

**UNITED STATES  
SECURITIES AND EXCHANGE COMMISSION**

Washington, D.C. 20549

**FORM 10-K/A**

**Amendment No. 1**

**Annual Report pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934**

For the Fiscal Year Ended December 31, 2009

**Transition Report pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934**

For the transition period from \_\_\_\_\_ to \_\_\_\_\_

**Commission File No. 1-13726**

**Chesapeake Energy Corporation**

(Exact name of registrant as specified in its charter)

**Oklahoma**

(State or other jurisdiction of incorporation or organization)

**6100 North Western Avenue  
Oklahoma City, Oklahoma**

(Address of principal executive offices)

**73-1395733**

(I.R.S. Employer Identification No.)

**73118**

(Zip Code)

**(405) 848-8000**

(Registrant's telephone number, including area code)

**Securities registered pursuant to Section 12(b) of the Act:**

<u>Title of Each Class</u>	<u>Name of Each Exchange on Which Registered</u>
Common Stock, par value \$0.01	New York Stock Exchange
7.5% Senior Notes due 2013	New York Stock Exchange
7.625% Senior Notes due 2013	New York Stock Exchange
7.0% Senior Notes due 2014	New York Stock Exchange
7.5% Senior Notes due 2014	New York Stock Exchange
6.375% Senior Notes due 2015	New York Stock Exchange
9.5% Senior Notes due 2015	New York Stock Exchange
6.625% Senior Notes due 2016	New York Stock Exchange
6.875% Senior Notes due 2016	New York Stock Exchange
6.5% Senior Notes due 2017	New York Stock Exchange
6.25% Senior Notes due 2018	New York Stock Exchange
7.25% Senior Notes due 2018	New York Stock Exchange
6.875% Senior Notes due 2020	New York Stock Exchange
2.75% Contingent Convertible Senior Notes due 2035	New York Stock Exchange
2.5% Contingent Convertible Senior Notes due 2037	New York Stock Exchange
2.25% Contingent Convertible Senior Notes due 2038	New York Stock Exchange
4.5% Cumulative Convertible Preferred Stock	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 Exchange 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 Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§ 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 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

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). YES  NO

The aggregate market value of our common stock held by non-affiliates on June 30, 2009 was approximately \$12.5 billion. At February 24, 2010, there were 651,861,064 shares of our \$0.01 par value common stock outstanding.

**DOCUMENTS INCORPORATED BY REFERENCE**

Portions of the proxy statement for the 2010 Annual Meeting of Shareholders are incorporated by reference in Part III.

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#### EXPLANATORY NOTE

Chesapeake Energy Corporation is filing this Amendment No. 1 to our Form 10-K for the year ended December 31, 2009 originally filed with the Securities and Exchange Commission on March 1, 2010 (the "2009 Form 10-K") solely for the purpose of filing revised reports of two of our third-party petroleum engineering firms. The report of Data Consulting Services Division of Schlumberger Technology Corporation was filed as Exhibit 99.2 to the 2009 Form 10-K, and the report of Ryder Scott Company, L.P. was filed as Exhibit 99.4 to the 2009 Form 10-K. Each of these reports included a statement limiting the use of the report to Chesapeake. The reports of these firms appearing in this Form 10-K/A do not contain any such limitation. In addition to the revised reports being filed as Exhibit 99.2 and 99.4, we are including in this Form 10-K/A consents of each engineering firm in Exhibit 23.3 and 23.5 and certifications of our principal executive officer and principal financial officer in Exhibit 31.1 and 31.2.

No item of or disclosures appearing in our 2009 Form 10-K are affected by this filing other than the exhibits described above. This report on Form 10-K/A is presented as of the filing date of the 2009 Form 10-K and does not reflect events occurring after that date, or modify or update disclosures in any way.

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**PART IV**

**ITEM 15. Exhibits and Financial Statement Schedules**

(a) The following exhibits are filed herewith pursuant to the requirements of Item 601 of Regulation S-K:

<u>Exhibit Number</u>	<u>Exhibit Description</u>	<u>Incorporated by Reference</u>			<u>Filed Herewith</u>
		<u>Form</u>	<u>SEC File Number</u>	<u>Exhibit</u>	
23.3	Consent of Data & Consulting Services, Division of Schlumberger Technology Corporation.				X
23.5	Consent of Ryder Scott Company, L.P.				X
31.1	Aubrey K. McClendon, Chairman and Chief Executive Officer, Certification pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.				X
31.2	Marcus C. Rowland, Executive Vice President and Chief Financial Officer, Certification pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.				X
99.2	Report of Data & Consulting Services, Division of Schlumberger Technology Corporation.				X
99.4	Report of Ryder Scott Company, L.P.				X

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**Signatures**

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

CHESAPEAKE ENERGY CORPORATION

Date: August 2, 2010

By \_\_\_\_\_ /s/ AUBREY K. MCCLENDON

Aubrey K. McClendon  
*Chairman of the Board and  
Chief Executive Officer*

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**INDEX TO EXHIBITS**

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99.4	Report of Ryder Scott Company, L.P.				X

**CONSENT OF DATA & CONSULTING SERVICES,  
DIVISION OF SCHLUMBERGER TECHNOLOGY CORPORATION**

As independent oil and gas consultants, Data & Consulting Services, Division of Schlumberger Technology Corporation hereby consents to the incorporation by reference in the Registration Statements on Form S-8 (File Nos. 33-84258, 33-89282, 33-88196, 333-07255, 333-27525, 333-30324, 333-30478, 333-52668, 333-67734, 333-67740, 333-109162, 333-118312, 333-126191, 333-135949, 333-143990, 333-151762, 333-157504 and 333-160350) and Form S-3 (File No. 333-155754) of Chesapeake Energy Corporation of all references to our firm and information from our reserves report dated February 10, 2010, entitled "Reserve and Economic Evaluation of Proved Reserves of Certain Chesapeake Energy Corporation Eastern Division Oil and Gas Interests as of 31 December 2009", included in or made a part of the Chesapeake Energy Corporation Annual Report on Form 10-K for the year ended December 31, 2009 filed with the Securities and Exchange Commission on March 1, 2010, and our summary report attached as Exhibit 99.2 to the amendment on Form 10-K/A to such Annual Report on Form 10-K filed on or about August 2, 2010.

DATA & CONSULTING SERVICES, DIVISION OF  
SCHLUMBERGER TECHNOLOGY CORPORATION

By:                   /S/ CHARLES M. BOYER II                  

Charles M. Boyer II, PG  
*Advisor Unconventional Reservoirs*

August 2, 2010

**CONSENT OF RYDER SCOTT COMPANY, L.P.**

As independent oil and gas consultants, Ryder Scott Company, L.P. hereby consents to the incorporation by reference in the Registration Statements on Form S-8 (File Nos. 33-84258, 33-89282, 33-88196, 333-07255, 333-27525, 333-30324, 333-30478, 333-52668, 333-67734, 333-67740, 333-109162, 333-118312, 333-126191, 333-135949, 333-143990, 333-151762, 333-157504 and 333-160350) and Form S-3 (File No. 333-155754) of Chesapeake Energy Corporation of all references to our firm and information from our reserves report dated February 24, 2010, entitled "Chesapeake Energy Corporation Estimated Future Reserves and Income Attributable to Certain Leasehold and Royalty Interests SEC Case of December 31, 2009", included in or made a part of the Chesapeake Energy Corporation Annual Report on Form 10-K for the year ended December 31, 2009 filed with the Securities and Exchange Commission on March 1, 2010, and our summary report attached as Exhibit 99.4 to the amendment on Form 10-K/A to such Annual Report on Form 10-K filed on or about August 2, 2010.

/s/ RYDER SCOTT COMPANY, L.P.

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RYDER SCOTT COMPANY, L.P.

