

Wednesday, October 26, 2011

Petroleum Club • 800 Bell (downtown)
Social 11:15 AM, Luncheon 11:30 AM

**Cost: \$30 pre-registered members; \$35 for non-members & walk-ups;
Emeritus/Life/Honorary: \$15; Students: FREE**

To guarantee a seat, you must pre-register on the HGS website (www.hgs.org) and pre-pay with a credit card.

Pre-registration without payment will not be accepted.

You may still walk up and pay at the door, if extra seats are available.

HGS General Luncheon Meeting

Arthur E. Berman and
Lynn Pittinger

HGS General Luncheon Meeting

U.S. Shale Gas: Magical Thinking

Shale gas producers are now in a twilight zone of magical thinking that justifies over-supplying the market with gas which degrades gas prices. They have suggested an impossible business model in which there are no barriers to entry except capital; a practically infinite volume of gas can be produced at low cost, yet somehow companies can still make great profits. The support for this model lies in regarding major capital expenditures as either sunk or fixed costs, for which there seems to be ample and enthusiastic support from sell-side brokerages and those who seek to find good news in an otherwise bleak global economy.

There are two major concerns at the center of the shale gas revolution. Despite impressive production growth, it is not yet clear that these plays are commercial at current prices because of the high capital costs of land, drilling and completion. Secondly, reserves and economics depend on estimated ultimate recoveries based on hyperbolic or increasingly flattening decline profiles that predict decades of commercial production. With only a few years of production history in most of these plays, this model has not been shown to be correct, and may be overly optimistic.

The marketing of the shale gas phenomenon has been so effective that important policy and strategic decisions are being made based on as yet unproven assumptions about the abundance and cost of these plays. If reserves are less and cost is more than many assume, these could be disastrous decisions.

Our analysis indicates that industry reserves are over-stated by at least 100 percent, based on detailed review of both individual well and group decline profiles for the Barnett, Fayetteville and Haynesville shale plays. The Barnett and Fayetteville have the most complete history of production and thus provide the best

available analogues for shale gas plays with less complete histories. We recognize that all shale plays are different, and until more production history is available, the best assumption is that newer plays will develop along similar lines as these older plays.

There is now far too much data in Barnett and Fayetteville to continue use of strong hyperbolic flattening decline models with b coefficients greater than 1.0. Type curves that are commonly used to support strong hyperbolic flattening are misleading because they incorporate survivorship bias and rate increases from re-stimulations that require additional capital investment. Comparison of individual and group decline-curve analysis indicates that group or type-curve methods substantially over-estimate recoverable reserves. Results to date in the Haynesville Shale play are disappointing, and will substantially underperform industry claims. ■

Biographical Sketch

ARTHUR E. BERMAN is a geological consultant with 33 years of experience in petroleum exploration and production. Berman worked 20 years for Amoco Corporation now BP p.l.c. and has been an independent consulting geologist for 12 years. He has an M.S. in Geology from the Colorado School of Mines. Berman is on the editorial board and a frequent contributor at *The Oil Drum*, and is an associate editor of the American Association of Petroleum Geologists *Bulletin*. He has published 11 articles on shale gas plays including the Barnett, Haynesville and Fayetteville.

