'NEIL UNIT 2H (10276.1)	1,483,711	788,374	695,337	1,107,482
1020159970	1	085-09970		PRUNTY UNIT 1H (10288.1)	3,854,801	1,742,708	2,111,859	2,469,438
1020159978	1	085-09978		PULLMAN UNIT 2H (10261.1)	1,156,720	611,602	545,118	860,377
1020160005	1	085-10005		IRELAND UNIT 1H (10738.1)	5,711,251	2,379,972	3,331,279	3,339,726
1020160017	1	085-10017		ALLSTATE UNIT 2H (10424.1)	2,887,090	1,325,302	1,561,748	1,789,877
1020160019	1	085-10019		MCCABE UNIT 3H (10423.1)	4,620,833	2,055,284	2,565,549	2,863,435
1020160045	1	085-10045		LANGFORD UNIT 2H (10566.1)	8,472,297	3,353,873	5,118,424	4,800,992
1020160048	1	085-10046		RUFUS UNIT 1H (10398.1)	8,636,376	3,447,349	5,189,027	4,959,190
1020169996	1	085-09996		SNOODGRASS UNIT 2H (10538.1)	3,416,033	1,581,441	1,834,592	2,234,579
1020169999	1	085-09999		DEBERRY UNIT 1H (10296.1)	6,017,811	2,385,969	3,631,842	3,301,432
1020170044	1	085-10044		LANGFORD UNIT 1H (10397.1)	4,721,174	2,282,017	2,439,157	3,324,480
1020170102	1	085-10102		DUCKWORTH UNIT 1H (10528.1)	2,652,099	1,445,713	1,216,388	2,159,090
1020170103	1	085-10103		DUCKWORTH UNIT 3H (10529.1)	2,207,016	1,234,640	972,376	1,797,526
1020170138	1	085-10138		STALNAKER UNIT 3H (10530.1)	1,937,025	1,144,440	792,585	1,720,509
1020170139	1	085-10139		STALNAKER UNIT 1H (10531.1)	1,824,960	1,036,905	728,035	1,650,464
0320150038	1	085-10038		BLANCHE UNIT 1H (10758.1)	2,382,863	1,341,480	1,041,983	1,967,368
0320159963	1	085-09963		ANNA UNIT 2H (10233.1)	1,247,845	784,735	463,110	1,154,007
0320160027	1	085-10027		BELLE UNIT 1H (10351.1)	2,204,341	3,381,085	3,823,256	4,999,598
0320160028	1	085-10028		BELLE UNIT 2H (10526.1)	5,423,100	2,636,965	2,786,135	3,903,614
0320160029	1	085-10029		BELLE UNIT 3H (10440.1)	5,930,946	3,267,134	3,663,812	4,832,983
0320160060	1	085-10060		HENDERSHOT UNIT 1H (10524.1)	5,958,210	2,867,167	3,092,043	4,271,908
0320160082	1	085-10082		HORNET UNIT 1H (10942.1)	7,856,899	3,659,074	4,197,825	5,446,574
0320160083	1	085-10083		HORNET UNIT 2H (10937.1)	6,724,801	3,185,334	3,539,467	4,735,513
0320160088	1	085-10088		HENDERSHOT UNIT 2H (10525.1)	6,406,284	3,053,376	3,352,908	4,545,821
0320170019	1	085-10019		CAIRO-ANNA UNIT 3HRB (10537.1)	3,178,709	1,656,066	1,521,643	2,455,851
0320170041	1	085-10041		BLANCHE UNIT 3H (10442.1)	3,068,259	1,809,419	1,458,840	2,384,647
0320170042	1	085-10042		SCHMIDLE UNIT 1H (10683.1)	2,394,085	1,337,853	1,056,230	2,011,575
0320170057	1	085-10057		CHANDOS UNIT 2H (10523.1)	3,715,460	1,874,071	1,841,386	2,758,943
0320170082	1	085-10082		MYRTLE UNIT 2H (10938.1)	4,952,046	2,396,696	2,555,350	3,582,163
0320170105	1	085-10105		MULVAY UNIT 1H (10636.1)	3,587,293	1,830,984	1,756,311	2,732,433
0320170106	1	085-10106		MULVAY UNIT 2H (10637.1)	3,516,264	1,793,478	1,772,786	2,648,647
0320170143	1	085-10143		ERICSON UNIT 2H (10694.1)	6,125,223	2,881,710	3,243,519	4,321,023
0320170144	1	085-10144		ERICSON UNIT 3H (10695.1)	4,134,633	1,814,621	2,320,092	2,711,049
0320170146	1	085-10146		BOW UNIT 1H (11418.1)	2,826,828	1,511,684	1,315,144	2,247,876
0320170157	1	085-10157		BOW UNIT 2H (10670.1)	3,844,650	1,937,413	1,907,237	2,888,661
0320170163	1	085-10163		MUSGRAVE UNIT 1H (10686.1)	4,075,365	2,031,030	2,044,335	3,021,382
0320170164	1	085-10164		NOLAND UNIT 1H (10687.1)	2,469,799	1,363,533	1,106,260	2,033,366
0320170165	1	085-10165		PAIGE UNIT 1H (10669.1)	3,066,045	1,615,882	1,450,183	2,417,148
0320170191	1	085-10191		MUSGRAVE UNIT 2H (10689.1)	4,150,856	2,062,547	2,088,309	3,069,595
0320179962	1	085-09962		CAIRO-ANNA UNIT 1H (10588.1)	3,071,386	1,612,579	1,458,807	2,395,077
					178,137,150	85,551,894	92,385,256	125,166,581

TAB

13

IN THE MATTER OF THE ASSESSED VALUE OF CERTAIN OIL AND NATURAL GAS
PRODUCING PROPERTIES LOCATED IN RITCHIE COUNTY, WEST VIRGINIA FOR THE 2017
TAX YEAR

And In Re:

RITCHIE COUNTY TAX ASSESSOR,

ANTERO RESOURCES CORPORATION, TAXPAYER,

Expert Report of James Harden
January 31, 2017

Highly Confidential

Introduction

1. I have been retained by Altus Group US Inc. ("Altus") to assist in assessing the fair market value of certain producing oil and natural gas properties of Antero Resources Corporation ("Antero" or the "Taxpayer") in connection with the Taxpayer's appeal of the tax commissioner of the West Virginia State Tax Department, Property Tax Division 2017 assessed value of natural resource properties.
2. The opinions expressed in this matter are my own, and my compensation is not contingent upon the content of my testimony or the outcome of this matter. This report reflects my opinions as of the date of this report and documents received to date. Should additional information be provided, I reserve the right to amend and/or supplement this report. My opinion is based upon a reasonable probability unless otherwise noted.
3. All capitalized terms not defined herein shall have the meaning ascribed in Title 110 Legislative Rule Series 11 Valuation of Producing and Reserve Oil and Natural Gas for Ad Valorem Property Tax Purposes.

Professional Biography and Qualifications

4. I am a Principal and the National Valuation Leader for Hein & Associates, LLP, a Certified Professional Geologist and hold the American Society of Appraisers' Accredited Senior Appraiser ("ASA") certification in Oil and Gas Valuation. I have been involved in all aspects of the oil and gas business since 1980, including working on drilling rigs, owning an oil and gas production company, working for Texaco Inc., and was Global Oil & Gas Valuation Leader for Ernst & Young. I have performed hundreds of valuations in the oil and gas industry for a wide variety of purposes ranging from financial reporting, assorted tax matters, mergers and acquisitions, and expert testimony.
5. All work by myself and my staff was performed on an hourly basis. My curriculum vitae with expert testimony experience is attached as Exhibit A.

Antero Resources¹

Company Overview

6. Antero Resources Corporation ("Antero" or the "Taxpayer"), an independent oil and natural gas company, acquires, explores, and develops natural gas, natural gas liquids, and oil properties in the United States. As of December 31, 2015, the company had 569,000 net acres of oil and gas properties located in the Appalachian Basin in West Virginia, Ohio, and Pennsylvania. The company was formerly known as Antero Resources Appalachian Corporation and changed its name to Antero Resources Corporation in June 2013. Antero Resources Corporation was founded in 2002 and is headquartered in Denver, Colorado. Antero Resources Corporation is a subsidiary of Antero Resources Investment LLC.

Ritchie County Oil and Natural Gas Properties

7. Subject to this assessment, the Taxpayer holds approximately 45 horizontal wells with an average working interest of approximately 83%. Production from the 45 wells began as early back as April of 2013 to as recent as December of 2015. The wells are gas weighted (approximately 68% gas) and target the Marcellus Shale. Additional information about the Marcellus Shale gas play can be found in the Industry section of this report.

The State Tax Commissioner's Office²

Powers and Duties of the State of West Virginia's Tax Commissioners Office

8. Before I discuss the valuation methodology employed by the State, it is important to discuss the governing body which establishes the Office of the Tax Commissioner and lays out the appointment, powers, and duties of the state tax commissioner ("Tax Commissioner") with respects to implementing, monitoring, and enforcing the policy and procedures for assessing and collecting real and personal property tax.
9. W.Va. Code §11-1 (the "Code") establishes the Office of the Tax Commissioner and defines the powers and duties of the individuals appointed as the West Virginia Tax Commissioner ("Tax Commissioner"). In particular, Article 11 of the Code states, "It shall be the duty of the tax commissioner to see that the laws concerning the assessment and collection of all taxes and levies, whether of the state or of any county, district or municipal corporation thereof, are faithfully enforced. The Code further establishes:

¹ Information referenced herein was obtained from S&P CapitalIQ

² Information and, in some cases, direct excerpts in this section were obtained from <http://www.legis.state.wv.us/wv/>.

that the Tax Commissioner shall be responsible for determining the methods of valuation for both real and personal property. Specifically, W.Va. Code §§11-1C-10(b)(1) states, "[T]he state tax commissioner shall value all industrial property in the state at its fair market value within three years of the approval date of the plan for industrial property required . . . The commissioner shall thereafter maintain accurate values for all such property. The tax commissioner shall forward each industrial property appraisal to the county assessor of the county in which that property is located and the assessor shall multiply each such appraisal by sixty percent and include the resulting assessed value in the land book or the personal property book, as appropriate for each tax year. The commissioner shall supply support data that the assessor might need to evaluate the appraisal.

Valuation Methodology Used by the State Tax Commissioner

Defined Terms

10. The following section outlines the methodology used by the State Tax Commissioner to assess the Fair Market Value of producing oil and gas properties. Included below are key terms and definitions for certain terms used by the State. The following defined terms are listed in alphabetical order. For a more comprehensive list of defined terms used by the State, please refer to Title 110 Legislative Rule, Series 1J.

- **"Average Industry Operating Expenses"** - The Tax Commissioner shall every five years, determine the Average Annual Industry Operating Expenses per well. The Average Annual Industry Operating Expenses shall be deducted from working interest gross receipts to develop an income stream for application of a yield capitalization procedure.
- **"Average Industry Production Decline Rates"** - The Tax Commissioner shall every five years derive and report the average industry production decline rates by reviewing well production records of various State agencies along with data provided by companies and individuals.
- **Capitalization Rate"** means a rate used to convert an estimate of income to an estimate of market value. A single statewide capitalization rate for oil and natural gas shall be determined annually by the Tax Commissioner through the use of generally accepted methods. The rate shall be based on the assumption of a declining-terminal, non-inflating income series. The capitalization rate used to value oil and natural gas shall be developed through consideration of: (1) a discount rate determined by the summation technique, and (2) a property tax component.

- **"Discount Component"** means a rate reflecting a provision for returning to an investor a sum of money equal to the aggregate of the anticipated return-on-investment over the economic life of an investment. The discount component is composed of the following five subcomponents: (i) safe rate (ii) risk rate (iii) non-liquidity rate, (iv) management rate, and (v) inflation rate.
- **"Flush Production"** means the production of oil and/or natural gas from any well on an oil and/or natural gas property with an initial production date that is two calendar years or less prior to the July 1st assessment date.
- **"Gross Receipts"** means total income received from production on any well, at the field line point of sale, during a calendar year before subtraction of any royalties and/or expenses.
- **"Inflation Rate"** means Nominal interest rates, including the "safe rate" (defined below) are higher than real rates by an amount representing expectation of future inflation; however, net annual income from oil and natural gas property is to be estimated assuming level future royalties (no inflation). The capitalization rate shall be a real rate, net of expectation of inflation. The inflation rate shall be estimated through analysis of the most recent calendar year's urban consumer price index as determined by the U.S. Department of Labor, Bureau of Labor Statistics. The weighted average (sum of year's digits) rate will be used from the data of the three calendar year periods prior to the July 1 assessment date.
- **"Management Rate"** means a rate reflecting a return to an investor for the management of similar investment portfolios. The Management Rate represents the cost of managing the investment, not the cost of managing the oil and natural gas property. Because the Management Rate has historically been one-half of one percent (0.5%) of the value of investment portfolios, for purposes of determining the discount component the Management rate shall be one-half of one percent (0.5%).
- **"Natural Gas Producing Property"** means the property from which natural gas has been produced or extracted at any time during the calendar year preceding the July 1 assessment date. Natural gas producing property includes the interest or interests underlying an area of up to one hundred twenty-five acres of surface per well for property with active wells on the parcel.
- **"Nonliquidity Rate"** means a rate reflecting a return to an investor representing the loss of interest on an investment arising from the time required to sell the investment. The Nonliquidity Rate shall be developed through an annual survey to determine a reasonable estimate of time that oil and natural gas properties, when exposed to the market for sale, remain on the market. The time determined in this manner shall be used to identify United States Constant Maturity Treasury Yields with similar time differentials in excess of thirteen

week United States Constant Maturity Treasury Yields. The interest differential between these securities shall be used to represent the Nonliquidity Rate. For example, if it is determined that oil and natural gas property remains on the market for an average of nine months (39 weeks) before being sold, the nonliquidity rate shall be derived by taking the rate on one (1) year United States Constant Maturity Treasury Yields minus the rate on 13-week United States Constant Maturity Treasury Yields; The rate used will be a weighted average (sum of years digits) of the data from the three (3) calendar year periods prior to the July 1 assessment date

- **"Non-Producing or Shut-in Well"** means a well, which due to the producer's decisions, market reasons and/or product performance, was non-productive during the entire most recent calendar year preceding the July 1st assessment date.
- **"Oil and/or Natural Gas, Non-producing Property"** means properties that were not engaged in production during the previous assessment year period of July 1st through June 30th. This category includes any acreage that has been shut-in for the entire year.
- **"Oil Producing Property"** means property from which oil has been produced or extracted at any time during the calendar year preceding the July 1 assessment date. Oil producing property includes the interest or interests underlying an area of up to forty acres of surface per well with one or more active well(s) on the parcel.
- **"Operating Expenses"** means only those ordinary expenses which are directly related to the maintenance and production of natural gas and/or oil. These expenses do not include extraordinary expenses, depreciation, ad valorem taxes, capital expenditures or expenditures relating to vehicles or other tangible personal property not permanently used in the production of natural gas or oil.
- **"Property Tax Component"** means a rate reflecting a provision for returning to an investor a sum of money equal to property taxes paid over the economic life of an investment. The Property Tax Component shall be estimated by multiplying the assessment rate by the prior tax year's statewide average for Class III property. At the present time, research indicates that royalty rates on oil and natural gas include a component for property tax, with no additional compensation from the producer. As a result, the Property Tax Component shall be used in the capitalization rate; however, if this described general practice changes and property taxes are paid as additional compensation, the use of this component shall be deleted. The rate used will be a weighted average (sum of year's digits) of the data from the three tax year periods prior to the July 1 assessment date.

- **"Recapture Component"** means a rate reflecting a provision for returning to an investor a sum of money equal to his or her investment.
- **"Risk Rate"** means a rate reflecting a return to an investor necessary to attract capital to an investment containing a possible loss of principal and/or interest. The relative degree of risk of an investment in oil and natural gas property is difficult to determine from published interest rates. Interest rates required on loans for acquisition and/or development of oil and natural gas properties shall be calculated by adding two percent to the Prime Interest Rate charged by banks as published in the Economic Indicators Prepared By The Council Of Economic Advisors For The Joint Economic Committee for the three (3) calendar years immediately prior to the July 1 assessment date. The loan rate shall be compared to quarterly interest rates offered on thirteen week United States Constant Maturity Treasury Yields for the same three calendar years period. The weighted average (sum of year's digits) difference between the two, combined with hands-of-investment analysis, shall be used as a basis to estimate the risk rate.
- **"Royalty Interest"** means a fractional interest in oil and/or natural gas production that is not subject to development costs or operating expenses and extends undiminished over the life of the property. Typically, it is retained by the oil and/or natural gas rights owner or lessor.
- **"Safe Rate"** means a rate reflecting a return to an investor on an investment which has little, if any, likelihood of loss of principal or of loss in anticipated return on investment.
- **"Settled Production"** means the production of oil and/or natural gas from all wells on a property with an initial production date that is more than two calendar years prior to the July 1st assessment date.
- **"Sum of the Years digit"** means the weighted average that will be used in the calculations. For a 3 year weighted average, the sum of the year's digit method places the first year at 50%, the second year at 33.33% and the third year at 16.67%.
- **"Summation Discount Component"** means a discount rate expressed as the aggregate of a safe rate, risk rate, nonliquidity rate, and management rate, adjusted for inflation.
- **"Well"** means any shaft or hole sunk, drilled, bored or dug into the earth or into underground strata for the extraction of oil or gas.
- **"Working interest"** means the fractional interest in oil and/or natural gas production subject to development and operating expenses and owned by the leaseholder and/ or operator.

Valuation Methodology Overview

11. The value of Oil and/or Natural Gas Producing Property is determined through the process of applying a Yield Capitalization Model to the Net Receipts (Gross Receipts, less Royalties paid, less Operating Expenses for a Working Interest and a Yield Capitalization Model applied to the gross royalty payments for their royalty interest. Where ownership is split through a lease or royalty arrangement, different values are determined for the Working Interest and the Royalty Interest. If the Well has been in production for less than 12 months during the first calendar year of production, or during the first calendar year of production after being shut-in during the previous calendar year, the Gross Receipts and Royalties are annualized prior to the process of applying a Yield Capitalization Rate.
12. Of note, and as discussed herein, my findings and conclusions contrast significantly from those of the State. It can be shown that the delta between the concluded Fair Market Value arrived at through my analysis and the assessed value calculated by the State can be attributed to (i) differences in the selection and application of oil and natural gas decline curves, (ii) differences in the application of actual versus "one size fits all" ceiling on operating expense assumption, and (iii) methodology selection for calculating the appropriate rate used to discount the expected future cash flows of an investment with this risk profile.

Findings and Methodology

Application of Fair Market Value

13. Based on my experience, the most commonly accepted premise of value is Fair Market Value ("FMV"). Courts typically consider the FMV or what would be the fairly equivalent value of the property, taking into consideration all of the specific circumstances of each case affecting the value of the asset. The American Society of Appraisers ("ASA") defines FMV as: "[a]n opinion expressed in terms of money, at which the property would change hands between a willing buyer and a willing seller, neither being under any compulsion to buy or to sell and both having reasonable knowledge of relevant facts, as of a specific date."^{3, 4}
14. Further, per West Virginia Code § 11-3-1 (a) "all property shall be assessed at the price for which the property would sell if voluntarily offered for sale by the owner thereof, upon the terms as the property,

³ <http://www.appraisers.org/Disciplines/Machinery-Technical-Specialties/mts-appraiser-resources/DefinitionsOfValue>.

⁴ IRS Revenue ruling 59-60.

the value of which is sought to be ascertained, is usually sold, and not the price which might be realized if the property were sold at a forced sale."

Valuation Approach

15. In determining the Fair Market Value of the Taxpayer's producing oil and natural gas properties, I relied on the Income Approach, more specifically, the Discounted Cash Flow ("DCF") method, a widely used and accepted valuation method. Per the 2016 Society of Petroleum Evaluation Engineers Thirty Fifth Annual Survey of Parameters used in Property Evaluations, it is reported that 144 out of the 177 market participants surveyed (76%), reported using the DCF as their preferred method for evaluation oil and gas properties.
16. The DCF method of the Income Approach focuses on the income-producing capability of the asset or business being assessed. The underlying premise of this approach is that the value of an asset or business can be measured by the present worth of the net economic benefit (cash receipts less cash outlays) to be received over the life of the subject asset. The steps followed in applying this approach include estimating the expected cash flows attributable to the asset over its life and converting these cash flows to present value through "discounting." The discounting process uses a rate of return, which accounts for both the time value of money and investment risk factors. Finally, the present value of the cash flows over the life of the asset are totaled to arrive at the Fair Market Value of the asset.

Valuation of the Producing Oil & Gas Wells

Overview

17. Due to the inherent nature of oil and gas properties, and in particular, producing oil and gas properties, I utilized the Income Approach, specifically the Discounted Cash Flow ("DCF") method, in our Fair Market Value assessment of the Taxpayer's oil and gas wells. For reference purposes, Exhibit 1 reflects the results of our DCF analyses as of July 1, 2016.⁵

Sources of Information

18. We were provided with historic production and operating financial data which served as the foundation of the cash flow forecast for this analysis. The data provided consisted of gross production volumes, revenues, and all operating costs incurred by the Taxpayer on a well by well basis for the 18 month period ending June 30, 2016. In addition, the provided data contained descriptive information

⁵ The analysis reflected in Exhibit 1 was conducted for the 2017 tax year.

identifying each wells unique identifiers, county and district location, date of first production, well configuration, producing formation, field name, well depth and lateral length, etc., We relied on the unique well level information during our decline curve analysis which was used to develop our decline curve assumptions.

Production Decline Curve Analysis

19. In order to estimate the future production of oil and gas volumes, curve parameters must be developed that best characterize the decline in production over time. We collected the production data for all Antero oil and gas wells drilled in West Virginia using Drillinginfo⁶, a subscription based and widely used data source for the oil and gas industry. We grouped wells by county and normalized the production streams by initial production date. We averaged all normalized production and plotted rate versus time, then generated a best fit curve for the average curve. Each curve for the separate counties was approximated using 3 exponential curves for different stages in the life of an oil and gas well; year one, year two, and year 3 until the economic limit.

Projected Revenues

20. In order to estimate revenues in the first period of our forecast (2018 tax year), we applied our Year 1 production decline rate to the gross (8/8's) revenues corresponding to the most recent 12 month period preceding the July 1st assessment date. The revenue results of this calculation served as the basis for forecasting all future revenues. In Year 2 (2019 tax year) of our forecast, revenue calculated in Year 1 was multiplied by our estimated production decline factor for Year 2. For all periods thereafter, revenues from the preceding period were multiplied by our calculated long-term production decline factor ("Terminal Decline Factor").

Operating Expenses

21. Given the unique production behavior of a particular oil and gas formation, coupled with the existing infrastructure in place to get production volumes to market, obtaining actual operating expenses is crucial to accurately assessing the fair market value of a given well. Further, in keeping with the States definition of Operating Expense⁷ "... only those ordinary expenses which are directly related to the maintenance and production of natural gas and/or oil . . . do not include extraordinary expenses, depreciation, ad valorem taxes, capital expenditures or expenditures relating to vehicles or other tangible personal property not permanently used in the production of natural gas or oil.", we reviewed

⁶ Drillinginfo is a subscription based service for oil and gas production data. See www.drillinginfo.com

⁷ Per Subsection 3.2 of Title 110 Legislative Rule, Series 1J "Valuation of Producing and Reserve Oil and Natural Gas for Ad Valorem Property Tax Purposes"

historic Operating Expense data of publicly traded upstream oil and gas companies with producing assets located in or near the same West Virginia counties as that of the Taxpayer in order to identify ordinary vs. extraordinary Operating Expenses from a market participants' view point. For further detail behind the Operating Expense assumptions we relied upon, please refer to the section "Comparison of the State's Methodology" provided in later sections of this report.

Discount Rate

22. In estimating the appropriate discount rate for discounting the expected cash flows of an investment of this risk profile, we relied calculated the per-tax weighted average cost of capital ("WACC"). The WACC is a market based weighted average of the cost of debt and cost of equity and as such, we relied on financial data of publicly traded guideline company financial data when developing our assumptions to be used in our discount rate analysis. In developing the cost of equity, we relied on the Capital Asset Pricing Model ("CAPM"), which attempts to measure the systemic risks based on the Company's relationship with the market (i.e. typically against the S&P 500 Index). In my experience, CAPM is the most widely used method of estimating a discount rate when valuing a business enterprise or asset. The discount rate I utilized was 20%. Exhibit 4 reflects our discount rate analysis as of July 1, 2016. The following section discusses our selection of publicly traded guideline companies.

Guideline Comparable Company Selection

23. Selecting companies that are comparable to Debtors is critical in determining an indication of value. One of the initial screening criteria included all publically traded United States oil and gas exploration and production companies operating oil and gas reserves in West Virginia. That selection criteria led us to choosing the following companies as comparable to Debtors:

- Antero Resources Corporation (NYSE:AR)
- Chesapeake Energy Corporation (NYSE:CHK)
- CONSOL Energy Inc. (NYSE:CNX)
- Cabot Oil & Gas Corporation (NYSE:COG)
- Carrizo Oil & Gas Inc. (NasdaqGS:CRZO)
- Eclipse Resources Corporation (NYSE:ECR)
- EQT Corporation (NYSE:EQT)
- Noble Energy, Inc. (NYSE:NBL)

- Range Resources Corporation (NYSE:RRC)
- Stone Energy Corp. (NYSE:SGY)

Economic and Industry Factors

24. Valuation analyses are typically accompanied by a detailed examination of the current economic and industry conditions. The intent is to identify the general direction of the economy, survey the general industry sentiment regarding future outlook, and to identify any specific risks that could impact the future value of an investment. To reduce any biased opinions, the following economic and industry overview is generally referenced from publically accessible sources that were available at or before the Valuation Date.

General Economic Overview

25. Although real gross domestic product is reported to have increased at a sluggish rate in the first quarter of 2016, the available data for the second quarter point to a noticeable step-up in the pace of growth. On average, consumer spending so far this year appears to be expanding at a moderate pace, supported by solid income gains and the ongoing effects of the increases in wealth and the declines in oil prices of the past two years. Fiscal policy at all levels of government is now modestly boosting economic activity after exerting a considerable drag in recent years. One area of concern, however, is the softening in business fixed investment in recent quarters even beyond those sectors most directly affected by the plunge in energy prices. In addition, the weakness of exports—following the significant appreciation of the dollar over the past two years and the subdued pace of foreign economic growth—continues to hold back overall output growth.
26. After having raised the target range for the federal funds rate to between 1/4 and 1/2 percent last December, the Committee maintained that target range over the first half of the year. The Committee's decisions to leave the stance of policy unchanged were supported by its assessments earlier in the year that global economic and financial developments posed risks to the economic outlook and that growth in economic activity appeared to have slowed. In June, the Committee noted that recent information indicated that the pace of improvement in the labor market had slowed, while growth in economic activity appeared to have picked up. In addition, the Committee's policy stance so far this year reflected its expectation that inflation would remain low in the near term, in part due to earlier declines in energy prices and in the prices of non-energy imports. The Committee stated that its accommodative stance of

47. In continuing with the discussion of accounting for and quantifying risks specific to a particular investment (in this case, a single producing oil and gas well), we have identified several other risk factors for which required an adjustment to capture and that which the State failed to identify. The following table lists the additional property-specific risks we identified and the resulting adjustment we made to our discount rate¹¹.

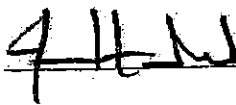
Oil & Gas Property Specific Risks	WACC Adjustment (Basis Points)
Single Completion Risk	100
Limited Production History	100
Steep Production Decline	100
Total	300

Conclusion

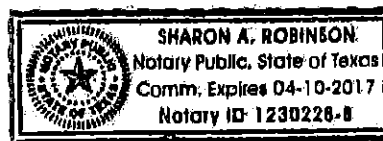
1. For detail of my analysis of the Fair Market Value of these oil and gas wells, please see Exhibits 1 through 4.

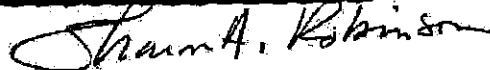
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My analyses and opinions are based on the information provided to me as of the date of this report. Should new information become available, I reserve the right to supplement or amend this report as necessary.



James Harden, ASA





¹¹ Adjustments to the calculated WACC for property-specific risks were obtained from the Texas Comptroller of Public Accounts 2014 Property Tax Study: Discount Rate Range for Oil and Gas Properties. August 2015.

Highly Confidential

EXHIBIT A
CURRICULUM VITAE
OF
JAMES HARDEN

*Carizzo Oil and Gas, Inc.
Fair Value of Certain Oil and Gas Assets Acquired from Sanchez Energy
Corporation*

James Harden, ASA

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James Harden is a Principal and the Business Valuation Leader at Hein & Associates. He has spent his entire thirty year career in various facets of the energy industry. He is one of a handful of professionals globally that holds the American Society of Appraisers' Senior Appraiser certification ("ASA") in Oil and Gas Valuation.

In his 30-year career, he has led hundreds of energy-sector valuations in North and South America, Africa, Russia, Eastern and Western Europe, Middle East and Southeast Asia. Jim's work has supported mergers and acquisitions, financial reporting and purchase price allocations, Federal, state and local and international tax, insurance, solvency opinions, bankruptcy and as expert witness on valuation of pipelines, terminals, refineries, chemical plants, gas processing facilities and oil and gas reserves.

His clients have included major and independent oil and gas companies, midstream MLP's, independent oil refiners, petrochemical companies, onshore and offshore drillers and oilfield service companies, mining companies, gas storage operators, LNG operators, and ammonia and ethanol manufacturers.

Jim has also served energy clients as an expert witness before U.S. Federal Court, U.S. Bankruptcy courts in Delaware, District courts and state tax boards and other tax tribunals, testifying on valuations of oil and gas reserves, gas gathering and processing facilities, oil refineries, and crude and product terminals. As well, he has represented oil and gas companies before the IRS and state, local and international tax authorities.

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*Carrizo Oil and Gas, Inc.
Fair Value of Certain Oil and Gas Assets Acquired from Sanchez Energy
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- ✓ Dozens of pipeline engagements for midstream MLP's. Assignments included purchase price allocations, partnership contributions and dropdowns, §704(b) book-ups, GP and LP stock acquisitions, pipeline and gas processing remaining life studies and intangible asset valuations. This included valuation of some of the largest pipelines in the US.
- ✓ Valuation of more than 60 global oil refineries for tax and financial reporting purchase price allocations, Federal and international tax structuring and litigation purposes.
- ✓ Valuation of several world-class petrochemical plants in the North America, Asia and Europe. Products included olefins and aromatics, intermediates and fine/specialty chemicals.
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- ✓ Cost-of-capital modeling for MLP's using both CAPM and yield analysis.
- ✓ Replacement cost and depreciation studies of gas gathering systems, gas processing plants and field and station compression facilities.
- ✓ Valuation of gas processing plants in US and Canada.
- ✓ Valuation of more than a dozen gas salt dome and depleted-reservoir storage facilities in US and Canada.
- ✓ Valuation of line-fill and cushion gas on pipelines and gas storage facilities.
- ✓ Valuation of all global midstream and downstream assets (pipelines, terminals, 40+ refineries) of a super-major oil company for §861 tax purposes.
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- ✓ Valuation of ethanol facilities in for purposes that included bankruptcy, tax and financial reporting.
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policy is intended to support further improvements in labor market conditions and a return to 2 percent inflation.

U.S. Upstream Exploration and Production Industry⁸

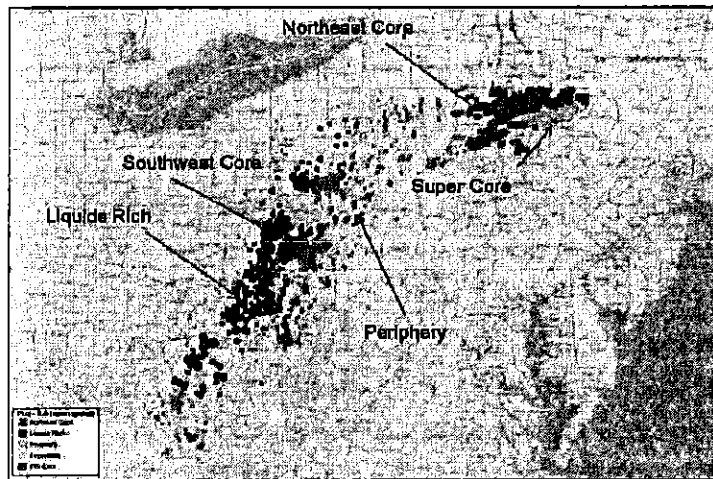
27. Due to unforeseen global market conditions, global oil prices began to plunge in the fall of 2014 and have since remained at depressed levels.⁹
28. Domestic production of oil and gas has steadily increased in the five years to 2016, and industry operators have positioned themselves to continue performing strongly in the five years to 2021 when prices rise. Though the industry remains exposed to global commodity price fluctuations, IBISWorld expects that the industry will continue to profit from its highly lucrative operations. Nevertheless, industry revenue is expected to decline 18.4% in 2016 due to persistently low oil and gas prices.
29. In the five years to 2016, industry revenue is expected to decrease at an annualized rate of 7.4% to total \$202.5 billion. The industry includes several very large, globalized companies that engage in all steps of the oil and gas production process, from exploration to refining; it is these companies that have benefited the most from the emergence of hydraulic fracturing and horizontal drilling techniques. Furthermore, the United States has been seeking to lessen its reliance on foreign sources of oil and gas, most notably those in the Middle East. By reducing exposure to foreign political events and pressure, domestic operators are expected to perform strongly as US-produced oil and gas resources increasingly meet domestic demand.
30. The future of oil and gas is expected to increasingly hinge on improvements to drilling technology and techniques. As industry operators deplete their reserves, it becomes necessary to improve efficiency and minimize waste. Industry operators replenish their reserves through either acquisitions or exploration. The number of industry operators is expected to increase, as previously uneconomical resources have become accessible. In the five years to 2021, IBISWorld expects industry revenue to expand at an annualized rate of 18.1% to total \$466.1 billion. This growth rate, however, is inflated by the anticipated decline in 2016, with 2016 revenue less than half of its 2014 level. Improving technology is anticipated to assist operators in meeting environmental concerns and maximize well efficiency; as a result, IBISWorld expects industry companies will be able to continue operating profitably and successfully in the United States.

⁸ Source: U.S. Federal Reserve System, as prepared at the Federal Reserve Bank of Philadelphia and based on information collected on or before January 4, 2016.

⁹ www.eia.gov.

Upstream Exploration and Production Industry of West Virginia

31. The Marcellus gas play, located in the mountains of Pennsylvania and West Virginia, includes areas with wet and dry gas. Five sub-plays were identified based on high performance variations and depths in the formation. This includes: Liquids Rich, Southwest Core, Periphery, Super Core, and Northeast Core.



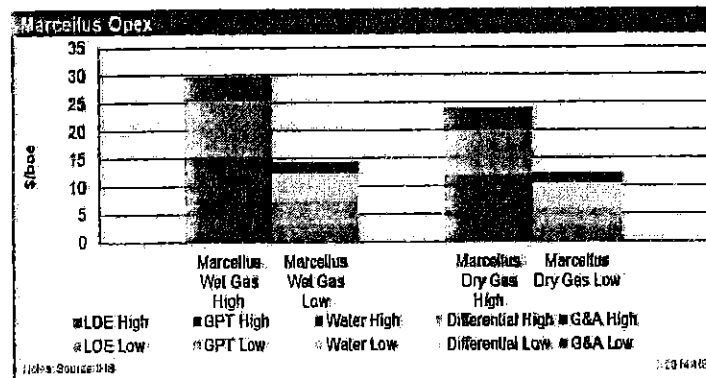
32. Drilling within all sub-plays has leveled off in the past three years. Production began in 2007 and has ramped up quickly to nearly 16 Bcf/day, making it by far the largest gas play in North America. As a result of this run-up in production, the Marcellus serves an over supplied gas market which precipitated drops in gas price and increased pressure to reduce the number of wells being drilled in the play.
33. Much of the value derived from the Marcellus is from NGL sales, mainly from the Liquids Rich gas area where current drilling is most active. NGLs are processed locally and are either shipped to the Gulf Coast or are marketed locally. Lack of processing and transportation infrastructure is being overcome by new and projected capacity. Production is expected to continue to grow there significantly and thus more infrastructure will be needed. The Marcellus benefits from being fairly close to market. However, logistically infrastructure is still lacking and transport fees are high. Also, water disposal is extremely expensive, averaging over \$5/bbl in some areas.¹⁰ Water disposal fees in other regions in the US typically range from a few cents per bbl. to +/- \$1.00 per bbl. of disposed water.

¹⁰ U.S. Energy Information Administration. *Trends in U.S. Oil and Natural Gas Upstream Costs*. March 2016.

34. Marcellus gas infrastructure is quite substantial, but there is a supply glut in nearby hubs. Reaching the Gulf Coast markets is more complicated. However there is sufficient capacity to move production south to fetch better prices than the local differential affords. Gas marketing is based on a series of complicated arrangements that potentially allocate production to many different nodes and destinations. Dry gas in the Marcellus rarely requires processing as its raw production can meet pipeline specifications. Few companies benefit from vertical integration. Furthermore, gathering and processing is almost a monopoly as most of the capacity is owned by one company. Fees for long haul transport of NGL's are very high since production must be trucked to Mont Belvieu. Ethane production in this play is injected into the gas line maxing out the thermal content limit for pipelines. Transportation differentials are so high that recovered ethane often becomes a net cost. There are alternatives for Ethane in this play as Edmonton can receive production through a specialized Ethane pipeline.

	Units	Marcellus Wet Gas High	Marcellus Wet Gas Low	Marcellus Dry Gas High	Marcellus Dry Gas Low
Gas Gathering	\$/mcf	0.60	0.50	0.60	0.50
Gas Processing	\$/mcf	0.60	0.35	n/a	n/a
Short Transportation Oil	\$/bbl	n/a	n/a	n/a	n/a
Long Transportation Gas	\$/mcf	1.40	0.70	1.40	0.70
Long Transportation Oil	\$/bbl	11.00	8.00	11.00	8.00

35. Operating costs are highly variable in the Marcellus. According to HIS, operating costs can range from \$2.06 to \$4.93 per mcf. This wide range is driven by geology, location, well performance and operator efficiency. Overall, this play offers both very high and very low operating costs rates.



Comparison with the States Methodology

36. As previously stated, I have concluded that the difference between the concluded Fair Market Value arrived at through my analysis and the assessed value calculated by the State can be attributed to (i) differences in the selection and application of oil and natural gas decline curves, (ii) differences in the application of actual versus capped "one size fits all" operating expense assumption, and (iii) methodology selection for calculating the appropriate rate used to discount the expected future cash flows of an investment with this risk profile. The following is a discussion of those differences.

Production Decline Curve Assumption

37. The state of West Virginia surveys operating companies in order to determine the decline curve parameters of various oil and gas reservoirs. This approach is too general to be used in estimating the future production of an individual operators' oil and gas wells. This is because not all oil and gas reserves are created equal. Estimated ultimate recovery (EUR) can vary greatly between wells that are in close proximity. Each operator has different investment criteria that influences their investment decisions. Oil and gas leases can contain different qualities of acreage and each operator develops this acreage according to their own engineering insight. Our estimations of Antero's future oil and gas production have been developed using Antero production data, not those of a competing operator.

38. The state of West Virginia bucketed the survey results by region. Each region encompasses multiple counties. Reservoir characteristics can vary drastically over the distance of just a few miles, leading this approach to be an inaccurate representation of the Marcellus play within a particular county. For example, both Lewis and Upshur counties are listed as part of the North Central region according to the state. We performed an EUR analysis of all wells in Lewis and Upshur counties and found that a Lewis County Marcellus gas well is roughly 833 MMcf. The average EUR for an Upshur County Marcellus gas well is nearly twice as much at 1,511 MMcf. Although these counties are adjacent to one another, the reservoir characteristics yield very different results.

Operating Expense Assumption

39. As discussed previously, we reviewed historic operating expense data of the Taxpayer and other publicly traded oil and gas companies that operate in the Marcellus Shale. The purpose of this analysis was to establish if the expenses reported by the Taxpayer were "ordinary" and to ensure we were not burdening a well with expenses related to inefficiencies in production or extraordinary.
40. The results of our analysis and conclusion of actual operating expenses of the Taxpayer contrasts starkly with that of the State. Given the burden of the State tax commissioner of assessing all oil and natural gas properties located in the State, we agree that a mass appraisal system would be the most effective method for assessing and assigning value to said properties. However, although we commend the State on its work in surveying market participants in order to establish Operating Expense variables, the process of applying these variables to every oil and natural gas producing property suggests that all oil and natural gas wells are created equal. This assumption is inherently incorrect as reservoir characteristics, production profiles, and technologies used to extract hydrocarbons differ across fields.
41. The following table shows the Operating Expense variable the State developed to apply to horizontal Marcellus wells for the 2017 tax year.