*TBPE Firm Registration No. F-1580*

Houston, Texas  
August 2, 2010



**CERTIFICATION**

I, Aubrey K. McClendon, certify that:

1. I have reviewed this annual report on Form 10-K/A of Chesapeake Energy Corporation; and
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under such statements were made, not misleading with respect to the period covered by this report.

Date: August 2, 2010

/s/ AUBREY K. MCCLENDON

Aubrey K. McClendon

Chairman of the Board and Chief Executive Officer

**CERTIFICATION**

I, Marcus C. Rowland, certify that:

1. I have reviewed this annual report on Form 10-K/A of Chesapeake Energy Corporation; and
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under such statements were made, not misleading with respect to the period covered by this report.

Date: August 2, 2010

/s/ MARCUS C. ROWLAND

Marcus C. Rowland

Executive Vice President and Chief Financial Officer

**Reserve And Economic Evaluation Of  
Proved Reserves  
Of Certain Chesapeake Energy Corporation  
Eastern Division  
Oil And Gas Interests  
As Of 31 December 2009**

**Executive Summary**

*Prepared For*

**Chesapeake Energy Corporation  
Oklahoma City, Oklahoma**

*Prepared By*

**Data & Consulting Services  
Division of Schlumberger Technology Corporation  
Pittsburgh, Pennsylvania**

**August 2010**

Two Robinson Plaza, Suite 200  
Pittsburgh, PA 15205  
Tel: 412-787-5403  
Fax: 412-787-2906

2 August 2010

Chesapeake Energy Corporation  
6100 N. Western Avenue  
Oklahoma City, OK 73118  
Building Seven

Dear Gentlemen:

At the request of Chesapeake Energy Corporation (Chesapeake), through their letter of engagement, Data & Consulting Services (DCS) Division of Schlumberger Technology Corporation has evaluated the proved reserves of certain Chesapeake oil and gas interests located in their Eastern Division United States (U.S.) properties as of 31 December 2009. The evaluated properties are located in Kentucky, New York, Pennsylvania, Tennessee, Virginia, and West Virginia. This report was completed as of the date of this letter and has been prepared using constant prices and costs and conforms to our understanding of the U.S. Securities and Exchange Commission (SEC) guidelines and applicable financial accounting rules. All prices, costs, and cash flow estimates are expressed in U.S. dollars (US\$). It is our understanding that the properties evaluated by DCS comprise approximately 7.3 percent (7.3%) of Chesapeake's total proved reserves. We believe that the assumptions, data, methods, and procedures used in preparing this report are appropriate for the purpose of this report and that we have used all methods and procedures that we consider necessary and appropriate under the circumstances to prepare this report. The Lead Evaluator for this evaluation was Charles M. Boyer II, PG, CPG, and his qualifications, independence, objectivity, and confidentiality meet the requirements set forth in the Standards Pertaining to the Estimating and Auditing of Oil and Gas Reserves Information promulgated by the Society of Petroleum Engineers.

The results of the Proved reserve evaluation are summarized in **Table 1** and **Table 2**. The values contained in this report do not include existing Chesapeake financial instruments or hedges. **Fig. 1** illustrates the net gas equivalent reserves distribution by reserve category for the properties evaluated. **Attachment 1** contains the summary level cash flows by reserve category for this evaluation.

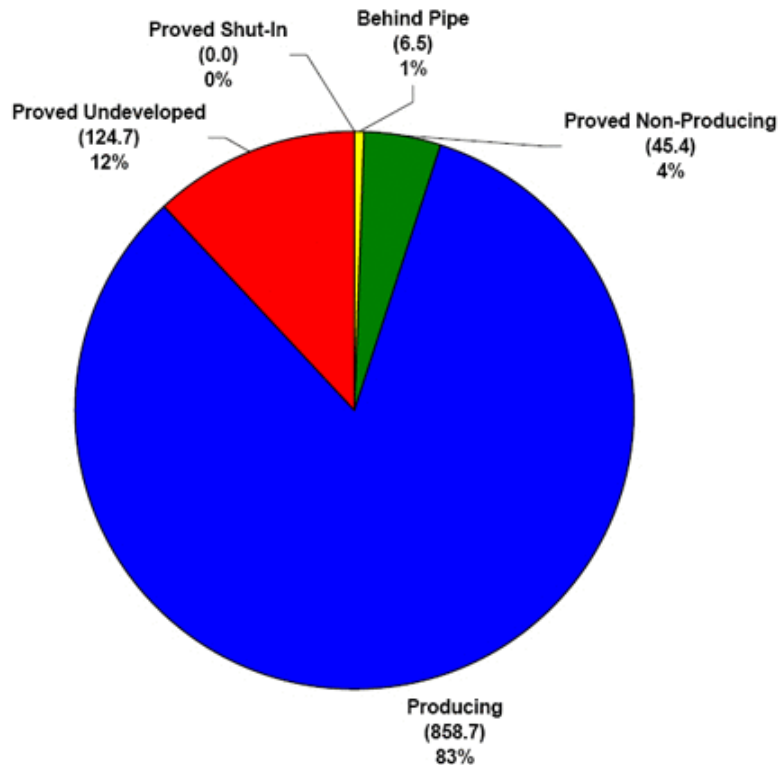
**Table 1**  
**Estimated Net Reserves And Income**  
**Certain Eastern Division Oil And Gas Interests**  
**Chesapeake Energy Corporation**  
**As Of 31 December 2009**  
**Proved Developed And Undeveloped Reserves**

	Proved Developed Reserves	Proved Undeveloped Reserves	Total Proved Reserves
<b>Remaining Net Reserves</b>			
Oil – Mbbls	340.35	0.00	340.35
Gas – MMscf	908,494.25	124,683.91	1,033,178.38
Gas Equiv. – MMscfe	910,536.50	124,683.91	1,035,220.38
<b>Income Data (M\$)</b>			
Future Net Revenue	3,530,842.17	479,253.72	4,010,095.42
<b>Deductions</b>			
Operating Expense	1,236,567.62	108,785.79	1,345,353.50
Production Taxes	236,542.18	30,161.98	266,704.18
Investment	128,789.10	142,628.42	271,417.53
Future Net Cashflow (FNC)	1,928,943.38	197,677.48	2,126,621.00
Discounted PV @ 10% (M\$)	796,095.88	7,626.28	803,722.00

**Table 2**  
**Estimated Net Reserves And Income**  
**Certain Eastern Division Oil And Gas Interests**  
**Summarized By Reserve Category**  
**Chesapeake Energy Corporation**  
**As Of 31 December 2009**

	<u>Proved Producing Reserves</u>	<u>Proved Behind Pipe Reserves</u>	<u>Proved Non-producing Reserves</u>	<u>Proved Shut-In Reserves</u>	<u>Proved Undeveloped Reserves</u>	<u>Total Proved Reserves</u>
<b>Remaining Net Reserves</b>						
Oil – Mbbls	340.35	0.00	0.00	0.00	0.00	340.35
Gas – MMscf	856,634.38	6,482.06	45,369.71	8.09	124,683.91	1,033,178.38
Gas Equiv. – MMscfe	858,676.50	6,482.06	45,369.71	8.09	124,683.91	1,035,220.38
<b>Income Data (M\$)</b>						
Future Net Revenue	3,320,636.42	26,106.15	184,066.66	33.05	479,253.72	4,010,095.42
<b>Deductions</b>						
Operating Expense	1,195,842.88	13,919.19	26,221.10	584.61	108,785.79	1,345,353.50
Production Taxes	224,425.29	1,853.54	10,260.74	2.59	30,161.98	266,704.18
Investment	106,715.90	6,124.25	13,182.45	2,766.50	142,628.42	271,417.53
Future Net Cashflow (FNC)	1,793,652.38	4,209.17	134,402.38	(3,320.66)	197,677.48	2,126,621.00
Discounted PV @ 10% (M\$)	736,630.88	306.61	62,222.01	(3,063.61)	7,626.28	803,722.00

The values in the tables above may not add up arithmetically or exactly match the attached cash flows due to rounding procedures in the computer software program used to prepare the economic projections.



