



DIVISION OF
CORPORATION FINANCE

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

September 1, 2010

Mr. Eugene B. Shepherd, Jr.
Executive Vice President
Brigham Exploration Company
6300 Bridge Point Parkway, Building 2, Suite 500
Austin, Texas 78730

**Re: Brigham Exploration Company
Form 10-K for Fiscal Year Ended December 31, 2009
Filed March 1, 2010
Schedule 14A Definitive Proxy Statement
Filed April 26, 2010
Response Letter Dated July 19, 2010
File No. 1-34224**

Dear Mr. Shepherd:

We have reviewed your response and have the following comments. In some of our comments, we may ask you to provide us with information so we may better understand your disclosure.

Please respond to this letter within ten business days by amending your filing, by providing the requested information, or by advising us when you will provide the requested response. If you do not believe our comments apply to your facts and circumstances or do not believe an amendment is appropriate, please tell us why in your response.

After reviewing any amendment to your filing and the information you provide in response to these comments, we may have additional comments.

Form 10-K for Fiscal Year Ended December 31, 2009

Properties, page 22

Oil and Natural Gas Reserves, page 27

1. We have read your response to prior comment 1, in our letter dated July 1, 2010, in which you state that your policies regarding internal controls over the recording of reserves estimates requires reserves to be in compliance with the SEC definitions and guidance and prepared in accordance with generally accepted petroleum engineering principles.

While we understand that there are fundamentals of physics, mathematics and economics which are applied in the estimation of reserves, we are not aware of an official industry compilation of such “generally accepted petroleum engineering principles.” Please explain to us, with a view towards disclosure, the basis for concluding that such principles have been sufficiently established so as to judge that the reserve information has been prepared in conformity with such principles. As part of your response, please submit proposed revisions to your disclosure to comply with Item 1202(a)(7) of Regulation S-K.

Proved Undeveloped Reserves, page 28

2. We have read your response to prior comment 4 in which you state that your third party reserve engineers permitted you to book a maximum of four offsetting PUD locations in the Middle Bakken and Three Forks objectives in the Williston Basin, provided SEC standards were met for those four locations and that you do not wish to amend your filing to modify your prior disclosure. However, your current disclosure on page 29 of your filing implies that the “modernization of SEC oil and gas reporting rules,” specifically the new definition of proved undeveloped reserves in Rule 4-10(a)(31) of Regulation S-X, permitted you to identify only two additional offsetting PUD locations and should be revised to clarify the policy of your reserve engineers in relation to the new definition of proved undeveloped reserves. Please submit proposed revisions to your disclosure with your next response.

Sales Volumes, Prices and Production Costs, page 32

3. We note your response to comment 6 in our letter dated July 1, 2010, and reissue such comment. You indicate in your response that if you provided disclosure on a field-by-field basis for fields containing 15% or more of your total proved reserves, you would be providing disclosure for one field, which contained 20.1% of your total proved reserves. Please expand your disclosure to provide the production information required by Item 1204 of Regulation S-K with respect to such field.

Definitive Proxy Statement Filed April 26, 2010

Compensation Committee, page 11

4. We note your response to comment 11 in our letter dated July 1, 2010. Please tell us whether you intend to provide in future filings the additional clarifying information that you provided in your response.

Non-Equity Incentive Plan Compensation and Discretionary Bonuses, page 13

5. We note your response to comment 13 in our letter dated July 1, 2010. We also note that your response includes information that was not set forth in your proxy statement filed on April 26, 2010 regarding how your compensation committee determined the amount of equity awards granted to each of your named executive officers during 2009. Please tell us whether you intend to provide such additional information for the relevant fiscal year in future filings.

Closing Comments

You may contact Tracie Towner at (202) 551-3744, Mark Wojciechowski at (202) 551-3759, or Mark Shannon, Branch Chief, at (202) 551-3299 if you have questions regarding comments on the financial statements and related matters. Please contact Tracey McNeil at (202) 551-3392, Laura Nicholson at (202) 551-3584, or me at (202) 551-3740 with any other questions.

Sincerely,

H. Roger Schwall
Assistant Director