MARCELLUS	
% W.L. Expenses - Horizontal	20%
Max. Operating Expenses	\$175,000

The above Operating Expenses used by the State do not accurately capture the actual cost to extract hydrocarbons in the Marcellus. Based on our review of the data provided we note that the States variable would be reasonable in terms of LOE alone, however, adding G&C, processing, and transportation, we noted Antero's total Operating Expense exceeds the State's allowable cost dramatically. In the table below, we have calculated the Taxpayer's Operating Expenses by category on a \$/Mcf basis.

Antero Actual 2017 Tax Year Operating Expenses (\$/Mcf)					
County	LOE	G&C	Processing	Transport	Total OPEX
Ritchie	\$0.08	\$0.41	\$0.43	\$0.33	\$1.25

In order to assess the reasonableness of Antero's Operating Expenses, we have surveyed various public data sources in order to identify ordinary Marcellus Operating Expenses. The following table was taken from the Energy Information Administration's *Trends in U.S. Oil and Natural Gas Upstream Costs*. As can be seen, Antero's gathering, compression, and processing costs on a \$/Mcfe basis is in line with market participant costs.

	Units	Marcellus Wet Gas High	Marcellus Wet Gas Low	Marcellus Dry Gas High	Marcellus Dry Gas Low
Gas Gathering	\$/mcf	0.60	0.50	0.60	0.50
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Long Transportation Oil	\$/bbl	11.00	8.00	11.00	8.00

Discount Rate Methodology

42. In previous sections of this report, I discussed our reliance a per-tax weighted average cost of capital ("WACC") when estimating the appropriate discount rate for discounting the expected cash flows of an investment of this risk profile. I further define the WACC to be a market based weighted average of the cost of debt and cost of equity which is developed based on financial data of publicly traded guideline companies. Similarly, in estimating their selected discount rate, the State relied on the "Band of Investment" method which is viewed as being synonymous to a WACC.

43. The general components of a discount rate can be summarized below:

- **Inflation rate:** the annual rate of price change for a basket of consumer goods. Inflation is normally measured by the Consumer Price Index for All Urban Consumers (CPI-U), calculated by the United States Bureau of Labor Statistics. The inflation rate is the most basic component of a discount rate. An investor's rate of return must equal the rate of inflation just to break even in real dollar terms.
- **Risk-free component:** A return to compensate the investor for a loss of liquidity. This component can also be defined as the risk-free rate minus the inflation rate. The risk-free rate is made up of the inflation rate plus a return to reimburse the investor for a loss of liquidity and is measured by the yield to maturity on federal government securities with a maturity period comparable to the investment under consideration (oil or gas reserves in this case).
- **General risk premium:** A return to compensate the investor for assuming diversified company-wide risk. For property tax purposes, appraisers traditionally estimate the value of individual mineral reserves, not the value of oil companies. Individual reserves as riskier than

the stock and debt of an entire company. Companies can spread their risk over many individual mineral reserves and often over several kinds of assets. This asset diversification reduces the company's risk and, as a result, the WACC derived from company financial data is usually lower than an individual producing property's discount rate. However, the WACC is always higher than the risk-free rate. This increase in the rate is a general risk premium to reward investors for assuming the diversified company-wide risk.

- **Property-specific risk premium:** A return that compensates the investor for assuming the unique risks associated with a particular mineral producing property. Investors demand a premium above the WACC to compensate them for this individual property risk. For certain high-risk properties, this premium can be quite high.
44. The basic premise behind calculating a WACC is that investors can create a risk/reward profile that fits their individual risk preferences through diversification. Because our analysis focuses on assessing the Fair Market Value of an individual oil or natural gas well or property, we need to account for the fact that lack of diversification increases the risk of an investment and an investor would need to be compensated for such risk. As such, we have added an additional risk adjustment of 100 basis points to our WACC to account for the fact that we are appraising a non-diversified investment (single well) and the unadjusted WACC has this diversification benefit inherent within it.

47. In continuing with the discussion of accounting for and quantifying risks specific to a particular investment (in this case, a single producing oil and gas well), we have identified several other risk factors for which required an adjustment to capture and that which the State failed to identify. The following table lists the additional property-specific risks we identified and the resulting adjustment we made to our discount rate¹¹.

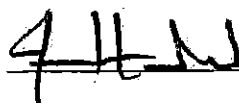
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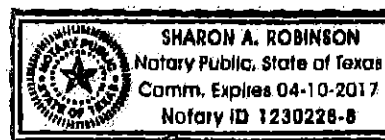
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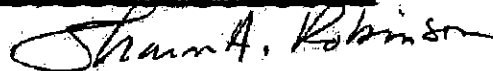
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UPSTREAM OIL AND GAS EXPERIENCE

Jim's upstream valuation exploration and production valuation experience includes hundreds of valuations of oil and gas reserves throughout the United States and in dozens of other countries for mergers and acquisitions, Federal and international tax, financial reporting, bankruptcy and litigation purposes. Some of the North American fields he has worked in include Prudhoe Bay, Gulf of Mexico, Hugoton Gas Field, Central Kansas Uplift, and the Permian Basin. Some of his experience includes:

- ✓ Oil and gas asset valuations and business enterprise (equity) valuations of oil and gas companies; including analyses around market discount rates, transaction multiples, price forecasting and reserve bookings.
- ✓ As co-owner of an independent oil and gas company, performed all phases of oil and gas operations, including leasing, exploration, drilling, well completions and artificial stimulations, operating and lease accounting, and buying and selling of oil and gas working and royalty interests.
- ✓ Valuation of hundreds of thousands of acres of developed and undeveloped mineral acres, including shale gas reserves in Eagle Ford, Barnett, Utica and Marcellus shale.
- ✓ Valuation of ownership rights including complex overriding royalties, back-in carried working interests, volumetric production payments and preferred stock exchanges.
- ✓ Valuation due diligence for large public employee fund of large equity investment into Western Oklahoma Granite Wash, Cleveland and Tonkawa plays.
- ✓ Valuation of North and South American, Asian and African oil and gas reserves for major oil companies. Most of this work also entailed analysis and modeling of various PSC's and tax and concession arrangements.
- ✓ Performed expert testimony in US Federal court (Houston) on value of producing and non-producing oil and gas reserves in South Texas. Client was a major independent oil and gas company.
- ✓ Valuation of production equipment of more than 4,000 producing oil and gas wells and equipment for federal tax purposes.
- ✓ Analysis of intangible drilling costs (IDC's) involving turn-key drilling partnerships.
- ✓ Valuation of working interests in more than one hundred Barnett Shale gas wells for litigation purposes.
- ✓ Valuation of an oil and gas company in Colombia. Reserves included developed and undeveloped leases.
- ✓ Valuation of oil and gas reserves for bankruptcies, including shallow water Gulf of Mexico oil and gas company with value in excess of \$300 million.
- ✓ Valuation of private oil and gas partnerships for tax purposes, including one with more than 1,400 operated oil and gas wells, and over 1,000 overriding royalty interests.
- ✓ Due diligence of oil and gas transactions including analysis of reservoir decline, gas gathering and processing agreements, price hedges, lease operating expenses, and projected capex.

OILFIELD SERVICES EXPERIENCE

- ✓ Valuation of oil and gas service equipment and technology, ranging from commodity tool rentals, completion rigs and fracking equipment to seismic technology, seamless threading, logging, and other downhole tools and applications.

***Carrizo Oil and Gas, Inc.
Fair Value of Certain Oil and Gas Assets Acquired from Sanchez Energy
Corporation***

- ✓ Several valuations for clients of more than 250 offshore drilling rigs in Gulf of Mexico, South America, North Sea, West Africa, Middle East and Southeast Asia for purposes such as acquisitions, purchase price allocations, US and international tax structuring. Rigs valued included jack-ups, semi-submersibles and drillships.
- ✓ Valuations of hundreds of land drilling rigs (up to 3,000 horsepower) and completion/workover rigs in more than a dozen countries in North and South America, Central and Eastern Europe, Russia and Asia.
- ✓ Inspected offshore drilling rigs in Sea of Thailand, Gulf of Mexico, Singapore and North Sea.
- ✓ Developed valuation model to forecast dayrates and utilization for offshore drilling rigs using regression analysis of historical oil prices, correlated to dayrates and utilization by rig class, competitive growth and asset attrition and contract terms.
- ✓ Analysis of drilling contracts, renewal and dayrate probability, and commodity price effect on forecast.
- ✓ Represented client before IRS valuation engineers on value of offshore drilling rigs.
- ✓ Valuation of offshore oil and gas production facilities in Gulf of Mexico, West Africa, North Sea and Southeast Asia. Assets included fixed platforms, FPSO's and subsea oil and gas production facilities.
- ✓ Damage analysis for independent that declared force majeure on semi-submersible drilling rig in GOM.
- ✓ Market value studies of new and used onshore and offshore drilling rigs using transaction analysis.
- ✓ Business enterprise valuations of drilling and oilfield service companies.
- ✓ Damage analysis of force majeure on semi-submersible drilling rig in GOM.
- ✓ Business enterprise valuations of drilling and oilfield service companies.
- ✓ Analysis of intangible drilling costs (IDC's) involving turn-key drilling partnerships.

EXPERT WITNESS AND VALUATION FOR LEGAL MATTERS

- ✓ US Bankruptcy Court (Delaware) – Expert witness regarding value of a crude and product terminal at a Gulf Coast refinery.
- ✓ US Bankruptcy Court (Delaware) – Expert witness regarding value of refinery.
- ✓ District Court (Oklahoma City) – Expert witness regarding value of gas processing plants and associated gas gathering pipeline networks.
- ✓ Kansas State Board of Tax Appeals – Expert witness representing on the value of a Midcontinent crude refinery.
- ✓ US District Court (California) – Expert witness regarding value of Midwestern ethanol plant.
- ✓ US District Court (Kansas) – Expert witness regarding value of chemical company.
- ✓ Valuation expert on bankruptcy matter involving oil and gas reserves in Gulf of Mexico.
- ✓ US Federal Court (Texas) – Expert witness regarding value of developed and undeveloped reserves of large oil and gas fields in South Texas.
- ✓ US District Court (Texas) – Expert witness regarding value of non-operated working interests in Barnett Shale.
- ✓ US District Court (Illinois) – Expert witness regarding agriculture and steel economics.
- ✓ State Tax Appeals – Expert witness regarding Alaska North Slope oil and gas developments.

Carrizo Oil and Gas, Inc.
Fair Value of Certain Oil and Gas Assets Acquired from Sanchez Energy
Corporation

- ✓ Represented clients in Federal, state and local tax negotiations on several occasions regarding oil and gas valuation.

SELECTED SPEAKING ENGAGEMENTS

- 2014: Society of Petroleum Engineers
 Hydrocarbon Evaluation and Economics Symposium
"Development of Discount Rates"
- 2014: Petroleum Accountants Society of Houston
 Monthly Meeting
"Purchase Price Allocations: Book and Tax Differences"
- 2014: Financial Executives Institute of Houston
 Annual Meeting
"Oil and Gas Price Outlook"
- 2013: American Society of Appraisers
 Advanced Business Valuation Conference
"Oil and Gas Reserves: From Rock to Bank"
- 2013: American Society of Appraisers
 Annual Oil and Gas School
"Oil and Gas Prices: History and Outlook"
- 2012: American Association of Drilling Contractors
 International Tax Conference
"Oil and Gas Prices: Valuation Effect on Drillers?"
- 2012: American Society of Appraisers
 Annual Oil and Gas School
"Fundamentals of Reservoir Analysis for Oil and Gas Valuation"
- 2012: Gardere Wynne and Sewell
 Energy Luncheon Series
"Oil and Gas Outlook: How we got here and where we're headed"
- 2011: American Institute of Professional Geologists
 Annual Conference
"Oil Prices, Currencies and Reserve Valuation"
- 2011: Petroleum Accountants Society of Houston
 Annual Conference
"A Funny Thing Happened on the Way to the Bank"
- 2011: Tax Executives Institute
 Annual Conference
"Oil, Gas, Money and Value"
- 2011: Haynes Boone
 Energy Team
"Oil and Gas Valuation"
- 2010: Society of Petroleum Evaluation Engineers
 Spring Meeting
"Currencies and Oil Prices – Where are we headed"
- 2010: Society of Petroleum Engineers
 International Oil and Gas Conference, Beijing, China
"Oil & Gas Prices and Outlook and Effect on Global Drillers"
- 2010: International Association of Drilling Contractors
 Contracts and Risk Management Conference

Carrizo Oil and Gas, Inc.
Fair Value of Certain Oil and Gas Assets Acquired from Sanchez Energy
Corporation

- *"Economic Trends and the Effect on Oil and Gas Companies"*
- 2010: Society of Petroleum Engineers
Business Development Conference
"Currencies and the Value-effect on Oil and Gas Price"
- 2009: Mergermarket
Energy M&A Conference (keynote speaker),
"Perspectives on Oil and Gas Trends and Prices"
- 2009: International Association of Drilling Contractors
International Tax Conference
"Oil and Gas Issues in Volatile Times"
- 2008: International Association of Drilling Contractors
International Tax Conference,
"Valuation of Offshore Drilling Rigs"
- 2007: International Association of Drilling Contractors
International Tax Conference,
"Current Issues in Drilling Rig Valuations"
- 2003: American Society of Appraisers
International Business Valuation Conference,
"Oil and Gas Valuation Using Monte Carlo Simulations"

SELECTED ARTICLES

Canadian Institute of Chartered Business Valuators

Probabilities and Sensitivity Analysis in Oil and Gas Valuation

Society of Petroleum Engineers

Currencies and their Effect on the Oil Industry

His articles have also appeared in Oilpro.com, Colorado Energy News and Iraqi Economists Network. Jim was listed by the American City Business Journals as a "Who's Who in Energy" in 2014.

ALTUS GROUP US INC.

FMV Assessment of Ritchie County, WV Gas Wells

Held by Antero Resources Corporation

As of July 1, 2016



Specialty Services Group

ALTUS GROUP US INC.

Fair Market Value Assessment - Antero Resources Corp.

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Valuation as of July 1, 2016



Reference #	Exhibit Description
Exhibit 1	FMV Conclusion
Exhibit 2	FMV Detail
Exhibit 3	FMV Comparison
Exhibit 4	Discount Rate Derivation

ALTUS GROUP US INC.**Exhibit 1****Fair Market Value Assessment - Antero Resources Corp.**

FMV Conclusion

Valuation as of July 1, 2016**Income Approach Summary**

<u>County</u>	<u>Well Count^[1]</u>	<u>Fair Market Value^[2]</u>
Ritchie	45	53,505,425
Total	45	\$ 53,505,425

Notes to Exhibit

[1] As provided by management. See Exhibit 3.

[2] See Exhibit 2.

[illegible]

Source: www.fishbase.org

[illegible]

[illegible]

Notes to Table 10

1. Used a logit model to estimate the effect of these firm characteristics on the probability of receiving the 1992-1993 contract between years 1-3 and graduation.
2. Statistics reported here are a function of the number of firms that were submitted to the selection process, and not the number of firms that received the contract. Data collected from the following table:
3. The number of firms that were submitted to the selection process was 1,000 in each year. The number of firms that received the contract was 100 in each year. The number of firms that were submitted to the selection process was 1,000 in each year. The number of firms that received the contract was 100 in each year.
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[illegible]

ALTUS GROUP US INC.

Fair Market Value Assessment - Antero Resources Corp.

FMV Comparison - Antero Resources Corp.

Valuation as of July 1, 2018

Exhibit A



Fair Market Value Summary

Well Name	NRA #	County	Well Type	Target Interval	Utah		West Virginia	
					FMV	% of Total	State Estimate	% of Total
Anna Unit 2H	0320159963	Ritchie	Horizontal	Marcellus	\$ 1,139,820	2.1%	\$ 1,247,045	0.7%
Belle Unit 1H	0320160027	Ritchie	Horizontal	Marcellus	1,064,409	2.0%	7,204,341	4.0%
Belle Unit 2H	0320160028	Ritchie	Horizontal	Marcellus	823,369	1.5%	5,449,100	3.0%
Belle Unit 3H	0320160029	Ritchie	Horizontal	Marcellus	1,043,908	2.0%	6,930,946	3.9%
Blanche Unit 1H	0320150256	Ritchie	Horizontal	Marcellus	1,911,881	3.6%	2,389,863	1.3%
Henderson Unit 1H	0320160069	Ritchie	Horizontal	Marcellus	975,019	1.8%	5,959,210	3.3%
Henderson Unit 2H	0320160068	Ritchie	Horizontal	Marcellus	920,688	1.7%	4,486,284	2.5%
Hornet Unit 1H	0320160063	Ritchie	Horizontal	Marcellus	1,047,173	2.0%	7,894,898	4.4%
Hornet Unit 2H	0320160065	Ritchie	Horizontal	Marcellus	939,442	1.8%	6,724,801	3.8%
Myrtle Unit 2H	0320170082	Ritchie	Horizontal	Marcellus	1,157,106	2.2%	4,951,044	2.8%
Murray Unit 2H	0320170106	Ritchie	Horizontal	Marcellus	1,069,384	2.0%	3,516,264	2.0%
Charles Unit 2H	0320170087	Ritchie	Horizontal	Marcellus	1,113,308	2.1%	3,715,460	2.1%
Cairo-Anna Unit 1H	0320179962	Ritchie	Horizontal	Marcellus	905,307	1.8%	3,071,386	1.7%
Cairo-Anna Unit 3H/4H	0320170016	Ritchie	Horizontal	Marcellus	1,016,182	1.9%	3,178,709	1.8%
Bow Unit 1H	0320170144	Ritchie	Horizontal	Marcellus	613,385	1.1%	2,834,828	1.6%
Bow Unit 2H	0320170157	Ritchie	Horizontal	Marcellus	1,061,159	2.0%	3,044,850	1.7%
Paige Unit 1H	0320170166	Ritchie	Horizontal	Marcellus	923,209	1.7%	3,066,046	1.7%
Murray Unit 1H	0320170109	Ritchie	Horizontal	Marcellus	1,064,012	2.0%	3,587,393	2.0%
Blanche Unit 3H	0320170041	Ritchie	Horizontal	Marcellus	935,168	1.7%	3,069,259	1.7%
Ericson Unit 2H	0320170146	Ritchie	Horizontal	Marcellus	1,674,583	3.1%	6,135,379	3.4%
Ericson Unit 3H	0320170144	Ritchie	Horizontal	Marcellus	1,141,281	2.1%	4,134,653	2.3%
Margrave Unit 1H	0320170163	Ritchie	Horizontal	Marcellus	1,024,268	1.9%	4,076,365	2.3%
Margrave Unit 2H	0320170181	Ritchie	Horizontal	Marcellus	1,049,231	2.0%	4,158,854	2.3%
Schmidt Unit 1H	0320170048	Ritchie	Horizontal	Marcellus	776,362	1.5%	2,994,085	1.7%
Noland Unit 1H	0320170164	Ritchie	Horizontal	Marcellus	774,848	1.4%	2,468,793	1.4%
Altman Unit 2H	1020160017	Ritchie	Horizontal	Marcellus	2,392,933	4.5%	2,087,050	1.0%
Conchita Unit 1H	1020180023	Ritchie	Horizontal	Marcellus	2,683,747	5.0%	3,764,632	2.1%
Deberry Unit 1H	1020169999	Ritchie	Horizontal	Marcellus	934,383	1.7%	6,917,811	3.8%
Ireland Unit 1H	1020160062	Ritchie	Horizontal	Marcellus	934,096	1.6%	5,711,251	3.2%
Kuhn Unit 1H	1020150082	Ritchie	Horizontal	Marcellus	1,381,253	2.5%	1,535,487	0.9%
Langford Unit 2H	1020160049	Ritchie	Horizontal	Marcellus	1,159,266	2.2%	6,472,297	3.6%
McCabe Unit 3H	1020160019	Ritchie	Horizontal	Marcellus	3,650,599	6.8%	4,670,833	2.6%
Nicholson Unit 1H	1020159961	Ritchie	Horizontal	Marcellus	1,048,553	2.0%	1,310,044	0.7%
Nicholson Unit 2H	1020149960	Ritchie	Horizontal	Marcellus	1,361,010	2.5%	1,616,605	0.9%
O'Neil Unit 1H	1020159944	Ritchie	Horizontal	Marcellus	1,609,311	3.0%	1,987,315	1.1%
O'Neil Unit 2H	1020159968	Ritchie	Horizontal	Marcellus	1,220,630	2.3%	1,483,711	0.8%
Prunty Unit 1H	1020159979	Ritchie	Horizontal	Marcellus	2,789,860	5.2%	3,854,601	2.2%
Pullman Unit 2H	1020159978	Ritchie	Horizontal	Marcellus	812,439	1.5%	1,156,720	0.6%
Rutledge Unit 1H	1020160046	Ritchie	Horizontal	Marcellus	1,182,427	2.2%	8,636,376	4.8%
Sandgrass Unit 2H	1020169996	Ritchie	Horizontal	Marcellus	557,424	1.0%	3,416,038	1.9%

Fair Market Value Assessment - Antero Resources Corp.

FMV Comparison - Antero Resources Corp.

Valuation as of July 1, 2016



Top 5 Productive Wells

Well Name	NRA #	County	Well Type	Target Interval	Utah		West Virginia	
					FMV	% of Total	State Estimate	% of Total
Langford Unit 1H	1020170044	Richie	Horizontal	Marcellus	1,042,501	1.9%	4,721,174	2.7%
Duckworth Unit 3H	1020170103	Richie	Horizontal	Marcellus	712,851	1.3%	2,207,010	1.2%
Duckworth Unit 1H	1020170102	Richie	Horizontal	Marcellus	501,110	1.0%	2,662,099	1.5%
Stalnaker Unit 1H	1020170139	Richie	Horizontal	Marcellus	540,717	1.0%	1,024,980	0.6%
Stalnaker Unit 3H	1020170138	Richie	Horizontal	Marcellus	573,182	1.1%	1,337,023	0.7%
					\$ 53,505,425	100.0%	\$ 170,137,180	100.0%

Notes to Exhibit A:

[1] Individual well data provided by Client.

[2] For further detail on the development of the FMV for each individual well, please refer to Exhibit 2.

Lawrence	3.61	1.61	53.16	2.60	1.64	33.26	1.62	7.7
Power University	3.61	1.61	53.16	2.60	1.64	33.26	1.62	7.7
Average	3.62	2.00	52.44	(23.54)	(1.97)	33.26	1.62	1.1
Median	3.61	2.00	52.38	(1.12)	(1.24)	33.26	1.62	1.1
Lower Quartile	2.03	2.00	24.18	(1.10)	(1.24)	33.26	1.62	1.1
Maximum	4.48	2.26	52.38	(1.10)	(1.24)	33.26	1.62	1.1
Notes	17.16	22.00	(1.12)	(1.24)	(1.24)	33.26	1.62	1.1

[illegible]

11. I have read Capital IQ, which is a public website, and I have read the following information:

- Securities of most listed stocks of ASAT, including the value of preferred equity and the total capex
- 8 years monthly historical data provided by S&P Capital IQ (I asked for March 2016, because the March 2016 data was the latest available data as of 3/23/2016)
- Reported 5-year average capital expenditure of ASAT
- Reported 5-year average return on investment of ASAT

TAB 14

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10 -K

☒ **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the fiscal year ended December 31, 2015

or

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

Commission File No. 001 -36120

ANTERO RESOURCES CORPORATION

(Exact name of registrant as specified in its charter)

Delaware
(State or other jurisdiction of
incorporation or organization)

80 -0162034
(IRS Employer
Identification No.)

1615 Wynkoop Street
Denver Colorado
(Address of principal executive offices)

80202
(Zip Code)

(303) 357 -7310

(Registrant's telephone number, including area code)

Securities Registered Pursuant to Section 12(b) of the Act:

Title of Each Class:
Common Stock, Par Value \$0.01 Per Share

Name of Each Exchange on which Registered:
New York Stock Exchange

Securities Registered Pursuant to Section 12(g) of the Act: None

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. ☒ Yes ☐ No

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. ☐ Yes ☒ No

Indicate by check mark whether the registrant: (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. ☒ Yes ☐ No

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Website, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-K (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). ☒ Yes ☐ No

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§ 229.405 of this chapter) is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. See the definitions of "large accelerated filer," "accelerated filer" and "smaller reporting company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer ☒

Accelerated filer ☐

Non-accelerated filer ☐

Smaller reporting company ☐

(Do not check if a
smaller reporting company)

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Act). ☐ Yes ☒ No

The aggregate market value of the voting common stock held by non-affiliates of the registrant as of June 30, 2015, the last business day of the registrant's most recently completed second fiscal quarter, was approximately \$2.6 billion.

The registrant had 277,061,336 shares of common stock outstanding as of February 19, 2016.

Documents incorporated by reference: Portions of the registrant's proxy statement for its annual meeting of stockholders to be filed pursuant to Regulation 14A within 120 days after the registrant's fiscal year end are incorporated by reference into Part III of this Annual Report on Form 10-K.

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In response to these market conditions and concerns about access to capital markets, many U.S. exploration and development companies significantly reduced their capital spending in 2015. Our capital spending for drilling, completions, and land for 2015 was \$1.8 billion, a reduction of approximately 44% from our 2014 capital expenditures. In conjunction with the reduction in our capital expenditures during 2015, we deferred the completion of 50 wells.

Our capital budget for drilling, completions, and land for 2016 is \$1.4 billion, a 24% reduction from our 2015 capital expenditures. We plan to operate an average of 7 drilling rigs in 2016 as compared to an average of 14 rigs in 2015, and we plan to complete 115 horizontal wells in the Marcellus and Utica Shales in 2016 as compared to 130 in 2015. We believe that our 2016 capital budget will be fully funded through operating cash flow and available borrowing capacity under our revolving credit facility or capital market transactions. We will continue to monitor commodity prices and may revise the capital budget if conditions warrant.

We evaluate the carrying amount of our proved natural gas, NGLs, and oil properties for impairment on a field-by-field basis whenever events or changes in circumstances (such as the decline in commodity prices during 2015) indicate that a property's carrying amount may not be recoverable. If the carrying amount exceeded the estimated undiscounted future cash flows (measured using strip prices at the end of a quarter), we would further evaluate our proved properties and record an impairment charge if the carrying amount of our proved properties exceeded the estimated fair value of the properties. Due to the current commodity price environment, we compared the carrying value of our proved properties to estimated future cash flows. As estimated future cash flows remained higher than the carrying value of our properties at December 31, 2015, we did not further evaluate our proved properties for impairment. See "Critical Accounting Policies and Estimates" for a discussion of such evaluation.

Source of Our Revenues

Our revenues are primarily derived from the sale of natural gas and oil production, as well as the sale of NGLs that are extracted from our natural gas during processing. Our production is entirely from within the continental United States. During 2015, our revenues from production were comprised of approximately 76% from the sale of natural gas and 24% from the sale of NGLs and oil. Natural gas, NGLs, and oil prices are inherently volatile and are influenced by many factors outside of our control. All of our production is derived from natural gas wells, some of which also produce NGLs, after processing, and limited quantities of oil. To achieve more predictable cash flows and to reduce our exposure to downward price fluctuations, we utilize derivative instruments to hedge future sales prices on a significant portion of our production.

We currently enter into fixed price natural gas and propane swap contracts in which we receive or pay the difference between a fixed price and the variable market price received. We enter into these contracts in order to reduce the variability in cash flows associated with our expected future production. In the past, we have also used fixed-price oil swaps. In addition, we also use basis swap contracts in order to hedge the difference between the New York Mercantile Exchange ("NYMEX") index price and a local index price. At the end of each accounting period, we estimate the fair value of these swaps and, because we have not elected hedge accounting, we recognize changes in the fair value of these derivative instruments in earnings. We expect continued volatility in the prices we receive for our production and the fair value of our derivative instruments.

Revenues from our gathering and compression and water handling and treatment operations are primarily derived from intersegment transactions for services Antero Midstream provides to our exploration and production operations. The portion of such fees shown in our consolidated financial statements represent amounts charged to outside working interest owners in Company-operated wells, as well as fees charged to other third parties for water handling and treatment services provided by the Company or usage of Antero Midstream's gathering pipelines.

Marketing revenues are primarily derived from activities to purchase and sell third-party natural gas and NGLs and to market excess firm transportation capacity to third parties.

Principal Components of Our Cost Structure

- *Lease operating expenses.* These are the day to day operating costs incurred to maintain production of our natural gas, NGLs, and oil. Such costs include labor-related costs to monitor producing wells, produced water treatment and disposal, maintenance, repairs, and workover expenses. Cost levels for these expenses can vary based on supply and demand for oilfield services, and activity levels.
- *Gathering, compression, processing and transportation.* These are costs incurred to bring natural gas, NGLs, and oil to the market. Such costs include the costs to operate and maintain our low- and high-pressure gathering and compression

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systems held by Antero Midstream, as well as fees paid to third parties who operate low - and high -pressure gathering systems that transport our gas. They also include costs to process and extract NGLs from our produced gas and to transport our NGLs and oil to market. We often enter into fixed price long -term contracts that secure transportation and processing capacity which may include minimum volume commitments, the cost for which is included in these expenses to the extent that they are not excess capacity. Costs associated with excess capacity are included in marketing expenses.

- *Production and ad valorem taxes.* Production and ad valorem taxes consist of severance and ad valorem taxes. Severance taxes are paid on produced natural gas and oil based on a percentage of realized prices (not hedged prices) and at fixed per-unit rates established by federal, state or local taxing authorities. Ad valorem taxes are paid based on the value of our property and equipment in service, as well as the value of our reserves.
- *Marketing expenses.* In 2014, we began to purchase and sell third-party natural gas and NGLs and to market our excess firm transportation capacity in order to utilize this excess capacity. Marketing costs include the cost of purchased third-party natural gas and NGLs. We also classify firm transportation costs related to capacity contracted for in advance of having sufficient production and infrastructure to fully utilize the capacity (excess capacity) as marketing expenses since we are marketing this excess capacity to third parties. We enter into long-term firm transportation agreements for a significant part of our current and expected future production in order to secure capacity on major pipelines.
- *Exploration expense.* These are geological and geophysical costs and include seismic costs, costs related to unsuccessful leasing efforts, and costs of unsuccessful exploratory dry holes. We have not recorded any costs related to exploratory dry holes in the three years ended December 31, 2015.
- *Impairment of unproved and proved properties.* These costs include unproved property impairment and costs associated with lease expirations. We would also record impairment charges for proved properties if the carrying values were to exceed estimated future cash flows. Through December 31, 2015, we have not recorded any impairment for proved properties.
- *Depletion, depreciation, and amortization.* Depletion, depreciation, and amortization, or DD&A, includes the systematic expensing of the capitalized costs incurred to acquire, explore, and develop natural gas, NGLs, and oil. As a "successful efforts" company, we capitalize all costs associated with our acquisition and development efforts and all successful exploration efforts, and allocate these costs to each unit of production using the units of production method.
- *General and administrative expense.* These costs include overhead, including payroll and benefits for our staff, costs of maintaining our headquarters, costs of managing our production and development operations, franchise taxes, audit and other professional fees, and legal compliance expenses. General and administrative expense also includes noncash equity-based compensation expense (see note 8 to the consolidated financial statements included elsewhere in this report).
- *Interest expense.* We finance a portion of our capital expenditures, working capital requirements and acquisitions with borrowings under our revolving credit facilities, which have variable rates of interest based on LIBOR or the prime rate. As a result, we incur substantial interest expense that is affected by both fluctuations in interest rates and our financing decisions. At December 31, 2015 we had a fixed interest rate of 6.00% on our senior notes due 2020 having a principal balance of \$525 million, a fixed interest rate of 5.375% on our senior notes due 2021 having a principal balance of \$1 billion, a fixed interest rate of 5.125% on our senior notes due 2022 having a principal balance of \$1.1 billion, and a fixed interest rate of 5.625% on our senior notes due 2023 having a principal balance of \$750 million. We expect to continue to incur significant interest expense as we continue to grow our operations.
- *Income tax expense.* We are subject to state and federal income taxes, but are currently not in a tax paying position for regular federal income taxes, primarily due to the differences in the tax and financial statement treatment of oil and gas properties, and the deferral of unsettled commodity hedge gains for tax purposes until they are settled in an exchange of cash. We do pay some state income or franchise taxes where state income or franchise taxes are determined on a basis other than income. We have recorded deferred income tax expense to the extent our deferred tax liabilities exceed our deferred tax assets. Our deferred tax assets and liabilities result from temporary differences between tax and financial statement income primarily from derivatives, oil and gas properties, and net operating loss carryforwards. At December 31, 2015, we had approximately \$1.4 billion of U.S. federal net operating loss carryforwards (NOLs) and approximately \$1.2 billion of state NOLs, which expire from 2024 through 2035. We recorded valuation allowances for deferred tax assets at December 31,

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ANTERO RESOURCES CORPORATION
Consolidated Statements of Operations and Comprehensive Income (Loss)
Years Ended December 31, 2013, 2014, and 2015
(In thousands, except share and per share amounts)

	2013	2014	2015
Revenues:			
Natural gas sales	\$ 689,198	1,301,349	1,039,892
Natural gas liquids sales	111,663	328,313	264,489
Oil sales	20,584	107,080	70,753
Gathering, compression, and water handling and treatment	—	22,075	22,000
Marketing	—	53,604	176,229
Commodity derivative fair value gains	491,689	868,201	2,381,501
Gain on sale of gathering system	—	40,000	—
Total revenue	1,313,134	2,720,632	3,954,858
Operating expenses:			
Lease operating	9,439	29,341	36,011
Gathering, compression, processing, and transportation	218,428	461,413	659,361
Production and ad valorem taxes	50,481	87,918	78,325
Marketing	—	103,435	299,062
Exploration	22,272	27,893	3,846
Impairment of unproved properties	10,928	15,198	104,321
Depletion, depreciation, and amortization	233,876	477,896	709,763
Accretion of asset retirement obligations	1,065	1,271	1,655
General and administrative (including equity-based compensation expense of \$365,280, \$112,252, and \$97,877 in 2013, 2014, and 2015, respectively)	425,438	216,533	233,697
Contract termination and rig stacking	—	—	38,531
Total operating expenses	971,927	1,420,898	2,164,572
Operating income	341,207	1,299,734	1,790,286
Other expenses:			
Interest	(136,617)	(160,051)	(234,400)
Loss on early extinguishment of debt	(42,567)	(20,386)	—
Total other expenses	(179,184)	(180,437)	(234,400)
Income from continuing operations before income taxes and discontinued operations	162,023	1,119,297	1,555,886
Provision for income tax expense	(186,210)	(445,672)	(575,890)
Income (loss) from continuing operations	(24,187)	673,625	979,996
Discontinued operations:			
Income from sale of discontinued operations, net of income tax expense of \$1,249 and \$1,354 in 2013 and 2014, respectively	5,257	1,210	—
Net income (loss) and comprehensive income (loss) including noncontrolling interest	(18,930)	675,835	979,996
Net income and comprehensive income attributable to noncontrolling interest:			
Net income (loss) and comprehensive income (loss) attributable to Antero Resources Corporation	\$ (18,930)	673,587	941,364
Earnings (loss) per common share:			
Continuing operations	\$ (0.09)	2.56	3.43
Discontinued operations	0.02	0.01	—
Total	\$ (0.07)	2.57	3.43
Earnings (loss) per common share—assuming dilution:			
Continuing operations	\$ (0.09)	2.56	3.43
Discontinued operations	0.02	0.01	—
Total	\$ (0.07)	2.57	3.43
Weighted average number of shares outstanding:			
Basic	262,049,659	262,053,868	274,122,567
Diluted	262,049,659	262,068,106	274,143,341

See accompanying notes to consolidated financial statements.