**Fig. 1 - Net gas equivalent reserves distribution by reserve category – (Bcfe).**

2 August 2010

Page 3

## **RESERVES ESTIMATES**

Standard geological and engineering methods generally accepted by the petroleum industry were used in the estimation of Chesapeake's reserves. Deterministic methods were used for all reserves included in this report. The appropriate combination of conventional decline curve analysis (DCA), production data analysis, volumetrics, and type curves were used to estimate the remaining reserves in the various producing areas. Volumetric calculations were based on data and maps provided by Chesapeake. Comparisons were made to similar properties for which more complete data were available for areas of new development.

Reserve estimates are strictly technical judgments. The accuracy of any reserve estimate is a function of the quality and quantity of data available and of the engineering and geological interpretations. The reserve estimates presented in this report are believed reasonable; however, they are estimates only and should be accepted with the understanding that reservoir performance subsequent to the date of the estimate may justify their revision. A portion of these reserves are for undeveloped locations and producing or non-producing wells that lack sufficient production history to utilize conventional performance-based reserve estimates. In these cases, the reserves are based on volumetric estimates and recovery efficiencies along with analogies to similar producing areas. These reserve estimates are subject to a greater degree of uncertainty than those based on substantial production and pressure data. As additional production and pressure data becomes available, these estimates may be revised up or down. Actual future prices may vary significantly from the prices used in this evaluation; therefore, future hydrocarbon volumes recovered and the income received from these volumes may vary significantly from those estimated in this report. The present worth is shown to indicate the effect of time on the value of money and should not be construed as being the fair market value of the properties.

## **RESERVE CATEGORIES**

Reserves were assigned to the proved developed producing (PDP), proved developed non-producing (PDNP), proved developed behind pipe (PDBP), and proved undeveloped (PUD) reserve categories. Oil and gas reserves by definition fall into one of the following categories: proved, probable, and possible. The proved category is further divided into: developed and undeveloped. The developed reserve category is even further divided into the appropriate reserve status subcategories: producing and non-producing. Non-producing reserves include shut-in and behind-pipe reserves. The proved reserves evaluated in this report conform to the *U.S. Securities and Exchange Commission Regulation S-X, Rule 210.4-10 (a)*. These reserve definitions are presented in the **Reserve Definitions** section of this report.

In our opinion the above-described estimates of Chesapeake's reserves and supporting data are, in the aggregate, reasonable and have been prepared in accordance with generally accepted petroleum engineering and evaluation practices. It is also our opinion that the above-described estimates of Chesapeake's proved reserves conform to the definitions of proved oil and gas reserves promulgated by the SEC.

Chesapeake has an active exploration and development program to develop their interests in certain tracts not classified as proved at this time. Future drilling may result in the reclassification of additional volumes to the proved reserve category. However, changes in the regulatory requirements for oil and gas operations may impact future development plans and the ability of the company to recover the estimated proved undeveloped reserves. The reserves and income attributable to the various reserve categories included in this report have not been adjusted to reflect the varying degrees of risk associated with them.

2 August 2010

Page 4

## **ECONOMIC TERMS**

Net revenue (sales) is defined as the total proceeds from the sale of oil, condensate, natural gas liquids (NGL), and gas adjusted for commodity price basis differential and gathering/ transportation expense. Future net income (cashflow) is future net revenue less net lease operating expenses, state severance or production taxes, operating/development capital expenses and net salvage. Future net income (cashflow) for nonoperated wells includes those general and administrative (G&A) deductions charged by the operator for a particular well or project on a monthly basis; operated well G&A deductions include only those expenses estimated as necessary to continue production activities. Future plugging, abandonment, and salvage costs are included at the economic life of each well or unit. No provisions for State or Federal income taxes have been made in this evaluation. The present worth (discounted cashflow) at various discount rates is calculated on a monthly basis.

## **PRICING AND ECONOMIC PARAMETERS**

All product prices, costs, and economic parameters used in this report were supplied by Chesapeake and reviewed by DCS. Data from Chesapeake were accepted as presented. All prices used in preparation of this report were based on the twelve month unweighted arithmetic average of the first day of the month price for the period January through December 2009. The resulting Henry Hub gas price used was \$3.866/MMBtu and the resulting West Texas Intermediate oil price used was \$61.14/Bbl. The prices were adjusted for local differentials, gravity and Btu where applicable. As required by SEC guidelines, all pricing was held constant for the life of the projects (no escalation). Chesapeake's estimates for capital costs for all non-producing and undeveloped wells are included in the evaluation. Chesapeake has indicated to us that they have the ability and intent to implement their capital expenditure program as scheduled.

## **OWNERSHIP**

The leasehold interests were supplied by Chesapeake and were accepted as presented. No attempt was made by the undersigned to verify the title or ownership of the interests evaluated.

## **GENERAL**

All data used in this study were obtained from Chesapeake, public industry information sources, or the non-confidential files of DCS. A field inspection of the properties was not made in connection with the preparation of this report.

The potential environmental liabilities attendant to ownership and/or operation of the properties have not been addressed in this report. Abandonment and clean-up costs and possible salvage value of the equipment were considered in this report.

Government regulations and policies can affect Chesapeake's ability to recover oil and gas reserves and changes may cause volumes of reserves actually recovered to increase or decrease from the estimated quantities.

In the conduct of our evaluation, we have not independently verified the accuracy and completeness of information and data furnished by Chesapeake with respect to ownership interests, historical gas production, costs of operation and development, product prices, payout balances, and agreements relating to current and future operations and sales of production. If in the course of our examination something came to our attention which brought into question the validity or sufficiency of any of the information or data provided by Chesapeake, we did not rely on such information or data until we had satisfactorily resolved our questions relating thereto or independently verified such information or data.

2 August 2010  
Page 5

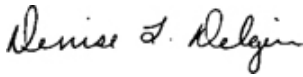
In evaluating the information at our disposal related to this report, we have excluded from our consideration all matters which require a legal or accounting interpretation, or any interpretation other than those of an engineering or geological nature. In assessing the conclusions expressed in this report pertaining to all aspects of oil and gas evaluations, especially pertaining to reserve evaluations, there are uncertainties inherent in the interpretation of engineering data, and such conclusions represent only informed professional judgments.

We are independent with respect to Chesapeake as provided in the SEC regulations. Neither the employment of nor the compensation received by DCS was contingent upon the values estimated for the properties included in this report.

Data and worksheets used in the preparation of this evaluation will be maintained in our files in Pittsburgh and will be available for inspection by anyone having proper authorization by Chesapeake.

We appreciate the opportunity to perform this evaluation and are available should you need further assistance in this matter.

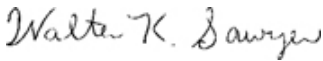
Sincerely yours,



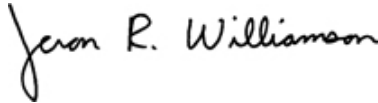
Denise L. Delozier  
Technical Director of Reserves  
US Land



Charles M. Boyer II, PG, CPG  
Advisor  
Unconventional Reservoirs



Walter K. Sawyer, PE  
Principal Consultant



Jeron R. Williamson  
Senior Engineer



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Attachment 1

Data Intentionally Omitted

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**SECURITIES AND EXCHANGE COMMISSION**  
**REGULATION S-X, RULE 210.4-10 (a)**

**RESERVES DEFINITIONS**

(2) Analogous reservoir. Analogous reservoirs, as used in resources assessments, have similar rock and fluid properties, reservoir conditions (depth, temperature, and pressure) and drive mechanisms, but are typically at a more advanced stage of development than the reservoir of interest and thus may provide concepts to assist in the interpretation of more limited data and estimation of recovery. When used to support proved reserves, an “analogous reservoir” refers to a reservoir that shares the following characteristics with the reservoir of interest:

- (i) Same geological formation (but not necessarily in pressure communication with the reservoir of interest);
- (ii) Same environment of deposition;
- (iii) Similar geological structure; and
- (iv) Same drive mechanism.

Instruction to paragraph (a)(2): Reservoir properties must, in the aggregate, be no more favorable in the analog than in the reservoir of interest.

(5) Deterministic estimate. The method of estimating reserves or resources is called deterministic when a single value for each parameter (from the geoscience, engineering, or economic data) in the reserves calculation is used in the reserves estimation procedure.

(6) Developed oil and gas reserves. Developed oil and gas reserves are reserves of any category that can be expected to be recovered:

- (i) Through existing wells with existing equipment and operating methods or in which the cost of the required equipment is relatively minor compared to the cost of a new well; and
- (ii) Through installed extraction equipment and infrastructure operational at the time of the reserves estimate if the extraction is by means not involving a well.

(10) Economically producible. The term economically producible, as it relates to a resource, means a resource which generates revenue that exceeds, or is reasonably expected to exceed, the costs of the operation. The value of the products that generate revenue shall be determined at the terminal point of oil and gas producing activities as defined in paragraph (a)(16) of this section.

(16) Oil and gas producing activities.

(i) Oil and gas producing activities include:

- (A) The search for crude oil, including condensate and natural gas liquids, or natural gas (“oil and gas”) in their natural states and original locations;
- (B) The acquisition of property rights or properties for the purpose of further exploration or for the purpose of removing the oil or gas from such properties;
- (C) The construction, drilling, and production activities necessary to retrieve oil and gas from their natural reservoirs, including the acquisition, construction, installation, and maintenance of field gathering and storage systems, such as:
  - (1) Lifting the oil and gas to the surface; and
  - (2) Gathering, treating, and field processing (as in the case of processing gas to extract liquid hydrocarbons); and
- (D) Extraction of saleable hydrocarbons, in the solid, liquid, or gaseous state, from oil sands, shale, coalbeds, or other nonrenewable natural resources which are intended to be upgraded into synthetic oil or gas, and activities undertaken with a view to such extraction.

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Instruction 1 to paragraph (a)(16)(i): The oil and gas production function shall be regarded as ending at a “terminal point”, which is the outlet valve on the lease or field storage tank. If unusual physical or operational circumstances exist, it may be appropriate to regard the terminal point for the production function as:

- a. The first point at which oil, gas, or gas liquids, natural or synthetic, are delivered to a main pipeline, a common carrier, a refinery, or a marine terminal; and
- b. In the case of natural resources that are intended to be upgraded into synthetic oil or gas, if those natural resources are delivered to a purchaser prior to upgrading, the first point at which the natural resources are delivered to a main pipeline, a common carrier, a refinery, a marine terminal, or a facility which upgrades such natural resources into synthetic oil or gas.

Instruction 2 to paragraph (a)(16)(i): For purposes of this paragraph (a)(16), the term saleable hydrocarbons means hydrocarbons that are saleable in the state in which the hydrocarbons are delivered.

(ii) Oil and gas producing activities do not include:

- (A) Transporting, refining, or marketing oil and gas;
- (B) Processing of produced oil, gas or natural resources that can be upgraded into synthetic oil or gas by a registrant that does not have the legal right to produce or a revenue interest in such production;
- (C) Activities relating to the production of natural resources other than oil, gas, or natural resources from which synthetic oil and gas can be extracted; or
- (D) Production of geothermal steam.

(17) Possible reserves. Possible reserves are those additional reserves that are less certain to be recovered than probable reserves.

- (i) When deterministic methods are used, the total quantities ultimately recovered from a project have a low probability of exceeding proved plus probable plus possible reserves. When probabilistic methods are used, there should be at least a 10% probability that the total quantities ultimately recovered will equal or exceed the proved plus probable plus possible reserves estimates.
- (ii) Possible reserves may be assigned to areas of a reservoir adjacent to probable reserves where data control and interpretations of available data are progressively less certain. Frequently, this will be in areas where geoscience and engineering data are unable to define clearly the area and vertical limits of commercial production from the reservoir by a defined project.
- (iii) Possible reserves also include incremental quantities associated with a greater percentage recovery of the hydrocarbons in place than the recovery quantities assumed for probable reserves.
- (iv) The proved plus probable and proved plus probable plus possible reserves estimates must be based on reasonable alternative technical and commercial interpretations within the reservoir or subject project that are clearly documented, including comparisons to results in successful similar projects.
- (v) Possible reserves may be assigned where geoscience and engineering data identify directly adjacent portions of a reservoir within the same accumulation that may be separated from proved areas by faults with displacement less than formation thickness or other geological discontinuities and that have not been penetrated by a wellbore, and the registrant believes that such adjacent portions are in communication with the known (proved) reservoir. Possible reserves may be assigned to areas that are structurally higher or lower than the proved area if these areas are in communication with the proved reservoir.
- (vi) Pursuant to paragraph (a)(22)(iii) of this section, where direct observation has defined a highest known oil (HKO) elevation and the potential exists for an associated gas cap, proved oil reserves should be assigned in the structurally higher portions of the reservoir above the HKO only if the higher contact can be established with reasonable certainty through reliable technology. Portions of the reservoir that do not meet this reasonable certainty criterion may be assigned as probable and possible oil or gas based on reservoir fluid properties and pressure gradient interpretations.

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(18) Probable reserves. Probable reserves are those additional reserves that are less certain to be recovered than proved reserves but which, together with proved reserves, are as likely as not to be recovered.

- (i) When deterministic methods are used, it is as likely as not that actual remaining quantities recovered will exceed the sum of estimated proved plus probable reserves. When probabilistic methods are used, there should be at least a 50% probability that the actual quantities recovered will equal or exceed the proved plus probable reserves estimates.
- (ii) Probable reserves may be assigned to areas of a reservoir adjacent to proved reserves where data control or interpretations of available data are less certain, even if the interpreted reservoir continuity of structure or productivity does not meet the reasonable certainty criterion. Probable reserves may be assigned to areas that are structurally higher than the proved area if these areas are in communication with the proved reservoir.
- (iii) Probable reserves estimates also include potential incremental quantities associated with a greater percentage recovery of the hydrocarbons in place than assumed for proved reserves.
- (iv) See also guidelines in paragraphs (a)(17)(iv) and (a)(17)(vi) of this section.

(19) Probabilistic estimate. The method of estimation of reserves or resources is called probabilistic when the full range of values that could reasonably occur for each unknown parameter (from the geoscience and engineering data) is used to generate a full range of possible outcomes and their associated probabilities of occurrence.

(21) Proved area. The part of a property to which proved reserves have been specifically attributed.

(22) Proved oil and gas reserves. Proved oil and gas reserves are those quantities of oil and gas, which, by analysis of geoscience and engineering data, can be estimated with reasonable certainty to be economically producible—from a given date forward, from known reservoirs, and under existing economic conditions, operating methods, and government regulations—prior to the time at which contracts providing the right to operate expire, unless evidence indicates that renewal is reasonably certain, regardless of whether deterministic or probabilistic methods are used for the estimation. The project to extract the hydrocarbons must have commenced or the operator must be reasonably certain that it will commence the project within a reasonable time.