TAB 15

Weighted Average Sales Price
2015

Purchaser	Location	State	Index	2015 YTD			
				\$	MMBTU	Price	%
ARM	TCO Pool	WV	Columbia	\$ 49,919	25,600	\$ 1.95	0.01%
ARM	TGP	TN	Tennessee	\$ 1,320,600	620,000	\$ 2.13	0.14%
Atmos	TGP	TN	Tennessee	\$ 100,296	58,088	\$ 1.73	0.01%
BG Energy	M2 Pool Delmont	PA	NYMEX	\$ 26,264,859	10,535,313	\$ 2.49	2.34%
BG Energy	TGP	TN	Tennessee	\$ 1,345,400	620,000	\$ 2.17	0.14%
8G Energy	Sabine	LA	NYMEX	\$ 102,089	52,900	\$ 1.93	0.01%
BG Energy	TCO Pool	WV	Columbia	\$ 10,544	4,950	\$ 2.13	0.00%
BNP Paribas	Doddridge County	WV	Dominion	\$ 15,219,520	10,551,000	\$ 1.44	2.35%
BNP Paribas	TGP	TN	Tennessee	\$ 1,322,150	620,000	\$ 2.13	0.14%
BP	Doddridge County	WV	Dominion	\$ 38,746,659	28,271,284	\$ 1.37	6.29%
BP	TCO Pool	WV	Columbia	\$ 1,154,626	615,600	\$ 1.88	0.14%
BP	Sabine	LA	NYMEX	\$ 110,055	56,300	\$ 1.95	0.01%
BTG Pactual	TCO Pool	WV	Columbia	\$ 3,837,963	1,975,838	\$ 1.94	0.44%
Cargill	TCO Pool	WV	Columbia	\$ 45,225	20,000	\$ 2.26	0.00%
Castleton	TCO Pool	WV	Columbia	\$ 450,821	217,082	\$ 2.08	0.05%
Chevron	Sabine	LA	NYMEX	\$ 35,230	16,600	\$ 2.12	0.00%
Chevron	TCO Pool	WV	Columbia	\$ 17,205	8,500	\$ 2.02	0.00%
CNE	TCO Pool	WV	Columbia	\$ 1,831,950	920,000	\$ 1.99	0.20%
Colonial	M2 Pool Delmont	PA	Tetco	\$ (4,800)	(5,000)	\$ 0.96	0.00%
Colonial	TCO Pool	WV	Columbia	\$ 1,184	600	\$ 1.97	0.00%
Concord	M2 Pool Delmont	PA	Tetco	\$ (25,772)	(28,731)	\$ 0.90	0.00%
Conoco	M2 Pool Delmont	PA	Tetco	\$ (4,680)	(4,800)	\$ 0.98	0.00%
Conoco	TCO Pool	WV	Columbia	\$ 20,258,684	7,733,846	\$ 2.62	1.72%
Direct Energy	TCO Pool	WV	Columbia	\$ 20,062,966	7,427,924	\$ 2.70	1.65%
Direct Energy	M2 Pool Delmont	PA	Tetco	\$ (96,576)	(107,700)	\$ 0.90	0.00%
Dominion Field Services	Doddridge County	WV	Dominion	\$ 207,700	155,000	\$ 1.34	0.03%
Dominion Field Services	M2 Pool Delmont	PA	Tetco	\$ 510,500	450,000	\$ 1.13	0.10%
OTE Energy Trading	TCO Pool	WV	Columbia	\$ 746,088	302,500	\$ 2.47	0.07%
DTE Energy Trading	M2 Pool Delmont	PA	Tetco	\$ 672	560	\$ 1.20	0.00%
ECA	TCO Pool	WV	Columbia	\$ 2,608,002	1,272,196	\$ 2.05	0.28%
EDF Trading	M2 Pool Delmont	PA	NYMEX	\$ 26,213,237	10,513,838	\$ 2.49	2.34%
EDF Trading	TCO Pool	WV	Columbia	\$ 105,982	53,000	\$ 2.00	0.01%
Emera Energy Services	Doddridge County	WV	Columbia	\$ 18,603,034	7,204,015	\$ 2.58	1.60%
Exelon	TCO Pool	WV	Columbia	\$ 1,980,435	1,039,801	\$ 1.90	0.23%
Exelon	M2 Pool Delmont	PA	Tetco	\$ 91,743	63,186	\$ 1.45	0.01%
Exelon	Sabine	LA	NYMEX	\$ 93,638	42,500	\$ 2.20	0.01%
Exelon	TGP	TN	Tennessee	\$ 4,597,237	2,138,728	\$ 2.15	0.48%
J Aron	TCO Pool	WV	Columbia	\$ 1,687,500	900,000	\$ 1.88	0.20%
J Aron	M2 Pool Delmont	PA	Tetco	\$ 73,430	52,500	\$ 1.40	0.01%
J Aron	TGP	TN	Tennessee	\$ 4,891,301	2,301,641	\$ 2.13	0.51%
Kaiser	TCO Pool	WV	Columbia	\$ 27,165	12,100	\$ 2.25	0.00%
Macquarie	TCO Pool	WV	Columbia	\$ 10,650,773	4,506,349	\$ 2.36	1.00%
Macquarie	M2 Pool Delmont	PA	Tetco	\$ 3,879,200	2,080,000	\$ 1.87	0.46%
Macquarie	Henry Hub	LA	NYMEX	\$ 1,558,445	746,300	\$ 2.09	0.17%
Mercuria	TCO Pool	WV	Columbia	\$ 1,171,286	624,700	\$ 1.87	0.14%
Mercuria	Sabine	LA	NYMEX	\$ 21,609	10,000	\$ 2.16	0.00%
MMGS	TCO Pool	WV	Columbia	\$ 80,891,104	35,518,375	\$ 2.28	7.90%
MMGS	Sabine	LA	NYMEX	\$ 114,400	60,000	\$ 1.91	0.01%
MMGS	TGP	TN	Tennessee	\$ 4,896,946	2,317,173	\$ 2.11	0.52%
NextEra Energy	Doddridge County	WV	Dominion	\$ 51,804,265	42,747,900	\$ 1.21	9.51%
NextEra Energy	TCO Pool	WV	Columbia	\$ 53,123,096	21,310,757	\$ 2.49	4.74%
NextEra Energy	M2 Pool Delmont	PA	NYMEX	\$ 9,501,834	3,928,120	\$ 2.42	0.87%
NextEra Energy	M2 Pool Delmont	PA	Tetco	\$ 2,183,766	1,773,719	\$ 1.23	0.39%
NJR	M2 Pool Delmont	PA	Tetco	\$ 500,088	295,000	\$ 1.70	0.07%
NJR	Sabine	LA	NYMEX	\$ 21,598	9,600	\$ 2.25	0.00%

Noble Americas Gas & Power	Ooddridge County	WV	NYMEX	\$ 32,217,420	14,375,310	\$ 2.24	3.20%
Noble Americas Gas & Power	TCO Pool	WV	Columbia	\$ 553,947	138,821	\$ 3.99	0.03%
Noble Energy	TCO Pool	WV	Columbia	\$ 28,519	14,800	\$ 1.93	0.00%
Pacific Summit Energy	TCO Pool	WV	Columbia	\$ 69,398,141	26,214,267	\$ 2.65	5.83%
Sabine	Sabine	LA	NYMEX	\$ 70,479	35,100	\$ 2.01	0.01%
Sabine	TCO Pool	WV	Columbia	\$ 41,600	20,000	\$ 2.08	0.00%
Sequent Energy	TCO Pool	WV	Columbia	\$ 101,895,149	39,358,896	\$ 2.59	8.76%
Sequent Energy	M2 Pool Delmont	PA	Tetco	\$ 21,990,196	13,175,154	\$ 1.67	2.93%
Sequent Energy	Ooddridge County	WV	Dominion	\$ 25,087,957	17,451,632	\$ 1.44	3.88%
Sequent Energy	TGP	TN	Tennessee	\$ 2,641,200	1,240,000	\$ 2.13	0.28%
Shell	Sabine	LA	NYMEX	\$ 28,228	14,800	\$ 1.91	0.00%
Shell	TCO Pool	WV	Columbia	\$ 454,563	248,500	\$ 1.83	0.06%
South Jersey Gas	Ooddridge County	WV	Columbia	\$ 10,326,145	7,570,799	\$ 1.36	1.68%
South Jersey Resources	Ooddridge County	WV	Columbia	\$ 33,631,953	19,838,166	\$ 1.70	4.41%
South Jersey Resources	TCO Pool	WV	Columbia	\$ 109,334,993	43,663,153	\$ 2.50	9.71%
South Jersey Resources	Ooddridge County	WV	Dominion	\$ 49,682,825	33,872,000	\$ 1.47	7.54%
South Jersey Resources	M2 Pool Delmont	PA	Tetco	\$ 26,260,363	15,438,938	\$ 1.70	3.43%
Tenaska	M2 Pool Delmont	PA	Tetco	\$ 50,892	42,600	\$ 1.19	0.01%
Tenaska	TCO Pool	WV	Columbia	\$ 3,142,795	1,757,900	\$ 1.79	0.39%
Tenaska	TGP	TN	Tennessee	\$ 2,746,043	1,296,368	\$ 2.12	0.29%
Tenaska	Henry Hub	LA	NYMEX	\$ 798,907	369,549	\$ 2.16	0.08%
Total	M2 Pool Delmont	PA	Tetco	\$ 472,050	337,500	\$ 1.40	0.08%
Total	TCO Pool	WV	Columbia	\$ 532,531	292,200	\$ 1.82	0.07%
Total	Henry Hub	LA	NYMEX	\$ 18,992	5,125	\$ 3.71	0.00%
Twin Eagle	TCO Pool	WV	Columbia	\$ 18,450	9,000	\$ 2.05	0.00%
United Energy Trading	TCO Pool	WV	Columbia	\$ 80,428	41,500	\$ 1.94	0.01%
Vitol	TCO Pool	WV	Columbia	\$ 42,200	20,000	\$ 2.11	0.00%
WGL	TCO Pool	WV	Columbia	\$ 2,025	1,000	\$ 2.03	0.00%
WAVG Sales Price				\$ 906,461,176	449,475,830	\$ 2.02	100.00%

TCO Pool	WV	\$ 486,237,856	196,269,755	\$ 2.48	43.67%
Ooddridge County	WV	\$ 275,527,478	182,035,106	\$ 1.51	40.50%
M2 Pool Delmont	PA	\$ 117,861,000	58,540,197	\$ 2.01	13.02%
TGP	TN	\$ 23,861,174	11,211,998	\$ 2.13	2.49%
Sabine	LA	\$ 597,325	297,800	\$ 2.01	0.07%
Henry Hub	LA	\$ 2,376,344	1,120,974	\$ 2.12	0.25%
		\$ 906,461,176	449,475,830	\$ 2.02	100.00%

	TCO Pool				Doddridge County				M2 Pool Delmont			
	Dollars	Volume	Price		Dollars	Volume	Price		Dollars	Volume	Price	
January	\$ 52,209,548	17,950,554	\$ 2.91	\$	29,177,311	15,628,020	\$ 1.87	\$	12,893,553	5,528,935	\$ 2.33	
February	\$ 43,147,567	17,297,783	\$ 2.49	\$	28,989,201	13,531,342	\$ 2.14	\$	15,356,109	5,717,142	\$ 2.69	
March	\$ 43,973,658	15,946,524	\$ 2.76	\$	35,816,736	17,593,243	\$ 2.04	\$	18,927,806	8,663,412	\$ 2.18	
April	\$ 40,117,847	16,339,091	\$ 2.46	\$	24,986,413	17,171,084	\$ 1.46	\$	13,142,991	7,740,910	\$ 1.70	
May	\$ 40,403,424	16,602,155	\$ 2.43	\$	25,157,356	18,196,094	\$ 1.38	\$	11,828,465	6,975,251	\$ 1.70	
June	\$ 44,279,640	16,420,244	\$ 2.70	\$	23,292,187	16,292,998	\$ 1.43	\$	9,403,789	4,974,977	\$ 1.89	
July	\$ 40,114,030	15,145,286	\$ 2.65	\$	21,374,386	16,395,404	\$ 1.30	\$	8,517,098	4,842,377	\$ 1.76	
August	\$ 45,014,263	16,585,228	\$ 2.71	\$	23,583,446	17,566,668	\$ 1.34	\$	7,980,994	3,853,828	\$ 2.07	
September	\$ 41,856,440	17,664,723	\$ 2.37	\$	20,755,450	16,663,550	\$ 1.25	\$	6,462,481	3,206,715	\$ 2.02	
October	\$ 38,020,911	16,281,105	\$ 2.34	\$	20,081,890	16,355,285	\$ 1.23	\$	6,269,698	3,221,377	\$ 1.95	
November	\$ 29,875,529	15,870,657	\$ 1.88	\$	15,032,601	12,205,818	\$ 1.23	\$	4,513,144	2,548,062	\$ 1.77	
December	\$ 27,224,997	14,166,405	\$ 1.92	\$	7,280,502	4,435,600	\$ 1.64	\$	2,564,874	1,267,211	\$ 2.02	
Full year 2015	\$ 486,237,856	196,269,755	\$ 2.48	\$	275,527,478	182,035,106	\$ 1.51	\$	117,861,000	58,540,197	\$ 2.01	

TGP				Sabine				Henry Hub				2015 Weighted Average			
Dollars	Volume	Price		Dollars	Volume	Price		Dollars	Volume	Price		Dollars	Volume	Price	
\$ -	-	#DIV/0!		\$ -	-	#DIV/0!		\$ -	-	#DIV/0!		\$ 94,280,411	39,107,509	\$ 2.41	
\$ -	-	#DIV/0!		\$ -	-	#DIV/0!		\$ -	-	#DIV/0!		\$ 87,492,878	36,546,267	\$ 2.39	
\$ -	-	#DIV/0!		\$ -	-	#DIV/0!		\$ -	-	#DIV/0!		\$ 98,718,200	42,203,179	\$ 2.34	
\$ -	-	#DIV/0!		\$ -	-	#DIV/0!		\$ -	-	#DIV/0!		\$ 78,247,251	41,251,085	\$ 1.90	
\$ -	-	#DIV/0!		\$ -	-	#DIV/0!		\$ -	-	#DIV/0!		\$ 77,389,245	41,773,500	\$ 1.85	
\$ -	-	#DIV/0!		\$ -	-	#DIV/0!		\$ -	-	#DIV/0!		\$ 76,975,616	37,688,219	\$ 2.04	
\$ -	-	#DIV/0!		\$ -	-	#DIV/0!		\$ -	-	#DIV/0!		\$ 70,005,514	36,383,067	\$ 1.92	
\$ -	-	#DIV/0!		\$ -	-	#DIV/0!		\$ -	-	#DIV/0!		\$ 76,578,703	38,005,724	\$ 2.01	
\$ -	-	#DIV/0!		\$ -	-	#DIV/0!		\$ -	-	#DIV/0!		\$ 69,074,370	37,534,988	\$ 1.84	
\$ -	-	#DIV/0!		\$ -	-	#DIV/0!		\$ -	-	#DIV/0!		\$ 64,372,499	35,857,767	\$ 1.80	
\$ -	-	#DIV/0!		\$ -	-	#DIV/0!		\$ -	-	#DIV/0!		\$ 49,421,274	30,624,537	\$ 1.61	
\$ 23,861,174	11,211,998	\$ 2.13		\$ 597,325	297,800	\$ 2.01		\$ 2,376,344	1,120,974	\$ 2.12		\$ 63,905,215	32,499,988	\$ 1.97	
\$ 23,861,174	11,211,998	\$ 2.13		\$ 597,325	297,800	\$ 2.01		\$ 2,376,344	1,120,974	\$ 2.12		\$ 906,461,176	449,475,830	\$ 2.02	

Weighted Average Sales Price
2014

Purchaser	Location	State	Index	2014 YTD			
				\$	MMBTU	Price	%
8G Energy	M2 Pool Delmont	PA	NYMEX	\$ 29,314,825	7,519,533	\$ 3.90	2.16%
BNP Paribas	Doddridge County	WV	Dominion	\$ 13,010,852	5,533,994	\$ 2.35	1.59%
BP	Doddridge County	WV	Dominion	\$ 87,031,511	27,752,396	\$ 3.14	7.97%
BP	TCO Pool	WV	Columbia	\$ 7,506,325	1,645,000	\$ 4.56	0.47%
Direct Energy	TCO Pool	WV	Columbia	\$ 14,387,075	3,307,228	\$ 4.35	0.95%
DTE Energy	TCO Pool	WV	Columbia	\$ 1,310,525	310,000	\$ 4.23	0.09%
EDF Trading	M2 Pool Delmont	PA	NYMEX	\$ 37,637,390	9,127,224	\$ 4.12	2.62%
Emera Energy Services	Doddridge County	WV	Columbia	\$ 31,850,105	7,260,000	\$ 4.39	2.08%
Macquarie	M2 Pool Delmont	PA	Tetco	\$ 5,402,758	2,495,625	\$ 2.16	0.72%
MarkWest Hydrocarbons	TCO Pool	WV	Columbia	\$ 6,894,795	1,584,859	\$ 4.35	0.46%
NextEra Energy	Doddridge County	WV	Dominion	\$ 143,494,980	47,306,000	\$ 3.03	13.58%
NextEra Energy	TCO Pool	WV	Columbia	\$ 9,488,984	2,545,590	\$ 3.73	0.73%
NextEra Energy	M2 Pool Delmont	PA	NYMEX	\$ 9,391,255	2,335,000	\$ 4.02	0.67%
NJR	M2 Pool Delmont	PA	Tetco	\$ 705,113	363,100	\$ 1.94	0.10%
Noble Americas Gas & Power	Doddridge County	WV	NYMEX	\$ 57,017,587	14,348,380	\$ 3.97	4.12%
Noble Americas Gas & Power	TCO Pool	WV	Columbia	\$ 89,299	18,945	\$ 4.71	0.01%
Pacific Summit Energy	TCO Pool	WV	Columbia	\$ 117,827,023	27,132,840	\$ 4.34	7.79%
Sequent Energy	TCO Pool	WV	Columbia	\$ 156,383,203	37,275,072	\$ 4.20	10.70%
Sequent Energy	M2 Pool Delmont	PA	Tetco	\$ 11,807,571	5,270,644	\$ 2.24	1.51%
Sequent Energy	Doddridge County	WV	Dominion	\$ 65,129,175	19,901,316	\$ 3.27	5.71%
South Jersey Gas	Doddridge County	WV	Columbia	\$ 29,452,071	7,561,129	\$ 3.90	2.17%
South Jersey Resources	Doddridge County	WV	Columbia	\$ 85,840,830	21,583,000	\$ 3.98	6.20%
South Jersey Resources	TCO Pool	WV	Columbia	\$ 222,061,589	53,136,621	\$ 4.18	15.26%
South Jersey Resources	Doddridge County	WV	Dominion	\$ 100,142,926	33,174,622	\$ 3.02	9.52%
South Jersey Resources	M2 Pool Delmont	PA	Tetco	\$ 14,463,255	7,152,650	\$ 2.02	2.05%
Tenaska	TCO Pool	WV	Columbia	\$ 11,078,755	2,440,882	\$ 4.54	0.70%
Texla	TCO Pool	WV	Columbia	\$ 862,887	205,448	\$ 4.20	0.06%
WGL Midstream	TCO Pool	WV	Columbia	\$ 14,706	3,129	\$ 4.70	0.00%
WAVG Sales Price				\$ 1,269,597,371	348,290,227	\$ 3.65	100.00%
	M2 Pool Delmont	PA	Tetco	\$ 108,722,167	34,263,776	\$ 3.17	9.84%
	Doddridge County	WV	Dominion	\$ 612,970,037	184,420,837	\$ 3.32	52.95%
	TCO Pool	WV	Columbia	\$ 547,905,167	129,605,614	\$ 4.23	37.21%
				\$ 1,269,597,371	348,290,227	\$ 3.65	100.00%

	TCO Pool			Doddridge County			M2 Pool Delmont			2014 Weighted Average		
	Dollars	Volume	Price	Dollars	Volume	Price	Dollars	Volume	Price	Dollars	Volume	Price
January	\$ 37,243,259	8,585,665	\$ 4.34	\$ 50,591,540	13,873,069	\$ 3.65	\$ 1,852,420	435,000	\$ 4.26	\$ 89,687,219	22,893,734	\$ 3.92
February	\$ 52,171,314	9,160,385	\$ 5.70	\$ 72,384,776	13,543,488	\$ 5.34	\$ 214,780	40,000	\$ 5.37	\$ 124,770,870	22,743,873	\$ 5.49
March	\$ 39,481,737	8,208,881	\$ 4.81	\$ 68,261,410	15,122,242	\$ 4.51	\$ 4,878,563	1,055,000	\$ 4.62	\$ 112,621,710	24,386,123	\$ 4.62
April	\$ 41,665,343	9,371,577	\$ 4.45	\$ 56,731,220	13,710,895	\$ 4.14	\$ 4,019,288	915,000	\$ 4.39	\$ 102,415,850	23,997,472	\$ 4.27
May	\$ 46,268,926	10,119,010	\$ 4.57	\$ 62,296,708	15,898,778	\$ 3.92	\$ 4,652,622	974,880	\$ 4.77	\$ 113,218,256	26,992,668	\$ 4.19
June	\$ 45,437,393	10,038,920	\$ 4.53	\$ 51,406,703	14,725,663	\$ 3.49	\$ 6,717,776	1,691,087	\$ 3.97	\$ 103,561,871	26,455,670	\$ 3.91
July	\$ 43,927,090	10,628,458	\$ 4.13	\$ 47,207,564	15,435,911	\$ 3.06	\$ 15,158,365	4,313,000	\$ 3.51	\$ 106,293,019	30,377,369	\$ 3.50
August	\$ 38,728,360	10,189,429	\$ 3.80	\$ 43,314,700	16,870,473	\$ 2.57	\$ 12,189,443	4,067,146	\$ 3.00	\$ 94,232,502	31,127,048	\$ 3.03
September	\$ 38,937,741	9,974,770	\$ 3.90	\$ 39,274,613	16,328,784	\$ 2.41	\$ 16,022,056	6,133,339	\$ 2.61	\$ 94,234,410	32,436,893	\$ 2.91
October	\$ 45,309,230	11,637,833	\$ 3.89	\$ 35,717,422	16,742,590	\$ 2.13	\$ 15,822,217	6,134,475	\$ 2.58	\$ 96,848,868	34,514,838	\$ 2.81
November	\$ 55,034,961	14,684,328	\$ 3.75	\$ 35,627,636	15,320,973	\$ 2.33	\$ 10,649,892	3,094,900	\$ 3.44	\$ 101,312,490	33,100,201	\$ 3.06
December	\$ 63,699,813	17,006,358	\$ 3.75	\$ 50,155,746	16,848,031	\$ 2.98	\$ 16,544,746	5,409,949	\$ 3.06	\$ 130,400,305	39,264,338	\$ 3.32
Full year 2014	\$ 547,905,167	129,605,614	\$ 4.23	\$ 612,970,037	184,420,837	\$ 3.32	\$ 108,722,167	34,263,776	\$ 3.17	\$ 1,269,597,371	348,290,227	\$ 3.65

TAX DEPT. EXHIBITS

FEB-15-2017
03:28 PM

PRODUCING VALUE ABSTRACT

COUNTY: 43 RITCHIE COUNTY, WV

Account	Rt	Taxyr	Name	System	PTD	ASSR	COMM	CRT	Final
0318189639	OG	2017	ANTERO RESOURCES CORPORAT	6319	0	0	0	0	
0320150036	OG	2017	ANTERO RESOURCES CORPORAT	ANTERO RESOURCES ELUESTONE LLC	0	0	0	0	
0320159963	OG	2017	ANTERO RESOURCES CORPORAT	3019012	0	0	0	0	4409
0320160027	OG	2017	ANTERO RESOURCES CORPORAT	1607219	0	0	0	0	2382863
0320160028	OG	2017	ANTERO RESOURCES CORPORAT	8760178	0	0	0	0	1247845
0320160029	OG	2017	ANTERO RESOURCES CORPORAT	ANTERO RESOURCES COMPANY	0	0	0	0	7204341
0320160060	OG	2017	ANTERO RESOURCES CORPORAT	6630194	0	0	0	0	5423100
0320160062	OG	2017	ANTERO RESOURCES CORPORAT	ANTERO RESOURCES COMPANY	0	0	0	0	6930946
0320160063	OG	2017	ANTERO RESOURCES CORPORAT	ANTERO RESOURCES CORPORATION	0	0	0	0	5959210
0320160088	OG	2017	ANTERO RESOURCES CORPORAT	7085485	0	0	0	0	7856899
0320170015	OG	2017	ANTERO RESOURCES CORPORAT	9610689	0	0	0	0	6724801
0320170041	OG	2017	ANTERO RESOURCES CORPORAT	8246064	0	0	0	0	6406284
0320170042	OG	2017	ANTERO RESOURCES CORPORAT	ANTERO RESOURCES CORPORATION	0	0	0	0	3849695
0320170057	OG	2017	ANTERO RESOURCES CORPORAT	7605669	0	0	0	0	4312331
0320170082	OG	2017	ANTERO RESOURCES CORPORAT	4660372	3872823	0	0	0	6423228
0320170105	OG	2017	ANTERO RESOURCES CORPORAT	5357811	3853957	0	0	0	4520512
0320170106	OG	2017	ANTERO RESOURCES CORPORAT	8015566	3085387	0	0	0	5316999
0320170143	OG	2017	ANTERO RESOURCES CORPORAT	5388585	4447725	0	0	0	4834329
0320170144	OG	2017	ANTERO RESOURCES CORPORAT	6692058	6245493	0	0	0	4166909
0320170146	OG	2017	ANTERO RESOURCES CORPORAT	5833392	4360474	0	0	0	8712170
0320170157	OG	2017	ANTERO RESOURCES CORPORAT	5036941	4273056	0	0	0	5943775
0320170163	OG	2017	ANTERO RESOURCES CORPORAT	10554037	7469989	0	0	0	3863245
0320170164	OG	2017	ANTERO RESOURCES CORPORAT	7250920	4976517	0	0	0	4996867
0320170165	OG	2017	ANTERO RESOURCES CORPORAT	4785121	3545136	0	0	0	7565819
				6152438	4765425	0	0	0	6869179
				9337916	5109869	0	0	0	
				8524691	3160979	0	0	0	
				5596511	3722906	0	0	0	

PAGE 2
NR100

NR100

Account	Rt	Taxyr	Name	System	PTD	ASSR	COMM	CRT	Final
0320170165	OG	2017	ANTERO RESOURCES CORPORAT	5596511	3722906	0	0	0	
			PP 17010165	ANTERO RESOURCES CORPORATION					
0320170191	OG	2017	ANTERO RESOURCES CORPORAT	9684809	5201446	0	0	0	4662763
			PP 17010163	ANTERO RESOURCES CORPORATION					
0320179962	OG	2017	ANTERO RESOURCES CORPORAT	4657294	3747346	0	0	0	7848344
			PP 17010015	ANTERO RESOURCES CORPORATION					
1020149960	OG	2017	ANTERO RESOURCES CORPORAT	2116998	0	0	0	0	3846501
			PP 20149960	ANTERO RESOURCES CORPORATION					
1020150002	OG	2017	ANTERO RESOURCES CORPORAT	2030234	0	0	0	0	1616605
			PP 00150002	ANTERO RESOURCES CORPORATION					
1020150023	OG	2017	ANTERO RESOURCES CORPORAT	4760741	0	0	0	0	1535487
			PP 00150023	ANTERO RESOURCES CORPORATION					
1020159961	OG	2017	ANTERO RESOURCES CORPORAT	1718112	0	0	0	0	3764632
			PP 20159961	ANTERO RESOURCES CORPORATION					
1020159964	OG	2017	ANTERO RESOURCES CORPORAT	2562688	0	0	0	0	1310944
			PP 20159964	ANTERO RESOURCES CORPORATION					
1020159966	OG	2017	ANTERO RESOURCES CORPORAT	1939957	0	0	0	0	1987315
			PP 20159966	ANTERO RESOURCES CORPORATION					
1020159970	OG	2017	ANTERO RESOURCES CORPORAT	4950296	0	0	0	0	1483711
			PP 20159970	ANTERO RESOURCES CORPORATION					
1020159978	OG	2017	ANTERO RESOURCES CORPORAT	1494244	0	0	0	0	3854601
			PP 20159978	ANTERO RESOURCES CORPORATION					
1020160005	OG	2017	ANTERO RESOURCES CORPORAT	7168849	0	0	0	0	1156720
			PP 15010005	IRELAND BETTY S					
1020160017	OG	2017	ANTERO RESOURCES CORPORAT	3704333	0	0	0	0	18403
			PP 16010017	ANTERO RESOURCES CORPORATION					5692848
1020160019	OG	2017	ANTERO RESOURCES CORPORAT	5728002	0	0	0	0	2887050
			PP 16010019	ANTERO RESOURCES CORPORATION					
1020160045	OG	2017	ANTERO RESOURCES CORPORAT	10523770	0	0	0	0	4620833
			PP 14010045	SWN PRODUCTION COMPANY LLC					
1020160046	OG	2017	ANTERO RESOURCES CORPORAT	10772154	0	0	0	0	159183
			PP 16010046	ANTERO RESOURCES CORPORATION					8313114
1020169996	OG	2017	ANTERO RESOURCES CORPORAT	4337080	0	0	0	0	8636376
			PP 20169996	ANTERO RESOURCES CORPORATION					
1020169999	OG	2017	ANTERO RESOURCES CORPORAT	7671654	0	0	0	0	3416033
			PP 20169999	ANTERO RESOURCES CORPORATION					
1020170044	OG	2017	ANTERO RESOURCES CORPORAT	6031922	5934706	0	0	0	6017811
			PP 17010044	ANTERO RESOURCES CORPORATION					
			PP 17010044	STATOIL USA ONSHORE PROPERTIES INC					4666610
020170102	OG	2017	ANTERO RESOURCES CORPORAT	8196922	3392416	0	0	0	43425
			PP 17010044	SWN PRODUCTION COMPANY LLC					90190
020170103	OG	2017	ANTERO RESOURCES CORPORAT	5850557	2829605	0	0	0	6597385
			PP 17010102	ANTERO RESOURCES CORPORATION					
020170138	OG	2017	ANTERO RESOURCES CORPORAT	5904056	2409324	0	0	0	4676772
			PP 17010138	ANTERO RESOURCES CORPORATION					
020170139	OG	2017	ANTERO RESOURCES CORPORAT	5357576	2277669	0	0	0	4885420
			PP 17010138	ANTERO RESOURCES CORPORATION					4417239

STATE OF WEST VIRGINIA
TAX AND REVENUE - PROPERTY TAX DIVISION
NATURAL RESOURCES GAS/OIL VALUE ABSTRACT FOR EXCEL
FOR TAXYR: 2017

NR128PTD

PRODUCER	CY ACCOUNT	RTN FIL WELLS API	CH1VPTD	OM1VPTD	TOTAL OPERATOR
ANTERO RESOURCES CORPORATION	43 0318189639 C	1 09639	4409	0	4409 HALL, B #1 (10764.1)
	43 0320150036 C	1 10036	2087283	295580	2382863 BLANCHE UNIT 1H (10758.1)
	43 0320159963 C	1 09963	1089608	158237	1247845 ANNA UNIT 2H (10223.1)
	43 0320160027 C	1 10027	6622994	574347	7204341 BELLE UNIT 1H (10351.1)
	43 0320160028 C	1 10028	4994345	428755	5423100 BELLE UNIT 2H (10526.1)
	43 0320160029 C	1 10029	6384124	546822	6930946 BELLE UNIT 3H (10440.1)
	43 0320160060 C	1 10060	5607528	351682	5959210 HENDERSHOT UNIT 1H (10524
	43 0320160062 C	1 10062	7386960	469939	7856899 HORNET UNIT 1H (10524
	43 0320160063 C	1 10063	6292622	432179	6724801 HORNET UNIT 2H (10937.1)
	43 0320160088 C	1 10088	6017758	388526	6406284 HENDERSHOT UNIT 2H (10525
	43 0320170041 C	1 10041	3178709	0	3178709 CAIRO-ANNA UNIT 3H (105
	43 0320170042 C	1 10042	3068259	0	3068259 BLANCHE UNIT 3H (10442.1)
	43 0320170043 C	1 10043	2394085	0	2394085 SCHMIDLE UNIT 1H (10683.1
	43 0320170057 C	1 10057	3715460	0	3715460 CHANDOS UNIT 2H (10523.1)
	43 0320170082 C	1 10082	4952046	0	4952046 MYRTLE UNIT 2H (10938.1)
	43 0320170105 C	1 10105	3587293	0	3587293 MULVAY UNIT 1H (10636.1)
	43 0320170106 C	1 10106	3516264	0	3516264 MULVAY UNIT 2H (10637.1)
	43 0320170143 C	1 10143	6125229	0	6125229 ERICSON UNIT 2H (10694.1)
	43 0320170144 C	1 10144	4134653	0	4134653 ERICSON UNIT 3H (10695.1)
	43 0320170146 C	1 10146	2826828	0	2826828 BOW UNIT 1H (11418.1)
	43 0320170157 C	1 10157	3844650	0	3844650 BOW UNIT 2H (10670.1)
	43 0320170163 C	1 10163	4075365	0	4075365 MUSGRAVE UNIT 1H (10686.1
	43 0320170164 C	1 10164	4075365	0	4075365 MUSGRAVE UNIT 2H (10689.1
	43 0320170165 C	1 10165	2469793	0	2469793 MOLLAND UNIT 1H (10687.1)
	43 0320170191 C	1 10191	3071386	0	3071386 KUHNS UNIT 1H (10724.1)
	43 0320179962 C	1 09962	1116151	500454	1616605 NICHOLSON UNIT 1H (10588
	43 1020149960 C	1 09960	1209234	326253	1535487 KUHNS UNIT 2H (10207.1
	43 1020150002 C	1 10002	3068647	695985	3764632 CONSTABLE UNIT 1H (10326
	43 1020150023 C	1 10023	914633	396311	1310944 NICHOLSON UNIT 1H (10267
	43 1020159961 C	1 09961	1361733	625562	1987315 O'NEIL UNIT 1H (10275.1)
	43 1020159964 C	1 09964	1104784	378927	1483711 O'NEIL UNIT 2H (10276.1)
	43 1020159966 C	1 09966	3100202	754399	3854601 PRUNTY UNIT 1H (10288.1)
	43 1020159970 C	1 09970	869301	287419	1156720 PULLMAN UNIT 1H (10261.1)
	43 1020159978 C	1 09978	4538487	1172764	5711251 IRELAND UNIT 1H (10738.1)
	43 1020160005 C	1 10005	1939208	947842	2887050 ALLSTATE UNIT 2H (10424.1
	43 1020160017 C	1 10017	3520859	1099974	4620833 MCCABE UNIT 3H (10423.1)
	43 1020160019 C	1 10019	7222752	1249545	8472297 LANGFORD UNIT 2H (10566.1
	43 1020160045 C	1 10045	7456561	1179815	8636376 RUPUS UNIT 1H (10398.1)
	43 1020160046 C	1 10046	2704966	711067	3416033 SNODGRASS UNIT 2H (10535
	43 1020169996 C	1 09996	4641695	1376116	6017811 DEBERRY UNIT 1H (10296.1)
	43 1020169999 C	1 09999	4721174	0	4721174 LANGFORD UNIT 1H (10397.1
	43 1020170044 C	1 10044	2662099	0	2662099 DUCKWORTH UNIT 1H (10528
	43 1020170102 C	1 10102	2207016	0	2207016 DUCKWORTH UNIT 3H (10529
	43 1020170103 C	1 10103	1937025	0	1937025 STALNAKER UNIT 3H (10530
	43 1020170138 C	1 10138	1824960	0	1824960 STALNAKER UNIT 1H (10531

'RITCHIE' COUNTY, WV
YIELD CAP MODEL REPORT FOR - 2017

NR105: 1

FEB 13, 2017
10:16 AM

ACCOUNT: 0318189639

RESOURCE: GS OWNER: ANTERO RESOURCES CORPORATI LOCATION: HALL, B #1 (10764.1)

STATUS: A API#: 09639

DATE: 10/12/2007 DAYS: 365 BBLs: 0.000 MCPS: 1629 RCPTS: 5100 GWI: 4323 OWI: 0

SYSTEM RATES:

CAP RATE: 16.000 DECLINE RATE: 0.390 0.230 0.130 WELLLIFE: 99 EXPENSE: 0.45 5000 5000 5000

RATES USED:

CAP RATE: 16.000 DECLINE RATE: WELLLIFE: 99 EXPENSE: 0.45 5000 5000 5000

SETTLED YEARS: 9

	GAS WORKING INTEREST			GAS ROYALTY INTEREST			OIL WORKING INTEREST			OIL ROYALTY INTEREST		
	GROSS INCOME	NET INCOME	DISCOUNT INCOME	GROSS INCOME	DISCOUNT INCOME	INCOME FACTOR	GROSS INCOME	NET INCOME	DISCOUNT INCOME	GROSS INCOME	DISCOUNT INCOME	INCOME FACTOR
1	3,480	1,914	1,777	625	581	0.928						
2	3,028	1,462	1,170	544	436	0.800						
3	2,634	1,068	737	473	327	0.690						
4	2,292	726	432	412	245	0.595						
5	1,994	428	219	358	184	0.513						
6	1,735	169	74	312	138	0.442						
7	1,509	0	0	271	0	0.381						
TOTAL:			4,409			1,910						
EXPENSE:	1566		1566	1566								

FEB 13, 2017
10:16 AM

NR105: 2

ACCOUNT: 0320150036

RESOURCE: OG

STATUS:Z API#:10036
DATE:08/01/2013 DAYS:155
OWNER:ANTERO RESOURCES CORPORATI LOCATION:BLANCHE UNIT 1H (10758.1)

SYSTEM RATES:

CAP RATE.

000000

CAP RATE.

165324

THE

0.1130	*****99	0.2	175000	175000
<u>RATES USED:-</u>		<u>EXPENSE:</u>	0.2	175000
<u>CARD EXPENSE:-</u>				

CAP RATE:

0.230	U-230 WELLIFE:99	GS EXPENSE:	0.2	175000	175000
0.230	U-230	SETTLED YEARS: 3			175000

1

0.2 5750 5750

[illegible]

GS EXPENSE:	158849	158849	158849
OL EXPENSE:	531	531	531

'RITCHIE' COUNTY, WV
YIELD CAP MODEL REPORT FOR - 2017

NR105: 3

FEB 13, 2017
10:16 AM

ACCOUNT: 0320159963 RESOURCE: OG OWNER: ANTERO RESOURCES CORPORATI LOCATION: ANNA UNIT 2H (10223.1)
STATUS: Z API# 09963 DATE: 10/01/2013 DAYS: 365 BBLs: 2877.000 MCPS: 434027 RCPTS: 1257671 GWI: 958874 OWI: 89229
SYSTEM RATES:
CAP RATE: 16.000 DECLINE RATE: 0.460 0.290 0.230 WELLIFE: 99 EXPENSE: 0.2 175000 175000 175000
RATES USED:
CAP RATE: 16.000 DECLINE RATE: 0.460 0.290 0.230 WELLIFE: 99 GS EXPENSE: 0.2 175000 175000 175000
SETTLED YEARS: 3 OL EXPENSE: 0.2 5750 5750 5750

	GAS WORKING INTEREST			GAS ROYALTY INTEREST			OIL WORKING INTEREST			OIL ROYALTY INTEREST		
	GROSS INCOME	NET INCOME	DISCOUNT INCOME	GROSS INCOME	DISCOUNT INCOME	INCOME FACTOR	GROSS INCOME	NET INCOME	DISCOUNT INCOME	GROSS INCOME	DISCOUNT INCOME	INCOME FACTOR
1	628,062	502,450	466,513	125,581	116,599	0.928	58,445	57,955	53,810	11,686	10,850	0.928
2	483,608	357,996	286,544	96,698	77,398	0.800	45,003	44,513	35,629	8,998	7,202	0.800
3	372,378	246,766	170,271	74,457	51,376	0.690	34,652	34,163	23,572	6,929	4,781	0.690
4	286,731	161,119	95,839	57,332	34,103	0.595	26,682	26,193	15,580	5,335	3,173	0.595
5	220,783	95,171	48,802	44,146	22,637	0.513	20,545	20,056	10,284	4,108	2,107	0.513
6	170,003	44,390	19,623	33,992	15,027	0.442	15,820	15,330	6,777	3,163	1,398	0.442
7	130,902	5,290	2,016	26,174	9,975	0.381	12,181	11,692	4,456	2,436	928	0.381
8	100,795	0	0	20,154	0	0.329	9,380	8,890	2,921	1,875	616	0.329
9							7,222	6,733	1,907	1,444	409	0.283
10							5,561	5,072	1,238	1,112	271	0.244
11							4,282	3,793	798	856	180	0.210
12							3,297	2,808	509	659	120	0.181
13							2,539	2,049	321	508	79	0.156
14							1,955	1,465	198	391	53	0.135
15							1,505	1,016	118	301	35	0.116
16							1,159	670	67	232	23	0.100
17							892	403	35	178	15	0.086
18							687	198	15	137	10	0.074
19							529	40	3	106	7	0.064
20							407	0	0	81	0	0.055
TOTAL:			1,089,608			327,115			158,237			32,259

GS EXPENSE: 125612 125612
OL EXPENSE: 490 490

'RITCHIE' COUNTY, WV
YIELD CAP MODEL REPORT POR - 2017

NR105: 4

FEB 13, 2017
10:16 AM

ACCOUNT: 0320160027

RESOURCE: OG OWNER: ANTERO RESOURCES CORPORATI LOCATION: BELLE UNIT 1H (10351.1)

STATUS: 2 API#: 10027

DATE: 10/12/2014 DAYS: 365 BELS: 11820.000 MCPS: 1857079 RCPTS: 5929760 GWI: 4621929 OWI: 351172

SYSTEM RATES:

CAP RATE: 16.000 DECLINE RATE: 0.460 0.290 0.230 WELLLIFE: 99 EXPENSE: 0.2 175000 175000

RATES USED:

CAP RATE: 16.000 DECLINE RATE: 0.460 0.290 0.230 WELLLIFE: 99 GS EXPENSE: 0.2 175000 175000

SETTLED YEARS: 2

OL EXPENSE: 0.2 5750 5750

	GAS WORKING INTEREST			GAS ROYALTY INTEREST			OIL WORKING INTEREST			OIL ROYALTY INTEREST		
	GROSS INCOME	NET INCOME	DISCOUNT INCOME	GROSS INCOME	DISCOUNT INCOME	INCOME FACTOR	GROSS INCOME	NET INCOME	DISCOUNT INCOME	GROSS INCOME	DISCOUNT INCOME	INCOME FACTOR
1	2,750,048	2,587,405	2,402,346	529,017	491,181	0.928	208,947	208,541	193,626	40,195	37,320	0.928
2	2,117,537	1,954,894	1,564,719	407,343	326,042	0.800	160,889	160,483	128,453	30,950	24,773	0.800
3	1,630,503	1,467,861	1,012,837	313,654	216,424	0.690	123,885	123,479	85,202	23,831	16,444	0.690
4	1,255,488	1,092,845	650,064	241,514	143,661	0.595	95,391	94,985	56,501	18,350	10,915	0.595
5	966,725	804,083	412,325	185,966	95,361	0.513	73,451	73,045	37,457	14,130	7,246	0.513
6	744,379	581,736	257,162	143,194	63,300	0.442	56,558	56,152	24,822	10,880	4,810	0.442
7	573,171	410,529	156,447	110,259	42,018	0.381	43,549	43,143	16,441	8,377	3,193	0.381
8	441,342	278,700	91,559	84,899	27,891	0.329	33,533	33,127	10,883	6,451	2,119	0.329
9	339,833	177,191	50,182	65,373	18,514	0.283	25,820	25,414	7,198	4,967	1,407	0.283
10	261,672	99,029	24,178	50,337	12,290	0.244	19,882	19,476	4,755	3,825	934	0.244
11	201,467	38,845	8,176	38,759	8,158	0.210	15,309	14,903	3,137	2,945	620	0.210
12	155,145	0	0	29,845	0	0.181	11,788	11,382	2,065	2,268	411	0.181
13							9,077	8,671	1,356	1,746	273	0.156
14							6,989	6,583	888	1,344	181	0.135
15							5,382	4,976	578	1,035	120	0.116
16							4,144	3,738	375	797	80	0.100
17							3,191	2,785	241	614	53	0.086
18							2,457	2,051	153	473	35	0.074
19							1,892	1,486	95	364	23	0.064
20							1,457	1,051	58	280	16	0.055
21							1,122	716	34	216	10	0.048
22							864	458	19	166	7	0.041
23							665	259	9	128	5	0.035
24							512	106	3	99	3	0.031
25							394	0	0	76	0	0.026
TOTAL:			6,629,994		1,444,841				574,347		110,996	

GS EXPENSE: 162642

OL EXPENSE: 406

'RITCHIE' COUNTY, WV
YIELD CAP MODEL REPORT FOR - 2017

NR105: S

FEB 13, 2017
10:16 AM

ACCOUNT:0320160028 RESOURCE:OG OWNER:ANTERO RESOURCES CORPORATI LOCATION:BELLE UNIT 2H (10526.1)
STATUS:2 API#:10028 DATE:11/05/2014 DAYS:365 BBLs: 8750.000 MCFS: 1416250 RCPTS: 4625078 GWI: 3616410 OWI: 262495
SYSTEM RATES:
CAP RATE: 16.000 DECLINE RATE: 0.460 0.290 0.230 WELLLIFE:99 EXPENSE: 0.2 175000 175000 175000
RATES USED:
CAP RATE: 16.000 DECLINE RATE: 0.460 0.290 0.230 WELLLIFE:99 GS EXPENSE: 0.2 175000 175000 175000
SETTLED YEARS: 2 OL EXPENSE: 0.2 5750 5750 5750