- (i) The area of the reservoir considered as proved includes:
  - (A) The area identified by drilling and limited by fluid contacts, if any, and
  - (B) Adjacent undrilled portions of the reservoir that can, with reasonable certainty, be judged to be continuous with it and to contain economically producible oil or gas on the basis of available geoscience and engineering data.
- (ii) In the absence of data on fluid contacts, proved quantities in a reservoir are limited by the lowest known hydrocarbons (LKH) as seen in a well penetration unless geoscience, engineering, or performance data and reliable technology establishes a lower contact with reasonable certainty.
- (iii) Where direct observation from well penetrations has defined a highest known oil (HKO) elevation and the potential exists for an associated gas cap, proved oil reserves may be assigned in the structurally higher portions of the reservoir only if geoscience, engineering, or performance data and reliable technology establish the higher contact with reasonable certainty.
- (iv) Reserves which can be produced economically through application of improved recovery techniques (including, but not limited to, fluid injection) are included in the proved classification when:
  - (A) Successful testing by a pilot project in an area of the reservoir with properties no more favorable than in the reservoir as a whole, the operation of an installed program in the reservoir or an analogous reservoir, or other evidence using reliable technology establishes the reasonable certainty of the engineering analysis on which the project or program was based; and

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(B) The project has been approved for development by all necessary parties and entities, including governmental entities.

(v) Existing economic conditions include prices and costs at which economic producibility from a reservoir is to be determined. The price shall be the average price during the 12-month period prior to the ending date of the period covered by the report, determined as an unweighted arithmetic average of the first-day-of-the-month price for each month within such period, unless prices are defined by contractual arrangements, excluding escalations based upon future conditions.

(23) Proved properties. Properties with proved reserves.

(24) Reasonable certainty. If deterministic methods are used, reasonable certainty means a high degree of confidence that the quantities will be recovered. If probabilistic methods are used, there should be at least a 90% probability that the quantities actually recovered will equal or exceed the estimate. A high degree of confidence exists if the quantity is much more likely to be achieved than not, and, as changes due to increased availability of geoscience (geological, geophysical, and geochemical), engineering, and economic data are made to estimated ultimate recovery (EUR) with time, reasonably certain EUR is much more likely to increase or remain constant than to decrease.

(25) Reliable technology. Reliable technology is a grouping of one or more technologies (including computational methods) that has been field tested and has been demonstrated to provide reasonably certain results with consistency and repeatability in the formation being evaluated or in an analogous formation.

(26) Reserves. Reserves are estimated remaining quantities of oil and gas and related substances anticipated to be economically producible, as of a given date, by application of development projects to known accumulations. In addition, there must exist, or there must be a reasonable expectation that there will exist, the legal right to produce or a revenue interest in the production, installed means of delivering oil and gas or related substances to market, and all permits and financing required to implement the project.

Note to paragraph (a)(26): Reserves should not be assigned to adjacent reservoirs isolated by major, potentially sealing, faults until those reservoirs are penetrated and evaluated as economically producible. Reserves should not be assigned to areas that are clearly separated from a known accumulation by a non-productive reservoir (i.e., absence of reservoir, structurally low reservoir, or negative test results). Such areas may contain prospective resources (i.e., potentially recoverable resources from undiscovered accumulations).

(27) Reservoir. A porous and permeable underground formation containing a natural accumulation of producible oil and/or gas that is confined by impermeable rock or water barriers and is individual and separate from other reservoirs.

(28) Resources. Resources are quantities of oil and gas estimated to exist in naturally occurring accumulations. A portion of the resources may be estimated to be recoverable, and another portion may be considered to be unrecoverable. Resources include both discovered and undiscovered accumulations.

(31) Undeveloped oil and gas reserves. Undeveloped oil and gas reserves are reserves of any category that are expected to be recovered from new wells on undrilled acreage, or from existing wells where a relatively major expenditure is required for recompletion.

(i) Reserves on undrilled acreage shall be limited to those directly offsetting development spacing areas that are reasonably certain of production when drilled, unless evidence using reliable technology exists that establishes reasonable certainty of economic producibility at greater distances.

(ii) Undrilled locations can be classified as having undeveloped reserves only if a development plan has been adopted indicating that they are scheduled to be drilled within five years, unless the specific circumstances, justify a longer time.

(iii) Under no circumstances shall estimates for undeveloped reserves be attributable to any acreage for which an application of fluid injection or other improved recovery technique is contemplated, unless such techniques have been proved effective by actual projects in the same reservoir or an analogous reservoir, as defined in paragraph (a)(2) of this section, or by other evidence using reliable technology establishing reasonable certainty.

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(32) Unproved properties. Properties with no proved reserves.

**Chesapeake Energy Corporation**

**Estimated**

**Future Reserves and Income**

**Attributable to Certain**

**Leasehold and Royalty Interests**

**SEC Parameters**

**As of**

**December 31, 2009**

/s/ Don P. Griffin

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Don P. Griffin, P.E.

TBPE License No. 64150

Senior Vice President

[SEAL]

**RYDER SCOTT COMPANY, L.P.**

TBPE Firm License No. F-1580

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**RYDER SCOTT COMPANY**  
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August 2, 2010

Chesapeake Energy Corporation  
 6100 North Western Avenue  
 Oklahoma City, Oklahoma 73118

Gentlemen:

At your request, we have prepared an estimate of the proved reserves, future production, and income attributable to certain leasehold and royalty interests of Chesapeake Energy Corporation (Chesapeake) as of December 31, 2009. The subject properties are located in the states of Kansas, Oklahoma, and Texas. It is our understanding that the proved reserves estimated in this report constitute approximately 7% of the total proved reserves of Chesapeake. The reserves and income data were estimated based on the definitions and disclosure guidelines contained in the United States Securities and Exchange Commission Title 17, Code of Federal Regulations, Modernization of Oil and Gas Reporting, Final Rule released January 14, 2009 in the Federal Register (SEC regulations). The results of our third party study, completed on January 29, 2010, are presented herein.

The estimated reserves and future net income amounts presented in this report, as of December 31, 2009 are related to hydrocarbon prices. The hydrocarbon prices used in the preparation of this report are based on the average prices during the 12-month period prior to the ending date of the period covered in this report, determined as unweighted arithmetic averages of the prices in effect on the first-day-of-the-month for each month within such period, unless prices were defined by contractual arrangements as required by the SEC regulations. Actual future prices may vary significantly from the prices required by SEC regulations; therefore, volumes of reserves actually recovered and the amounts of income actually received may differ significantly from the estimated quantities presented in this report. The results of this study are summarized below.

**SEC PARAMETERS**  
 Estimated Net Reserves and Income Data  
 Certain Leasehold and Royalty Interests of  
**Chesapeake Energy Corporation**  
 As of December 31, 2009

	Proved			Total Proved
	Developed		Undeveloped	
	Producing	Non-Producing		
<b><u>Net Remaining Reserves</u></b>				
Gas – MMCF	475,978	38,166	423,105	937,249
Oil/Condensate – MBarrels	7,728	986	9,350	18,064
<b><u>Income Data (\$000)</u></b>				
Future Gross Revenue	\$1,966,699	\$ 165,950	\$1,915,801	\$ 4,048,450
Deductions	670,740	80,908	1,023,705	1,775,353
Future Net Income (FNI)	\$ 1,295,959	\$ 85,042	\$ 892,096	\$ 2,273,097
Discounted FNI @ 10%	\$ 662,653	\$ 31,358	\$ 238,907	\$ 932,918

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Liquid hydrocarbons are expressed in thousands of standard 42 gallon barrels. All gas volumes are reported on an "as sold" basis expressed in millions of cubic feet (MMCF) at the official temperature and pressure bases of the areas in which the gas reserves are located.

The estimates of the reserves, future production, and income attributable to properties in this report were prepared using the economic software package Aries™ System Petroleum Economic Evaluation Software, a copyrighted program of Halliburton. The program was used solely at the request of Chesapeake. Ryder Scott has found this program to be generally acceptable, but notes that certain summaries and calculations may vary due to rounding and may not exactly match the sum of the properties being summarized. Furthermore, one line economic summaries may vary slightly from the more detailed cash flow projections of the same properties, also due to rounding. The rounding differences are not material.