	GAS WORKING INTEREST			GAS ROYALTY INTEREST			OIL WORKING INTEREST			OIL ROYALTY INTEREST		
	GROSS INCOME	DISCOUNT INCOME	NET INCOME	GROSS INCOME	DISCOUNT INCOME	NET INCOME	GROSS INCOME	DISCOUNT INCOME	NET INCOME	GROSS INCOME	DISCOUNT INCOME	NET INCOME
1	2,151,764	1,988,607	1,846,376	413,928	384,322	0.928	156,185	144,652	155,795	30,045	27,896	0.928
2	1,656,858	1,493,701	1,195,575	318,724	255,111	0.800	120,262	95,948	119,873	23,135	18,517	0.800
3	1,275,781	1,112,624	767,720	245,418	169,340	0.690	92,602	63,628	92,213	17,814	12,292	0.690
4	982,351	819,194	487,286	188,972	112,407	0.595	71,303	42,182	70,914	13,717	8,159	0.595
5	756,410	593,253	304,214	145,508	74,615	0.513	54,904	27,984	54,514	10,562	5,416	0.513
6	582,436	419,279	185,346	112,041	49,529	0.442	42,276	18,516	41,887	8,133	3,595	0.442
7	448,476	285,318	108,731	86,272	32,877	0.381	32,552	12,257	32,163	6,262	2,386	0.381
8	345,326	182,169	59,847	66,429	21,823	0.329	25,065	8,107	24,676	4,822	1,584	0.329
9	265,901	102,744	29,098	51,151	14,486	0.283	19,300	5,356	18,911	3,713	1,051	0.283
10	204,744	41,587	10,153	39,386	9,616	0.244	14,861	3,533	14,472	2,859	698	0.244
11	157,653	0	0	30,327	0	0.210	11,443	2,327	11,054	2,201	463	0.210
12							8,811	1,528	8,422	1,695	308	0.181
13							6,785	1,000	6,396	1,305	204	0.156
14							5,224	652	4,835	1,008	136	0.135
15							4,023	422	3,633	774	90	0.116
16							3,097	271	2,708	596	60	0.100
17							2,385	172	1,996	459	40	0.086
18							1,836	108	1,447	353	26	0.074
19							1,414	66	1,025	272	17	0.064
20							1,089	39	700	209	12	0.055
21							838	21	449	161	8	0.048
22							646	11	256	124	5	0.041
23							497	4	108	96	3	0.035
24							383	0	0	74	0	0.031

TOTAL: 4,994,345 1,124,127 428,755 82,967

GS EXPENSE: 163157 163157
OL EXPENSE: 389 389

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'RITCHIE' COUNTY, WV
YIELD CAP MODEL REPORT FOR ~ 2017

NR105: 6

ACCOUNT:0320160029

RESOURCE:OG OWNER:ANTERO RESOURCES CORPORATI LOCATION:BELLE UNIT 3H (10440.1)
STATUS:2 API#:10029 DATE:10/12/2014 DAYS:365 BBLs: 11297.000 MCFS: 1796387 RCPTS: 5730068 GWI: 4471230 OWI: 334396
SYSTEM RATES:
CAP RATE: 16.000 DECLINE RATE: 0.460 0.290 0.230 WELLLIFE:99 EXPENSE: 0.2 175000 175000 175000

RATES USED:
CAP RATE: 16.000 DECLINE RATE: 0.460 0.290 0.230 WELLLIFE:99 GS EXPENSE: 0.2 175000 175000 175000
SETTLED YEARS: 2
OL EXPENSE: 0.2 5750 5750 5750

	GAS WORKING INTEREST			GAS ROYALTY INTEREST			OIL WORKING INTEREST			OIL ROYALTY INTEREST		
	GROSS INCOME	NET INCOME	DISCOUNT INCOME	GROSS INCOME	DISCOUNT INCOME	INCOME FACTOR	GROSS INCOME	NET INCOME	DISCOUNT INCOME	GROSS INCOME	DISCOUNT INCOME	INCOME FACTOR
1	2,660,382	2,497,559	2,318,926	511,768	475,165	0.928	198,966	198,566	184,364	38,275	35,537	0.928
2	2,048,494	1,885,671	1,509,312	394,062	315,411	0.800	153,204	152,803	122,306	29,471	23,589	0.800
3	1,577,340	1,414,518	976,030	303,427	209,368	0.690	117,967	117,567	81,122	22,693	15,658	0.690
4	1,214,552	1,051,729	625,606	233,639	138,977	0.595	90,834	90,434	53,794	17,474	10,394	0.595
5	935,205	772,382	396,069	179,902	92,252	0.513	69,542	69,142	35,661	13,455	6,899	0.513
6	720,108	557,285	246,353	138,525	61,236	0.442	53,856	53,456	23,631	10,360	4,580	0.442
7	554,483	391,660	149,256	106,664	40,648	0.381	41,469	41,069	15,651	7,977	3,040	0.381
8	426,952	264,129	86,772	82,131	26,982	0.329	31,931	31,531	10,359	6,143	2,018	0.329
9	328,753	165,930	46,993	63,241	17,910	0.283	24,587	24,187	6,850	4,730	1,340	0.283
10	253,140	90,317	22,051	48,696	11,889	0.244	14,578	14,177	4,524	3,642	889	0.244
11	194,918	32,095	6,755	37,496	7,892	0.210	11,225	10,825	1,984	2,804	590	0.210
12	150,087	0	0	28,872	0	0.181	8,643	8,243	1,289	2,159	392	0.181
13							6,655	6,255	843	1,663	260	0.156
14							5,124	4,724	549	1,280	173	0.135
15							3,946	3,546	355	986	115	0.116
16							3,038	2,638	228	759	76	0.100
17							2,339	1,939	144	584	50	0.086
18							1,801	1,401	90	450	34	0.074
19							1,387	987	55	347	22	0.064
20							1,068	668	32	267	15	0.055
21							822	422	17	205	10	0.048
22							633	233	8	158	7	0.041
23							488	87	3	122	4	0.035
24							375	0	0	94	3	0.031
25										72	0	0.026
TOTAL:			6,384,124						546,822			
												105,694

GS EXPENSE: 162823 162823 162823 400

OL EXPENSE: 400 400 400 400

'RITCHIE' COUNTY, WV
YIELD CAP MODEL REPORT FOR - 2017

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ACCOUNT: 0320160060 RESOURCE: OG OWNER: ANTERO RESOURCES CORPORATI LOCATION: HENDERSHOT UNIT 1H (10524.1) 215206
STATUS: Z API#: 10060 DATE: 09/16/2014 DAYS: 365 BBLs: 7213.000 MCPS: 1615474 RCPTS: 4912061 GWI: 4004176 OWI: 215206
SYSTEM RATES: 16.000 DECLINE RATE: 0.460 0.290 0.230 WELLLIFE: 99 EXPENSE: 0.2 175000 175000 175000
CAP RATE: 16.000 DECLINE RATE: 0.460 0.290 0.230 WELLLIFE: 99 GS EXPENSE: 0.2 175000 175000 175000
RATES USED: 16.000 DECLINE RATE: 0.460 0.290 0.230 WELLLIFE: 99 OL EXPENSE: 0.2 5750 5750 5750
SETTLED YEARS: 2

	GAS WORKING INTEREST			GAS ROYALTY INTEREST			OIL WORKING INTEREST			OIL ROYALTY INTEREST		
	GROSS INCOME	DISCOUNT INCOME	NET INCOME	GROSS INCOME	DISCOUNT INCOME	NET INCOME	GROSS INCOME	DISCOUNT INCOME	NET INCOME	GROSS INCOME	DISCOUNT INCOME	NET INCOME
1	2,382,485	2,216,410	2,057,886	391,123	363,148	0.928	128,048	127,754	118,617	21,021	19,518	0.928
2	1,834,513	1,668,439	1,335,437	301,164	241,055	0.800	98,597	98,303	78,683	16,186	12,956	0.800
3	1,412,575	1,246,501	860,097	231,897	160,011	0.690	75,919	75,626	52,183	12,464	8,600	0.690
4	1,087,683	921,609	548,206	178,560	106,214	0.595	58,458	58,165	34,598	9,597	5,709	0.595
5	837,516	671,442	344,308	137,492	70,504	0.513	45,013	44,719	22,932	7,390	3,789	0.513
6	644,887	478,813	211,664	105,868	46,800	0.442	34,660	34,366	15,192	5,690	2,515	0.442
7	496,563	330,489	125,945	81,519	31,066	0.381	26,688	26,395	10,059	4,381	1,670	0.381
8	382,354	216,279	71,053	62,769	20,621	0.329	20,550	20,256	6,655	3,374	1,108	0.329
9	294,412	128,338	36,346	48,332	13,688	0.283	15,823	15,530	4,398	2,598	736	0.283
10	226,697	60,623	14,801	37,216	9,086	0.244	12,184	11,891	2,903	2,000	488	0.244
11	174,557	8,483	1,785	28,656	6,031	0.210	9,382	9,088	1,913	1,540	324	0.210
12	134,409	0	0	22,065	0	0.181	7,224	6,931	1,257	1,186	215	0.181
13							5,562	5,269	824	913	143	0.156
14							4,283	3,990	538	703	95	0.135
15							3,298	3,005	349	541	63	0.116
16							2,539	2,246	225	417	42	0.100
17							1,955	1,662	144	321	28	0.086
18							1,506	1,212	90	247	18	0.074
19							1,159	866	56	190	12	0.064
20							893	599	33	147	8	0.055
21							687	394	19	113	5	0.048
22							529	236	10	87	4	0.041
23							408	114	4	67	2	0.035
24							314	21	1	52	2	0.031
25							242	0	0	40	0	0.026
TOTAL:			5,607,528		1,068,225				351,682		58,050	

GS EXPENSE: 166074 166074 166074
OL EXPENSE: 293 293 293

'RITCHIE' COUNTY, WV
YIELD CAP MODEL REPORT FOR - 2017

NR105: 8

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ACCOUNT: 0320160062

RESOURCE: OG OWNER: ANTERO RESOURCES CORPORATI LOCATION: HORNET UNIT 1H (10942.1)

STATUS: Z API#: 10062

DATE: 10/29/2014 DAYS: 365

BBLS: 10006.000 MCFS:

2325693 RCPTS:

6459209 GWI:

5097205 OWI: 287232

SYSTEM RATES:

CAP RATE: 16.000 DECLINE RATE: 0.460

0.290

0.230 WELLLIFE: 99

EXPENSE:

175000

RATES USED:

CAP RATE: 16.000 DECLINE RATE: 0.460

0.290

0.230 WELLLIFE: 99

GS EXPENSE:

175000

SETTLED YEARS: 2

OL EXPENSE:

5750

5750

5750

	GAS WORKING INTEREST			GAS ROYALTY INTEREST			OIL WORKING INTEREST			OIL ROYALTY INTEREST		
	GROSS INCOME	NET INCOME	DISCOUNT INCOME	GROSS INCOME	DISCOUNT INCOME	INCOME FACTOR	GROSS INCOME	NET INCOME	DISCOUNT INCOME	GROSS INCOME	DISCOUNT INCOME	INCOME FACTOR
1	3,032,837	2,867,172	2,662,104	605,376	562,078	0.928	170,903	170,596	158,395	34,113	31,673	0.928
2	2,335,284	2,169,620	1,736,588	466,140	373,103	0.800	131,595	131,289	105,085	26,267	21,024	0.800
3	1,798,169	1,632,504	1,126,443	358,928	247,663	0.690	101,328	101,022	69,706	20,226	13,956	0.690
4	1,384,590	1,218,926	725,061	276,374	164,397	0.595	78,033	77,716	46,228	15,574	9,264	0.595
5	1,066,134	900,470	461,751	212,808	109,126	0.513	60,078	59,771	36,650	11,992	6,149	0.513
6	820,924	655,259	289,664	163,862	72,437	0.442	46,260	45,953	20,314	9,234	4,082	0.442
7	632,111	466,446	177,756	126,174	48,083	0.381	35,620	35,313	13,457	7,110	2,709	0.381
8	486,726	321,061	105,476	97,154	31,917	0.329	27,427	27,121	8,910	5,475	1,799	0.329
9	374,779	209,114	59,223	74,809	21,186	0.283	21,119	20,812	5,894	4,215	1,194	0.283
10	288,580	122,915	30,009	57,603	14,063	0.244	16,262	15,955	3,895	3,246	792	0.244
11	222,206	56,542	11,900	44,354	9,335	0.210	12,522	12,215	2,571	2,499	526	0.210
12	171,099	5,434	986	34,153	6,197	0.181	9,642	9,335	1,694	1,925	349	0.181
13	131,746	0	0	26,297	0	0.156	7,424	7,117	1,113	1,482	232	0.156
14							5,716	5,410	729	1,141	154	0.135
15							4,402	4,095	476	879	102	0.116
16							3,389	3,083	309	677	68	0.100
17							2,610	2,303	199	521	45	0.086
18							2,010	1,703	127	401	30	0.074
19							1,547	1,241	80	309	20	0.064
20							1,191	885	49	238	13	0.055
21							917	611	29	183	9	0.048
22							706	400	16	141	6	0.041
23							544	237	8	109	4	0.035
24							419	112	3	84	3	0.031
25							322	16	0	64	2	0.026
26							248	0	0	50	0	0.023
TOTAL:			7,386,960						469,939			
												94,204

GS EXPENSE: 165665 165665

OL EXPENSE: 307 307

'RITCHIE' COUNTY, WV
YIELD CAP MODEL REPORT FOR - 2017

NR105: 9

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ACCOUNT:0320160063
STATUS:Z API#:10063 DATE:11/08/2014 DAYS:365 BELLS: 9163.000 MCPS: 2218727 RCPTS: 5622483 GWI: 4422615 OWI: 264321
SYSTEM RATES:
CAP RATE: 16.000 DECLINE RATE: 0.460 0.290 0.230 WELLLIFE:99 EXPENSE: 0.2 175000 175000
RATES USED:
CAP RATE: 16.000 DECLINE RATE: 0.460 0.290 0.230 WELLLIFE:99 GS EXPENSE: 0.2 175000 175000
SETTLED YEARS: 2 OL EXPENSE: 0.2 5750 5750

GAS WORKING INTEREST				GAS ROYALTY INTEREST				OIL WORKING INTEREST				OIL ROYALTY INTEREST			
GROSS INCOME	NET INCOME	DISCOUNT INCOME		GROSS INCOME	DISCOUNT INCOME			GROSS INCOME	NET INCOME	DISCOUNT INCOME		GROSS INCOME	DISCOUNT INCOME		
1 2,631,456	2,466,325	2,289,926	0.928	525,258	487,690	0.928	157,271	156,947	145,721	145,721	31,392	29,147	0.928	0.928	
2 2,026,221	1,861,090	1,489,637	0.800	404,449	323,725	0.800	121,099	120,774	96,669	96,669	24,172	19,348	0.800	0.800	
3 1,560,190	1,395,059	962,604	0.690	311,426	214,886	0.690	93,246	92,922	64,117	64,117	18,612	12,843	0.690	0.690	
4 1,201,346	1,036,216	616,378	0.595	239,798	142,640	0.595	71,799	71,475	42,516	42,516	14,332	8,525	0.595	0.595	
5 925,037	759,906	389,671	0.513	184,644	94,684	0.513	55,286	54,961	28,184	28,184	11,035	5,659	0.513	0.513	
6 712,278	547,147	241,872	0.442	142,176	62,850	0.442	42,570	42,246	18,675	18,675	8,497	3,756	0.442	0.442	
7 548,454	383,323	146,079	0.381	109,476	41,720	0.381	32,779	32,455	12,368	12,368	6,543	2,493	0.381	0.381	
8 422,310	257,179	84,489	0.329	84,296	27,693	0.329	25,240	24,915	8,185	8,185	5,038	1,655	0.329	0.329	
9 325,179	160,048	45,327	0.283	64,908	18,383	0.283	19,435	19,110	5,412	5,412	3,879	1,099	0.283	0.283	
10 250,387	85,257	20,815	0.244	49,979	12,202	0.244	14,965	14,640	3,574	3,574	2,987	729	0.244	0.244	
11 192,798	27,668	5,823	0.210	38,484	8,100	0.210	11,523	11,198	2,357	2,357	2,300	484	0.210	0.210	
12 148,455	0	0	0.181	29,633	0	0.181	8,873	8,548	1,551	1,551	1,771	321	0.181	0.181	
13							6,832	6,508	1,018	1,018	1,364	213	0.156	0.156	
14							5,261	4,936	666	666	1,050	142	0.135	0.135	
15							4,051	3,726	433	433	809	94	0.116	0.116	
16							3,119	2,795	280	280	623	62	0.100	0.100	
17							2,402	2,077	179	179	479	41	0.086	0.086	
18							1,849	1,525	114	114	369	27	0.074	0.074	
19							1,424	1,100	71	71	284	18	0.064	0.064	
20							1,096	772	43	43	219	12	0.055	0.055	
21							844	520	25	25	169	8	0.048	0.048	
22							650	326	13	13	130	5	0.041	0.041	
23							501	176	6	6	100	4	0.035	0.035	
24							385	61	2	2	77	2	0.031	0.031	
25							297	0	0	0	59	0	0.026	0.026	

TOTAL: 6,292,622 1,434,574 432,179 86,689

GS EXPENSE: 165131 165131 165131
OL EXPENSE: 324 324 324

'RITCHIE' COUNTY, WV
YIELD CAP MODEL REPORT FOR - 2017

NR105: 10

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ACCOUNT: 0320160088
STATUS: Z API#: 10088
SYSTEM RATES:
CAP RATE: 16.000 DECLINE RATE: 0.460 0.290 0.230 WELLLIFE: 99 EXPENSE: 0.2 175000 175000 175000
DATE: 09/30/2014 DAYS: 365 BBLs: 8097.000 MCFS: 1718824 RCPTS: 5230814 GWI: 4255514 OWI: 237673
RATES USED:
CAP RATE: 16.000 DECLINE RATE: 0.460 0.290 0.230 WELLLIFE: 99 GS EXPENSE: 0.2 175000 175000 175000
SETTLED YEARS: 2 OL EXPENSE: 0.2 5750 5750 5750

	GAS WORKING INTEREST			GAS ROYALTY INTEREST			OIL WORKING INTEREST			OIL ROYALTY INTEREST		
	GROSS INCOME	NET INCOME	DISCOUNT INCOME	GROSS INCOME	DISCOUNT INCOME	FACTOR	GROSS INCOME	NET INCOME	DISCOUNT INCOME	GROSS INCOME	DISCOUNT INCOME	FACTOR
1	2,532,031	2,366,288	2,197,044	415,673	385,943	0.928	141,415	141,111	131,019	23,215	21,555	0.928
2	1,949,664	1,783,921	1,427,870	320,068	256,186	0.800	108,890	108,586	86,913	17,876	14,308	0.800
3	1,501,241	1,335,498	921,506	246,452	170,054	0.690	83,845	83,541	57,644	13,764	9,497	0.690
4	1,155,956	990,212	589,014	189,768	112,881	0.595	64,561	64,257	38,222	10,598	6,304	0.595
5	890,086	724,343	371,435	146,122	74,930	0.513	49,712	49,408	25,336	8,161	4,185	0.513
6	685,366	519,623	229,705	112,514	49,738	0.442	38,278	37,974	16,787	6,284	2,778	0.442
7	527,732	361,989	137,949	86,636	33,016	0.381	29,474	29,170	11,116	4,839	1,844	0.381
8	406,354	240,610	79,046	66,709	21,915	0.329	22,695	22,391	7,356	3,726	1,224	0.329
9	312,892	147,149	41,674	51,366	14,547	0.283	17,475	17,171	4,863	2,869	812	0.283
10	240,927	75,184	18,356	39,552	14,547	0.244	13,456	13,152	3,211	2,209	539	0.244
11	185,514	19,771	4,161	30,455	6,410	0.210	10,361	10,057	2,117	1,701	238	0.210
12	142,846	0	0	23,450	0	0.181	7,978	7,674	1,392	1,310	158	0.181
13							6,143	5,839	913	1,008	105	0.156
14							4,730	4,426	597	777	70	0.116
15							3,642	3,338	388	598	46	0.100
16							2,805	2,500	251	460	31	0.086
17							2,159	1,855	160	355	20	0.074
18							1,663	1,359	101	273	13	0.064
19							1,280	976	63	210	9	0.055
20							986	682	38	162	6	0.048
21							759	455	22	125	4	0.041
22							585	280	12	96	3	0.035
23							450	146	5	74	2	0.031
24							347	42	1	57	0	0.026
25							267	0	0	44	0	0.026
TOTAL:			6,017,758		1,135,277				388,526		64,106	

GS EXPENSE: 165743 165743
OL EXPENSE: 304 304

NATURAL OIL/GAS APPRAISAL - FLUSH WELL (Year 1)											
		2016		GAS INCOME		OIL INCOME		GAS CAP INCOME		OIL CAP INCOME	
DECLINE RATES		WRR INT		\$ 4,519,452		\$ 418,145		YR1 \$ 1,380,168		\$ 128,678	
YR 1 48%		ROY INT		\$ 614,211		\$ 55,828		YR2 \$ 1,226,745		\$ 113,900	
YR2 28%											
YR3+ 23%											
\$ 3,176,709		TY2017 WORKING INTEREST				TY2017 ROYALTY INTEREST				\$ 894,114	
YEAR	WRR INT INCOME	WORKING COST	NET INC	PRCT FCTR(18.5%)	GRS INC	YEAR	ROY INT INCOME	PRCT FCTR(18.5%)	GRS INC		
1	\$ 1,515,671	\$ 180,968	\$ 1,354,902	0.928477	\$ 1,257,996	1	\$ 284,548	0.928477	\$ 245,825		
2	\$ 1,121,744	\$ 180,968	\$ 950,776	0.800411	\$ 769,018	2	\$ 195,754	0.800411	\$ 158,892		
3	\$ 863,743	\$ 180,968	\$ 702,775	0.690009	\$ 484,921	3	\$ 150,738	0.690009	\$ 104,011		
4	\$ 685,082	\$ 180,968	\$ 504,114	0.594836	\$ 299,865	4	\$ 116,068	0.594836	\$ 66,042		
5	\$ 512,113	\$ 180,968	\$ 381,145	0.512789	\$ 160,083	5	\$ 89,373	0.512789	\$ 45,829		
6	\$ 394,327	\$ 180,968	\$ 233,359	0.442080	\$ 103,159	6	\$ 68,617	0.442080	\$ 30,421		
7	\$ 303,682	\$ 180,968	\$ 142,684	0.381086	\$ 54,367	7	\$ 52,989	0.381086	\$ 20,193		
8	\$ 233,797	\$ 180,968	\$ 72,628	0.328522	\$ 23,928	8	\$ 40,802	0.328522	\$ 13,404		
9	\$ 180,023	\$ 180,968	\$ 19,055	0.283209	\$ 5,397	9	\$ 31,417	0.283209	\$ 8,698		
10	\$ 138,616	\$ 180,968	\$ -	0.224146	\$ -	10	\$ 24,191	0.224146	\$ -		
11	\$ 108,738	\$ 180,968	\$ -	0.210470	\$ -	11	\$ 18,827	0.210470	\$ -		
12	\$ 82,167	\$ 180,968	\$ -	0.181440	\$ -	12	\$ 14,343	0.181440	\$ -		
13	\$ 63,284	\$ 180,968	\$ -	0.156414	\$ -	13	\$ 11,044	0.156414	\$ -		
14	\$ 48,729	\$ 180,968	\$ -	0.134840	\$ -	14	\$ 8,504	0.134840	\$ -		
15	\$ 37,521	\$ 180,968	\$ -	0.116241	\$ -	15	\$ 6,548	0.116241	\$ -		
16	\$ 28,691	\$ 180,968	\$ -	0.100208	\$ -	16	\$ 5,042	0.100208	\$ -		
17	\$ 22,246	\$ 180,968	\$ -	0.088388	\$ -	17	\$ 3,882	0.088388	\$ -		
18	\$ 17,130	\$ 180,968	\$ -	0.074471	\$ -	18	\$ 2,989	0.074471	\$ -		
19	\$ 13,190	\$ 180,968	\$ -	0.064199	\$ -	19	\$ 2,302	0.064199	\$ -		
20	\$ 10,158	\$ 180,968	\$ -	0.055344	\$ -	20	\$ 1,772	0.055344	\$ -		
21	\$ 7,820	\$ 180,968	\$ -	0.047710	\$ -	21	\$ 1,385	0.047710	\$ -		
22	\$ 6,022	\$ 180,968	\$ -	0.041129	\$ -	22	\$ 1,081	0.041129	\$ -		
23	\$ 4,637	\$ 180,968	\$ -	0.035455	\$ -	23	\$ 909	0.035455	\$ -		
24	\$ 3,570	\$ 180,968	\$ -	0.030586	\$ -	24	\$ 623	0.030586	\$ -		
25	\$ 2,749	\$ 180,968	\$ -	0.026350	\$ -	25	\$ 480	0.026350	\$ -		
26	\$ 2,117	\$ 180,968	\$ -	0.022716	\$ -	26	\$ 369	0.022716	\$ -		
27	\$ 1,630	\$ 180,968	\$ -	0.019582	\$ -	27	\$ 284	0.019582	\$ -		
28	\$ 1,255	\$ 180,968	\$ -	0.016881	\$ -	28	\$ 219	0.016881	\$ -		
29	\$ 968	\$ 180,968	\$ -	0.014563	\$ -	29	\$ 169	0.014563	\$ -		
30	\$ 744	\$ 180,968	\$ -	0.012548	\$ -	30	\$ 130	0.012548	\$ -		
31	\$ 573	\$ 180,968	\$ -	0.010816	\$ -	31	\$ 100	0.010816	\$ -		
32	\$ 441	\$ 180,968	\$ -	0.009323	\$ -	32	\$ 77	0.009323	\$ -		
33	\$ 340	\$ 180,968	\$ -	0.008037	\$ -	33	\$ 59	0.008037	\$ -		
34	\$ 282	\$ 180,968	\$ -	0.006929	\$ -	34	\$ 46	0.006929	\$ -		
35	\$ 201	\$ 180,968	\$ -	0.005973	\$ -	35	\$ 35	0.005973	\$ -		
36	\$ 168	\$ 180,968	\$ -	0.005149	\$ -	36	\$ 27	0.005148	\$ -		
37	\$ 119	\$ 180,968	\$ -	0.004439	\$ -	37	\$ 21	0.004439	\$ -		
38	\$ 92	\$ 180,968	\$ -	0.003827	\$ -	38	\$ 16	0.003827	\$ -		
39	\$ 71	\$ 180,968	\$ -	0.003299	\$ -	39	\$ 12	0.003299	\$ -		
40	\$ 55	\$ 180,968	\$ -	0.002844	\$ -	40	\$ 10	0.003812	\$ -		
WORKING INTEREST APPRAISAL					\$ 3,176,709	ROYALTY INTEREST APPRAISAL					\$ 894,114

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NATURAL OIL/GAS APPRAISAL - PLUM WELL (Year 1)									
DECLINE RATES		2018	GAS INCOME		OIL INCOME		GAS CAP. EXPENSE		OIL CAP. INCOME
YR 1	48%	WKR INT	\$ 3,412,114	\$	317,317		YR1	\$ 1,347,788	\$ 125,301
YR 2	38%	ROY INT	\$ 883,818	\$	84,484		YR2	\$ 173,380	\$ 23,471
YR3+	23%						YR3	\$ 167,381	\$ 22,723
								\$ 282,748	\$ 18,448
\$ 3,068,258		TY2017 WORKING INTEREST				TY2017 ROYALTY INTEREST			
YEAR	WKR INT INCOME	WORKING COST	NET INC	PRCT FCTR(18.2%)	DIS INC	YEAR	ROY INT INCOME	PRCT FCTR(18.8%)	DIS INC
1	\$ 1,473,088	\$ 180,804	\$ 1,312,482	0.928477	\$ 1,218,609	1	\$ 299,461	0.928477	\$ 276,033
2	\$ 1,080,083	\$ 180,804	\$ 929,480	0.800411	\$ 743,988	2	\$ 221,594	0.800411	\$ 177,368
3	\$ 839,384	\$ 180,804	\$ 678,781	0.690009	\$ 468,361	3	\$ 170,627	0.690009	\$ 117,734
4	\$ 646,310	\$ 180,804	\$ 460,707	0.594836	\$ 288,815	4	\$ 131,383	0.594836	\$ 78,181
5	\$ 497,659	\$ 180,804	\$ 337,055	0.512789	\$ 172,838	5	\$ 101,165	0.512789	\$ 51,875
6	\$ 383,197	\$ 180,804	\$ 222,594	0.442080	\$ 96,400	6	\$ 77,897	0.442080	\$ 34,435
7	\$ 285,082	\$ 180,804	\$ 134,458	0.381086	\$ 51,240	7	\$ 59,981	0.381086	\$ 22,858
8	\$ 227,198	\$ 180,804	\$ 88,594	0.328522	\$ 21,675	8	\$ 46,185	0.328522	\$ 15,173
9	\$ 174,942	\$ 180,804	\$ 14,338	0.283208	\$ 4,061	9	\$ 35,582	0.283208	\$ 10,072
10	\$ 134,708	\$ 180,804	\$ -	0.224148	\$ -	10	\$ 27,383	0.224148	\$ -
11	\$ 103,723	\$ 180,804	\$ -	0.210470	\$ -	11	\$ 21,085	0.210470	\$ -
12	\$ 79,867	\$ 180,804	\$ -	0.161440	\$ -	12	\$ 16,235	0.161440	\$ -
13	\$ 61,498	\$ 180,804	\$ -	0.158414	\$ -	13	\$ 12,501	0.158414	\$ -
14	\$ 47,353	\$ 180,804	\$ -	0.134840	\$ -	14	\$ 9,826	0.134840	\$ -
15	\$ 36,482	\$ 100,804	\$ -	0.116241	\$ -	15	\$ 7,412	0.116241	\$ -
16	\$ 26,078	\$ 100,804	\$ -	0.100208	\$ -	16	\$ 6,707	0.100208	\$ -
17	\$ 21,618	\$ 100,804	\$ -	0.086386	\$ -	17	\$ 4,386	0.086386	\$ -
18	\$ 16,848	\$ 180,804	\$ -	0.074471	\$ -	18	\$ 3,384	0.074471	\$ -
19	\$ 12,617	\$ 180,804	\$ -	0.064199	\$ -	19	\$ 2,808	0.064199	\$ -
20	\$ 9,869	\$ 180,804	\$ -	0.055344	\$ -	20	\$ 2,008	0.055344	\$ -
21	\$ 7,598	\$ 180,804	\$ -	0.047710	\$ -	21	\$ 1,545	0.047710	\$ -
22	\$ 5,852	\$ 180,804	\$ -	0.041129	\$ -	22	\$ 1,180	0.041129	\$ -
23	\$ 4,508	\$ 180,804	\$ -	0.035458	\$ -	23	\$ 916	0.035458	\$ -
24	\$ 3,489	\$ 180,804	\$ -	0.030586	\$ -	24	\$ 705	0.030586	\$ -
25	\$ 2,871	\$ 180,804	\$ -	0.026350	\$ -	25	\$ 543	0.026350	\$ -
26	\$ 2,057	\$ 180,804	\$ -	0.022715	\$ -	26	\$ 418	0.022715	\$ -
27	\$ 1,584	\$ 180,804	\$ -	0.019582	\$ -	27	\$ 322	0.019582	\$ -
28	\$ 1,220	\$ 180,804	\$ -	0.018801	\$ -	28	\$ 248	0.018801	\$ -
29	\$ 939	\$ 180,804	\$ -	0.014553	\$ -	29	\$ 191	0.014553	\$ -
30	\$ 723	\$ 180,804	\$ -	0.012546	\$ -	30	\$ 147	0.012546	\$ -
31	\$ 557	\$ 180,804	\$ -	0.010816	\$ -	31	\$ 113	0.010816	\$ -
32	\$ 429	\$ 180,804	\$ -	0.009323	\$ -	32	\$ 87	0.009323	\$ -
33	\$ 330	\$ 180,804	\$ -	0.008037	\$ -	33	\$ 67	0.008037	\$ -
34	\$ 254	\$ 180,804	\$ -	0.006929	\$ -	34	\$ 52	0.006929	\$ -
35	\$ 196	\$ 100,804	\$ -	0.005973	\$ -	35	\$ 40	0.005973	\$ -
36	\$ 151	\$ 180,804	\$ -	0.005149	\$ -	36	\$ 31	0.005149	\$ -
37	\$ 118	\$ 180,804	\$ -	0.004439	\$ -	37	\$ 24	0.004439	\$ -
38	\$ 89	\$ 180,804	\$ -	0.003827	\$ -	38	\$ 16	0.003827	\$ -
39	\$ 69	\$ 180,804	\$ -	0.003299	\$ -	39	\$ 14	0.003299	\$ -
40	\$ 53	\$ 180,804	\$ -	0.002844	\$ -	40	\$ 11	0.002812	\$ -
WORKING INTEREST APPRAISAL					\$ 3,068,258	ROYALTY INTEREST APPRAISAL			

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NATURAL OIL/GAS APPRAISAL - FLUSH WELL (Year 1)											
DECLINE RATE		2015		GAS INCOME		OIL INCOME		GAS CAP INCOME		OIL CAP INCOME	
YR 1	46%	WPK INT	\$	2,988,208	\$	148,084	YR1	\$	1,187,308	\$	58,481
YR 2	29%	ROY INT	\$	843,448	\$	32,238	YR2	\$	284,169	\$	12,733
YR3+	23%							\$	843,808	\$	43,276
								\$	188,080	\$	9,423
\$ 2,394,088				TY2017 WORKING INTEREST				TY2017 ROYALTY INTEREST			
YEAR	WPK INT INCOME	WORKING COST	NET INC	PRCT FCTR(16.0%)	DIS INC	YEAR	ROY INT INCOME	PRCT FCTR(16.0%)	DIS INC		
1	\$ 1,225,789	\$ 168,925	\$ 1,056,864	0.928477	\$ 983,131	1	\$ 298,895	0.928477	\$ 247,808		
2	\$ 907,084	\$ 168,925	\$ 740,159	0.800411	\$ 592,431	2	\$ 197,502	0.800411	\$ 158,083		
3	\$ 896,456	\$ 168,925	\$ 531,529	0.690009	\$ 398,760	3	\$ 152,077	0.690009	\$ 104,934		
4	\$ 637,810	\$ 168,925	\$ 370,885	0.594836	\$ 220,815	4	\$ 117,099	0.594836	\$ 69,855		
5	\$ 414,114	\$ 168,925	\$ 247,188	0.512789	\$ 128,768	5	\$ 90,188	0.512789	\$ 48,238		
6	\$ 315,868	\$ 168,925	\$ 151,942	0.442080	\$ 87,188	6	\$ 68,428	0.442080	\$ 30,691		
7	\$ 245,528	\$ 168,925	\$ 78,603	0.381088	\$ 29,854	7	\$ 53,460	0.381088	\$ 20,373		
8	\$ 188,067	\$ 168,925	\$ 22,131	0.328522	\$ 7,271	8	\$ 41,164	0.328522	\$ 13,523		
9	\$ 145,574	\$ 168,925	\$ -	0.283209	\$ -	9	\$ 31,598	0.283209	\$ -		
10	\$ 112,092	\$ 168,925	\$ -	0.224148	\$ -	10	\$ 24,408	0.224148	\$ -		
11	\$ 88,311	\$ 168,925	\$ -	0.210470	\$ -	11	\$ 18,793	0.210470	\$ -		
12	\$ 68,459	\$ 168,925	\$ -	0.181440	\$ -	12	\$ 14,470	0.181440	\$ -		
13	\$ 51,174	\$ 168,925	\$ -	0.159414	\$ -	13	\$ 11,142	0.159414	\$ -		
14	\$ 38,404	\$ 168,925	\$ -	0.134840	\$ -	14	\$ 8,578	0.134840	\$ -		
15	\$ 30,341	\$ 168,925	\$ -	0.118241	\$ -	15	\$ 6,808	0.118241	\$ -		
16	\$ 23,382	\$ 168,925	\$ -	0.100208	\$ -	16	\$ 5,087	0.100208	\$ -		
17	\$ 17,988	\$ 168,925	\$ -	0.086388	\$ -	17	\$ 3,917	0.086388	\$ -		
18	\$ 13,852	\$ 168,925	\$ -	0.074471	\$ -	18	\$ 3,018	0.074471	\$ -		
19	\$ 10,668	\$ 168,925	\$ -	0.064199	\$ -	19	\$ 2,322	0.064199	\$ -		
20	\$ 8,213	\$ 168,925	\$ -	0.056344	\$ -	20	\$ 1,768	0.056344	\$ -		
21	\$ 6,324	\$ 168,925	\$ -	0.047710	\$ -	21	\$ 1,377	0.047710	\$ -		
22	\$ 4,869	\$ 168,925	\$ -	0.041129	\$ -	22	\$ 1,080	0.041129	\$ -		
23	\$ 3,749	\$ 168,925	\$ -	0.035458	\$ -	23	\$ 816	0.035458	\$ -		
24	\$ 2,887	\$ 168,925	\$ -	0.030688	\$ -	24	\$ 629	0.030688	\$ -		
25	\$ 2,223	\$ 168,925	\$ -	0.026380	\$ -	25	\$ 484	0.026380	\$ -		
26	\$ 1,712	\$ 168,925	\$ -	0.022718	\$ -	26	\$ 373	0.022718	\$ -		
27	\$ 1,316	\$ 168,925	\$ -	0.019582	\$ -	27	\$ 287	0.019582	\$ -		
28	\$ 1,015	\$ 168,925	\$ -	0.016881	\$ -	28	\$ 221	0.016881	\$ -		
29	\$ 781	\$ 168,925	\$ -	0.014553	\$ -	29	\$ 170	0.014553	\$ -		
30	\$ 602	\$ 168,925	\$ -	0.012546	\$ -	30	\$ 131	0.012546	\$ -		
31	\$ 483	\$ 168,925	\$ -	0.010815	\$ -	31	\$ 101	0.010815	\$ -		
32	\$ 357	\$ 168,925	\$ -	0.009323	\$ -	32	\$ 78	0.009323	\$ -		
33	\$ 279	\$ 168,925	\$ -	0.008037	\$ -	33	\$ 60	0.008037	\$ -		
34	\$ 212	\$ 168,925	\$ -	0.006929	\$ -	34	\$ 48	0.006929	\$ -		
35	\$ 183	\$ 168,925	\$ -	0.005973	\$ -	35	\$ 35	0.005973	\$ -		
36	\$ 125	\$ 168,925	\$ -	0.005149	\$ -	36	\$ 27	0.005149	\$ -		
37	\$ 97	\$ 168,925	\$ -	0.004439	\$ -	37	\$ 21	0.004439	\$ -		
38	\$ 74	\$ 168,925	\$ -	0.003827	\$ -	38	\$ 18	0.003827	\$ -		
39	\$ 57	\$ 168,925	\$ -	0.003299	\$ -	39	\$ 12	0.003299	\$ -		
40	\$ 44	\$ 168,925	\$ -	0.002844	\$ -	40	\$ 10	0.002844	\$ -		
WORKING INTEREST APPRAISAL						ROYALTY INTEREST APPRAISAL					