The future gross revenue is after the deduction of production taxes. The deductions incorporate the normal direct costs of operating the wells, ad valorem taxes, recompletion costs, development costs, and certain abandonment costs net of salvage. "Other Costs" in this report represent an allocated fraction of corporate overhead which can be characterized as an operating expense of Chesapeake's oil and gas producing properties; and as such, its inclusion is required under SEC guidelines. The future net income is before the deduction of state and federal income taxes, and has not been adjusted for outstanding loans that may exist nor does it include any adjustment for cash on hand or undistributed income. Liquid hydrocarbon reserves account for approximately 23.1 percent and gas reserves account for the remaining 76.9 percent of total future gross revenue from proved reserves.

The discounted future net income shown above was calculated using a discount rate of 10 percent per annum compounded monthly. Future net income was discounted at four other discount rates which were also compounded monthly. These results are shown in summary form as follows.

<u>Discount Rate Percent</u>	<u>Discounted Future Net Income (\$000) As of December 31, 2009 Total Proved</u>
5	\$ 1,354,299
8	\$ 1,069,307
12	\$ 824,895
14	\$ 737,608

The results shown above are presented for your information and should not be construed as our estimate of fair market value.

#### ***Reserves Included in This Report***

The proved reserves included herein conform to the definition as set forth in the Securities and Exchange Commission's Regulations Part 210.4-10 (a). An abridged version of the SEC reserves definitions from 210.4-10(a) entitled "Petroleum Reserves Definitions" is included as an attachment to this report.

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The various reserve status categories are defined under the attachment entitled "Petroleum Reserves Definitions" in this report. The developed non-producing reserves included herein consist of the shut-in and behind pipe categories.

No attempt was made to quantify or otherwise account for any accumulated gas production imbalances that may exist. The gas volumes included herein do attribute gas consumed in operations as reserves.

While it may reasonably be anticipated that the future prices received for the sale of production and the operating costs and other costs relating to such production may also increase or decrease from existing levels, such changes were, in accordance with rules adopted by the SEC, omitted from consideration in making this evaluation.

Proved oil and gas reserves are those quantities of oil and gas, which, by analysis of geoscience and engineering data, can be estimated with reasonable certainty to be economically producible from a given date forward. Moreover, estimates of reserves may increase or decrease as a result of future operations, effects of regulation by governmental agencies or geopolitical risks. As a result, the estimates of oil and gas reserves have an intrinsic uncertainty. The reserves included in this report are therefore estimates only and should not be construed as being exact quantities. They may or may not be actually recovered, and if recovered, the revenues therefrom, and the actual costs related thereto, could be more or less than the estimated amounts.

The reserves reported herein are limited to the period prior to expiration of current contracts providing the legal right to produce or a revenue interest in such production unless evidence indicates that contract renewal is reasonably certain. The prices and economic return received for these net volumes can vary significantly based on the terms of these contracts. Ryder Scott has not conducted an exhaustive audit or verification of such contractual information. Our acceptance of Chesapeake's representations regarding such contractual information should not be construed as a legal opinion on this matter.

Chesapeake's operations may be subject to various levels of governmental controls and regulations. These controls and regulations may include matters relating to land tenure, drilling, production practices, environmental protection, marketing and pricing policies, royalties, various taxes and levies including income tax and are subject to change from time to time. Such changes in governmental regulations and policies may cause volumes of reserves actually recovered and amounts of income actually received to differ significantly from the estimated quantities.

The estimates of reserves presented herein were based upon a detailed study of the properties in which Chesapeake owns an interest; however, we have not made any field examination of the properties. No consideration was given in this report to potential environmental liabilities that may exist nor were any costs included for potential liability to restore and clean up damages, if any, caused by past operating practices.

#### ***Estimates of Reserves***

The reserves for the properties included herein were estimated by performance methods or the analogy method. In general, reserves attributable to producing wells and/or reservoirs were estimated by performance methods such as decline curve analysis, which utilized extrapolations of historical production and pressure data available through December 2009 in those cases where such data were considered to be definitive. In certain cases, producing reserves were estimated by the analogy method where there were inadequate historical performance data to establish a definitive trend and

where the use of production performance data as a basis for the reserve estimates was considered to be inappropriate. Reserves attributable to non-producing and undeveloped reserves included herein were estimated by the analogy method, which utilized all pertinent well data available through December 2009.

To estimate economically recoverable oil and gas reserves and related future net cash flows, we consider many factors and assumptions including, but not limited to, the use of reservoir parameters derived from geological, geophysical and engineering data that cannot be measured directly, economic criteria based on current costs and SEC pricing requirements, and forecasts of future production rates. Under the SEC regulations 210.4-10(a)(22)(v) and (26), proved reserves must be demonstrated to be economically producible based on existing economic conditions including the prices and costs at which economic producibility from a reservoir is to be determined as of the effective date of the report. Chesapeake has informed us that they have furnished us all of the accounts, records, geological and engineering data, and reports and other data required for this investigation. In preparing our forecast of future production and income, we have relied upon data furnished by Chesapeake with respect to property interests owned, production and well tests from examined wells, normal direct costs of operating the wells or leases, other costs such as transportation and/or processing fees, ad valorem and production taxes, recompletion and development costs, abandonment costs after salvage, product prices based on the SEC regulations, geological structural and isochore maps, well logs, core analyses, and pressure measurements. Ryder Scott reviewed such factual data for its reasonableness; however, we have not conducted an independent verification of the data supplied by Chesapeake. We consider the assumptions, data, methods and procedures used in this report appropriate for the purpose hereof, and we have used all such methods and procedures that we consider necessary and appropriate to prepare the estimates of reserves and future net revenues herein.

#### ***Future Production Rates***

Our forecasts of future production rates are based on historical performance from wells now on production. Test data and other related information were used to estimate the anticipated initial production rates for those wells or locations that are not currently producing. If no production decline trend has been established, future production rates were held constant, or adjusted for the effects of curtailment where appropriate, until a decline in ability to produce was anticipated. An estimated rate of decline was then applied to depletion of the reserves. If a decline trend has been established, this trend was used as the basis for estimating future production rates. For reserves not yet on production, sales were estimated to commence at an anticipated date furnished by Chesapeake.

The future production rates from wells now on production may be more or less than estimated because of changes in market demand or allowables set by regulatory bodies. Wells or locations that are not currently producing may start producing earlier or later than anticipated in our estimates.

#### ***Hydrocarbon Prices***

The hydrocarbon prices used herein are based on SEC price parameters using unweighted average prices during the 12-month period prior to December 31, 2009, taken on the first-day-of-the-month for each month within this period. Average oil and gas prices of \$61.14 per barrel and \$3.87 per MMBTU were obtained using this method based upon the WTI Cushing Oklahoma Spot Market for oil and the Henry Hub Cash Market for gas. For hydrocarbon products sold under contract, the contract prices including fixed and determinable escalations, exclusive of inflation adjustments, were used until expiration of the contract. Upon contract expiration, the prices were adjusted to the 12-month unweighted arithmetic average as previously described. Product prices which were actually used for each property reflect adjustment for gravity, quality, local conditions, and/or distance from market.

The effects of derivative instruments designated as price hedges of oil and gas quantities are not reflected in our individual property evaluations.

### ***Costs***

Operating costs for the leases and wells in this report are based on the operating expense reports of Chesapeake and include only those costs directly applicable to the leases or wells. When applicable for operated properties, the operating costs include an appropriate level of corporate general administrative and overhead costs. The operating costs for non-operated properties include the COPAS overhead costs that are allocated directly to the leases and wells under terms of operating agreements. No deduction was made for loan repayments, interest expenses, or exploration and development prepayments that were not charged directly to the leases or wells.

Development costs were furnished to us by Chesapeake and are based on authorizations for expenditure for the proposed work or actual costs for similar projects. The estimated net cost of abandonment after salvage was included for properties where abandonment costs net of salvage were significant. The estimates of the net abandonment costs furnished by Chesapeake were accepted without independent verification.