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NATURAL OIL/GAS APPRAISAL - FLUSH WELL (Year 1)									
DECLINE RATES		2018		BASE INCOME		OIL INCOME		GAS CAP INCOME	
YR 1	48%	WAK INT	\$	1,000,000	\$	438,784	YR1	\$	1,440,443
YR 2	28%	ROY INT	\$	634,968	\$	11,388	YR2	\$	250,511
YR3+	23%							\$	1,140,224
								\$	188,400
								\$	20,924
\$ 3,715,450		TY2017 WORKING INTEREST				TY2017 ROYALTY INTEREST			
YEAR	WAK INT INCOME	WORKING COST	NET INC	PROCT FCTR(18.0%)	DIS INC	YEAR	ROY INT INCOME	PROCT FCTR(18.0%)	DIS INC
1	\$ 1,714,650	\$ 157,853	\$ 1,556,807	0.928477	\$ 1,445,357	1	\$ 279,085	0.928477	\$ 258,125
2	\$ 1,288,787	\$ 157,853	\$ 1,130,934	0.800411	\$ 889,188	2	\$ 208,524	0.800411	\$ 186,304
3	\$ 976,950	\$ 157,853	\$ 819,098	0.690009	\$ 585,188	3	\$ 159,023	0.690009	\$ 109,727
4	\$ 752,252	\$ 157,853	\$ 594,399	0.594838	\$ 353,570	4	\$ 122,448	0.594838	\$ 72,838
5	\$ 579,234	\$ 157,853	\$ 421,381	0.512789	\$ 218,080	5	\$ 94,285	0.512789	\$ 48,348
6	\$ 445,010	\$ 157,853	\$ 287,157	0.442080	\$ 127,383	6	\$ 72,598	0.442080	\$ 32,098
7	\$ 343,428	\$ 157,853	\$ 185,575	0.381088	\$ 70,720	7	\$ 55,902	0.381088	\$ 21,303
8	\$ 264,439	\$ 157,853	\$ 106,587	0.328522	\$ 35,018	8	\$ 43,044	0.328522	\$ 14,141
9	\$ 208,616	\$ 157,853	\$ 45,768	0.283209	\$ 12,981	9	\$ 33,144	0.283209	\$ 9,387
10	\$ 153,786	\$ 157,853	\$ -	0.224148	\$ -	10	\$ 25,521	0.224148	\$ -
11	\$ 120,728	\$ 157,853	\$ -	0.210470	\$ -	11	\$ 19,651	0.210470	\$ -
12	\$ 92,958	\$ 157,853	\$ -	0.181440	\$ -	12	\$ 15,131	0.181440	\$ -
13	\$ 71,578	\$ 157,853	\$ -	0.158414	\$ -	13	\$ 11,651	0.158414	\$ -
14	\$ 56,115	\$ 157,853	\$ -	0.134840	\$ -	14	\$ 8,971	0.134840	\$ -
15	\$ 42,439	\$ 157,853	\$ -	0.118241	\$ -	15	\$ 6,908	0.118241	\$ -
16	\$ 32,576	\$ 157,853	\$ -	0.100208	\$ -	16	\$ 5,319	0.100208	\$ -
17	\$ 25,182	\$ 157,853	\$ -	0.086388	\$ -	17	\$ 4,096	0.086388	\$ -
18	\$ 19,875	\$ 157,853	\$ -	0.074471	\$ -	18	\$ 3,154	0.074471	\$ -
19	\$ 14,918	\$ 157,853	\$ -	0.064199	\$ -	19	\$ 2,428	0.064199	\$ -
20	\$ 11,487	\$ 157,853	\$ -	0.055344	\$ -	20	\$ 1,870	0.055344	\$ -
21	\$ 8,845	\$ 157,853	\$ -	0.047710	\$ -	21	\$ 1,440	0.047710	\$ -
22	\$ 6,811	\$ 157,853	\$ -	0.041129	\$ -	22	\$ 1,109	0.041129	\$ -
23	\$ 5,244	\$ 157,853	\$ -	0.035456	\$ -	23	\$ 854	0.035456	\$ -
24	\$ 4,038	\$ 157,853	\$ -	0.030568	\$ -	24	\$ 657	0.030568	\$ -
25	\$ 3,109	\$ 157,853	\$ -	0.026350	\$ -	25	\$ 508	0.026350	\$ -
26	\$ 2,394	\$ 157,853	\$ -	0.022718	\$ -	26	\$ 390	0.022718	\$ -
27	\$ 1,844	\$ 157,853	\$ -	0.019582	\$ -	27	\$ 300	0.019582	\$ -
28	\$ 1,420	\$ 157,853	\$ -	0.016881	\$ -	28	\$ 231	0.016881	\$ -
29	\$ 1,093	\$ 157,853	\$ -	0.014553	\$ -	29	\$ 178	0.014553	\$ -
30	\$ 842	\$ 157,853	\$ -	0.012548	\$ -	30	\$ 137	0.012548	\$ -
31	\$ 648	\$ 157,853	\$ -	0.010815	\$ -	31	\$ 105	0.010815	\$ -
32	\$ 499	\$ 157,853	\$ -	0.009323	\$ -	32	\$ 81	0.009323	\$ -
33	\$ 384	\$ 157,853	\$ -	0.008037	\$ -	33	\$ 63	0.008037	\$ -
34	\$ 298	\$ 157,853	\$ -	0.006929	\$ -	34	\$ 48	0.006929	\$ -
35	\$ 228	\$ 157,853	\$ -	0.005978	\$ -	35	\$ 37	0.005978	\$ -
36	\$ 178	\$ 157,853	\$ -	0.005149	\$ -	36	\$ 29	0.005149	\$ -
37	\$ 138	\$ 157,853	\$ -	0.004439	\$ -	37	\$ 22	0.004439	\$ -
38	\$ 104	\$ 157,853	\$ -	0.003827	\$ -	38	\$ 17	0.003827	\$ -
39	\$ 80	\$ 157,853	\$ -	0.003299	\$ -	39	\$ 13	0.003299	\$ -
40	\$ 62	\$ 157,853	\$ -	0.002844	\$ -	40	\$ 10	0.002844	\$ -
WORKING INTEREST APPRAISAL					\$ 3,715,450	ROYALTY INTEREST APPRAISAL			

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NATURAL OIL/GAS APPRAISAL - PLUSH WELL (Year 1)													
		2015		GAS INCOME		OL INCOME				OAS CAP INCOME			
DECLINE RATES		WRK INT		\$	6,207,080	\$	349,438	YR1	\$	2,059,738	\$	133,224	
YR 1	48%	ROY INT		\$	1,169,985	\$	77,981		\$	489,344	\$	30,602	
YR 2	28%							YR2	\$	1,822,921	\$	103,286	
YR3+	23%								\$	339,175	\$	22,794	
\$ 4,952,946		TY2017 WORKING INTEREST						TY2017 ROYALTY INTEREST \$ 1,293,447					
YEAR	WRK INT INCOME	WORKING COST	NET INC	PRCT FCTR(18.0%)	DIS INC	YEAR	ROY INT INCOME	PRCT FCTR(18.0%)	DIS INC				
1	\$ 2,195,009	\$ 184,342	\$ 2,030,657	0.928477	\$ 1,885,428	1	\$ 489,147	0.928477	\$ 454,161				
2	\$ 1,624,307	\$ 184,342	\$ 1,459,965	0.800411	\$ 1,188,572	2	\$ 381,969	0.800411	\$ 289,724				
3	\$ 1,250,715	\$ 184,342	\$ 1,066,374	0.690009	\$ 749,808	3	\$ 278,718	0.690009	\$ 192,318				
4	\$ 983,051	\$ 184,342	\$ 798,709	0.594836	\$ 476,101	4	\$ 214,611	0.594836	\$ 127,656				
5	\$ 741,550	\$ 184,342	\$ 577,208	0.512789	\$ 295,986	5	\$ 165,251	0.512789	\$ 84,739				
6	\$ 570,993	\$ 184,342	\$ 406,651	0.442080	\$ 179,764	6	\$ 127,243	0.442080	\$ 56,249				
7	\$ 439,686	\$ 184,342	\$ 275,322	0.381088	\$ 104,922	7	\$ 87,977	0.381088	\$ 37,338				
8	\$ 338,542	\$ 184,342	\$ 174,200	0.328522	\$ 57,225	8	\$ 75,442	0.328522	\$ 24,764				
9	\$ 260,577	\$ 184,342	\$ 95,335	0.283209	\$ 27,283	9	\$ 56,091	0.283209	\$ 19,452				
10	\$ 200,721	\$ 184,342	\$ 38,380	0.224146	\$ 6,154	10	\$ 44,730	0.224146	\$ 10,026				
11	\$ 154,558	\$ 184,342	\$ -	0.210470	\$ -	11	\$ 34,442	0.210470	\$ -				
12	\$ 116,008	\$ 184,342	\$ -	0.181440	\$ -	12	\$ 26,520	0.181440	\$ -				
13	\$ 91,835	\$ 184,342	\$ -	0.156414	\$ -	13	\$ 20,421	0.156414	\$ -				
14	\$ 70,580	\$ 184,342	\$ -	0.134840	\$ -	14	\$ 15,724	0.134840	\$ -				
15	\$ 54,331	\$ 184,342	\$ -	0.116241	\$ -	15	\$ 12,107	0.116241	\$ -				
16	\$ 41,835	\$ 184,342	\$ -	0.100208	\$ -	16	\$ 9,323	0.100208	\$ -				
17	\$ 32,213	\$ 184,342	\$ -	0.088386	\$ -	17	\$ 7,178	0.088386	\$ -				
18	\$ 24,804	\$ 184,342	\$ -	0.074471	\$ -	18	\$ 5,527	0.074471	\$ -				
19	\$ 19,099	\$ 184,342	\$ -	0.064199	\$ -	19	\$ 4,258	0.064199	\$ -				
20	\$ 14,708	\$ 184,342	\$ -	0.055344	\$ -	20	\$ 3,277	0.055344	\$ -				
21	\$ 11,324	\$ 184,342	\$ -	0.047710	\$ -	21	\$ 2,523	0.047710	\$ -				
22	\$ 8,719	\$ 184,342	\$ -	0.041129	\$ -	22	\$ 1,943	0.041129	\$ -				
23	\$ 6,714	\$ 184,342	\$ -	0.035458	\$ -	23	\$ 1,496	0.035458	\$ -				
24	\$ 5,170	\$ 184,342	\$ -	0.030588	\$ -	24	\$ 1,152	0.030588	\$ -				
25	\$ 3,951	\$ 184,342	\$ -	0.026350	\$ -	25	\$ 887	0.026350	\$ -				
26	\$ 3,065	\$ 184,342	\$ -	0.022715	\$ -	26	\$ 683	0.022715	\$ -				
27	\$ 2,380	\$ 184,342	\$ -	0.019582	\$ -	27	\$ 525	0.019582	\$ -				
28	\$ 1,817	\$ 184,342	\$ -	0.016881	\$ -	28	\$ 405	0.016881	\$ -				
29	\$ 1,399	\$ 184,342	\$ -	0.014553	\$ -	29	\$ 312	0.014553	\$ -				
30	\$ 1,077	\$ 184,342	\$ -	0.012546	\$ -	30	\$ 240	0.012546	\$ -				
31	\$ 830	\$ 184,342	\$ -	0.010515	\$ -	31	\$ 165	0.010515	\$ -				
32	\$ 636	\$ 184,342	\$ -	0.009323	\$ -	32	\$ 142	0.009323	\$ -				
33	\$ 492	\$ 184,342	\$ -	0.008037	\$ -	33	\$ 110	0.008037	\$ -				
34	\$ 379	\$ 184,342	\$ -	0.006929	\$ -	34	\$ 84	0.006926	\$ -				
35	\$ 292	\$ 184,342	\$ -	0.005973	\$ -	35	\$ 65	0.005973	\$ -				
36	\$ 225	\$ 184,342	\$ -	0.005149	\$ -	36	\$ 50	0.005149	\$ -				
37	\$ 173	\$ 184,342	\$ -	0.004439	\$ -	37	\$ 39	0.004439	\$ -				
38	\$ 133	\$ 184,342	\$ -	0.003827	\$ -	38	\$ 30	0.003827	\$ -				
39	\$ 103	\$ 184,342	\$ -	0.003299	\$ -	39	\$ 23	0.003299	\$ -				
40	\$ 79	\$ 184,342	\$ -	0.002844	\$ -	40	\$ 18	0.003612	\$ -				
WORKING INTEREST APPRAISAL					\$ 4,952,946	ROYALTY INTEREST APPRAISAL					\$ 1,293,447		

43-032017 0082

NATURAL OIL/GAS APPRAISAL - FLUSH WELL (Year 1)												
DECLINE RATES		2018		GAS INCOME		OIL INCOME		GAS CAP INCOME		OIL CAP INCOME		
YR 1	48%	WRK INT	\$	3,896,841	\$	283,728	YR1	\$	1,384,872	\$	112,148	
YR 2	29%	ROY INT	\$	886,128	\$	48,898		\$	274,871	\$	18,719	
YR3+	23%						YR2	\$	1,187,783	\$	82,998	
								\$	283,478	\$	14,388	
\$ 3,587,233		TY2017 WORKING INTEREST				TY2017 ROYALTY INTEREST				\$ 773,181		
YEAR	WRK INT INCOME	WORKING COST	NET INC	PRCT FCTR(18.0%)	DIS INC	YEAR	ROY INT INCOME	PRCT FCTR(18.0%)	DIS INC			
1	\$ 1,878,726	\$ 183,880	\$ 1,513,040	0.928477	\$ 1,404,823	1	\$ 294,880	0.928477	\$ 273,504			
2	\$ 1,240,773	\$ 183,880	\$ 1,077,093	0.800411	\$ 862,117	2	\$ 218,063	0.800411	\$ 174,840			
3	\$ 955,395	\$ 183,880	\$ 791,716	0.690009	\$ 545,291	3	\$ 167,909	0.690009	\$ 116,859			
4	\$ 738,854	\$ 183,880	\$ 571,975	0.594836	\$ 340,231	4	\$ 129,290	0.594836	\$ 78,908			
5	\$ 568,454	\$ 183,880	\$ 402,774	0.512789	\$ 208,538	5	\$ 99,553	0.512789	\$ 51,050			
6	\$ 438,189	\$ 183,880	\$ 272,490	0.442080	\$ 120,467	6	\$ 76,858	0.442080	\$ 33,887			
7	\$ 335,850	\$ 183,880	\$ 172,171	0.381086	\$ 85,812	7	\$ 59,025	0.381086	\$ 22,494			
8	\$ 258,808	\$ 183,880	\$ 84,925	0.328522	\$ 31,185	8	\$ 45,449	0.328522	\$ 14,931			
9	\$ 199,128	\$ 183,880	\$ 35,445	0.283209	\$ 10,039	9	\$ 34,998	0.283209	\$ 9,911			
10	\$ 153,327	\$ 183,880	\$ -	0.224146	\$ -	10	\$ 26,847	0.224146	\$ -			
11	\$ 118,082	\$ 183,880	\$ -	0.210470	\$ -	11	\$ 20,749	0.210470	\$ -			
12	\$ 90,907	\$ 183,880	\$ -	0.181440	\$ -	12	\$ 15,977	0.181440	\$ -			
13	\$ 69,999	\$ 183,880	\$ -	0.158414	\$ -	13	\$ 12,302	0.158414	\$ -			
14	\$ 53,899	\$ 183,880	\$ -	0.134840	\$ -	14	\$ 9,473	0.134840	\$ -			
15	\$ 41,502	\$ 183,880	\$ -	0.118241	\$ -	15	\$ 7,294	0.118241	\$ -			
16	\$ 31,957	\$ 183,880	\$ -	0.100208	\$ -	16	\$ 5,615	0.100208	\$ -			
17	\$ 24,807	\$ 183,880	\$ -	0.086386	\$ -	17	\$ 4,325	0.086386	\$ -			
18	\$ 18,947	\$ 183,880	\$ -	0.074471	\$ -	18	\$ 3,330	0.074471	\$ -			
19	\$ 14,589	\$ 183,880	\$ -	0.064198	\$ -	19	\$ 2,584	0.064198	\$ -			
20	\$ 11,234	\$ 183,880	\$ -	0.055344	\$ -	20	\$ 1,974	0.055344	\$ -			
21	\$ 8,650	\$ 183,880	\$ -	0.047710	\$ -	21	\$ 1,620	0.047710	\$ -			
22	\$ 6,885	\$ 183,880	\$ -	0.041129	\$ -	22	\$ 1,171	0.041129	\$ -			
23	\$ 5,129	\$ 183,880	\$ -	0.035458	\$ -	23	\$ 901	0.035458	\$ -			
24	\$ 3,949	\$ 183,880	\$ -	0.030586	\$ -	24	\$ 694	0.030586	\$ -			
25	\$ 3,041	\$ 183,880	\$ -	0.026350	\$ -	25	\$ 534	0.026350	\$ -			
26	\$ 2,341	\$ 183,880	\$ -	0.022715	\$ -	26	\$ 411	0.022715	\$ -			
27	\$ 1,803	\$ 183,880	\$ -	0.019582	\$ -	27	\$ 317	0.019582	\$ -			
28	\$ 1,388	\$ 183,880	\$ -	0.016881	\$ -	28	\$ 244	0.016881	\$ -			
29	\$ 1,069	\$ 183,880	\$ -	0.014553	\$ -	29	\$ 188	0.014553	\$ -			
30	\$ 823	\$ 183,880	\$ -	0.012548	\$ -	30	\$ 145	0.012548	\$ -			
31	\$ 634	\$ 183,880	\$ -	0.010815	\$ -	31	\$ 111	0.010815	\$ -			
32	\$ 488	\$ 183,880	\$ -	0.009323	\$ -	32	\$ 88	0.009323	\$ -			
33	\$ 376	\$ 183,880	\$ -	0.008037	\$ -	33	\$ 68	0.008037	\$ -			
34	\$ 289	\$ 183,880	\$ -	0.006929	\$ -	34	\$ 51	0.006929	\$ -			
35	\$ 223	\$ 183,880	\$ -	0.005973	\$ -	35	\$ 39	0.005973	\$ -			
36	\$ 172	\$ 183,880	\$ -	0.005149	\$ -	36	\$ 30	0.005149	\$ -			
37	\$ 132	\$ 183,880	\$ -	0.004439	\$ -	37	\$ 23	0.004439	\$ -			
38	\$ 102	\$ 183,880	\$ -	0.003827	\$ -	38	\$ 18	0.003827	\$ -			
39	\$ 78	\$ 183,880	\$ -	0.003299	\$ -	39	\$ 14	0.003299	\$ -			
40	\$ 60	\$ 183,880	\$ -	0.002844	\$ -	40	\$ 11	0.002812	\$ -			
WORKING INTEREST APPRAISAL					\$ 3,587,233	ROYALTY INTEREST APPRAISAL					\$ 773,181	

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NATURAL OIL/GAS APPRAISAL - FLUSH WELL (YR00-1)									
		2015		GAS INCOME		OIL INCOME		GAS/GAS INCOME	
DECLINE RATES		WPK INT		\$ 2,716,188		\$ 357,922		YR1 \$ 1,187,388	
YR 1	48%	ROY INT		\$ 882,041		\$ 88,171		\$ 281,496	
YR 2	28%							\$ 1,181,386	
YR3+	23%							\$ 183,315	
\$ 3,515,264		TY2017 WORKING INTEREST				TY2017 ROYALTY INTEREST \$ 758,792			
YEAR	WPK INT INCOME	WORKING COST	NET INC	PRCT FCTR(18.0%)	DIS INC	YEAR	ROY INT INCOME	PRCT FCTR(18.0%)	DIS INC
1	\$ 1,641,177	\$ 159,199	\$ 1,481,978	0.928477	\$ 1,375,982	1	\$ 288,434	0.928477	\$ 267,804
2	\$ 1,214,471	\$ 159,199	\$ 1,055,272	0.800411	\$ 844,861	2	\$ 213,441	0.800411	\$ 170,840
3	\$ 935,143	\$ 159,199	\$ 775,943	0.690009	\$ 635,408	3	\$ 184,350	0.690009	\$ 113,408
4	\$ 720,060	\$ 159,199	\$ 560,861	0.594886	\$ 333,620	4	\$ 128,540	0.594886	\$ 75,278
5	\$ 554,448	\$ 159,199	\$ 395,247	0.512799	\$ 202,676	5	\$ 97,443	0.512799	\$ 49,968
6	\$ 428,923	\$ 159,199	\$ 269,724	0.442060	\$ 118,360	6	\$ 75,031	0.442060	\$ 33,188
7	\$ 328,731	\$ 159,199	\$ 169,532	0.381086	\$ 64,806	7	\$ 57,774	0.381086	\$ 22,017
8	\$ 253,123	\$ 159,199	\$ 93,924	0.328522	\$ 30,858	8	\$ 44,486	0.328522	\$ 14,815
9	\$ 194,905	\$ 159,199	\$ 35,706	0.283209	\$ 10,112	9	\$ 34,254	0.283209	\$ 9,701
10	\$ 150,077	\$ 159,199	\$ -	0.224148	\$ -	10	\$ 26,376	0.224148	\$ -
11	\$ 115,559	\$ 159,199	\$ -	0.210470	\$ -	11	\$ 20,309	0.210470	\$ -
12	\$ 89,990	\$ 159,199	\$ -	0.191440	\$ -	12	\$ 15,638	0.191440	\$ -
13	\$ 68,515	\$ 159,199	\$ -	0.168414	\$ -	13	\$ 12,041	0.168414	\$ -
14	\$ 52,758	\$ 159,199	\$ -	0.134840	\$ -	14	\$ 9,272	0.134840	\$ -
15	\$ 40,822	\$ 159,199	\$ -	0.118241	\$ -	15	\$ 7,139	0.118241	\$ -
16	\$ 31,279	\$ 159,199	\$ -	0.100208	\$ -	16	\$ 5,497	0.100208	\$ -
17	\$ 24,085	\$ 159,199	\$ -	0.088388	\$ -	17	\$ 4,233	0.088388	\$ -
18	\$ 18,546	\$ 159,199	\$ -	0.074471	\$ -	18	\$ 3,259	0.074471	\$ -
19	\$ 14,280	\$ 159,199	\$ -	0.064199	\$ -	19	\$ 2,510	0.064199	\$ -
20	\$ 10,898	\$ 159,199	\$ -	0.055344	\$ -	20	\$ 1,932	0.055344	\$ -
21	\$ 8,467	\$ 159,199	\$ -	0.047710	\$ -	21	\$ 1,488	0.047710	\$ -
22	\$ 6,519	\$ 159,199	\$ -	0.041129	\$ -	22	\$ 1,148	0.041129	\$ -
23	\$ 5,020	\$ 159,199	\$ -	0.035458	\$ -	23	\$ 882	0.035458	\$ -
24	\$ 3,858	\$ 159,199	\$ -	0.030568	\$ -	24	\$ 679	0.030568	\$ -
25	\$ 2,976	\$ 159,199	\$ -	0.026350	\$ -	25	\$ 523	0.026350	\$ -
26	\$ 2,292	\$ 159,199	\$ -	0.022715	\$ -	26	\$ 403	0.022715	\$ -
27	\$ 1,785	\$ 159,199	\$ -	0.019582	\$ -	27	\$ 310	0.019582	\$ -
28	\$ 1,359	\$ 159,199	\$ -	0.016881	\$ -	28	\$ 239	0.016881	\$ -
29	\$ 1,046	\$ 159,199	\$ -	0.014553	\$ -	29	\$ 164	0.014553	\$ -
30	\$ 806	\$ 159,199	\$ -	0.012548	\$ -	30	\$ 142	0.012548	\$ -
31	\$ 620	\$ 159,199	\$ -	0.010815	\$ -	31	\$ 109	0.010815	\$ -
32	\$ 478	\$ 159,199	\$ -	0.009323	\$ -	32	\$ 84	0.009323	\$ -
33	\$ 366	\$ 159,199	\$ -	0.008037	\$ -	33	\$ 65	0.008037	\$ -
34	\$ 283	\$ 159,199	\$ -	0.006929	\$ -	34	\$ 50	0.006929	\$ -
35	\$ 218	\$ 159,199	\$ -	0.005973	\$ -	35	\$ 38	0.005973	\$ -
36	\$ 168	\$ 159,199	\$ -	0.005149	\$ -	36	\$ 30	0.005149	\$ -
37	\$ 129	\$ 159,199	\$ -	0.004439	\$ -	37	\$ 23	0.004439	\$ -
38	\$ 100	\$ 159,199	\$ -	0.003827	\$ -	38	\$ 17	0.003827	\$ -
39	\$ 77	\$ 159,199	\$ -	0.003299	\$ -	39	\$ 13	0.003299	\$ -
40	\$ 59	\$ 159,199	\$ -	0.002844	\$ -	40	\$ 10	0.002844	\$ -
WORKING INTEREST APPRAISAL					\$ 3,515,264	ROYALTY INTEREST APPRAISAL			

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NATURAL OIL/GAS APPRAISAL - PLUSH WELL (Year 1)									
DECLINE RATE		2016	GAS INCOME		OIL INCOME		O&G CAP INCOME		O&G CAP INCOME
YR 1	48%	WK IN	\$ 6,317,337	\$	368,728	YR1	\$ 2,189,344	\$	144,481
YR 2	28%	ROY IN	\$ 1,216,236	\$	70,883	YR2	\$ 478,842	\$	27,678
YR3+	21%						\$ 1,846,356	\$	106,901
							\$ 353,791	\$	28,478
\$ 6,125,728			TY2017 WORKING INTEREST			TY2017 ROYALTY INTEREST			\$ 1,344,780
YEAR	WK IN INCOME	WORKING COST	NET INC	PRCT FCTR(18.5%)	OIS INC	YEAR	ROY IN INCOME	PRCT FCTR(18.5%)	DIS INC
1	\$ 2,630,809	\$ 165,738	\$ 2,474,072	0.928477	\$ 2,297,119	1	\$ 505,717	0.928477	\$ 469,547
2	\$ 1,953,459	\$ 165,738	\$ 1,787,721	0.800411	\$ 1,430,912	2	\$ 374,231	0.800411	\$ 299,536
3	\$ 1,504,163	\$ 165,738	\$ 1,338,426	0.690009	\$ 923,526	3	\$ 286,158	0.690009	\$ 198,831
4	\$ 1,158,200	\$ 165,738	\$ 992,462	0.594836	\$ 590,365	4	\$ 221,651	0.594836	\$ 131,983
5	\$ 891,819	\$ 165,738	\$ 726,081	0.512759	\$ 372,326	5	\$ 170,849	0.512759	\$ 87,609
6	\$ 686,700	\$ 165,738	\$ 520,962	0.442080	\$ 230,297	6	\$ 131,584	0.442080	\$ 58,155
7	\$ 528,759	\$ 165,738	\$ 363,021	0.381088	\$ 138,342	7	\$ 101,296	0.381088	\$ 38,608
8	\$ 407,145	\$ 165,738	\$ 241,407	0.328522	\$ 79,307	8	\$ 77,998	0.328522	\$ 25,624
9	\$ 313,501	\$ 165,738	\$ 147,763	0.283209	\$ 41,848	9	\$ 60,059	0.283209	\$ 17,009
10	\$ 241,396	\$ 165,738	\$ 75,658	0.224146	\$ 16,858	10	\$ 46,245	0.224146	\$ 10,366
11	\$ 185,875	\$ 165,738	\$ 20,137	0.210470	\$ 4,238	11	\$ 35,808	0.210470	\$ 7,486
12	\$ 143,124	\$ 165,738	\$ -	0.181440	\$ -	12	\$ 27,419	0.181440	\$ -
13	\$ 110,205	\$ 165,738	\$ -	0.158414	\$ -	13	\$ 21,112	0.158414	\$ -
14	\$ 84,858	\$ 165,738	\$ -	0.134840	\$ -	14	\$ 16,257	0.134840	\$ -
15	\$ 65,341	\$ 165,738	\$ -	0.118241	\$ -	15	\$ 12,518	0.118241	\$ -
16	\$ 50,312	\$ 165,738	\$ -	0.100208	\$ -	16	\$ 8,639	0.100208	\$ -
17	\$ 38,740	\$ 165,738	\$ -	0.089388	\$ -	17	\$ 7,422	0.089388	\$ -
18	\$ 29,830	\$ 165,738	\$ -	0.074471	\$ -	18	\$ 5,715	0.074471	\$ -
19	\$ 22,989	\$ 165,738	\$ -	0.064199	\$ -	19	\$ 4,400	0.064199	\$ -
20	\$ 17,688	\$ 165,738	\$ -	0.055344	\$ -	20	\$ 3,368	0.055344	\$ -
21	\$ 13,518	\$ 165,738	\$ -	0.047710	\$ -	21	\$ 2,809	0.047710	\$ -
22	\$ 10,485	\$ 165,738	\$ -	0.041129	\$ -	22	\$ 2,008	0.041129	\$ -
23	\$ 8,074	\$ 165,738	\$ -	0.035456	\$ -	23	\$ 1,547	0.035456	\$ -
24	\$ 6,217	\$ 165,738	\$ -	0.030565	\$ -	24	\$ 1,191	0.030565	\$ -
25	\$ 4,787	\$ 165,738	\$ -	0.026350	\$ -	25	\$ 917	0.026350	\$ -
26	\$ 3,686	\$ 165,738	\$ -	0.022715	\$ -	26	\$ 706	0.022715	\$ -
27	\$ 2,838	\$ 165,738	\$ -	0.019582	\$ -	27	\$ 544	0.019582	\$ -
28	\$ 2,186	\$ 165,738	\$ -	0.016881	\$ -	28	\$ 419	0.016881	\$ -
29	\$ 1,683	\$ 165,738	\$ -	0.014553	\$ -	29	\$ 322	0.014553	\$ -
30	\$ 1,298	\$ 165,738	\$ -	0.012549	\$ -	30	\$ 248	0.012549	\$ -
31	\$ 998	\$ 165,738	\$ -	0.010815	\$ -	31	\$ 181	0.010815	\$ -
32	\$ 768	\$ 165,738	\$ -	0.009323	\$ -	32	\$ 147	0.009323	\$ -
33	\$ 592	\$ 165,738	\$ -	0.008037	\$ -	33	\$ 113	0.008037	\$ -
34	\$ 456	\$ 165,738	\$ -	0.006929	\$ -	34	\$ 87	0.006929	\$ -
35	\$ 351	\$ 165,738	\$ -	0.005973	\$ -	35	\$ 87	0.005973	\$ -
36	\$ 270	\$ 165,738	\$ -	0.005149	\$ -	36	\$ 52	0.005149	\$ -
37	\$ 208	\$ 165,738	\$ -	0.004439	\$ -	37	\$ 40	0.004439	\$ -
38	\$ 160	\$ 165,738	\$ -	0.003827	\$ -	38	\$ 31	0.003827	\$ -
39	\$ 123	\$ 165,738	\$ -	0.003299	\$ -	39	\$ 24	0.003299	\$ -
40	\$ 95	\$ 165,738	\$ -	0.002844	\$ -	40	\$ 18	0.002844	\$ -
WORKING INTEREST APPRAISAL			\$ 6,125,728			ROYALTY INTEREST APPRAISAL			\$ 1,344,780

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NATURAL OIL/GAS APPRAISAL - PLUSH WELLS (YR 0-1)											
DECLINE RATES		2018	GAS INCOME		OIL INCOME		GAS O&G INCOME		OIL O&G INCOME		
YR 1	48%	WKR INT	\$	3,937,847	\$	754,387	YR1	\$	1,538,488	\$	287,343
YR 2	28%	ROY INT	\$	754,387	\$	81,813		\$	287,343	\$	28,387
YR3+	23%						YR2	\$	1,381,533	\$	238,807
								\$	220,407	\$	18,888
\$ 4,124,653		TY2017 WORKING INTEREST				TY2017 ROYALTY INTEREST				\$ 841,854	
YEAR	WKR INT INCOME	WORKING COST	NET INC	PRCT FCTR(16.0%)	DIS INC	YEAR	ROY INT INCOME	PRCT FCTR(16.0%)	DIS INC		
1	\$ 1,853,432	\$ 147,789	\$ 1,705,643	0.928477	\$ 1,583,851	1	\$ 318,370	0.928477	\$ 298,599		
2	\$ 1,371,540	\$ 147,789	\$ 1,223,751	0.800411	\$ 979,804	2	\$ 235,594	0.800411	\$ 188,572		
3	\$ 1,058,086	\$ 147,789	\$ 908,297	0.690009	\$ 826,733	3	\$ 181,407	0.690009	\$ 125,178		
4	\$ 813,188	\$ 147,789	\$ 665,397	0.594836	\$ 395,802	4	\$ 138,884	0.594836	\$ 83,059		
5	\$ 626,189	\$ 147,789	\$ 478,384	0.512789	\$ 245,300	5	\$ 107,558	0.512789	\$ 55,154		
6	\$ 482,138	\$ 147,789	\$ 334,349	0.442080	\$ 147,802	6	\$ 82,618	0.442080	\$ 38,811		
7	\$ 371,246	\$ 147,789	\$ 223,457	0.381088	\$ 88,156	7	\$ 68,770	0.381088	\$ 24,302		
8	\$ 286,580	\$ 147,789	\$ 138,791	0.328522	\$ 45,359	8	\$ 49,103	0.328522	\$ 16,131		
9	\$ 220,112	\$ 147,789	\$ 72,323	0.283209	\$ 20,482	9	\$ 37,809	0.283209	\$ 10,708		
10	\$ 169,488	\$ 147,789	\$ 21,697	0.224148	\$ 4,863	10	\$ 29,118	0.224148	\$ 6,528		
11	\$ 130,804	\$ 147,789	\$ -	0.210470	\$ -	11	\$ 22,417	0.210470	\$ -		
12	\$ 100,488	\$ 147,789	\$ -	0.181440	\$ -	12	\$ 17,281	0.181440	\$ -		
13	\$ 77,378	\$ 147,789	\$ -	0.158414	\$ -	13	\$ 13,291	0.158414	\$ -		
14	\$ 59,580	\$ 147,789	\$ -	0.134840	\$ -	14	\$ 10,234	0.134840	\$ -		
15	\$ 45,876	\$ 147,789	\$ -	0.116241	\$ -	15	\$ 7,880	0.116241	\$ -		
16	\$ 35,326	\$ 147,789	\$ -	0.100208	\$ -	16	\$ 6,068	0.100208	\$ -		
17	\$ 27,200	\$ 147,789	\$ -	0.086388	\$ -	17	\$ 4,872	0.086388	\$ -		
18	\$ 20,944	\$ 147,789	\$ -	0.074471	\$ -	18	\$ 3,598	0.074471	\$ -		
19	\$ 16,127	\$ 147,789	\$ -	0.064199	\$ -	19	\$ 2,770	0.064199	\$ -		
20	\$ 12,418	\$ 147,789	\$ -	0.055344	\$ -	20	\$ 2,133	0.055344	\$ -		
21	\$ 9,892	\$ 147,789	\$ -	0.047710	\$ -	21	\$ 1,642	0.047710	\$ -		
22	\$ 7,382	\$ 147,789	\$ -	0.041129	\$ -	22	\$ 1,288	0.041129	\$ -		
23	\$ 5,889	\$ 147,789	\$ -	0.035489	\$ -	23	\$ 974	0.035489	\$ -		
24	\$ 4,368	\$ 147,789	\$ -	0.030568	\$ -	24	\$ 750	0.030568	\$ -		
25	\$ 3,381	\$ 147,789	\$ -	0.026350	\$ -	25	\$ 577	0.026350	\$ -		
26	\$ 2,588	\$ 147,789	\$ -	0.022716	\$ -	26	\$ 445	0.022716	\$ -		
27	\$ 1,993	\$ 147,789	\$ -	0.019582	\$ -	27	\$ 342	0.019582	\$ -		
28	\$ 1,538	\$ 147,789	\$ -	0.016881	\$ -	28	\$ 284	0.016881	\$ -		
29	\$ 1,182	\$ 147,789	\$ -	0.014553	\$ -	29	\$ 203	0.014553	\$ -		
30	\$ 910	\$ 147,789	\$ -	0.012546	\$ -	30	\$ 158	0.012546	\$ -		
31	\$ 701	\$ 147,789	\$ -	0.010816	\$ -	31	\$ 120	0.010816	\$ -		
32	\$ 539	\$ 147,789	\$ -	0.009323	\$ -	32	\$ 98	0.009323	\$ -		
33	\$ 416	\$ 147,789	\$ -	0.008037	\$ -	33	\$ 71	0.008037	\$ -		
34	\$ 320	\$ 147,789	\$ -	0.006929	\$ -	34	\$ 55	0.006929	\$ -		
35	\$ 246	\$ 147,789	\$ -	0.005973	\$ -	35	\$ 42	0.005973	\$ -		
36	\$ 190	\$ 147,789	\$ -	0.005149	\$ -	36	\$ 38	0.005149	\$ -		
37	\$ 146	\$ 147,789	\$ -	0.004439	\$ -	37	\$ 25	0.004439	\$ -		
38	\$ 112	\$ 147,789	\$ -	0.003827	\$ -	38	\$ 19	0.003827	\$ -		
39	\$ 87	\$ 147,789	\$ -	0.003299	\$ -	39	\$ 15	0.003299	\$ -		
40	\$ 67	\$ 147,789	\$ -	0.002844	\$ -	40	\$ 11	0.002844	\$ -		
WORKING INTEREST APPRAISAL					\$ 4,124,653	ROYALTY INTEREST APPRAISAL					\$ 841,854

43 - 0320170144

NATURAL OIL/GAS APPRAISAL - FLUHH WELLS (YOUNG)									
DECLINE RATE		2018		OIL INCOME		OIL INCOME		OIL CAP INCOME	
YR 1	48%	WRK INT	\$	1,237,833	\$	189,314	YR1	\$	1,278,431
YR 2	28%	ROY INT	\$	840,420	\$	43,868	YR2	\$	282,368
YR3+	23%							\$	948,328
								\$	187,188
\$ 2,929,328		TY2017 WORKING INTEREST		TY2017 ROYALTY INTEREST		\$ 718,388			
YEAR	WRK INT INCOME	WORKING COST	NET INC	PRCT FCTR(16.0%)	DIS INC	YEAR	ROY INT INCOME	PRCT FCTR(16.0%)	DIS INC
1	\$ 1,383,978	\$ 182,140	\$ 1,221,838	0.928477	\$ 1,134,448	1	\$ 278,787	0.928477	\$ 254,188
2	\$ 1,024,142	\$ 182,140	\$ 862,002	0.800411	\$ 689,956	2	\$ 202,587	0.800411	\$ 182,153
3	\$ 788,589	\$ 182,140	\$ 626,449	0.690009	\$ 432,256	3	\$ 155,992	0.690009	\$ 107,835
4	\$ 607,214	\$ 182,140	\$ 445,073	0.694836	\$ 284,746	4	\$ 120,114	0.694836	\$ 71,448
5	\$ 487,555	\$ 182,140	\$ 305,414	0.512789	\$ 158,613	5	\$ 92,488	0.512789	\$ 47,427
6	\$ 380,017	\$ 182,140	\$ 197,877	0.442080	\$ 87,473	6	\$ 71,218	0.442080	\$ 31,482
7	\$ 277,213	\$ 182,140	\$ 115,073	0.381088	\$ 43,853	7	\$ 54,888	0.381088	\$ 20,897
8	\$ 213,454	\$ 182,140	\$ 51,314	0.328522	\$ 16,558	8	\$ 42,224	0.328522	\$ 13,871
9	\$ 164,380	\$ 182,140	\$ 2,219	0.283209	\$ 829	9	\$ 32,512	0.283209	\$ 9,208
10	\$ 128,557	\$ 182,140	\$ -	0.224148	\$ -	10	\$ 25,034	0.224148	\$ -
11	\$ 97,449	\$ 182,140	\$ -	0.210470	\$ -	11	\$ 19,277	0.210470	\$ -
12	\$ 75,038	\$ 182,140	\$ -	0.181440	\$ -	12	\$ 14,843	0.181440	\$ -
13	\$ 57,777	\$ 182,140	\$ -	0.158414	\$ -	13	\$ 11,429	0.158414	\$ -
14	\$ 44,489	\$ 182,140	\$ -	0.134840	\$ -	14	\$ 8,800	0.134840	\$ -
15	\$ 34,256	\$ 182,140	\$ -	0.118241	\$ -	15	\$ 6,776	0.118241	\$ -
16	\$ 26,377	\$ 182,140	\$ -	0.100208	\$ -	16	\$ 5,218	0.100208	\$ -
17	\$ 20,311	\$ 182,140	\$ -	0.088388	\$ -	17	\$ 4,018	0.088388	\$ -
18	\$ 15,839	\$ 182,140	\$ -	0.074471	\$ -	18	\$ 3,094	0.074471	\$ -
19	\$ 12,042	\$ 182,140	\$ -	0.064199	\$ -	19	\$ 2,382	0.064199	\$ -
20	\$ 9,272	\$ 182,140	\$ -	0.055344	\$ -	20	\$ 1,834	0.055344	\$ -
21	\$ 7,140	\$ 182,140	\$ -	0.047710	\$ -	21	\$ 1,412	0.047710	\$ -
22	\$ 5,498	\$ 182,140	\$ -	0.041129	\$ -	22	\$ 1,087	0.041129	\$ -
23	\$ 4,233	\$ 182,140	\$ -	0.035458	\$ -	23	\$ 837	0.035458	\$ -
24	\$ 3,280	\$ 182,140	\$ -	0.030568	\$ -	24	\$ 645	0.030568	\$ -
25	\$ 2,510	\$ 182,140	\$ -	0.026350	\$ -	25	\$ 488	0.026350	\$ -
26	\$ 1,933	\$ 182,140	\$ -	0.022716	\$ -	26	\$ 382	0.022716	\$ -
27	\$ 1,488	\$ 182,140	\$ -	0.019582	\$ -	27	\$ 294	0.019582	\$ -
28	\$ 1,148	\$ 182,140	\$ -	0.016881	\$ -	28	\$ 227	0.016881	\$ -
29	\$ 882	\$ 182,140	\$ -	0.014553	\$ -	29	\$ 175	0.014553	\$ -
30	\$ 679	\$ 182,140	\$ -	0.012548	\$ -	30	\$ 134	0.012548	\$ -
31	\$ 523	\$ 182,140	\$ -	0.010816	\$ -	31	\$ 103	0.010816	\$ -
32	\$ 403	\$ 182,140	\$ -	0.009323	\$ -	32	\$ 80	0.009323	\$ -
33	\$ 310	\$ 182,140	\$ -	0.008037	\$ -	33	\$ 61	0.008037	\$ -
34	\$ 239	\$ 182,140	\$ -	0.006929	\$ -	34	\$ 47	0.006929	\$ -
35	\$ 184	\$ 182,140	\$ -	0.005973	\$ -	35	\$ 36	0.005973	\$ -
36	\$ 142	\$ 182,140	\$ -	0.005149	\$ -	36	\$ 28	0.005149	\$ -
37	\$ 109	\$ 182,140	\$ -	0.004439	\$ -	37	\$ 22	0.004439	\$ -
38	\$ 84	\$ 182,140	\$ -	0.003827	\$ -	38	\$ 17	0.003827	\$ -
39	\$ 65	\$ 182,140	\$ -	0.003299	\$ -	39	\$ 13	0.003299	\$ -
40	\$ 50	\$ 182,140	\$ -	0.002844	\$ -	40	\$ 10	0.002844	\$ -
WORKING INTEREST APPRAISAL				\$ 2,929,328		ROYALTY INTEREST APPRAISAL		\$ 718,388	