Because of the direct relationship between volumes of proved undeveloped reserves and development plans, we include in the proved undeveloped category only reserves assigned to undeveloped locations that we have been assured will definitely be drilled. Chesapeake has assured us of their intent and ability to proceed with the development activities included in this report, and that they are not aware of any legal, regulatory or political obstacles that would significantly alter their plans.

Current costs used by Chesapeake were held constant throughout the life of the properties.

### ***Standards of Independence and Professional Qualification***

Ryder Scott is an independent petroleum engineering consulting firm that has been providing petroleum consulting services throughout the world for over seventy years. Ryder Scott is employee owned and maintains offices in Houston, Texas; Denver, Colorado; and Calgary, Alberta, Canada. We have over eighty engineers and geoscientists on our permanent staff. By virtue of the size of our firm and the large number of clients for which we provide services, no single client or job represents a material portion of our annual revenue. We do not serve as officers or directors of any publicly traded oil and gas company and are separate and independent from the operating and investment decision-making process of our clients. This allows us to bring the highest level of independence and objectivity to each engagement for our services.

Ryder Scott actively participates in industry related professional societies and organizes an annual public forum focused on the subject of reserves evaluations and SEC regulations. Many of our staff have authored or co-authored technical papers on the subject of reserves related topics. We encourage our staff to maintain and enhance their professional skills by actively participating in ongoing continuing education.

Prior to becoming an officer of the Company, Ryder Scott requires that staff engineers and geoscientists have received professional accreditation in the form of a registered or certified professional engineer's license or a registered or certified professional geoscientist's license, or the equivalent thereof, from an appropriate governmental authority or a recognized self-regulating professional organization.

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We are independent petroleum engineers with respect to Chesapeake. Neither we nor any of our employees have any interest in the subject properties and neither the employment to do this work nor the compensation is contingent on our estimates of reserves for the properties which were reviewed.

The professional qualifications of the undersigned, the technical person primarily responsible for evaluating the reserves information discussed in this report, are included as an attachment to this letter.

***Terms of Usage***

The results of our third party report were prepared in accordance with the disclosure requirements set forth in the SEC regulations and intended for public disclosure as an exhibit in filings made with the SEC by Chesapeake. We have provided our written consent to Chesapeake for the references to our name as well as to the references to the results of our third party report in filings made by Chesapeake with the SEC.

We have provided Chesapeake with a digital version of the original signed copy of this report letter. In the event there are any differences between the digital version included in filings made by Chesapeake and the original signed report letter, the original signed report letter shall control and supersede the digital version.

The data and work papers used in the preparation of this report are available for examination by authorized parties in our offices. Please contact us if we can be of further service.

Very truly yours,

**RYDER SCOTT COMPANY, L.P.**  
TBPE Firm Registration No. F-1580

/s/ Don P. Griffin

Don P. Griffin, P.E.  
TBPE License No. 64150  
Senior Vice President

[SEAL]

DPG/sm

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### **Professional Qualifications of Primary Technical Person**

The conclusions presented in this report are the result of technical analysis conducted by teams of geoscientists and engineers from Ryder Scott Company, L.P. Don P. Griffin was the primary technical person responsible for overseeing the estimate of the reserves, future production and income presented herein.

Mr. Griffin, an employee of Ryder Scott Company L.P. (Ryder Scott) since 1981, is a Senior Vice President responsible for coordinating and supervising staff and consulting engineers of the company in ongoing reservoir evaluation studies worldwide. Before joining Ryder Scott, Mr. Griffin served in a number of engineering positions with Amoco Production Company. For more information regarding Mr. Griffin's geographic and job specific experience, please refer to the Ryder Scott Company website at <http://www.ryderscott.com/Experience/Employees.php>.

Mr. Griffin graduated with honors from Texas Tech University with a Bachelor of Science degree in Electrical Engineering in 1975 and is a registered Professional Engineer in the State of Texas. He is also a member of the Society of Petroleum Engineers and the Society of Petroleum Evaluation Engineers.

In addition to gaining experience and competency through prior work experience, the Texas Board of Professional Engineers requires a minimum of fifteen hours of continuing education annually, including at least one hour in the area of professional ethics, which Mr. Griffin fulfills. As part of his 2009 continuing education hours, Mr. Griffin attended an internally presented 16 hours of formalized training relating to the definitions and disclosure guidelines contained in the United States Securities and Exchange Commission Title 17, Code of Federal Regulations, Modernization of Oil and Gas Reporting, Final Rule released January 14, 2009 in the Federal Register. Mr. Griffin attended an additional 16 hours of formalized in-house training during 2009 covering such topics as reservoir engineering, geoscience and petroleum economics evaluation methods, procedures and software and ethics for consultants.

Based on his educational background, professional training and more than 30 years of practical experience in the estimation and evaluation of petroleum reserves, Mr. Griffin has attained the professional qualifications as a Reserves Estimator and Reserves Auditor as set forth in Article III of the "Standards Pertaining to the Estimating and Auditing of Oil and Gas Reserves Information" promulgated by the Society of Petroleum Engineers as of February 19, 2007.

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## PETROLEUM RESERVES DEFINITIONS

**As Adapted From:**  
**RULE 4-10(a) of REGULATION S-X PART 210**  
**UNITED STATES SECURITIES AND EXCHANGE COMMISSION (SEC)**

### ***PREAMBLE***

On January 14, 2009, the United States Securities and Exchange Commission (SEC) published the “Modernization of Oil and Gas Reporting; Final Rule” in the Federal Register of National Archives and Records Administration (NARA). The “Modernization of Oil and Gas Reporting; Final Rule” includes revisions and additions to the definition section in Rule 4-10 of Regulation S-X, revisions and additions to the oil and gas reporting requirements in Regulation S-K, and amends and codifies Industry Guide 2 in Regulation S-K. The “Modernization of Oil and Gas Reporting; Final Rule”, including all references to Regulation S-X and Regulation S-K, shall be referred to herein collectively as the “SEC Regulations”. The SEC Regulations take effect for all filings made with the United States Securities and Exchange Commission as of December 31, 2009, or after January 1, 2010. Reference should be made to the full text under Title 17, Code of Federal Regulations, Regulation S-X Part 210, Rule 4-10(a) for the complete definitions, as the following definitions, descriptions and explanations rely wholly or in part on excerpts from the original document (direct passages excerpted from the aforementioned SEC document are denoted in italics herein).

Reserves are those estimated remaining quantities of petroleum which are anticipated to be economically producible, as of a given date, from known accumulations under defined conditions. All reserve estimates involve some degree of uncertainty. The uncertainty depends chiefly on the amount of reliable geologic and engineering data available at the time of the estimate and the interpretation of these data. The relative degree of uncertainty may be conveyed by placing reserves into one of two principal classifications, either proved or unproved. Unproved reserves are less certain to be recovered than proved reserves and may be further sub-classified as probable and possible reserves to denote progressively increasing uncertainty in their recoverability. Under the SEC Regulations as of December 31, 2009, or after January 1, 2010, a company may optionally disclose estimated quantities of probable or possible oil and gas reserves in documents publicly filed with the Commission. The SEC Regulations continue to prohibit disclosure of estimates of oil and gas resources other than reserves and any estimated values of such resources in any document publicly filed with the Commission unless such information is required to be disclosed in the document by foreign or state law as noted in §229.1202 Instruction to Item 1202.

Reserves estimates will generally be revised as additional geologic or engineering data become available or as economic conditions change.

Reserves may be attributed to either natural energy or improved recovery methods. Improved recovery methods include all methods for supplementing natural energy or altering natural forces in the reservoir to increase ultimate recovery. Examples of such methods are pressure maintenance, natural gas cycling, waterflooding, thermal methods, chemical flooding, and the use of miscible and immiscible displacement fluids. Other improved recovery methods may be developed in the future as petroleum technology continues to evolve.