43-0320170146

NATURAL OIL/GAS APPRAISAL - FLUSH WELL (Year 1)											
DECLINE RATES		2015	GAS INCOME		OIL INCOME		GAS CAP INCOME		OIL CAP INCOME		
YR 1	40%	WK INT	\$	4,180,627	\$	218,496	YR1	\$	1,051,246	\$	122,728
YR 2	28%	ROY INT	\$	286,077	\$	51,499	YR2	\$	328,896	\$	24,278
YR3+	23%							\$	1,221,897	\$	85,878
								\$	241,728	\$	17,994
\$ 1,644,650			TOTAL WORKING INTEREST				TOTAL ROYALTY INTEREST				\$ 820,778
YEAR	WK INT INCOME	WORKING COST	NET INC	PRCT FCTR(16.0%)	DIS INC	YEAR	ROY INT INCOME	PRCT FCTR(16.0%)	DIS INC		
1	\$ 1,774,073	\$ 183,292	\$ 1,810,781	0.828477	\$ 1,495,573	1	\$ 380,932	0.928477	\$ 325,832		
2	\$ 1,312,614	\$ 183,292	\$ 1,149,622	0.800411	\$ 920,090	2	\$ 256,890	0.800411	\$ 207,869		
3	\$ 1,010,887	\$ 183,292	\$ 847,576	0.690009	\$ 584,834	3	\$ 199,061	0.690009	\$ 137,976		
4	\$ 778,367	\$ 183,292	\$ 516,076	0.604836	\$ 365,869	4	\$ 153,970	0.594836	\$ 91,587		
5	\$ 599,343	\$ 183,292	\$ 436,051	0.512789	\$ 223,602	5	\$ 118,557	0.512789	\$ 60,765		
6	\$ 461,494	\$ 183,292	\$ 295,202	0.442090	\$ 131,823	6	\$ 91,289	0.442090	\$ 40,366		
7	\$ 355,380	\$ 183,292	\$ 182,069	0.381088	\$ 73,191	7	\$ 70,292	0.381088	\$ 26,787		
8	\$ 273,620	\$ 183,292	\$ 110,328	0.328522	\$ 35,246	8	\$ 54,126	0.328522	\$ 17,761		
9	\$ 210,667	\$ 183,292	\$ 47,395	0.283209	\$ 13,423	9	\$ 41,678	0.283209	\$ 11,803		
10	\$ 162,229	\$ 183,292	\$ -	0.224146	\$ -	10	\$ 32,091	0.224146	\$ -		
11	\$ 124,818	\$ 183,292	\$ -	0.210470	\$ -	11	\$ 24,710	0.210470	\$ -		
12	\$ 98,188	\$ 183,292	\$ -	0.181440	\$ -	12	\$ 19,027	0.181440	\$ -		
13	\$ 74,063	\$ 183,292	\$ -	0.158414	\$ -	13	\$ 14,651	0.158414	\$ -		
14	\$ 57,028	\$ 183,292	\$ -	0.134840	\$ -	14	\$ 11,281	0.134840	\$ -		
15	\$ 43,912	\$ 183,292	\$ -	0.118241	\$ -	15	\$ 8,888	0.118241	\$ -		
16	\$ 33,812	\$ 183,292	\$ -	0.100208	\$ -	16	\$ 6,888	0.100208	\$ -		
17	\$ 26,035	\$ 183,292	\$ -	0.086386	\$ -	17	\$ 5,150	0.086386	\$ -		
18	\$ 20,047	\$ 183,292	\$ -	0.074471	\$ -	18	\$ 3,986	0.074471	\$ -		
19	\$ 16,436	\$ 183,292	\$ -	0.064199	\$ -	19	\$ 3,083	0.064199	\$ -		
20	\$ 11,885	\$ 183,292	\$ -	0.055344	\$ -	20	\$ 2,351	0.055344	\$ -		
21	\$ 8,182	\$ 183,292	\$ -	0.047710	\$ -	21	\$ 1,810	0.047710	\$ -		
22	\$ 7,047	\$ 183,292	\$ -	0.041129	\$ -	22	\$ 1,394	0.041129	\$ -		
23	\$ 6,425	\$ 183,292	\$ -	0.035458	\$ -	23	\$ 1,073	0.035458	\$ -		
24	\$ 4,176	\$ 183,292	\$ -	0.030566	\$ -	24	\$ 827	0.030566	\$ -		
25	\$ 3,217	\$ 183,292	\$ -	0.026350	\$ -	25	\$ 636	0.026350	\$ -		
26	\$ 2,477	\$ 183,292	\$ -	0.022715	\$ -	26	\$ 490	0.022715	\$ -		
27	\$ 1,906	\$ 183,292	\$ -	0.019582	\$ -	27	\$ 377	0.019582	\$ -		
28	\$ 1,488	\$ 183,292	\$ -	0.016881	\$ -	28	\$ 291	0.016881	\$ -		
29	\$ 1,131	\$ 183,292	\$ -	0.014553	\$ -	29	\$ 224	0.014553	\$ -		
30	\$ 871	\$ 183,292	\$ -	0.012546	\$ -	30	\$ 172	0.012546	\$ -		
31	\$ 671	\$ 183,292	\$ -	0.010815	\$ -	31	\$ 133	0.010815	\$ -		
32	\$ 515	\$ 183,292	\$ -	0.009323	\$ -	32	\$ 102	0.009323	\$ -		
33	\$ 395	\$ 183,292	\$ -	0.008037	\$ -	33	\$ 79	0.008037	\$ -		
34	\$ 308	\$ 183,292	\$ -	0.006929	\$ -	34	\$ 61	0.006929	\$ -		
35	\$ 238	\$ 183,292	\$ -	0.005973	\$ -	35	\$ 47	0.005973	\$ -		
36	\$ 182	\$ 183,292	\$ -	0.005149	\$ -	36	\$ 38	0.005149	\$ -		
37	\$ 140	\$ 183,292	\$ -	0.004439	\$ -	37	\$ 28	0.004439	\$ -		
38	\$ 108	\$ 183,292	\$ -	0.003827	\$ -	38	\$ 21	0.003827	\$ -		
39	\$ 83	\$ 183,292	\$ -	0.003299	\$ -	39	\$ 16	0.003299	\$ -		
40	\$ 64	\$ 183,292	\$ -	0.002844	\$ -	40	\$ 13	0.002812	\$ -		
WORKING INTEREST APPRAISAL					\$ 1,644,650	ROYALTY INTEREST APPRAISAL					\$ 820,778

43-0320170157

NATURAL OIL/GAS APPRAISAL - FLUSH WELL (Year 1)											
DECLINE RATES		2016	GAS INCOME		OIL INCOME	GAS O&G INCOME		OIL O&G INCOME			
YR 1	48%	WRK INT	\$	1,384,819	\$	172,781	YR1	\$	1,228,182	\$	138,248
YR 2	28%	ROY INT	\$	916,212	\$	14,222	YR2	\$	381,384	\$	22,318
YR3+	23%							\$	1,272,912	\$	103,118
								\$	187,809	\$	21,888
\$ 4,075,385			TY2017 WORKING INTEREST				TY2017 ROYALTY INTEREST				\$ 1,034,504
YEAR	WRK INT INCOME	WORKING COST	NET INC	PRCT FCTR(18.0%)	DIS INC	YEAR	ROY INT INCOME	PRCT FCTR(18.0%)	DIS INC		
1	\$ 1,589,500	\$ 182,317	\$ 1,597,184	0.928477	\$ 1,578,798	1	\$ 391,221	0.928477	\$ 363,240		
2	\$ 1,378,030	\$ 182,317	\$ 1,219,714	0.800411	\$ 871,470	2	\$ 289,504	0.800411	\$ 231,722		
3	\$ 1,059,543	\$ 182,317	\$ 897,227	0.690009	\$ 619,095	3	\$ 222,918	0.690009	\$ 163,815		
4	\$ 819,848	\$ 182,317	\$ 653,532	0.594836	\$ 388,744	4	\$ 171,847	0.594836	\$ 102,102		
5	\$ 628,209	\$ 182,317	\$ 465,887	0.512789	\$ 238,902	5	\$ 132,188	0.512789	\$ 87,774		
6	\$ 483,718	\$ 182,317	\$ 321,400	0.442060	\$ 142,078	6	\$ 101,769	0.442060	\$ 44,956		
7	\$ 372,482	\$ 182,317	\$ 210,145	0.381088	\$ 80,083	7	\$ 78,362	0.381088	\$ 29,883		
8	\$ 288,798	\$ 182,317	\$ 124,479	0.328522	\$ 40,894	8	\$ 60,339	0.328522	\$ 19,829		
9	\$ 220,833	\$ 182,317	\$ 58,516	0.283209	\$ 18,572	9	\$ 46,481	0.283209	\$ 13,158		
10	\$ 170,041	\$ 182,317	\$ 7,724	0.224148	\$ 1,731	10	\$ 35,778	0.224148	\$ 6,019		
11	\$ 130,932	\$ 182,317	\$ -	0.210470	\$ -	11	\$ 27,547	0.210470	\$ -		
12	\$ 100,817	\$ 182,317	\$ -	0.181440	\$ -	12	\$ 21,211	0.181440	\$ -		
13	\$ 77,829	\$ 182,317	\$ -	0.158414	\$ -	13	\$ 16,332	0.158414	\$ -		
14	\$ 58,778	\$ 182,317	\$ -	0.134840	\$ -	14	\$ 12,878	0.134840	\$ -		
15	\$ 48,026	\$ 182,317	\$ -	0.118241	\$ -	15	\$ 9,884	0.118241	\$ -		
16	\$ 38,440	\$ 182,317	\$ -	0.100208	\$ -	16	\$ 7,458	0.100208	\$ -		
17	\$ 27,289	\$ 182,317	\$ -	0.086388	\$ -	17	\$ 5,741	0.086388	\$ -		
18	\$ 21,013	\$ 182,317	\$ -	0.074471	\$ -	18	\$ 4,421	0.074471	\$ -		
19	\$ 18,180	\$ 182,317	\$ -	0.064199	\$ -	19	\$ 3,404	0.064199	\$ -		
20	\$ 12,458	\$ 182,317	\$ -	0.055344	\$ -	20	\$ 2,821	0.055344	\$ -		
21	\$ 8,593	\$ 182,317	\$ -	0.047710	\$ -	21	\$ 2,018	0.047710	\$ -		
22	\$ 7,387	\$ 182,317	\$ -	0.041129	\$ -	22	\$ 1,554	0.041129	\$ -		
23	\$ 6,688	\$ 182,317	\$ -	0.035458	\$ -	23	\$ 1,197	0.035458	\$ -		
24	\$ 4,379	\$ 182,317	\$ -	0.030588	\$ -	24	\$ 921	0.030588	\$ -		
25	\$ 3,372	\$ 182,317	\$ -	0.028350	\$ -	25	\$ 709	0.028350	\$ -		
26	\$ 2,597	\$ 182,317	\$ -	0.022715	\$ -	26	\$ 548	0.022715	\$ -		
27	\$ 1,899	\$ 182,317	\$ -	0.019582	\$ -	27	\$ 421	0.019582	\$ -		
28	\$ 1,540	\$ 182,317	\$ -	0.016881	\$ -	28	\$ 324	0.016881	\$ -		
29	\$ 1,185	\$ 182,317	\$ -	0.014553	\$ -	29	\$ 249	0.014553	\$ -		
30	\$ 913	\$ 182,317	\$ -	0.012546	\$ -	30	\$ 192	0.012546	\$ -		
31	\$ 703	\$ 182,317	\$ -	0.010816	\$ -	31	\$ 148	0.010816	\$ -		
32	\$ 541	\$ 182,317	\$ -	0.009323	\$ -	32	\$ 114	0.009323	\$ -		
33	\$ 417	\$ 182,317	\$ -	0.008037	\$ -	33	\$ 88	0.008037	\$ -		
34	\$ 321	\$ 182,317	\$ -	0.006929	\$ -	34	\$ 68	0.006929	\$ -		
35	\$ 247	\$ 182,317	\$ -	0.005973	\$ -	35	\$ 52	0.005973	\$ -		
36	\$ 190	\$ 182,317	\$ -	0.005149	\$ -	36	\$ 40	0.005149	\$ -		
37	\$ 146	\$ 182,317	\$ -	0.004439	\$ -	37	\$ 31	0.004439	\$ -		
38	\$ 113	\$ 182,317	\$ -	0.003827	\$ -	38	\$ 24	0.003827	\$ -		
39	\$ 87	\$ 182,317	\$ -	0.003298	\$ -	39	\$ 18	0.003298	\$ -		
40	\$ 67	\$ 182,317	\$ -	0.002844	\$ -	40	\$ 14	0.002844	\$ -		
WORKING INTEREST APPRAISAL					\$ 4,075,385	ROYALTY INTEREST APPRAISAL					\$ 1,034,504

43-032017 0143

NATURAL OIL/GAS APPRAISAL - PLUMB WELL (Year 1)											
DECLINERATED		2015	GAS INCOME		OIL INCOME	GAS CAP INCOME		OIL CAP INCOME			
YR 1	48%	WK IN	\$	2,343,723	\$	217,287	YR1	\$	1,163,270	\$	55,428
YR 2	28%	ROY IN	\$	528,135	\$	48,455		\$	248,309	\$	15,342
YR3+	23%						YR2	\$	200,456	\$	13,507
								\$	183,385	\$	12,873
\$ 2,469,793			TY2017 WORKING INTEREST				TY2017 ROYALTY INTEREST				\$ 831,136
YEAR	WK IN INCOME	WORKING COST	NET INC	PRCT FCTR(15.0%)	DIS INC	YEAR	ROY IN INCOME	PRCT FCTR(15.0%)	DIS INC		
1	\$ 1,246,591	\$ 163,367	\$ 1,085,224	0.928477	\$ 1,007,605	1	\$ 285,551	0.928477	\$ 247,785		
2	\$ 923,957	\$ 163,367	\$ 760,590	0.800411	\$ 605,785	2	\$ 197,489	0.800411	\$ 158,057		
3	\$ 711,447	\$ 163,367	\$ 548,080	0.690009	\$ 375,180	3	\$ 152,051	0.690009	\$ 104,917		
4	\$ 547,814	\$ 163,367	\$ 384,447	0.594836	\$ 228,683	4	\$ 117,080	0.594836	\$ 69,843		
5	\$ 421,517	\$ 163,367	\$ 258,150	0.512789	\$ 132,530	5	\$ 90,151	0.512789	\$ 46,228		
6	\$ 324,799	\$ 163,367	\$ 161,432	0.442060	\$ 71,383	6	\$ 69,417	0.442060	\$ 30,686		
7	\$ 250,095	\$ 163,367	\$ 86,728	0.381085	\$ 33,051	7	\$ 53,451	0.381085	\$ 20,369		
8	\$ 192,573	\$ 163,367	\$ 28,207	0.326522	\$ 9,585	8	\$ 41,187	0.326522	\$ 13,521		
9	\$ 146,281	\$ 163,367	\$ -	0.283209	\$ -	9	\$ 31,891	0.283209	\$ -		
10	\$ 114,177	\$ 163,367	\$ -	0.224148	\$ -	10	\$ 24,403	0.224148	\$ -		
11	\$ 87,919	\$ 163,367	\$ -	0.210470	\$ -	11	\$ 18,790	0.210470	\$ -		
12	\$ 67,695	\$ 163,367	\$ -	0.181440	\$ -	12	\$ 14,468	0.181440	\$ -		
13	\$ 52,125	\$ 163,367	\$ -	0.158414	\$ -	13	\$ 11,140	0.158414	\$ -		
14	\$ 40,137	\$ 163,367	\$ -	0.134840	\$ -	14	\$ 8,578	0.134840	\$ -		
15	\$ 30,905	\$ 163,367	\$ -	0.116241	\$ -	15	\$ 6,805	0.116241	\$ -		
16	\$ 23,797	\$ 163,367	\$ -	0.100208	\$ -	16	\$ 5,085	0.100208	\$ -		
17	\$ 18,324	\$ 163,367	\$ -	0.086386	\$ -	17	\$ 3,915	0.086386	\$ -		
18	\$ 14,109	\$ 163,367	\$ -	0.074471	\$ -	18	\$ 3,015	0.074471	\$ -		
19	\$ 10,954	\$ 163,367	\$ -	0.064199	\$ -	19	\$ 2,322	0.064199	\$ -		
20	\$ 8,365	\$ 163,367	\$ -	0.055344	\$ -	20	\$ 1,788	0.055344	\$ -		
21	\$ 6,441	\$ 163,367	\$ -	0.047710	\$ -	21	\$ 1,377	0.047710	\$ -		
22	\$ 4,980	\$ 163,367	\$ -	0.041129	\$ -	22	\$ 1,060	0.041129	\$ -		
23	\$ 3,819	\$ 163,367	\$ -	0.035458	\$ -	23	\$ 818	0.035458	\$ -		
24	\$ 2,941	\$ 163,367	\$ -	0.030566	\$ -	24	\$ 623	0.030566	\$ -		
25	\$ 2,284	\$ 163,367	\$ -	0.026350	\$ -	25	\$ 484	0.026350	\$ -		
26	\$ 1,744	\$ 163,367	\$ -	0.022715	\$ -	26	\$ 373	0.022715	\$ -		
27	\$ 1,343	\$ 163,367	\$ -	0.019552	\$ -	27	\$ 287	0.019552	\$ -		
28	\$ 1,034	\$ 163,367	\$ -	0.016881	\$ -	28	\$ 221	0.016881	\$ -		
29	\$ 796	\$ 163,367	\$ -	0.014553	\$ -	29	\$ 170	0.014553	\$ -		
30	\$ 613	\$ 163,367	\$ -	0.012546	\$ -	30	\$ 131	0.012546	\$ -		
31	\$ 472	\$ 163,367	\$ -	0.010815	\$ -	31	\$ 101	0.010815	\$ -		
32	\$ 363	\$ 163,367	\$ -	0.009323	\$ -	32	\$ 76	0.009323	\$ -		
33	\$ 280	\$ 163,367	\$ -	0.008037	\$ -	33	\$ 60	0.008037	\$ -		
34	\$ 215	\$ 163,367	\$ -	0.006929	\$ -	34	\$ 48	0.006929	\$ -		
35	\$ 166	\$ 163,367	\$ -	0.005973	\$ -	35	\$ 35	0.005973	\$ -		
36	\$ 129	\$ 163,367	\$ -	0.005149	\$ -	36	\$ 27	0.005149	\$ -		
37	\$ 98	\$ 163,367	\$ -	0.004439	\$ -	37	\$ 21	0.004439	\$ -		
38	\$ 76	\$ 163,367	\$ -	0.003827	\$ -	38	\$ 16	0.003827	\$ -		
39	\$ 58	\$ 163,367	\$ -	0.003299	\$ -	39	\$ 12	0.003299	\$ -		
40	\$ 45	\$ 163,367	\$ -	0.002844	\$ -	40	\$ 10	0.002844	\$ -		
WORKING INTEREST APPRAISAL			\$ 2,469,793			ROYALTY INTEREST APPRAISAL			\$ 831,136		

43- 032017 0164

NATURAL OIL/GAS APPRAISAL - PLUSH WELL (Year 1)											
DECLINE RATES		2015	GAS INCOME		DR INCOME	GAS CAP INCOME		DR CAP INCOME			
YR 1	48%	WKK INT	\$	1,315,801	\$	228,008	YR1	\$	1,315,801	\$	89,962
YR 2	29%	ROY INT	\$	885,223	\$	34,333		\$	235,113	\$	13,234
YR3+	23%						YR2	\$	1,028,348	\$	95,548
								\$	173,894	\$	11,873
\$ 3,068,043		TY2017 WORKING INTEREST				TY2017 ROYALTY INTEREST				\$ 658,881	
YEAR	WKK INT INCOME	WORKING COST	NET INC	PRCT FCTR(18.5%)	DIB INC	YEAR	ROY INT INCOME	PRCT FCTR(18.5%)	DIB INC		
1	\$ 1,479,989	\$ 184,701	\$ 1,315,288	0.928477	\$ 1,221,215	1	\$ 250,347	0.928477	\$ 232,442		
2	\$ 1,095,192	\$ 184,701	\$ 930,491	0.800411	\$ 744,776	2	\$ 185,257	0.800411	\$ 148,282		
3	\$ 843,298	\$ 184,701	\$ 875,597	0.890009	\$ 488,238	3	\$ 142,848	0.890009	\$ 95,428		
4	\$ 649,339	\$ 184,701	\$ 484,638	0.594838	\$ 288,280	4	\$ 109,839	0.594838	\$ 85,336		
5	\$ 499,891	\$ 184,701	\$ 335,291	0.512759	\$ 171,938	5	\$ 84,578	0.512759	\$ 43,370		
6	\$ 384,983	\$ 184,701	\$ 220,283	0.442080	\$ 97,383	6	\$ 65,124	0.442080	\$ 28,788		
7	\$ 298,445	\$ 184,701	\$ 131,744	0.381088	\$ 50,208	7	\$ 50,145	0.381088	\$ 18,110		
8	\$ 228,282	\$ 184,701	\$ 83,682	0.328522	\$ 20,881	8	\$ 38,612	0.328522	\$ 12,885		
9	\$ 175,782	\$ 184,701	\$ 11,082	0.283209	\$ 3,133	9	\$ 29,731	0.283209	\$ 8,420		
10	\$ 135,337	\$ 184,701	\$ -	0.224148	\$ -	10	\$ 22,883	0.224148	\$ -		
11	\$ 104,209	\$ 184,701	\$ -	0.210470	\$ -	11	\$ 17,628	0.210470	\$ -		
12	\$ 80,241	\$ 184,701	\$ -	0.181440	\$ -	12	\$ 13,573	0.181440	\$ -		
13	\$ 61,788	\$ 184,701	\$ -	0.158414	\$ -	13	\$ 10,451	0.158414	\$ -		
14	\$ 47,576	\$ 184,701	\$ -	0.134840	\$ -	14	\$ 8,048	0.134840	\$ -		
15	\$ 38,833	\$ 184,701	\$ -	0.116241	\$ -	15	\$ 6,197	0.116241	\$ -		
16	\$ 28,207	\$ 184,701	\$ -	0.100208	\$ -	16	\$ 4,771	0.100208	\$ -		
17	\$ 21,720	\$ 184,701	\$ -	0.080386	\$ -	17	\$ 3,874	0.080386	\$ -		
18	\$ 16,724	\$ 184,701	\$ -	0.074471	\$ -	18	\$ 2,829	0.074471	\$ -		
19	\$ 12,878	\$ 184,701	\$ -	0.064199	\$ -	19	\$ 2,175	0.064199	\$ -		
20	\$ 9,816	\$ 184,701	\$ -	0.056344	\$ -	20	\$ 1,877	0.056344	\$ -		
21	\$ 7,635	\$ 184,701	\$ -	0.047710	\$ -	21	\$ 1,292	0.047710	\$ -		
22	\$ 5,879	\$ 184,701	\$ -	0.041129	\$ -	22	\$ 994	0.041129	\$ -		
23	\$ 4,627	\$ 184,701	\$ -	0.035458	\$ -	23	\$ 768	0.035458	\$ -		
24	\$ 3,486	\$ 184,701	\$ -	0.030586	\$ -	24	\$ 590	0.030586	\$ -		
25	\$ 2,864	\$ 184,701	\$ -	0.028350	\$ -	25	\$ 454	0.028350	\$ -		
26	\$ 2,067	\$ 184,701	\$ -	0.022715	\$ -	26	\$ 350	0.022715	\$ -		
27	\$ 1,581	\$ 184,701	\$ -	0.018582	\$ -	27	\$ 289	0.018582	\$ -		
28	\$ 1,225	\$ 184,701	\$ -	0.016881	\$ -	28	\$ 207	0.016881	\$ -		
29	\$ 943	\$ 184,701	\$ -	0.014553	\$ -	29	\$ 160	0.014553	\$ -		
30	\$ 726	\$ 184,701	\$ -	0.012546	\$ -	30	\$ 123	0.012546	\$ -		
31	\$ 569	\$ 184,701	\$ -	0.010816	\$ -	31	\$ 95	0.010815	\$ -		
32	\$ 431	\$ 184,701	\$ -	0.009323	\$ -	32	\$ 73	0.009323	\$ -		
33	\$ 332	\$ 184,701	\$ -	0.008037	\$ -	33	\$ 58	0.008037	\$ -		
34	\$ 255	\$ 184,701	\$ -	0.006929	\$ -	34	\$ 43	0.006929	\$ -		
35	\$ 197	\$ 184,701	\$ -	0.005978	\$ -	35	\$ 33	0.005978	\$ -		
36	\$ 181	\$ 184,701	\$ -	0.005149	\$ -	36	\$ 28	0.005149	\$ -		
37	\$ 117	\$ 184,701	\$ -	0.004439	\$ -	37	\$ 20	0.004439	\$ -		
38	\$ 90	\$ 184,701	\$ -	0.003827	\$ -	38	\$ 16	0.003827	\$ -		
39	\$ 89	\$ 184,701	\$ -	0.003299	\$ -	39	\$ 12	0.003299	\$ -		
40	\$ 58	\$ 184,701	\$ -	0.002844	\$ -	40	\$ 9	0.003612	\$ -		
WORKING INTEREST APPRAISAL					\$ 3,068,043	ROYALTY INTEREST APPRAISAL					\$ 658,881

43-032017 0165

NATURAL OIL/GAS APPRAISAL - PLUMB WELL (Year 1)												
		2018		OAS INCOME		OIL INCOME		OAS CAP INCOME		OIL CAP INCOME		
DECLINE RATE		WYK INT		\$	4,427,775	\$	163,921	YR1	\$	1,748,873	\$	139,443
YR 1	48%	NOY INT		\$	931,842	\$	74,272	YR2	\$	387,387	\$	28,327
YR 2	28%								\$	1,294,234	\$	104,788
YR3+	23%								\$	173,288	\$	21,718
\$ 4,150,858		TY2017 WORKING INTEREST					TY2017 ROYALTY INTEREST					\$ 1,050,888
YEAR	WYK INT INCOME	WORKING COST	NET INC	PRCT FCTR(10.0%)	OIS INC	YEAR	ROY INT INCOME	PRCT FCTR(10.0%)	OIS INC			
1	\$ 1,888,413	\$ 192,502	\$ 1,725,911	0.928477	\$ 1,602,489	1	\$ 387,304	0.928477	\$ 368,888			
2	\$ 1,397,428	\$ 182,502	\$ 1,234,928	0.800411	\$ 988,448	2	\$ 294,006	0.800411	\$ 235,325			
3	\$ 1,078,019	\$ 182,502	\$ 913,516	0.690009	\$ 630,334	3	\$ 228,384	0.690009	\$ 158,207			
4	\$ 828,634	\$ 182,502	\$ 686,031	0.594838	\$ 396,179	4	\$ 174,318	0.594838	\$ 103,889			
5	\$ 637,971	\$ 182,502	\$ 475,469	0.512769	\$ 243,616	5	\$ 134,223	0.512769	\$ 68,829			
6	\$ 491,238	\$ 182,502	\$ 325,735	0.442080	\$ 145,321	6	\$ 103,362	0.442080	\$ 45,888			
7	\$ 376,263	\$ 182,502	\$ 215,761	0.381088	\$ 82,220	7	\$ 79,581	0.381088	\$ 30,327			
8	\$ 291,255	\$ 182,502	\$ 128,752	0.328522	\$ 42,298	8	\$ 61,277	0.328522	\$ 20,131			
9	\$ 224,288	\$ 182,502	\$ 81,784	0.283209	\$ 17,492	9	\$ 47,184	0.283209	\$ 13,368			
10	\$ 172,866	\$ 182,502	\$ 10,183	0.224148	\$ 2,282	10	\$ 36,331	0.224148	\$ 8,144			
11	\$ 132,987	\$ 182,502	\$ -	0.210470	\$ -	11	\$ 27,975	0.210470	\$ -			
12	\$ 102,385	\$ 182,502	\$ -	0.181440	\$ -	12	\$ 21,541	0.181440	\$ -			
13	\$ 78,835	\$ 182,502	\$ -	0.158414	\$ -	13	\$ 16,586	0.158414	\$ -			
14	\$ 60,704	\$ 182,502	\$ -	0.134840	\$ -	14	\$ 12,772	0.134840	\$ -			
15	\$ 46,742	\$ 182,502	\$ -	0.116241	\$ -	15	\$ 9,834	0.116241	\$ -			
16	\$ 35,991	\$ 182,502	\$ -	0.100208	\$ -	16	\$ 7,572	0.100208	\$ -			
17	\$ 27,713	\$ 182,502	\$ -	0.086388	\$ -	17	\$ 5,831	0.086388	\$ -			
18	\$ 21,339	\$ 182,502	\$ -	0.074471	\$ -	18	\$ 4,490	0.074471	\$ -			
19	\$ 16,431	\$ 182,502	\$ -	0.064199	\$ -	19	\$ 3,457	0.064199	\$ -			
20	\$ 12,882	\$ 182,502	\$ -	0.055344	\$ -	20	\$ 2,662	0.055344	\$ -			
21	\$ 9,742	\$ 182,502	\$ -	0.047710	\$ -	21	\$ 2,060	0.047710	\$ -			
22	\$ 7,501	\$ 182,502	\$ -	0.041129	\$ -	22	\$ 1,576	0.041129	\$ -			
23	\$ 5,778	\$ 182,502	\$ -	0.035458	\$ -	23	\$ 1,215	0.035458	\$ -			
24	\$ 4,448	\$ 182,502	\$ -	0.030588	\$ -	24	\$ 936	0.030588	\$ -			
25	\$ 3,425	\$ 182,502	\$ -	0.026350	\$ -	25	\$ 721	0.026350	\$ -			
26	\$ 2,837	\$ 182,502	\$ -	0.022716	\$ -	26	\$ 555	0.022716	\$ -			
27	\$ 2,030	\$ 182,502	\$ -	0.019582	\$ -	27	\$ 427	0.019582	\$ -			
28	\$ 1,593	\$ 182,502	\$ -	0.016881	\$ -	28	\$ 329	0.016881	\$ -			
29	\$ 1,204	\$ 182,502	\$ -	0.014553	\$ -	29	\$ 253	0.014553	\$ -			
30	\$ 927	\$ 182,502	\$ -	0.012548	\$ -	30	\$ 195	0.012548	\$ -			
31	\$ 714	\$ 182,502	\$ -	0.010816	\$ -	31	\$ 150	0.010816	\$ -			
32	\$ 550	\$ 182,502	\$ -	0.009323	\$ -	32	\$ 119	0.009323	\$ -			
33	\$ 423	\$ 182,502	\$ -	0.008037	\$ -	33	\$ 89	0.008037	\$ -			
34	\$ 326	\$ 182,502	\$ -	0.006929	\$ -	34	\$ 69	0.006929	\$ -			
35	\$ 251	\$ 182,502	\$ -	0.005973	\$ -	35	\$ 53	0.005973	\$ -			
36	\$ 193	\$ 182,502	\$ -	0.005149	\$ -	36	\$ 41	0.005149	\$ -			
37	\$ 149	\$ 182,502	\$ -	0.004439	\$ -	37	\$ 31	0.004439	\$ -			
38	\$ 115	\$ 182,502	\$ -	0.003827	\$ -	38	\$ 24	0.003827	\$ -			
39	\$ 88	\$ 182,502	\$ -	0.003299	\$ -	39	\$ 19	0.003299	\$ -			
40	\$ 68	\$ 182,502	\$ -	0.002844	\$ -	40	\$ 14	0.002844	\$ -			
WORKING INTEREST APPRAISAL					\$ 4,150,858	ROYALTY INTEREST APPRAISAL					\$ 1,050,888	

43-032017 0191

NATURAL OIL/GAS APPRAISAL - FLUSH WELL (Yr 1)											
DECLINE RATES		2018		O&G INCOME		OIL INCOME		DIS CAP INCOME		OIL CAP INCOME	
YR 1	48%	WRK INT	\$	1,442,131	\$	285,148	YR1	\$	1,188,442	\$	115,343
YR 2	38%	ROY INT	\$	806,711	\$	81,508	YR2	\$	237,281	\$	25,348
YR3+	23%							\$	1,006,136	\$	86,275
								\$	178,888	\$	15,086
\$ 3,071,439		TY2017 WORKING INTEREST				TY2017 ROYALTY INTEREST				\$ 874,989	
YEAR	WRK INT INCOME	WORKING COST	NET INC	PRCT FCTR(18.0%)	DIS INC	YEAR	ROY INT INCOME	PRCT FCTR(18.8%)	DIS INC		
1	\$ 1,476,225	\$ 181,834	\$ 1,314,592	0.928477	\$ 1,220,566	1	\$ 257,827	0.928477	\$ 239,200		
2	\$ 1,092,407	\$ 181,834	\$ 930,773	0.800411	\$ 745,001	2	\$ 190,844	0.800411	\$ 182,593		
3	\$ 841,153	\$ 181,834	\$ 679,519	0.690009	\$ 468,876	3	\$ 148,798	0.690009	\$ 101,290		
4	\$ 647,836	\$ 181,834	\$ 466,054	0.594836	\$ 289,123	4	\$ 113,033	0.594836	\$ 87,236		
5	\$ 498,720	\$ 181,834	\$ 337,086	0.512789	\$ 172,854	5	\$ 87,035	0.512789	\$ 44,831		
6	\$ 384,014	\$ 181,834	\$ 222,361	0.442060	\$ 98,308	6	\$ 67,017	0.442060	\$ 29,626		
7	\$ 298,691	\$ 181,834	\$ 134,057	0.381088	\$ 51,087	7	\$ 51,803	0.381088	\$ 19,665		
8	\$ 227,682	\$ 181,834	\$ 88,048	0.328522	\$ 21,898	8	\$ 39,734	0.328522	\$ 13,054		
9	\$ 175,315	\$ 181,834	\$ 13,881	0.283209	\$ 3,875	9	\$ 30,595	0.283209	\$ 8,565		
10	\$ 134,993	\$ 181,834	\$ -	0.224145	\$ -	10	\$ 23,559	0.224145	\$ -		
11	\$ 103,944	\$ 181,834	\$ -	0.210470	\$ -	11	\$ 18,140	0.210470	\$ -		
12	\$ 80,037	\$ 181,834	\$ -	0.181440	\$ -	12	\$ 13,868	0.181440	\$ -		
13	\$ 61,829	\$ 181,834	\$ -	0.158414	\$ -	13	\$ 10,755	0.158414	\$ -		
14	\$ 47,454	\$ 181,834	\$ -	0.134840	\$ -	14	\$ 8,282	0.134840	\$ -		
15	\$ 36,540	\$ 181,834	\$ -	0.116241	\$ -	15	\$ 6,377	0.116241	\$ -		
16	\$ 28,135	\$ 181,834	\$ -	0.100208	\$ -	16	\$ 4,910	0.100208	\$ -		
17	\$ 21,684	\$ 181,834	\$ -	0.086388	\$ -	17	\$ 3,761	0.086388	\$ -		
18	\$ 16,882	\$ 181,834	\$ -	0.074471	\$ -	18	\$ 2,911	0.074471	\$ -		
19	\$ 12,845	\$ 181,834	\$ -	0.064199	\$ -	19	\$ 2,242	0.064199	\$ -		
20	\$ 9,890	\$ 181,834	\$ -	0.055344	\$ -	20	\$ 1,726	0.055344	\$ -		
21	\$ 7,616	\$ 181,834	\$ -	0.047710	\$ -	21	\$ 1,329	0.047710	\$ -		
22	\$ 5,864	\$ 181,834	\$ -	0.041129	\$ -	22	\$ 1,023	0.041129	\$ -		
23	\$ 4,815	\$ 181,834	\$ -	0.035466	\$ -	23	\$ 788	0.035466	\$ -		
24	\$ 3,477	\$ 181,834	\$ -	0.030586	\$ -	24	\$ 607	0.030586	\$ -		
25	\$ 2,877	\$ 181,834	\$ -	0.026350	\$ -	25	\$ 467	0.026350	\$ -		
26	\$ 2,081	\$ 181,834	\$ -	0.022716	\$ -	26	\$ 360	0.022716	\$ -		
27	\$ 1,587	\$ 181,834	\$ -	0.019582	\$ -	27	\$ 277	0.019582	\$ -		
28	\$ 1,222	\$ 181,834	\$ -	0.016881	\$ -	28	\$ 213	0.016881	\$ -		
29	\$ 941	\$ 181,834	\$ -	0.014553	\$ -	29	\$ 184	0.014553	\$ -		
30	\$ 726	\$ 181,834	\$ -	0.012546	\$ -	30	\$ 126	0.012546	\$ -		
31	\$ 558	\$ 181,834	\$ -	0.010815	\$ -	31	\$ 97	0.010815	\$ -		
32	\$ 430	\$ 181,834	\$ -	0.009323	\$ -	32	\$ 76	0.009323	\$ -		
33	\$ 331	\$ 181,834	\$ -	0.008037	\$ -	33	\$ 58	0.008037	\$ -		
34	\$ 255	\$ 181,834	\$ -	0.006929	\$ -	34	\$ 44	0.006929	\$ -		
35	\$ 198	\$ 181,834	\$ -	0.005973	\$ -	35	\$ 34	0.005973	\$ -		
36	\$ 151	\$ 181,834	\$ -	0.005149	\$ -	36	\$ 26	0.005149	\$ -		
37	\$ 118	\$ 181,834	\$ -	0.004439	\$ -	37	\$ 20	0.004439	\$ -		
38	\$ 90	\$ 181,834	\$ -	0.003827	\$ -	38	\$ 16	0.003827	\$ -		
39	\$ 69	\$ 181,834	\$ -	0.003299	\$ -	39	\$ 12	0.003299	\$ -		
40	\$ 53	\$ 181,834	\$ -	0.002844	\$ -	40	\$ 9	0.002812	\$ -		
WORKING INTEREST APPRAISAL					\$ 3,071,439	ROYALTY INTEREST APPRAISAL					\$ 874,989

43-03 20179962

FEB 13, 2017
10:16 AM

'RITCHIE' COUNTY, WV
YIELD CAP MODEL REPORT FOR - 2017

NR105: 27

ACCOUNT:1020149960

RESOURCE:OG OWNER:ANTERO RESOURCES CORPORATI LOCATION:NICHOLSON UNIT 2H (10207.1)

STATUS:Z API#:09960

DATE:04/19/2013 DAYS:365 BHLS: 9387.000 MCPS: 491394 RCPTS: 1552924 GWI: 982232 OWT: 28126

SYSTEM RATES:

CAP RATE: 16.000 DECLINE RATE: 0.460 0.290 0.230 WELLLIFE:99 EXPENSE: 0.2 175000 175000 17500

RATES USED:

CAP RATE: 16.000 DECLINE RATE: 0.460 0.290 0.230 WELLLIFE:99 GS EXPENSE: 0.2 175000 175000 17500

SETTLED YEARS: 3

OL EXPENSE: 5750 5750 5750

	GAS WORKING INTEREST				GAS ROYALTY INTEREST				OIL WORKING INTEREST				OIL ROYALTY INTEREST			
	GROSS INCOME	NET INCOME	DISCOUNT INCOME	FACTO	GROSS INCOME	DISCOUNT INCOME	FACTO		GROSS INCOME	NET INCOME	DISCOUNT INCOME	FACTO	GROSS INCOME	DISCOUNT INCOME	FACTO	
1	643,362	514,690	477,877	147,374	136,834	0.928	184,228	182,948	169,863	42,201	39,183	0.92	42,201	39,183	0.92	
2	495,389	366,716	293,524	113,478	90,829	0.800	141,855	140,576	112,518	28,495	26,009	0.80	28,495	26,009	0.80	
3	381,449	252,777	174,418	87,378	60,292	0.690	109,229	107,949	74,486	35,021	32,495	0.69	35,021	32,495	0.69	
4	293,716	165,044	98,174	67,281	40,021	0.595	84,106	82,826	49,268	19,266	17,460	0.59	19,266	17,460	0.59	
5	226,161	97,489	49,991	51,807	26,566	0.513	64,762	63,482	32,553	14,835	11,423	0.51	14,835	11,423	0.51	
6	174,144	45,472	20,101	39,891	17,634	0.442	49,867	48,587	21,478	8,796	5,050	0.44	8,796	5,050	0.44	
7	134,091	5,419	2,065	30,716	11,705	0.381	38,397	37,117	14,145	3,352	2,225	0.38	3,352	2,225	0.38	
8	103,250	0	0	23,651	0	0.329	29,566	28,286	9,293	6,773	4,015	0.32	6,773	4,015	0.32	
9							22,766	21,486	6,085	5,215	3,967	0.28	5,215	3,967	0.28	
10							17,530	16,250	5,711	4,015	2,381	0.21	4,015	2,381	0.21	
11							13,498	12,218	4,03	2,87	1,90	0.15	2,87	1,90	0.15	
12							10,393	9,113	3,654	2,374	1,412	0.11	2,374	1,412	0.11	
13							8,003	6,723	3,465	2,166	1,284	0.08	2,166	1,284	0.08	
14							6,162	4,882	3,166	1,989	1,284	0.07	1,989	1,284	0.07	
15							4,745	3,465	2,166	1,989	1,284	0.06	1,989	1,284	0.06	
16							3,654	2,374	1,989	1,284	1,284	0.05	1,989	1,284	0.05	
17							2,813	1,533	886	4	0	0.04	886	4	0.04	
18							2,166	886	25	0	0		25	0		
19							1,668	388	66	0	0		66	0		
20							1,284	4	0	0	0		4	0		
21							989	0	0	0	0		0	0		

TOTAL: 1,116,151 383,882 500,454 116,511

GS EXPENSE: 128672 128672 128672
OL EXPENSE: 1280 1280 1280

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'RITCHIE' COUNTY, WV
YIELD CAP MODEL REPORT FOR - 2017

NR105: 28

ACCOUNT:1020150002

STATUS:2 API#:10002

RESOURCE:OG OWNER:ANTERO RESOURCES CORPORATI LOCATION:KUNH UNIT 1H (10724.1)

SYSTEM RATES:

CAP RATE: 16.000 DECLINE RATE: 0.460 0.230 WELLLIFE:99 EXPENSE: 0.2 175000 175000 175000 18339

RATES USED:

CAP RATE: 16.000 DECLINE RATE: 0.460 0.290 0.230 WELLLIFE:99 GS EXPENSE: 0.2 175000 175000 17500

SETTLED YEARS: 3

	GAS WORKING INTEREST			GAS ROYALTY INTEREST			OIL WORKING INTEREST			OIL ROYALTY INTEREST		
	GROSS INCOME	NET INCOME	DISCOUNT INCOME	GROSS INCOME	DISCOUNT INCOME	FACTOR	GROSS INCOME	NET INCOME	DISCOUNT INCOME	GROSS INCOME	DISCOUNT INCOME	FACTOR
1	697,016	557,613	517,731	160,604	149,117	0.928	120,126	119,280	110,749	27,678	25,699	0.92
2	536,703	397,299	318,003	123,665	98,983	0.800	92,497	91,651	73,359	21,312	17,059	0.80
3	413,261	273,858	188,964	95,222	65,704	0.690	71,223	70,377	48,561	16,410	11,323	0.69
4	318,211	178,808	106,361	73,321	43,614	0.595	54,841	53,996	32,119	12,636	7,516	0.59
5	245,022	105,619	54,160	56,457	28,951	0.513	42,228	41,383	21,221	9,730	4,989	0.51
6	188,667	49,264	21,778	43,472	19,217	0.442	32,515	31,670	14,000	7,492	3,312	0.44
7	145,274	5,871	2,237	33,473	12,756	0.381	25,037	24,192	9,219	5,769	2,198	0.38
8	111,861	0	0	25,775	0	0.329	19,278	18,433	6,056	4,442	1,459	0.32
9							14,844	13,999	3,965	3,420	969	0.28
10							11,430	10,585	2,584	2,634	643	0.24
11							8,801	7,956	1,674	2,028	427	0.21
12							6,777	5,932	1,076	1,561	283	0.18
13							5,218	4,373	684	1,202	188	0.15
14							4,018	3,173	428	713	125	0.13
15							3,094	2,249	261	549	55	0.11
16							2,382	1,537	154	423	37	0.08
17							1,834	989	85	325	24	0.07
18							1,412	567	42	251	16	0.06
19							1,088	242	16	193	0	0.05
20							837	0	0			

TOTAL: 1,209,234 418,342

326,253

76,405

GS EXPENSE: 139403 139403 139403
OL EXPENSE: 845 845 845

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'RITCHIE' COUNTY, WV
YIELD CAP MODEL REPORT FOR - 2017

NR105: 29

ACCOUNT:1020150023

STATUS:2 API#:10023

RESOURCE:OG OWNER:ANTERO RESOURCES CORPORATI LOCATION:CONSTABLE UNIT 1H (10326.1)

SYSTEM RATES:

CAP RATE: 16.000 DECLINE RATE: 0.460 0.290 0.230 WELLLIFE:99 EXPENSE: 0.2 175000 175000 17500 38794

RATES USED:

CAP RATE: 16.000 DECLINE RATE: 0.460 0.290 0.230 WELLLIFE:99 GS EXPENSE: 0.2 175000 175000 17500

SETTLED YEARS: 3

OL EXPENSE: 0.2 5750 5750 575

	GAS WORKING INTEREST				GAS ROYALTY INTEREST				OIL WORKING INTEREST				OIL ROYALTY INTEREST			
	GROSS INCOME	NET INCOME	DISCOUNT INCOME		GROSS INCOME	DISCOUNT INCOME	FACTOR		GROSS INCOME	NET INCOME	DISCOUNT INCOME		GROSS INCOME	DISCOUNT INCOME	FACTOR	
1	1,413,005	1,264,679	1,174,225		312,348	290,008	0.928		254,106	253,230	235,118		56,171	52,153	0.92	
2	1,088,014	939,688	752,136		240,508	192,505	0.800		195,662	194,785	155,908		43,252	34,619	0.80	
3	837,770	689,444	475,723		185,191	127,783	0.690		150,659	149,783	103,352		33,304	22,980	0.69	
4	645,083	496,757	295,489		142,597	84,822	0.595		115,131	88,450	68,484		25,644	15,254	0.59	
5	496,714	348,388	178,650		109,800	56,304	0.513		89,326	67,905	30,018		19,746	10,125	0.51	
6	382,470	234,144	103,506		84,546	37,374	0.442		68,781	52,085	19,849		15,204	6,721	0.44	
7	294,502	146,176	55,706		65,100	24,809	0.381		40,780	39,904	13,109		11,707	4,461	0.38	
8	226,766	78,440	25,769		50,127	16,468	0.329		31,401	30,524	8,645		9,015	2,961	0.32	
9	174,610	26,284	7,444		38,598	10,931	0.283		24,179	23,302	5,689		6,941	1,966	0.28	
10	134,450	0	0		29,720	0.244			18,618	17,741	3,734		5,345	1,305	0.24	
11									14,335	13,459	2,442		4,115	866	0.21	
12									11,038	10,162	1,589		3,169	575	0.18	
13									8,500	7,623	1,028		2,440	382	0.15	
14									6,545	5,668	659		1,879	253	0.13	
15									5,039	4,163	417		1,114	168	0.11	
16									3,880	3,004	259		858	74	0.10	
17									2,988	2,111	157		660	49	0.07	
18									2,301	1,424	91		509	33	0.06	
19									1,771	895	50		392	22	0.05	
20									1,364	488	23		302	14	0.04	
21									1,050	174	7		232	10	0.04	
22									809	0	0		179	0	0.03	
23																

TOTAL: 3,068,647 841,005 695,985 155,104

GS EXPENSE: 148326 148326 148326

OL EXPENSE: 876 876 876

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'RITCHIE' COUNTY, WV
YIELD CAP MODEL REPORT FOR - 2017

NR105: 30

ACCOUNT:1020159961

STATUS:Z API#:09961

DATE:03/29/2013 DAYS:365

RESOURCE:OG OWNER:ANTERO RESOURCES CORPORATI LOCATION:NICHOLSON UNIT 1H (10267.1)

BBLs: 7433.000 MCFS:

381007 RCPTS:

1264041 GWT:

804893 OMT: 22356

SYSTEM RATES:

CAP RATE: 16.000 DECLINE RATE:

0.460

0.290

0.230 WELLLIFE:99

EXPENSE:

0.2

175000

175000

17500

RATES USED:

CAP RATE: 16.000 DECLINE RATE:

0.460

0.290

0.230 WELLLIFE:99

GS EXPENSE:

0.2

175000

175000

17500

SETTLED YEARS: 3

OL EXPENSE:

0.2

5750

5750

575

	GAS WORKING INTEREST				GAS ROYALTY INTEREST				OIL WORKING INTEREST				OIL ROYALTY INTEREST			
	GROSS INCOME	NET INCOME	DISCOUNT INCOME		GROSS INCOME	DISCOUNT INCOME	FACTOR		GROSS INCOME	NET INCOME	DISCOUNT INCOME		GROSS INCOME	DISCOUNT INCOME	FACTOR	
1	527,205	421,764	391,598	120,766	112,129	0.928		146,432	145,183	134,799	33,543	31,144	0.92			
2	405,948	300,507	240,529	92,990	74,430	0.800		112,753	111,503	89,248	25,828	20,673	0.80			
3	312,580	207,139	142,928	71,602	49,406	0.690		86,820	85,570	59,044	19,888	13,723	0.69			
4	240,686	135,245	80,449	55,134	32,796	0.595		66,851	65,601	39,022	15,314	9,109	0.59			
5	185,329	79,888	40,965	42,453	21,769	0.513		51,475	50,226	25,755	11,791	6,047	0.51			
6	142,703	37,262	16,472	32,689	14,450	0.442		39,636	38,386	16,969	9,079	4,014	0.44			
7	109,881	4,440	1,692	25,170	9,592	0.381		30,520	29,270	11,154	6,991	2,664	0.38			
8	84,609	0	0	19,381	0	0.329		23,500	22,250	7,310	5,383	1,768	0.32			
9				18,095				13,933	12,683	4,771	4,145	1,174	0.28			
10				10,729				8,261	7,011	3,097	3,192	779	0.24			
11				6,361				5,111	4,898	1,272	1,892	517	0.21			
12				4,898				3,771	3,522	799	1,457	343	0.18			
13				2,904				2,236	1,986	492	864	228	0.15			
14				1,722				1,326	1,021	35	665	100	0.11			
15				0				0	0	0	512	67	0.10			
16				0				0	0	0	394	44	0.08			
17				0				0	0	0	304	29	0.07			
18				0				0	0	0	234	19	0.06			
19				0				0	0	0	0	0	0.05			
20				0				0	0	0	0	0	0.05			

TOTAL:

914,633

314,573

396,311

92,595

GS EXPENSE: 105441

105441

105441

OL EXPENSE: 1250

1250

1250

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'RITCHIE' COUNTY, WV
YIELD CAP MODEL REPORT FOR - 2017

NR105: 31

ACCOUNT:1020159964

RESOURCE:OG OWNER:ANTERO RESOURCES CORPORATI LOCATION:O'NEIL UNIT 1H (10275.1)

STATUS:2 API#:09964

DATE:05/01/2013 DAYS:365 BBLs: 11114.000 MCPS: 594452 RCPTS: 1822531 GMI: 1139279 OWI: 3507C

SYSTEM RATES:

CAP RATE: 16.000 DECLINE RATE: 0.460 0.290 0.230 WELLIFE:99 EXPENSE: 0.2 175000 175000 1750C

RATES USED:

CAP RATE: 16.000 DECLINE RATE: 0.460 0.290 0.230 WELLIFE:99 GS EXPENSE: 0.2 175000 175000 1750C

SETTLED YEARS: 3

OL EXPENSE: 0.2 5750 5750 575

	GAS WORKING INTEREST				GAS ROYALTY INTEREST				OIL WORKING INTEREST				OIL ROYALTY INTEREST			
	GROSS INCOME	NET INCOME	DISCOUNT INCOME		GROSS INCOME	DISCOUNT INCOME	FACTOR		GROSS INCOME	NET INCOME	DISCOUNT INCOME		GROSS INCOME	DISCOUNT INCOME	FACTC	
1	746,228	612,418	568,616	166,549	154,637	0.928		229,712	228,359	212,026	51,269	47,602	0.92			
2	574,595	440,785	352,810	128,243	102,647	0.800		176,879	175,525	140,492	39,477	31,598	0.80			
3	442,438	308,629	212,957	98,747	68,136	0.690		136,197	134,843	93,043	30,397	20,974	0.69			
4	340,678	206,868	123,053	76,035	45,228	0.595		104,871	103,518	61,576	23,406	13,923	0.59			
5	262,322	128,512	65,900	58,547	30,022	0.513		80,751	79,397	40,714	18,023	9,242	0.51			
6	201,988	68,178	30,139	45,081	19,929	0.442		62,178	60,825	26,888	13,877	6,135	0.44			
7	155,531	21,721	8,278	34,713	13,228	0.381		47,877	46,524	17,730	10,686	4,072	0.38			
8	119,759	0	0	26,729	0	0.329		36,865	35,512	11,666	8,228	2,703	0.32			
9								28,386	27,033	7,656	6,335	1,794	0.28			
10								21,858	20,504	5,006	4,878	1,191	0.24			
11								16,830	15,477	3,257	3,756	791	0.21			
12								12,959	11,606	1,349	2,892	525	0.18			
13								9,979	8,625	1,349	2,227	348	0.15			
14								7,684	6,330	854	1,715	231	0.13			
15								5,916	4,563	530	1,320	153	0.11			
16								4,556	3,202	321	783	102	0.08			
17								3,508	2,701	186	603	45	0.07			
18								2,701	1,348	100	464	30	0.06			
19								2,080	726	47	357	20	0.05			
20								1,601	248	14	275	0	0.04			
21								1,233	0	0						

TOTAL: 1,361,753 433,827

625,562 141,546

GS EXPENSE: 133809

133809 133809

OL EXPENSE: 1353

1353 1353

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'RITCHIE' COUNTY, WV
YIELD CAP MODEL REPORT FOR 2017

NR105: 32

ACCOUNT: 1020159966
STATUS: 2 API#: 09966
SYSTEM RATES:
CAP RATE: 16.000 DECLINE RATE: 0.460
RATES USED:
CAP RATE: 16.000 DECLINE RATE: 0.460
SETTLED YEARS: 3
RESOURCE: OG OWNER: ANTERO RESOURCES CORPORATI LOCATION: O'NEIL UNIT 2H (10276.1)
BBLs: 7379.000 MCFS: 464728 RCPTS: 1449989 GWT: 972229 OMT: 21319

	GAS WORKING INTEREST			GAS ROYALTY INTEREST			OIL WORKING INTEREST			OIL ROYALTY INTEREST		
	GROSS INCOME	NET INCOME	DISCOUNT INCOME	GROSS INCOME	DISCOUNT INCOME	FACTOR	GROSS INCOME	NET INCOME	DISCOUNT INCOME	GROSS INCOME	DISCOUNT INCOME	FACTOR
1	636,810	509,448	473,011	142,127	131,962	0.928	139,640	138,606	128,692	31,166	28,937	0.92
2	490,344	362,982	290,535	109,438	87,595	0.800	107,523	106,489	85,235	23,997	19,208	0.80
3	377,565	250,203	172,642	84,267	58,145	0.690	82,793	81,759	56,414	18,478	12,750	0.69
4	290,725	163,363	97,174	64,886	38,596	0.595	63,750	62,716	37,306	14,228	8,463	0.59
5	223,858	96,496	49,482	49,962	25,620	0.513	49,088	48,054	24,641	10,956	5,618	0.51
6	172,371	45,009	19,897	38,471	17,006	0.442	37,798	36,763	16,252	8,436	3,729	0.44
7	132,725	5,363	2,044	29,622	11,289	0.381	29,104	28,070	10,697	6,496	2,475	0.38
8	102,199	0	0	22,809	0	0.329	22,410	21,376	7,023	5,002	1,643	0.32
9							17,256	16,222	4,594	3,851	1,091	0.28
10							13,287	12,253	2,991	2,283	724	0.24
11							10,231	9,197	1,936	1,758	481	0.21
12							7,878	6,844	1,242	1,354	319	0.18
13							6,066	5,032	787	803	212	0.15
14							4,671	3,637	490	618	93	0.11
15							3,597	2,562	298	476	27	0.08
16							2,769	1,735	174	366	16	0.06
17							2,132	1,098	45	282	0	0.05
18							1,642	608	15	217	0	0.05
19							1,264	230	0			
20							973	0	0			

TOTAL: 1,104,784 370,214 378,927 86,032
GS EXPENSE: 127362 127362 127362
OL EXPENSE: 1034 1034 1034

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'RITCHIE' COUNTY, WV
YIELD CAP MODEL REPORT FOR - 2017

NR105: 33

ACCOUNT: 1020159370

RESOURCE: OG OWNER: ANTERO RESOURCES CORPORATI LOCATION: PRUNTY UNIT 1H (10288.1)

STATUS: Z API#: 09970

DATE: 08/01/2013 DAYS: 365

BBLs: 14340.000 MCPS: 1005336 RCPTS: 3209459 GWT: 2170294 OWI: 42044

SYSTEM RATES:

CAP RATE: 16.000 DECLINE RATE: 0.460

0.290 0.230 WELLLIFE: 99

EXPENSE:

0.2

175000

175000

17500

RATES USED:

CAP RATE: 16.000 DECLINE RATE: 0.460

0.290

0.230 WELLLIFE: 99

GS EXPENSE:

0.2

175000

175000

17500

SETTLED YEARS: 3

OL EXPENSE:

0.2

5750

5750

575

	GAS WORKING INTEREST				GAS ROYALTY INTEREST				OIL WORKING INTEREST				OIL ROYALTY INTEREST			
	GROSS INCOME	NET INCOME	DISCOUNT INCOME	FACTO	GROSS INCOME	NET INCOME	DISCOUNT INCOME	FACTO	GROSS INCOME	NET INCOME	DISCOUNT INCOME	FACTO	GROSS INCOME	NET INCOME	DISCOUNT INCOME	FACTO
1	1,421,543	1,274,943	1,183,755	0.928	275,393	274,460	254,830	0.92	65,769	61,065	40,535	0.80	61,065	40,535	26,907	0.69
2	1,094,588	947,988	758,780	0.800	212,053	211,120	168,983	0.80	50,642	40,535	26,907	0.69	40,535	26,907	11,856	0.51
3	842,833	696,233	480,407	0.690	163,281	162,348	112,021	0.69	38,995	30,026	17,860	0.59	30,026	17,860	7,870	0.44
4	648,981	502,382	298,835	0.595	125,726	124,793	74,221	0.59	23,120	13,708	5,224	0.38	13,708	5,224	2,302	0.28
5	499,715	353,116	181,074	0.513	96,809	95,876	49,184	0.51	17,802	10,555	3,468	0.32	10,555	3,468	1,528	0.24
6	384,781	238,181	105,290	0.442	74,543	73,610	32,540	0.44	13,708	8,127	2,302	0.28	8,127	2,302	1,014	0.21
7	296,281	149,682	57,042	0.381	57,398	56,465	21,518	0.38	10,555	6,258	1,528	0.24	6,258	1,528	673	0.18
8	228,137	81,537	26,787	0.283	44,197	43,263	14,213	0.28	8,127	4,819	1,014	0.21	4,819	1,014	447	0.15
9	175,665	29,066	8,232	0.244	34,031	33,098	9,374	0.24	6,258	3,710	873	0.15	3,710	873	297	0.13
10	135,262	0	0	0.244	26,204	25,271	6,170	0.24	4,819	2,200	595	0.08	2,200	595	197	0.11
11					20,177	19,244	4,050		3,710	1,725	447	0.15	1,725	447	131	0.10
12					15,536	14,603	3,650		2,857	1,304	38	0.07	1,304	38	87	0.08
13					11,963	11,030	2,83		2,200	1,004	58	0.06	1,004	58	25	0.05
14					9,212	8,278	2,305		1,725	773	38	0.06	773	38	17	0.04
15					7,093	6,160	1,725		1,304	595	25	0.05	595	25	11	0.04
16					5,462	4,528	1,116		1,004	459	11	0.04	459	11	0	0.03
17					4,205	3,272	1,116		773	353	0		353	0		
18					3,238	2,305	1,116		595	272			272			
19					2,493	1,560	1,116		459	209			209			
20					1,920	987	1,116		353							
21					1,478	545	1,116		272							
22					1,138	205	1,116		209							
23					876	0	1,116									

TOTAL: 3,100,202

914,087

754,399

181,608

GS EXPENSE: 146599

14

146599

933

933

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'RITCHIE' COUNTY, WV
YIELD CAP MODEL REPORT FOR - 2017

NR105: 34

ACCOUNT:1020159978

RESOURCE:OG

OWNER:ANTERO RESOURCES CORPORATION

STATUS:2 API#:09978

DATE:03/01/2013 DAYS:365

BEHS: 5845.000 MCFS:

355336 RCPTS:

1123272 GWI:

765000 OWT:

16248

SYSTEM RATES:

CAP RATE: 16.000

DECLINE RATE: 0.460

0.290

0.230 WELLIFE:99

EXPENSE:

0.2

175000

17500

RATES USED:

CAP RATE: 16.000

DECLINE RATE: 0.460

0.290

0.230 WELLIFE:99

EXPENSE:

0.2

175000

17500

SETTLED YEARS: 3

OL EXPENSE:

0.2

5750

5750

575

	GAS WORKING INTEREST			GAS ROYALTY INTEREST			OIL WORKING INTEREST			OIL ROYALTY INTEREST		
	GROSS INCOME	NET INCOME	DISCOUNT INCOME	GROSS INCOME	DISCOUNT INCOME	FACTOR	GROSS INCOME	NET INCOME	DISCOUNT INCOME	GROSS INCOME	DISCOUNT INCOME	FACTOR
1	501,075	400,860	372,189	105,773	98,208	0.928	106,428	105,421	97,881	22,467	20,860	0.92
2	385,828	285,613	228,608	81,445	65,190	0.800	81,950	80,942	64,787	17,299	13,846	0.80
3	297,087	196,872	135,844	62,713	43,273	0.690	63,101	62,094	42,845	13,320	9,191	0.69
4	228,757	128,542	76,462	48,289	28,724	0.595	48,588	47,581	28,303	10,257	6,101	0.59
5	176,143	75,928	38,935	37,183	19,067	0.513	37,413	36,405	18,668	7,898	4,050	0.51
6	135,630	35,415	15,656	28,631	12,656	0.442	28,808	27,801	12,289	6,081	2,688	0.44
7	104,435	4,220	1,608	22,046	8,401	0.381	22,182	21,175	8,069	4,683	1,784	0.38
8	80,415	0	0	16,975	0	0.329	17,080	16,073	5,280	3,606	1,185	0.32
9							13,152	12,144	3,439	2,776	786	0.28
10							10,127	9,119	2,226	2,138	522	0.24
11							7,798	6,790	1,429	1,646	346	0.21
12							6,004	4,997	907	1,267	230	0.18
13							4,623	3,616	566	976	153	0.15
14							3,560	2,553	344	751	101	0.13
15							2,741	1,734	202	579	67	0.11
16							2,111	1,103	111	446	45	0.10
17							1,625	618	53	343	30	0.08
18							1,251	244	18	264	20	0.07
19							964	0	0	203	0	0.06

TOTAL:

869,301

275,519

287,419

62,005

GS EXPENSE: 100215 100215 100215
OL EXPENSE: 1007 1007 1007

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'RITCHIE' COUNTY, WV
YIELD CAP MODEL REPORT FOR - 2017

NR105: 35

ACCOUNT:1020160005

RESOURCE:OG OWNER:ANTERO RESOURCES CORPORATI LOCATION:IRELAND UNIT 1H (10738.1)

STATUS:2 API#:10005

DATE:07/23/2014 DAYS:365

BBLs: 23940.000 MCFS: 1519639 RCPTS:

4888192 GWT: 3270988 OWT:

71788

SYSTEM RATES:

CAP RATE: 16.000 DECLINE RATE:

0.460

0.290

0.230 WELLIFE:99

EXPENSE:

0.2

175000

175000

RATES USED:

CAP RATE: 16.000 DECLINE RATE:

0.460

0.290

0.230 WELLIFE:99

EXPENSE:

0.2

175000

175000

SETTLED YEARS: 2

OL EXPENSE:

0.2

5750

5750

575

	GAS WORKING INTEREST				GAS ROYALTY INTEREST				OIL WORKING INTEREST				OIL ROYALTY INTEREST			
	GROSS INCOME	NET INCOME	DISCOUNT INCOME	FACTO	GROSS INCOME	NET INCOME	DISCOUNT INCOME	FACTO	GROSS INCOME	NET INCOME	DISCOUNT INCOME	FACTO	GROSS INCOME	NET INCOME	DISCOUNT INCOME	FACTO
1	1,946,238	1,802,733	1,673,796	438,796	407,412	0.928	427,139	426,104	395,628	96,302	89,414	0.92	96,302	89,414	0.92	0.92
2	1,498,603	1,355,098	1,084,635	337,873	270,437	0.800	328,897	327,862	262,424	74,152	59,352	0.80	74,152	59,352	0.80	0.80
3	1,153,924	1,010,419	697,198	260,162	179,514	0.690	253,250	252,216	174,031	57,097	39,398	0.69	57,097	39,398	0.69	0.69
4	888,522	745,017	443,163	200,325	119,160	0.595	195,003	193,968	115,379	43,965	26,152	0.59	43,965	26,152	0.59	0.59
5	684,162	540,657	277,243	154,250	79,098	0.513	150,152	149,117	76,466	33,853	17,359	0.51	33,853	17,359	0.51	0.51
6	526,805	383,299	169,441	118,773	52,505	0.442	89,025	87,990	33,532	20,071	11,523	0.44	20,071	11,523	0.44	0.44
7	405,640	262,134	92,896	91,455	34,852	0.381	68,549	67,515	22,180	15,455	7,649	0.38	15,455	7,649	0.38	0.38
8	312,342	168,837	55,467	70,420	23,135	0.329	52,783	51,748	14,656	9,163	3,370	0.32	9,163	3,370	0.32	0.32
9	240,504	96,999	27,471	54,224	15,357	0.283	31,295	30,260	6,369	7,056	1,485	0.28	7,056	1,485	0.28	0.28
10	185,188	41,683	10,177	41,752	10,194	0.244	18,555	17,520	4,184	4,183	654	0.24	4,183	654	0.15	0.15
11	142,595	0	0	32,149	0	0.210	14,287	13,252	1,158	2,480	288	0.11	2,480	288	0.11	0.11
12							11,001	7,436	745	1,910	191	0.10	1,910	191	0.10	0.10
13							6,523	5,488	474	1,471	127	0.08	1,471	127	0.08	0.08
14							5,022	3,988	297	872	84	0.07	872	84	0.07	0.07
15							3,867	2,832	182	671	56	0.06	671	56	0.06	0.06
16							2,978	1,943	108	517	37	0.05	517	37	0.05	0.05
17							2,293	1,258	60	398	25	0.04	398	25	0.04	0.04
18							1,766	731	30	307	16	0.04	307	16	0.04	0.04
19							1,359	325	12	236	7	0.03	236	7	0.03	0.03
20							1,047	12	0	182	0	0.03	182	0	0.03	0.03
21							806	0	0		0	0.02		0	0.02	0.02
22																
23																
24																
25																

TOTAL: 4,538,487

1,191,663

1,172,764

265,935

GS EXPENSE: 143505

143505

143505

OL EXPENSE: 1035

1035

1035

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'RITCHIE' COUNTY, WV
YIELD CAP MODEL REPORT FOR - 2017

NR105: 36

ACCOUNT: 1020160017 RESOURCE: OG OWNER: ANTERO RESOURCES CORPORATI LOCATION: ALLSTATE UNIT 2H (10424.1)
STATUS: Z API#: 10017 DATE: 05/15/2014 DAYS: 365 BBLs: 19347.000 MCFS: 749550 RCPTS: 2700774 GMI: 1606278 OWI: 58294
SYSTEM RATES:
CAP RATE: 16.000 DECLINE RATE: 0.460 0.290 0.230 WELLLIFE: 99 EXPENSE: 0.2 175000 175000 17500
RATES USED:
CAP RATE: 16.000 DECLINE RATE: 0.460 0.290 0.230 WELLLIFE: 99 GS EXPENSE: 0.2 175000 175000 17500
SETTLED YEARS: 2 OL EXPENSE: 0.2 5750 5750 575

	GAS WORKING INTEREST			GAS ROYALTY INTEREST			OIL WORKING INTEREST			OIL ROYALTY INTEREST		
	GROSS INCOME	NET INCOME	DISCOUNT INCOME	GROSS INCOME	DISCOUNT INCOME	FACTOR	GROSS INCOME	NET INCOME	DISCOUNT INCOME	GROSS INCOME	DISCOUNT INCOME	FACTOR
1	955,735	827,334	768,161	223,327	207,354	0.928	346,849	345,318	320,620	81,049	75,252	0.92
2	735,916	607,515	486,262	171,962	137,640	0.800	267,074	265,543	212,543	62,407	49,952	0.80
3	566,656	438,254	302,399	132,411	91,365	0.690	205,647	204,116	140,842	48,054	33,157	0.69
4	436,325	307,923	183,164	101,956	60,647	0.595	158,348	156,817	93,280	37,001	22,010	0.59
5	335,970	207,569	106,439	78,506	40,257	0.513	121,928	120,397	61,738	28,491	14,610	0.51
6	258,697	130,296	57,598	60,450	26,722	0.442	93,885	92,354	40,826	21,938	9,698	0.44
7	199,197	70,795	26,979	46,546	17,738	0.381	72,291	70,760	26,966	16,892	6,437	0.38
8	153,381	24,980	8,206	35,841	11,774	0.329	55,864	54,133	17,784	13,007	4,273	0.32
9	118,104	0	0	27,597	0	0.283	42,861	41,330	11,705	10,015	2,836	0.28
10							33,003	31,472	7,684	7,712	1,883	0.24
11							25,413	23,881	5,026	4,572	1,250	0.21
12							19,568	18,037	3,273	3,273	830	0.18
13							15,067	13,536	2,117	3,521	551	0.15
14							11,602	10,071	1,358	2,711	366	0.13
15							8,933	7,402	860	2,087	243	0.11
16							6,879	5,348	536	1,607	161	0.10
17							5,297	3,765	325	1,03	107	0.08
18							4,078	2,547	190	953	71	0.07
19							3,140	1,609	49	734	47	0.06
20							2,418	887	16	565	31	0.05
21							1,862	331	0	435	21	0.04
22							1,434	0	0	335	0	0.04

TOTAL: 1,939,208 593,459 947,842 223,784

GS EXPENSE: 128401 128401 128401

OL EXPENSE: 1531 1531 1531

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'RITCHIE' COUNTY, WV
YIELD CAP MODEL REPORT FOR - 2017

NR105: 37

ACCOUNT:1020160019

RESOURCE:OG OWNER:ANTERO RESOURCES CORPORATI LOCATION:MCCABE UNIT 3H (10423.1)

STATUS:Z API#:10019

DATE:05/21/2014 DAYS:365 BBLs: 21879.000 MCFS: 1196737 RCPTS: 3984541 GWT: 2627573 OMT: 67412:

SYSTEM RATES:

CAP RATE: 16.000 DECLINE RATE: 0.460 0.290 0.230 WELLIFE:99 EXPENSE: 0.2 175000 175000 175000

RATES USED:

CAP RATE: 16.000 DECLINE RATE: 0.460 0.290 0.230 WELLIFE:99 GS EXPENSE: 0.2 175000 175000 175000

SETTLED YEARS: 2

OL EXPENSE:

0.2

5750

5750

575.

	GAS WORKING INTEREST				GAS ROYALTY INTEREST				OIL WORKING INTEREST				OIL ROYALTY INTEREST			
	GROSS INCOME	NET INCOME	DISCOUNT INCOME	FACTO	GROSS INCOME	NET INCOME	DISCOUNT INCOME	FACTO	GROSS INCOME	NET INCOME	DISCOUNT INCOME	FACTO	GROSS INCOME	NET INCOME	DISCOUNT INCOME	FACTO
1	1,563,406	1,424,137	1,322,278	0.928	401,107	399,933	371,328	0.92	82,955	77,022	77,022	0.92	82,955	77,022	77,022	0.92
2	1,203,823	1,064,553	852,080	0.800	308,852	307,678	246,269	0.80	63,875	51,126	51,126	0.80	63,875	51,126	51,126	0.80
3	926,943	787,674	543,502	0.690	237,816	236,642	163,285	0.69	49,184	33,937	33,937	0.69	49,184	33,937	33,937	0.69
4	713,746	574,477	341,720	0.595	183,118	181,944	108,227	0.59	37,872	22,527	22,527	0.59	37,872	22,527	22,527	0.59
5	549,585	410,316	210,405	0.513	141,001	139,827	71,702	0.51	29,161	14,954	14,954	0.51	29,161	14,954	14,954	0.51
6	423,180	283,911	125,506	0.442	108,571	107,397	47,476	0.44	22,454	9,926	9,926	0.44	22,454	9,926	9,926	0.44
7	325,849	186,580	71,103	0.381	83,600	82,426	31,411	0.38	17,290	6,589	6,589	0.38	17,290	6,589	6,589	0.38
8	250,904	111,634	36,674	0.329	64,372	63,198	20,762	0.32	13,313	4,374	4,374	0.32	13,313	4,374	4,374	0.32
9	193,196	53,927	15,272	0.283	49,566	48,392	13,705	0.28	10,251	2,903	2,903	0.28	10,251	2,903	2,903	0.28
10	148,761	9,492	2,317	0.244	38,166	36,992	9,031	0.24	7,893	1,927	1,927	0.24	7,893	1,927	1,927	0.24
11	114,546	0	0	0.210	29,388	28,214	5,938	0.21	6,078	1,279	1,279	0.21	6,078	1,279	1,279	0.21
12					22,629	21,455	3,893	0.18	4,680	849	849	0.18	4,680	849	849	0.18
13					17,424	16,250	2,542	0.15	3,604	564	564	0.15	3,604	564	564	0.15
14					13,417	12,242	1,651	0.13	2,775	374	374	0.13	2,775	374	374	0.13
15					10,331	9,157	1,064	0.11	2,137	248	248	0.11	2,137	248	248	0.11
16					7,955	6,781	679	0.08	1,645	109	109	0.08	1,645	109	109	0.08
17					6,125	4,951	428	0.07	975	73	73	0.07	975	73	73	0.07
18					4,716	3,542	264	0.06	751	48	48	0.06	751	48	48	0.06
19					3,632	2,458	158	0.05	578	32	32	0.05	578	32	32	0.05
20					2,796	1,622	90	0.04	445	21	21	0.04	445	21	21	0.04
21					2,153	979	47	0.04	343	14	14	0.04	343	14	14	0.04
22					1,658	484	20	0.03	264	9	9	0.03	264	9	9	0.03
23					1,277	103	4	0.03	203	0	0	0.03	203	0	0	0.03
24					983	0	0	0.03	0	0	0	0.03	0	0	0	0.03

TOTAL: 3,520,859 878,097 1,099,974 229,072

GS EXPENSE: 139269 139269 139269

OL EXPENSE: 1174 1174 1174

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'RITCHIE' COUNTY, WV
YIELD CAP MODEL REPORT FOR - 2017

NR105: 38

ACCOUNT:1020160045

RESOURCE:OG

OWNER:ANTERO RESOURCES CORPORATION

STATUS: Z API#:10045

DATE:12/27/2014 DAYS:365

BELS: 25310.000 MCFS:

2230032 RCPTS:

6968301 GWT:

4948292 OWT:

SYSTEM RATES:

CAP RATE:

16.000 DECLINE RATE:

0.460

0.290

0.230 WELLLIFE:99

EXPENSE:

0.2

175000

175000

17500

RATES USED:

CAP RATE: 16.000 DECLINE RATE:

0.460

0.290

0.230 WELLLIFE:99

EXPENSE:

0.2

175000

175000

17500

SETTLED YEARS: 2

OL EXPENSE:

0.2

5750

5750

575

	GAS WORKING INTEREST				GAS ROYALTY INTEREST				OIL WORKING INTEREST				OIL ROYALTY INTEREST			
	GROSS INCOME	NET INCOME	DISCOUNT INCOME	FACTO	GROSS INCOME	DISCOUNT INCOME	FACTO		GROSS INCOME	NET INCOME	DISCOUNT INCOME	FACTO	GROSS INCOME	DISCOUNT INCOME	FACTO	
1	2,944,234	2,792,627	2,592,890	647,657	601,335	0.928	454,312	453,543	421,104	99,937	92,789	0.92	92,789	92,789	0.92	
2	2,267,060	2,115,454	1,693,232	498,696	399,162	0.800	349,820	349,051	279,385	76,951	61,593	0.80	61,593	61,593	0.80	
3	1,745,636	1,594,030	1,099,895	383,996	264,961	0.690	269,361	268,593	185,331	59,253	40,885	0.69	40,885	40,885	0.69	
4	1,344,140	1,193,534	709,362	295,677	175,879	0.595	207,408	206,640	122,917	45,624	27,139	0.59	27,139	27,139	0.59	
5	1,034,988	883,381	452,988	227,671	116,747	0.513	159,704	158,936	81,500	35,131	18,015	0.51	18,015	18,015	0.51	
6	796,941	645,334	285,276	175,307	77,496	0.442	122,972	122,204	54,021	27,051	11,958	0.44	11,958	11,958	0.44	
7	613,644	462,038	176,076	134,986	51,441	0.381	94,689	93,920	35,792	16,038	7,938	0.38	7,938	7,938	0.38	
8	472,506	320,900	105,423	80,033	34,146	0.329	72,910	72,142	23,700	12,350	5,269	0.32	5,269	5,269	0.32	
9	363,830	212,223	60,104	61,626	22,666	0.283	56,141	55,372	15,682	7,322	3,498	0.28	3,498	3,498	0.28	
10	280,149	128,543	31,383	47,452	15,046	0.244	43,229	42,460	10,366	5,509	2,322	0.24	2,322	2,322	0.24	
11	215,715	64,108	13,493	36,538	9,987	0.210	33,286	32,517	6,844	3,343	1,541	0.21	1,541	1,541	0.21	
12	166,100	14,494	2,630	28,134	6,629	0.181	25,630	24,862	4,511	2,967	1,023	0.18	1,023	1,023	0.18	
13	127,897	0	0	19,735	15,196	0.156	15,196	14,427	1,945	2,574	451	0.15	451	451	0.15	
14				11,701	9,010		11,701	10,932	1,271	1,982	299	0.11	299	299	0.11	
15				6,938	5,342		6,938	6,169	533	1,526	132	0.08	132	132	0.08	
16				5,342	4,113		5,342	4,573	341	1,175	88	0.07	88	88	0.07	
17				4,113	3,167		4,113	3,345	215	905	58	0.05	58	58	0.05	
18				3,167	2,439		3,167	2,399	133	697	39	0.04	39	39	0.04	
19				2,439	1,878		2,439	1,670	80	536	26	0.04	26	26	0.04	
20				1,878	1,446		1,878	1,109	46	413	17	0.04	17	17	0.04	
21				1,446	1,113		1,446	677	24	345	11	0.03	11	11	0.03	
22				1,113	857		1,113	345	11	189	5	0.02	5	5	0.02	
23				857	660		857	0	0	145	0	0.02	0	0	0.02	
24				660			660									
25																
26																

TOTAL:

7,222,752

1,775,495

1,249,545

275,978

GS EXPENSES: 151606

151606

151606

OL EXPENSE: 769

769

769

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'RITCHIE' COUNTY, WV
YIELD CAP MODEL REPORT FOR - 2017

NR105: 39

ACCOUNT:1020160046

RESOURCE:OG OWNER:ANTERO RESOURCES CORPORATI LOCATION:RUFUS UNIT 1H (10398.1)

STATUS:Z API#:10046

DATE:12/12/2014 DAYS:365

BRS: 24149.000 MCFS: 2349786 RCPTS:

7126580 GWT:

5097506 OWI:

72084

SYSTEM RATES:

CAP RATE: 16.000 DECLINE RATE:

0.460 0.290 0.230 WELLIFE:99

EXPENSE:

0.2

175000

175000

17500

RATES USED:

CAP RATE: 16.000 DECLINE RATE:

0.460 0.290

0.230 WELLIFE:99

GS EXPENSE:

0.2

175000

175000

17500

SETTLED YEARS: 2

OL EXPENSE:

0.2

5750

5750

575

	GAS WORKING INTEREST			GAS ROYALTY INTEREST			OIL WORKING INTEREST			OIL ROYALTY INTEREST		
	GROSS INCOME	NET INCOME	DISCOUNT INCOME	GROSS INCOME	DISCOUNT INCOME	FACTOR	GROSS INCOME	NET INCOME	DISCOUNT INCOME	GROSS INCOME	DISCOUNT INCOME	FACTOR
1	3,033,016	2,879,698	2,673,734	681,933	633,159	0.928	428,927	428,215	397,588	96,439	89,541	0.92
2	2,335,422	2,182,104	1,746,580	525,088	420,287	0.800	330,274	329,562	263,785	74,258	59,437	0.80
3	1,798,275	1,644,957	1,135,035	404,318	278,983	0.690	254,311	253,599	174,985	57,179	39,454	0.69
4	1,384,672	1,231,354	732,454	311,325	185,187	0.595	195,819	195,107	116,057	44,027	26,189	0.59
5	1,066,197	912,879	468,115	239,720	122,926	0.513	150,781	150,069	76,953	33,901	17,384	0.51
6	820,972	667,654	295,143	184,585	81,597	0.442	116,101	115,389	51,009	26,104	11,539	0.44
7	632,148	478,831	182,476	142,130	54,164	0.381	89,398	88,686	33,797	20,100	7,660	0.38
8	486,754	333,436	109,541	109,440	35,954	0.329	68,836	68,124	22,380	15,477	5,085	0.32
9	374,801	221,483	62,726	84,269	23,866	0.283	53,004	52,292	14,809	11,917	3,375	0.28
10	288,597	135,279	33,028	64,887	15,842	0.244	40,813	40,101	6,464	9,176	2,240	0.24
11	222,219	68,902	14,502	49,963	10,516	0.210	31,426	30,714	4,261	7,066	1,987	0.21
12	171,109	17,791	3,228	38,472	6,980	0.181	24,198	23,486	4,261	5,441	1,270	0.18
13	131,754	0	0	29,623	0	0.156	18,633	17,920	2,803	4,189	655	0.15
14							14,347	13,635	1,803	3,226	435	0.13
15							11,047	10,335	1,201	2,484	289	0.11
16							8,506	7,794	781	1,913	192	0.10
17							6,550	5,837	504	1,473	127	0.08
18							5,043	4,331	323	1,134	84	0.07
19							3,883	3,171	204	873	56	0.06
20							2,990	2,278	126	672	37	0.05
21							2,302	1,590	76	518	25	0.04
22							1,773	1,061	44	399	16	0.04
23							1,365	653	23	307	11	0.03
24							1,051	339	10	236	7	0.03
25							809	97	3	182	5	0.02
26							623	0	0	140	0	0.02

TOTAL: 7,456,561

1,869,460

1,179,815

266,318

GS EXPENSE: 153318

153318

153318

OL EXPENSE: 712

712

712

NR105: 40

175000

	GAS WORKING INTEREST	GAS ROYALTY INTEREST	OIL WORKING INTEREST	OIL ROYALTY INTEREST
	GROSS INCOME	NET DISCOUNT	GROSS INCOME	GROSS DISCOUNT
1	1,272,408	1,127,081	1,046,469	282,849
2	979,754	834,427	667,885	217,794
3	754,411	609,084	420,273	167,701
4	580,896	435,569	259,092	129,130
5	447,290	301,963	154,843	99,086
6	344,413	199,086	88,008	76,561
7	265,198	119,871	45,681	58,952
8	204,203	58,875	19,342	45,393
9	157,236	11,909	3,373	14,913
10	121,072	0	0	9,899
11				0.283
12				0.244
13				0.228
14				0.214
15				0.200
16				0.186
17				0.172
18				0.158
19				0.144
20				0.130
21				0.116
22				0.102
23				0.088
TOTAL:	2,704,966	761,579	711,067	159,468
GAS EXPENSE:	145327	145327	145327	145327
OIL EXPENSE:	975	975	975	975

FEB 13, 2017
10:16 AM

'RITCHIE' COUNTY, WV
YIELD CAP MODEL REPORT FOR - 2017

NR105: 41

ACCOUNT:1020169999

RESOURCE:OG

OWNER:ANTERO RESOURCES CORPORATION

STATUS:Z AP#H:09999

DATE:07/14/2014 DAYS:365

BBLS: 28459.000 MCPS:

1457707 RCPTS:

5179211 GWT:

3321618 ONI:

84215:

SYSTEM RATES:

CAP RATE: 16.000 DECLINE RATE: 0.460

0.290

0.230 WELLIFE:99

EXPENSE:

0.2

175000

175000

175000

RATES USED:

CAP RATE: 16.000 DECLINE RATE: 0.460

0.290

0.230 WELLIFE:99

EXPENSE:

0.2

175000

175000

175000

SETTLED YEARS: 2

OL EXPENSE:

0.2

5750

5750

5750

	GAS WORKING INTEREST				GAS ROYALTY INTEREST				OIL WORKING INTEREST				OIL ROYALTY INTEREST			
	GROSS INCOME	NET INCOME	DISCOUNT INCOME	FACTOR	GROSS INCOME	NET INCOME	DISCOUNT INCOME	FACTOR	GROSS INCOME	NET INCOME	DISCOUNT INCOME	FACTOR	GROSS INCOME	NET INCOME	DISCOUNT INCOME	FACTOR
1	1,976,363	1,836,758	1,705,387	0.928	481,986	447,513	0.928	501,081	499,918	464,162	122,201	113,461	0.926	94,095	75,315	0.800
2	1,521,799	1,382,194	1,106,324	0.800	371,129	297,056	0.800	385,832	384,669	307,894	94,095	75,315	0.800	94,095	75,315	0.800
3	1,171,785	1,032,180	712,214	0.690	285,769	197,183	0.690	297,091	295,928	204,193	72,453	49,993	0.690	55,789	33,185	0.595
4	902,275	762,670	453,663	0.513	220,042	130,889	0.513	228,760	227,597	135,383	55,789	33,185	0.595	42,957	22,028	0.513
5	694,752	555,147	284,673	0.442	169,433	86,883	0.442	176,145	174,982	89,729	42,957	22,028	0.513	33,077	14,622	0.442
6	534,959	395,354	174,770	0.329	130,463	57,673	0.329	135,637	134,469	59,443	25,469	9,706	0.381	9,706	0.381	0.381
7	411,918	272,313	103,775	0.283	100,457	38,283	0.283	104,437	103,274	39,356	19,611	4,277	0.283	11,628	1,884	0.210
8	317,177	177,572	58,336	0.244	77,352	25,412	0.244	80,416	79,253	26,036	15,101	4,277	0.283	8,953	1,884	0.210
9	244,226	104,621	29,630	0.210	59,561	16,868	0.210	61,920	60,757	17,207	11,357	1,884	0.210	8,953	1,884	0.210
10	188,054	48,449	11,829	0.181	45,862	11,197	0.181	47,679	46,516	11,357	11,628	1,884	0.210	8,953	1,884	0.210
11	144,802	5,197	1,094	0.181	35,314	7,432	0.181	36,713	35,550	11,357	11,628	1,884	0.210	8,953	1,884	0.210
12	111,497	0	0	0.181	27,191	0	0.181	28,269	27,106	11,357	11,628	1,884	0.210	8,953	1,884	0.210
13								21,767	20,604	4,918	6,894	1,251	0.181	5,308	1,251	0.181
14								16,761	15,598	3,223	4,087	830	0.156	3,666	830	0.156
15								12,906	11,743	2,103	3,147	551	0.135	2,423	551	0.135
16								9,937	8,774	1,365	2,423	366	0.116	1,852	366	0.116
17								7,652	6,489	879	1,852	243	0.100	1,437	243	0.100
18								5,892	4,729	561	1,437	161	0.086	1,077	161	0.086
19								4,537	3,374	352	1,077	107	0.074	71	107	0.074
20								3,493	2,330	217	73	47	0.055	31	47	0.055
21								2,690	1,527	129	37	21	0.048	14	21	0.048
22								2,071	908	73	37	14	0.035	9	14	0.035
23								1,595	432	15	2	9	0.031	0	9	0.031
24								1,228	65	2	0	0	0.026	0	0	0.026
25								946	0	0	231	0	0.026	0	0	0.026

TOTAL: 4,641,695 1,316,388 1,376,116 337,455

GS EXPENSE: 139605 139605 139605
OL EXPENSE: 1163 1163 1163

NATURAL OIL/GAS APPRAISAL - PLUMB WELL (Year 1)										
DECLINE RATES		2015	GAS INCOME		OIL INCOME		GAS CAP INCOME		OIL CAP INCOME	
YR 1	45%	WK INT	\$ 4,807,838	\$ 473,738	YR1	\$ 1,820,138	\$ 288,127			
YR 2	25%	ROY INT	\$ 1,013,830	\$ 148,204	YR2	\$ 450,384	\$ 88,841			
YR3+	23%				YR3	\$ 1,348,908	\$ 198,938			
						\$ 298,254	\$ 43,520			
\$ 4,721,174			TY2017 WORKING INTEREST				TY2017 ROYALTY INTEREST \$ 1,213,532			
YEAR	WK INT INCOME	WORKING COST	NET INC	PRCT FCTR(16.0%)	DIS INC	YEAR	ROY INT INCOME	PRCT FCTR(16.0%)	DIS INC	
1	\$ 2,086,262	\$ 153,410	\$ 1,932,852	0.928477	\$ 1,794,608	1	\$ 458,925	0.628477	\$ 426,101	
2	\$ 1,643,834	\$ 153,410	\$ 1,390,424	0.800411	\$ 1,112,910	2	\$ 339,804	0.800411	\$ 271,823	
3	\$ 1,188,752	\$ 153,410	\$ 1,035,342	0.690009	\$ 714,385	3	\$ 261,495	0.690009	\$ 180,434	
4	\$ 915,339	\$ 153,410	\$ 761,929	0.594838	\$ 453,223	4	\$ 201,351	0.594838	\$ 118,771	
5	\$ 704,811	\$ 153,410	\$ 551,401	0.512789	\$ 282,752	5	\$ 155,041	0.512789	\$ 79,509	
6	\$ 542,708	\$ 153,410	\$ 389,298	0.442080	\$ 172,091	6	\$ 116,381	0.442080	\$ 52,774	
7	\$ 417,883	\$ 153,410	\$ 264,472	0.381088	\$ 100,787	7	\$ 81,924	0.381088	\$ 35,031	
8	\$ 321,770	\$ 153,410	\$ 168,360	0.328522	\$ 56,310	8	\$ 70,781	0.328522	\$ 23,253	
9	\$ 247,783	\$ 153,410	\$ 94,352	0.283209	\$ 26,721	9	\$ 54,501	0.283209	\$ 15,435	
10	\$ 190,777	\$ 153,410	\$ 37,367	0.224148	\$ 8,376	10	\$ 41,968	0.224148	\$ 9,407	
11	\$ 148,896	\$ 153,410	\$ -	0.210470	\$ -	11	\$ 32,314	0.210470	\$ -	
12	\$ 113,112	\$ 153,410	\$ -	0.181440	\$ -	12	\$ 24,882	0.181440	\$ -	
13	\$ 87,086	\$ 153,410	\$ -	0.156414	\$ -	13	\$ 19,189	0.156414	\$ -	
14	\$ 87,084	\$ 153,410	\$ -	0.134840	\$ -	14	\$ 14,752	0.134840	\$ -	
15	\$ 51,839	\$ 153,410	\$ -	0.116241	\$ -	15	\$ 11,359	0.116241	\$ -	
16	\$ 39,782	\$ 153,410	\$ -	0.100208	\$ -	16	\$ 8,747	0.100208	\$ -	
17	\$ 30,617	\$ 153,410	\$ -	0.088388	\$ -	17	\$ 6,788	0.088388	\$ -	
18	\$ 23,576	\$ 153,410	\$ -	0.074471	\$ -	18	\$ 5,196	0.074471	\$ -	
19	\$ 18,153	\$ 153,410	\$ -	0.064199	\$ -	19	\$ 3,993	0.064199	\$ -	
20	\$ 13,976	\$ 153,410	\$ -	0.056344	\$ -	20	\$ 3,078	0.056344	\$ -	
21	\$ 10,783	\$ 153,410	\$ -	0.047710	\$ -	21	\$ 2,368	0.047710	\$ -	
22	\$ 8,267	\$ 153,410	\$ -	0.041129	\$ -	22	\$ 1,823	0.041129	\$ -	
23	\$ 6,361	\$ 153,410	\$ -	0.035456	\$ -	23	\$ 1,404	0.035456	\$ -	
24	\$ 4,914	\$ 153,410	\$ -	0.030568	\$ -	24	\$ 1,061	0.030568	\$ -	
25	\$ 3,783	\$ 153,410	\$ -	0.026350	\$ -	25	\$ 832	0.026350	\$ -	
26	\$ 2,913	\$ 153,410	\$ -	0.022715	\$ -	26	\$ 641	0.022715	\$ -	
27	\$ 2,243	\$ 153,410	\$ -	0.019582	\$ -	27	\$ 498	0.019582	\$ -	
28	\$ 1,727	\$ 153,410	\$ -	0.016881	\$ -	28	\$ 380	0.016881	\$ -	
29	\$ 1,330	\$ 153,410	\$ -	0.014553	\$ -	29	\$ 293	0.014553	\$ -	
30	\$ 1,024	\$ 153,410	\$ -	0.012548	\$ -	30	\$ 226	0.012548	\$ -	
31	\$ 789	\$ 153,410	\$ -	0.010815	\$ -	31	\$ 173	0.010815	\$ -	
32	\$ 607	\$ 153,410	\$ -	0.009323	\$ -	32	\$ 134	0.009323	\$ -	
33	\$ 486	\$ 153,410	\$ -	0.008037	\$ -	33	\$ 103	0.008037	\$ -	
34	\$ 380	\$ 153,410	\$ -	0.006929	\$ -	34	\$ 78	0.006929	\$ -	
35	\$ 277	\$ 153,410	\$ -	0.005973	\$ -	35	\$ 61	0.005973	\$ -	
36	\$ 213	\$ 153,410	\$ -	0.005149	\$ -	36	\$ 47	0.005149	\$ -	
37	\$ 164	\$ 153,410	\$ -	0.004439	\$ -	37	\$ 38	0.004439	\$ -	
38	\$ 127	\$ 153,410	\$ -	0.003827	\$ -	38	\$ 28	0.003827	\$ -	
39	\$ 97	\$ 153,410	\$ -	0.003299	\$ -	39	\$ 21	0.003299	\$ -	
40	\$ 75	\$ 153,410	\$ -	0.002844	\$ -	40	\$ 17	0.002844	\$ -	
WORKING INTEREST APPRAISAL					\$ 4,721,174	ROYALTY INTEREST APPRAISAL \$ 1,213,532				

43-1020170044

NATURAL OIL/GAS APPRAISAL - FLUSH WELL (Year 1)									
		2016	GAS INCOME	CR. INCOME			GAS CAP INCOME	CR. CAP INCOME	
DECLINE RATES		WRK INT	\$ 1,134,997	\$ 217,448	YR1	\$ 1,237,933	\$ 28,942		
YR1	48%	ROY INT	\$ 187,423	\$ 48,398		\$ 281,674	\$ 18,228		
YR2	23%				YR2	\$ 916,979	\$ 23,578		
YR3+	23%					\$ 188,084	\$ 12,588		
\$ 2,652,098		TY2017 WORKING INTEREST				TY2017 ROYALTY INTEREST			
									\$ 739,317
YEAR	WRK INT INCOME	WORKING COST	NET INC	PRCT FCTR(16.0%)	DIS INC	YEAR	ROY INT INCOME	PRCT FCTR(16.0%)	DIS INC
1	\$ 1,323,980	\$ 184,000	\$ 1,159,979	0.928477	\$ 1,077,014	1	\$ 281,958	0.928477	\$ 261,791
2	\$ 979,745	\$ 184,000	\$ 815,745	0.800411	\$ 652,931	2	\$ 208,849	0.800411	\$ 167,005
3	\$ 784,404	\$ 184,000	\$ 590,403	0.690009	\$ 407,384	3	\$ 180,980	0.690009	\$ 110,857
4	\$ 580,881	\$ 184,000	\$ 418,880	0.594836	\$ 247,981	4	\$ 123,708	0.594836	\$ 73,588
5	\$ 447,286	\$ 184,000	\$ 283,286	0.512789	\$ 145,286	5	\$ 95,255	0.512789	\$ 48,848
6	\$ 344,410	\$ 184,000	\$ 180,410	0.442080	\$ 79,752	6	\$ 73,348	0.442080	\$ 32,423
7	\$ 285,198	\$ 184,000	\$ 101,198	0.381086	\$ 38,584	7	\$ 68,477	0.381086	\$ 21,522
8	\$ 204,201	\$ 184,000	\$ 40,200	0.328522	\$ 13,207	8	\$ 43,487	0.328522	\$ 14,288
9	\$ 157,235	\$ 184,000	\$ -	0.283209	\$ -	9	\$ 33,485	0.283209	\$ -
10	\$ 121,071	\$ 184,000	\$ -	0.224148	\$ -	10	\$ 26,783	0.224148	\$ -
11	\$ 93,224	\$ 184,000	\$ -	0.210470	\$ -	11	\$ 19,859	0.210470	\$ -
12	\$ 71,783	\$ 184,000	\$ -	0.181440	\$ -	12	\$ 15,287	0.181440	\$ -
13	\$ 55,273	\$ 184,000	\$ -	0.158414	\$ -	13	\$ 11,771	0.158414	\$ -
14	\$ 42,580	\$ 184,000	\$ -	0.134840	\$ -	14	\$ 9,084	0.134840	\$ -
15	\$ 32,771	\$ 184,000	\$ -	0.118241	\$ -	15	\$ 8,978	0.118241	\$ -
16	\$ 25,234	\$ 184,000	\$ -	0.100208	\$ -	16	\$ 5,374	0.100208	\$ -
17	\$ 19,430	\$ 184,000	\$ -	0.088386	\$ -	17	\$ 4,138	0.088386	\$ -
18	\$ 14,981	\$ 184,000	\$ -	0.074471	\$ -	18	\$ 3,185	0.074471	\$ -
19	\$ 11,520	\$ 184,000	\$ -	0.064199	\$ -	19	\$ 2,453	0.064199	\$ -
20	\$ 8,870	\$ 184,000	\$ -	0.055344	\$ -	20	\$ 1,888	0.055344	\$ -
21	\$ 6,830	\$ 184,000	\$ -	0.047710	\$ -	21	\$ 1,455	0.047710	\$ -
22	\$ 5,259	\$ 184,000	\$ -	0.041129	\$ -	22	\$ 1,120	0.041129	\$ -
23	\$ 4,050	\$ 184,000	\$ -	0.035456	\$ -	23	\$ 882	0.035456	\$ -
24	\$ 3,118	\$ 184,000	\$ -	0.030588	\$ -	24	\$ 664	0.030588	\$ -
25	\$ 2,401	\$ 184,000	\$ -	0.026350	\$ -	25	\$ 511	0.026350	\$ -
26	\$ 1,849	\$ 184,000	\$ -	0.022715	\$ -	26	\$ 394	0.022715	\$ -
27	\$ 1,424	\$ 184,000	\$ -	0.019682	\$ -	27	\$ 302	0.019682	\$ -
28	\$ 1,096	\$ 184,000	\$ -	0.016881	\$ -	28	\$ 233	0.016881	\$ -
29	\$ 844	\$ 184,000	\$ -	0.014553	\$ -	29	\$ 180	0.014553	\$ -
30	\$ 650	\$ 184,000	\$ -	0.012546	\$ -	30	\$ 138	0.012546	\$ -
31	\$ 500	\$ 184,000	\$ -	0.010815	\$ -	31	\$ 107	0.010815	\$ -
32	\$ 385	\$ 184,000	\$ -	0.009323	\$ -	32	\$ 82	0.009323	\$ -
33	\$ 297	\$ 184,000	\$ -	0.008037	\$ -	33	\$ 63	0.008037	\$ -
34	\$ 228	\$ 184,000	\$ -	0.006929	\$ -	34	\$ 49	0.006929	\$ -
35	\$ 178	\$ 184,000	\$ -	0.005973	\$ -	35	\$ 37	0.005973	\$ -
36	\$ 135	\$ 184,000	\$ -	0.005149	\$ -	36	\$ 29	0.005149	\$ -
37	\$ 104	\$ 184,000	\$ -	0.004439	\$ -	37	\$ 22	0.004439	\$ -
38	\$ 80	\$ 184,000	\$ -	0.003827	\$ -	38	\$ 17	0.003827	\$ -
39	\$ 62	\$ 184,000	\$ -	0.003299	\$ -	39	\$ 13	0.003299	\$ -
40	\$ 48	\$ 184,000	\$ -	0.002844	\$ -	40	\$ 10	0.002844	\$ -
WORKING INTEREST APPRAISAL					\$ 2,652,098	ROYALTY INTEREST APPRAISAL			

43-1020170102

NATURAL GAS APPRAISAL - PLUSH WELL (Year 1)									
DECLINE RATES		2018		GAS INCOME		OIL INCOME		GAS CAP INCOME	
YR 1	48%	WKK INT	\$ 2,488,508	\$ 148,321	YR1	\$ 482,989	\$ 148,724		
YR 2	28%	ROY INT	\$ 555,927	\$ 78,358	YR2	\$ 304,133	\$ 31,924		
YR3+	23%					\$ 727,388	\$ 107,536		
						\$ 154,905	\$ 22,165		
\$ 2,207,018		TY2017 WORKING INTEREST				TY2017 ROYALTY INTEREST			
YEAR	WKK INT INCOME	WORKING COST	NET INC	PRCT FCTR(18.0%)	DIS INC	YEAR	ROY INT INCOME	PRCT FCTR(18.0%)	DIS INC
1	\$ 1,128,682	\$ 153,148	\$ 975,534	0.928477	\$ 905,781	1	\$ 240,387	0.928477	\$ 223,176
2	\$ 835,226	\$ 153,148	\$ 682,077	0.800411	\$ 545,942	2	\$ 177,871	0.800411	\$ 142,370
3	\$ 643,123	\$ 153,148	\$ 489,975	0.690009	\$ 338,087	3	\$ 136,981	0.690009	\$ 94,504
4	\$ 496,205	\$ 153,148	\$ 342,957	0.594836	\$ 203,468	4	\$ 105,460	0.594836	\$ 62,731
5	\$ 381,308	\$ 153,148	\$ 228,160	0.512789	\$ 118,988	5	\$ 81,204	0.512789	\$ 41,841
6	\$ 293,807	\$ 153,148	\$ 140,659	0.442060	\$ 62,091	6	\$ 62,527	0.442060	\$ 27,641
7	\$ 228,077	\$ 153,148	\$ 72,929	0.381086	\$ 27,792	7	\$ 48,146	0.381086	\$ 16,348
8	\$ 174,080	\$ 153,148	\$ 20,931	0.328522	\$ 6,875	8	\$ 37,072	0.328522	\$ 12,179
9	\$ 134,041	\$ 153,148	\$ -	0.283209	\$ -	9	\$ 28,548	0.283209	\$ -
10	\$ 103,212	\$ 153,148	\$ -	0.224148	\$ -	10	\$ 21,980	0.224148	\$ -
11	\$ 79,473	\$ 153,148	\$ -	0.210470	\$ -	11	\$ 16,925	0.210470	\$ -
12	\$ 61,194	\$ 153,148	\$ -	0.181440	\$ -	12	\$ 13,032	0.181440	\$ -
13	\$ 47,120	\$ 153,148	\$ -	0.158414	\$ -	13	\$ 10,035	0.158414	\$ -
14	\$ 36,282	\$ 153,148	\$ -	0.134840	\$ -	14	\$ 7,727	0.134840	\$ -
15	\$ 27,937	\$ 153,148	\$ -	0.118241	\$ -	15	\$ 5,950	0.118241	\$ -
16	\$ 21,512	\$ 153,148	\$ -	0.100208	\$ -	16	\$ 4,581	0.100208	\$ -
17	\$ 16,584	\$ 153,148	\$ -	0.088386	\$ -	17	\$ 3,527	0.088386	\$ -
18	\$ 12,754	\$ 153,148	\$ -	0.074471	\$ -	18	\$ 2,718	0.074471	\$ -
19	\$ 9,821	\$ 153,148	\$ -	0.064199	\$ -	19	\$ 2,091	0.064199	\$ -
20	\$ 7,582	\$ 153,148	\$ -	0.055344	\$ -	20	\$ 1,810	0.055344	\$ -
21	\$ 5,823	\$ 153,148	\$ -	0.047710	\$ -	21	\$ 1,240	0.047710	\$ -
22	\$ 4,484	\$ 153,148	\$ -	0.041129	\$ -	22	\$ 955	0.041129	\$ -
23	\$ 3,452	\$ 153,148	\$ -	0.036456	\$ -	23	\$ 735	0.036456	\$ -
24	\$ 2,658	\$ 153,148	\$ -	0.030588	\$ -	24	\$ 568	0.030588	\$ -
25	\$ 2,047	\$ 153,148	\$ -	0.026350	\$ -	25	\$ 436	0.026350	\$ -
26	\$ 1,576	\$ 153,148	\$ -	0.022715	\$ -	26	\$ 338	0.022715	\$ -
27	\$ 1,214	\$ 153,148	\$ -	0.018582	\$ -	27	\$ 258	0.018582	\$ -
28	\$ 934	\$ 153,148	\$ -	0.016881	\$ -	28	\$ 199	0.016881	\$ -
29	\$ 720	\$ 153,148	\$ -	0.014553	\$ -	29	\$ 153	0.014553	\$ -
30	\$ 564	\$ 153,148	\$ -	0.012548	\$ -	30	\$ 116	0.012548	\$ -
31	\$ 427	\$ 153,148	\$ -	0.010815	\$ -	31	\$ 91	0.010815	\$ -
32	\$ 328	\$ 153,148	\$ -	0.009323	\$ -	32	\$ 70	0.009323	\$ -
33	\$ 253	\$ 153,148	\$ -	0.008097	\$ -	33	\$ 54	0.008097	\$ -
34	\$ 195	\$ 153,148	\$ -	0.006926	\$ -	34	\$ 41	0.006926	\$ -
35	\$ 150	\$ 153,148	\$ -	0.005973	\$ -	35	\$ 32	0.005973	\$ -
36	\$ 115	\$ 153,148	\$ -	0.005149	\$ -	36	\$ 25	0.005149	\$ -
37	\$ 89	\$ 153,148	\$ -	0.004439	\$ -	37	\$ 19	0.004439	\$ -
38	\$ 68	\$ 153,148	\$ -	0.003827	\$ -	38	\$ 15	0.003827	\$ -
39	\$ 53	\$ 153,148	\$ -	0.003299	\$ -	39	\$ 11	0.003299	\$ -
40	\$ 41	\$ 153,148	\$ -	0.002844	\$ -	40	\$ 9	0.002812	\$ -
WORKING INTEREST APPRAISAL				\$ 2,207,018	ROYALTY INTEREST APPRAISAL				\$ 822,589

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NATURAL OIL/GAS APPRAISAL - FLUSH WELL (Year 1)									
		2016		GAS INCOME		OIL INCOME		GAS CAP EXCISE	
DECLINE RATES		WVK INT		\$ 2,326,888	\$	127,633		YR1 \$ 839,148	\$ 40,418
YR 1	48%	ROY INT		\$ 448,801	\$	22,639		YR2 \$ 738,339	\$ 37,301
YR 2	29%								
YR3	23%								
\$ 1,937,928		TY2017 WORKING INTEREST				TY2017 ROYALTY INTEREST			
YEAR	WVK INT INCOME	WORKING COST	NET INC	PRCT FCTR(16.0%)	DIS INC	YEAR	ROY INT INCOME	PRCT FCTR(16.0%)	DIS INC
1	\$ 1,049,583	\$ 166,862	\$ 881,701	0.928477	\$ 818,639	1	\$ 185,961	0.928477	\$ 172,679
2	\$ 776,937	\$ 166,862	\$ 609,075	0.800411	\$ 487,610	2	\$ 137,626	0.800411	\$ 110,168
3	\$ 697,471	\$ 166,862	\$ 430,609	0.690009	\$ 297,124	3	\$ 105,972	0.690009	\$ 73,122
4	\$ 460,053	\$ 166,862	\$ 293,191	0.694836	\$ 174,400	4	\$ 81,599	0.694836	\$ 48,638
5	\$ 354,241	\$ 166,862	\$ 187,376	0.612789	\$ 98,088	5	\$ 82,831	0.612789	\$ 32,219
6	\$ 272,766	\$ 166,862	\$ 105,003	0.442060	\$ 46,616	6	\$ 48,380	0.442060	\$ 21,387
7	\$ 210,029	\$ 166,862	\$ 43,167	0.381086	\$ 16,450	7	\$ 37,252	0.381086	\$ 14,198
8	\$ 181,723	\$ 166,862	\$ -	0.328522	\$ -	8	\$ 28,664	0.328522	\$ -
9	\$ 124,528	\$ 166,862	\$ -	0.283209	\$ -	9	\$ 22,087	0.283209	\$ -
10	\$ 95,666	\$ 166,862	\$ -	0.224146	\$ -	10	\$ 17,007	0.224146	\$ -
11	\$ 73,832	\$ 166,862	\$ -	0.210470	\$ -	11	\$ 13,095	0.210470	\$ -
12	\$ 68,850	\$ 166,862	\$ -	0.181440	\$ -	12	\$ 10,083	0.181440	\$ -
13	\$ 43,778	\$ 166,862	\$ -	0.156414	\$ -	13	\$ 7,784	0.156414	\$ -
14	\$ 33,707	\$ 166,862	\$ -	0.134840	\$ -	14	\$ 6,278	0.134840	\$ -
15	\$ 26,954	\$ 166,862	\$ -	0.116241	\$ -	15	\$ 4,603	0.116241	\$ -
16	\$ 19,985	\$ 166,862	\$ -	0.100208	\$ -	16	\$ 3,545	0.100208	\$ -
17	\$ 16,366	\$ 166,862	\$ -	0.086388	\$ -	17	\$ 2,728	0.086388	\$ -
18	\$ 11,849	\$ 166,862	\$ -	0.074471	\$ -	18	\$ 2,102	0.074471	\$ -
19	\$ 9,124	\$ 166,862	\$ -	0.064199	\$ -	19	\$ 1,816	0.064199	\$ -
20	\$ 7,025	\$ 166,862	\$ -	0.056344	\$ -	20	\$ 1,240	0.056344	\$ -
21	\$ 5,409	\$ 166,862	\$ -	0.047710	\$ -	21	\$ 959	0.047710	\$ -
22	\$ 4,185	\$ 166,862	\$ -	0.041129	\$ -	22	\$ 739	0.041129	\$ -
23	\$ 3,207	\$ 166,862	\$ -	0.035456	\$ -	23	\$ 589	0.035456	\$ -
24	\$ 2,470	\$ 166,862	\$ -	0.030568	\$ -	24	\$ 438	0.030568	\$ -
25	\$ 1,902	\$ 166,862	\$ -	0.025950	\$ -	25	\$ 337	0.025950	\$ -
26	\$ 1,484	\$ 166,862	\$ -	0.022716	\$ -	26	\$ 280	0.022716	\$ -
27	\$ 1,127	\$ 166,862	\$ -	0.019582	\$ -	27	\$ 200	0.019582	\$ -
28	\$ 858	\$ 166,862	\$ -	0.016881	\$ -	28	\$ 154	0.016881	\$ -
29	\$ 868	\$ 166,862	\$ -	0.014553	\$ -	29	\$ 119	0.014553	\$ -
30	\$ 516	\$ 166,862	\$ -	0.012546	\$ -	30	\$ 91	0.012546	\$ -
31	\$ 398	\$ 166,862	\$ -	0.010816	\$ -	31	\$ 70	0.010816	\$ -
32	\$ 306	\$ 166,862	\$ -	0.009323	\$ -	32	\$ 54	0.009323	\$ -
33	\$ 235	\$ 166,862	\$ -	0.008037	\$ -	33	\$ 42	0.008037	\$ -
34	\$ 181	\$ 166,862	\$ -	0.006929	\$ -	34	\$ 32	0.006929	\$ -
35	\$ 139	\$ 166,862	\$ -	0.005973	\$ -	35	\$ 25	0.005973	\$ -
36	\$ 107	\$ 166,862	\$ -	0.005149	\$ -	36	\$ 19	0.005149	\$ -
37	\$ 83	\$ 166,862	\$ -	0.004439	\$ -	37	\$ 16	0.004439	\$ -
38	\$ 64	\$ 166,862	\$ -	0.003827	\$ -	38	\$ 11	0.003827	\$ -
39	\$ 49	\$ 166,862	\$ -	0.003299	\$ -	39	\$ 9	0.003299	\$ -
40	\$ 33	\$ 166,862	\$ -	0.002844	\$ -	40	\$ 7	0.002844	\$ -
WORKING INTEREST APPRAISAL					\$ 1,937,928	ROYALTY INTEREST APPRAISAL			

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NATURAL GAS APPRAISAL - PLUMB WELL (Yr 1)									
DECLINE RATES		2018		GAS INCOME		OIL INCOME		GAS CAP INCOME	
YR 1	48%	WKB INT	\$	2,427,748	\$	118,743	YR1	\$	458,948
YR 2	28%	ROY INT	\$	458,804	\$	28,708	YR2	\$	170,288
YR3+	23%							\$	789,831
								\$	123,868
\$ 1,824,388		172017 WORKING INTEREST		172017 ROYALTY INTEREST				\$ 482,709	
YEAR	WKB INT INCOME	WORKING COST	NET INC	PRCT PCTR(18.0%)	DIS INC	YEAR	ROY INT INCOME	PRCT PCTR(18.0%)	DIS INC
1	\$ 1,008,073	\$ 167,235	\$ 837,838	0.928477	\$ 777,913	1	\$ 178,287	0.928477	\$ 165,617
2	\$ 743,754	\$ 167,235	\$ 576,519	0.800411	\$ 481,462	2	\$ 131,918	0.800411	\$ 105,589
3	\$ 572,890	\$ 167,235	\$ 405,655	0.690009	\$ 279,788	3	\$ 101,577	0.690009	\$ 70,089
4	\$ 440,972	\$ 167,235	\$ 273,737	0.594836	\$ 182,828	4	\$ 78,214	0.594836	\$ 48,625
5	\$ 339,648	\$ 167,235	\$ 172,413	0.512789	\$ 88,360	5	\$ 60,226	0.512789	\$ 30,883
6	\$ 261,452	\$ 167,235	\$ 94,217	0.442080	\$ 41,850	6	\$ 48,373	0.442080	\$ 20,500
7	\$ 201,318	\$ 167,235	\$ 34,083	0.381088	\$ 12,989	7	\$ 35,707	0.381088	\$ 13,808
8	\$ 155,018	\$ 167,235	\$ -	0.328522	\$ -	8	\$ 27,485	0.328522	\$ -
9	\$ 119,382	\$ 167,235	\$ -	0.283209	\$ -	9	\$ 21,171	0.283209	\$ -
10	\$ 91,908	\$ 167,235	\$ -	0.224148	\$ -	10	\$ 16,302	0.224148	\$ -
11	\$ 70,766	\$ 167,235	\$ -	0.210470	\$ -	11	\$ 12,552	0.210470	\$ -
12	\$ 54,492	\$ 167,235	\$ -	0.181440	\$ -	12	\$ 9,885	0.181440	\$ -
13	\$ 41,958	\$ 167,235	\$ -	0.158414	\$ -	13	\$ 7,442	0.158414	\$ -
14	\$ 32,309	\$ 167,235	\$ -	0.134840	\$ -	14	\$ 5,730	0.134840	\$ -
15	\$ 24,876	\$ 167,235	\$ -	0.116241	\$ -	15	\$ 4,412	0.116241	\$ -
16	\$ 19,158	\$ 167,235	\$ -	0.100208	\$ -	16	\$ 3,398	0.100208	\$ -
17	\$ 14,750	\$ 167,235	\$ -	0.088386	\$ -	17	\$ 2,618	0.088386	\$ -
18	\$ 11,357	\$ 167,235	\$ -	0.074471	\$ -	18	\$ 2,014	0.074471	\$ -
19	\$ 8,748	\$ 167,235	\$ -	0.064199	\$ -	19	\$ 1,551	0.064199	\$ -
20	\$ 6,734	\$ 167,235	\$ -	0.055344	\$ -	20	\$ 1,194	0.055344	\$ -
21	\$ 5,185	\$ 167,235	\$ -	0.047710	\$ -	21	\$ 920	0.047710	\$ -
22	\$ 3,892	\$ 167,235	\$ -	0.041129	\$ -	22	\$ 708	0.041129	\$ -
23	\$ 3,074	\$ 167,235	\$ -	0.035458	\$ -	23	\$ 545	0.035458	\$ -
24	\$ 2,387	\$ 167,235	\$ -	0.030588	\$ -	24	\$ 420	0.030588	\$ -
25	\$ 1,823	\$ 167,235	\$ -	0.026350	\$ -	25	\$ 323	0.026350	\$ -
26	\$ 1,403	\$ 167,235	\$ -	0.022715	\$ -	26	\$ 249	0.022715	\$ -
27	\$ 1,081	\$ 167,235	\$ -	0.019582	\$ -	27	\$ 192	0.019582	\$ -
28	\$ 832	\$ 167,235	\$ -	0.016881	\$ -	28	\$ 148	0.016881	\$ -
29	\$ 641	\$ 167,235	\$ -	0.014553	\$ -	29	\$ 114	0.014553	\$ -
30	\$ 498	\$ 167,235	\$ -	0.012546	\$ -	30	\$ 88	0.012546	\$ -
31	\$ 380	\$ 167,235	\$ -	0.010815	\$ -	31	\$ 67	0.010815	\$ -
32	\$ 293	\$ 167,235	\$ -	0.009323	\$ -	32	\$ 52	0.009323	\$ -
33	\$ 225	\$ 167,235	\$ -	0.008037	\$ -	33	\$ 40	0.008037	\$ -
34	\$ 173	\$ 167,235	\$ -	0.006929	\$ -	34	\$ 31	0.006929	\$ -
35	\$ 134	\$ 167,235	\$ -	0.005973	\$ -	35	\$ 24	0.005973	\$ -
36	\$ 103	\$ 167,235	\$ -	0.005149	\$ -	36	\$ 18	0.005149	\$ -
37	\$ 78	\$ 167,235	\$ -	0.004439	\$ -	37	\$ 14	0.004439	\$ -
38	\$ 61	\$ 167,235	\$ -	0.003827	\$ -	38	\$ 11	0.003827	\$ -
39	\$ 47	\$ 167,235	\$ -	0.003299	\$ -	39	\$ 8	0.003299	\$ -
40	\$ 38	\$ 167,235	\$ -	0.002844	\$ -	40	\$ 6	0.002844	\$ -
WORKING INTEREST APPRAISAL					\$ 1,824,388	ROYALTY INTEREST APPRAISAL			

43-162070139

EXHIBIT

B



The County Commission of Ritchie County

RITCHIE COUNTY COURT HOUSE
115 East Main Street, Room 201
Harrisville, West Virginia
Phone (304) 643-2164
Fax (304) 643-2906

MEMBERS:
SAMUEL C. ROGERS
STEPHEN C. WORDEN
FLOYD M. HODGE, SR.

TRACIE D. MCDONALD
CLERK

February 22, 2017

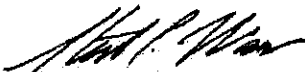
Craig A. Griffith
Legal Counsel for Antero Resources Corporation
PO Box 1588 Charleston WV 25326-1588

RE: Antero Resources Corporation

Dear Mr. Griffith:

The Ritchie County Commission met as the Board of Review and Equalization on February 17, 2017. A motion to deny the request from Antero Resources Corporation to adjust the property tax assessment, for the tax year 2017 was made and passed by the commission.

Respectfully,


Stephen C. Worden
Commission President