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Reserves may be attributed to either conventional or unconventional petroleum accumulations. Petroleum accumulations are considered as either conventional or unconventional based on the nature of their in-place characteristics, extraction method applied, or degree of processing prior to sale. Examples of unconventional petroleum accumulations include coalbed or coalseam methane (CBM/CSM), basin-centered gas, shale gas, gas hydrates, natural bitumen and oil shale deposits. These unconventional accumulations may require specialized extraction technology and/or significant processing prior to sale.

Reserves do not include quantities of petroleum being held in inventory.

Because of the differences in uncertainty, caution should be exercised when aggregating quantities of petroleum from different reserves categories.

**RESERVES (SEC DEFINITIONS)**

Securities and Exchange Commission Regulation S-X §210.4-10(a)(26) defines reserves as follows:

**Reserves.** *Reserves are estimated remaining quantities of oil and gas and related substances anticipated to be economically producible, as of a given date, by application of development projects to known accumulations. In addition, there must exist, or there must be a reasonable expectation that there will exist, the legal right to produce or a revenue interest in the production, installed means of delivering oil and gas or related substances to market, and all permits and financing required to implement the project.*

*Note to paragraph (a)(26): Reserves should not be assigned to adjacent reservoirs isolated by major, potentially sealing, faults until those reservoirs are penetrated and evaluated as economically producible. Reserves should not be assigned to areas that are clearly separated from a known accumulation by a non-productive reservoir (i.e., absence of reservoir, structurally low reservoir, or negative test results). Such areas may contain prospective resources (i.e., potentially recoverable resources from undiscovered accumulations).*

**PROVED RESERVES (SEC DEFINITIONS)**

Securities and Exchange Commission Regulation S-X §210.4-10(a)(22) defines proved oil and gas reserves as follows:

**Proved oil and gas reserves.** *Proved oil and gas reserves are those quantities of oil and gas, which, by analysis of geoscience and engineering data, can be estimated with reasonable certainty to be economically producible—from a given date forward, from known reservoirs, and under existing economic conditions, operating methods, and government regulations—prior to the time at which contracts providing the right to operate expire, unless evidence indicates that renewal is reasonably certain, regardless of whether deterministic or probabilistic methods are used for the estimation. The project to extract the hydrocarbons must have commenced or the operator must be reasonably certain that it will commence the project within a reasonable time.*

(i) *The area of the reservoir considered as proved includes:*

(A) *The area identified by drilling and limited by fluid contacts, if any, and*



*(B) Adjacent undrilled portions of the reservoir that can, with reasonable certainty, be judged to be continuous with it and to contain economically producible oil or gas on the basis of available geoscience and engineering data.*

*(ii) In the absence of data on fluid contacts, proved quantities in a reservoir are limited by the lowest known hydrocarbons (LKH) as seen in a well penetration unless geoscience, engineering, or performance data and reliable technology establishes a lower contact with reasonable certainty.*

**PROVED RESERVES (SEC DEFINITIONS) CONTINUED**

*(iii) Where direct observation from well penetrations has defined a highest known oil (HKO) elevation and the potential exists for an associated gas cap, proved oil reserves may be assigned in the structurally higher portions of the reservoir only if geoscience, engineering, or performance data and reliable technology establish the higher contact with reasonable certainty.*

*(iv) Reserves which can be produced economically through application of improved recovery techniques (including, but not limited to, fluid injection) are included in the proved classification when:*

*(A) Successful testing by a pilot project in an area of the reservoir with properties no more favorable than in the reservoir as a whole, the operation of an installed program in the reservoir or an analogous reservoir, or other evidence using reliable technology establishes the reasonable certainty of the engineering analysis on which the project or program was based; and*

*(B) The project has been approved for development by all necessary parties and entities, including governmental entities.*

*(v) Existing economic conditions include prices and costs at which economic producibility from a reservoir is to be determined. The price shall be the average price during the 12-month period prior to the ending date of the period covered by the report, determined as an unweighted arithmetic average of the first-day-of-the-month price for each month within such period, unless prices are defined by contractual arrangements, excluding escalations based upon future conditions.*

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**RESERVES STATUS DEFINITIONS AND GUIDELINES**

**As Adapted From:  
RULE 4-10(a) of REGULATION S-X PART 210  
UNITED STATES SECURITIES AND EXCHANGE COMMISSION (SEC)**

**and**

**PETROLEUM RESOURCES MANAGEMENT SYSTEM (SPE-PRMS)**

**Sponsored and Approved by:**

**SOCIETY OF PETROLEUM ENGINEERS (SPE),  
WORLD PETROLEUM COUNCIL (WPC)  
AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS (AAPG)  
SOCIETY OF PETROLEUM EVALUATION ENGINEERS (SPEE)**

Reserves status categories define the development and producing status of wells and reservoirs. Reference should be made to Title 17, Code of Federal Regulations, Regulation S-X Part 210, Rule 4-10(a) and the SPE-PRMS as the following reserves status definitions are based on excerpts from the original documents (direct passages excerpted from the aforementioned SEC and SPE-PRMS documents are denoted in italics herein).

**DEVELOPED RESERVES (SEC DEFINITIONS)**

Securities and Exchange Commission Regulation S-X §210.4-10(a)(6) defines developed oil and gas reserves as follows:

*Developed oil and gas reserves are reserves of any category that can be expected to be recovered:*

- (i) Through existing wells with existing equipment and operating methods or in which the cost of the required equipment is relatively minor compared to the cost of a new well; and*
- (ii) Through installed extraction equipment and infrastructure operational at the time of the reserves estimate if the extraction is by means not involving a well.*

**Developed Producing (SPE-PRMS Definitions)**

While not a requirement for disclosure under the SEC regulations, developed oil and gas reserves may be further sub-classified according to the guidance contained in the SPE-PRMS as Producing or Non-Producing.

**Developed Producing Reserves**

*Developed Producing Reserves are expected to be recovered from completion intervals that are open and producing at the time of the estimate.*

*Improved recovery reserves are considered producing only after the improved recovery project is in operation.*

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**Developed Non-Producing**

*Developed Non-Producing Reserves include shut-in and behind-pipe reserves.*

**Shut-In**

*Shut-in Reserves are expected to be recovered from:*

- (1) completion intervals which are open at the time of the estimate but which have not yet started producing;*
- (2) wells which were shut-in for market conditions or pipeline connections; or*
- (3) wells not capable of production for mechanical reasons.*

**Behind-Pipe**

*Behind-pipe Reserves are expected to be recovered from zones in existing wells which will require additional completion work or future re-completion prior to start of production.*

*In all cases, production can be initiated or restored with relatively low expenditure compared to the cost of drilling a new well.*

**UNDEVELOPED RESERVES (SEC DEFINITIONS)**

Securities and Exchange Commission Regulation S-X §210.4-10(a)(31) defines undeveloped oil and gas reserves as follows:

*Undeveloped oil and gas reserves are reserves of any category that are expected to be recovered from new wells on undrilled acreage, or from existing wells where a relatively major expenditure is required for recompletion.*

- (i) Reserves on undrilled acreage shall be limited to those directly offsetting development spacing areas that are reasonably certain of production when drilled, unless evidence using reliable technology exists that establishes reasonable certainty of economic producibility at greater distances.*
- (ii) Undrilled locations can be classified as having undeveloped reserves only if a development plan has been adopted indicating that they are scheduled to be drilled within five years, unless the specific circumstances, justify a longer time.*
- (iii) Under no circumstances shall estimates for undeveloped reserves be attributable to any acreage for which an application of fluid injection or other improved recovery technique is contemplated, unless such techniques have been proved effective by actual projects in the same reservoir or an analogous reservoir, as defined in paragraph (a)(2) of this section, or by other evidence using reliable technology establishing reasonable certainty.*