



*Scott R. Reeves*

Executive Vice President

March 21, 2008

Mr. Garry Ward  
Far East Energy Corp  
363 N. Sam Houston Pkwy E., Suite 380  
Houston, TX 77060

RE: Summary of Reservoir Simulation Modeling Study Results, Shouyang Block, Qinshui Basin, Shanxi Province, China

Dear Garry,

This letter presents a results summary of the coalbed methane (CBM) reservoir simulation modeling study that Advanced Resources International, Inc. (ARI) has been performing on behalf of Far East Energy Corporation (FEEC) for the Shouyang Block, Qinshui basin, Shanxi province, China. The objective of our study has been to develop an understanding of the CBM productive potential of the block, based upon actual coal reservoir property measurements and production results obtained from a pilot area that covers an area of approximately two square miles, and that exclusively targets the #15 coal seam.

#### Summary

Based upon our analysis of the reservoir and well performance data described in further detail below, we conclude that several coal properties needed for commercial gas production exist in the pilot area. These include coal permeability (80-120 md) and gas content (approximately 500 scf/ton on a dry, ash-free basis and 360 scf/ton in-situ). The coal is also under-saturated with methane, containing an estimated 75% of the theoretical storage capacity at reservoir conditions. Based upon model predictions of reservoir pressure, dewatering of the #15 coal seam has been occurring and is approaching the estimated desorption pressure within the pilot area .

Using these reservoir properties, as well as others derived from our analysis, probabilistic production forecasting was performed assuming a fully confined, effectively stimulated well condition producing at a low bottomhole pressure. Forecasts for both (single) vertical and horizontal (900 meter long) wells on various well spacings were generated. Results from these forecasts suggested individual vertical well (20-year, P50) gas recovery estimates of 487 to 1,186 MMcf, depending upon well spacing (from 40 to 160 acres per well), corresponding to recovery factors of 71% to 43% respectively. Individual horizontal well (20-year, P50) gas recoveries of 3,361 to 5,341 MMcf were

also forecast, depending upon well spacing (from 250 to 550 acres per well), corresponding to recovery factors of 77% to 56% respectively.

## Discussion

The principal analytic tool used for this study was Advanced Resources International's proprietary COMET3 reservoir simulator, designed specifically for unconventional gas reservoirs such as CBM. Data used to construct the reservoir simulation model was provided by FEEC and included coal depth and thickness information across the pilot area, estimated reservoir pressure, and gas content and isotherm data. A reservoir simulation model was constructed of the pilot area (1.5 miles by 1.5 miles) that included these data, which was then extrapolated for 10-miles in each direction to serve as the pilot area boundary condition. A no-flow boundary was assumed beyond the 10-mile buffer zone.

Within the pilot area, water and gas production (and in some instances pressure) data was available for seven wells: three vertical (FCCHZ01V, FCCHZ06V and FCCHZ07V), two single-bore horizontal (FCCHZ04H and FCCHZ05H) and two multi-branch horizontal (FCCHZ01H, FCCHZ03H/V). Dewatering of the pilot area began in the 4<sup>th</sup> (calendar) quarter of 2005 from the FCCHZ01H well.

Two individual reservoir models were constructed, both utilizing the same grid dimensions. The first was used to model the FCCHZ01H and FCCHZ01V wells only on a daily basis for approximately the first six months of dewatering where only water production occurred. The second included all wells in the pilot area and was modeled on a monthly basis using production data through the 4<sup>th</sup> (calendar) quarter of 2007.

Since only water production occurred during the first six months of dewatering, the first model provided insights into reservoir properties unencumbered with uncertainties related to two-phase (i.e., water plus gas) flow. This model was used to "history-match" the actual production and pressure data obtained from the FCCHZ01H and FCCHZ01V wells (the FCCHZ01V well was used as a pressure observation well during this period), principally by varying cleat porosity, cleat permeability, cleat compressibility, and skin factor in the FCCHZ01H well. Results of that model indicated a coal porosity on the order of 1% and an initial permeability on the order of 115-120 md. Skin factor results indicated the well was highly damaged from a flow efficiency perspective. Potential causes for (or remedies to) the damage were not investigated as part of the study.

"History-matching" of the second model provided an opportunity to investigate reservoir character in the presence of two-phase flow effects, and thus determine reservoir properties that are specifically important to gas flow rate forecasting, such as gas content saturation level and two-phase relative permeability relationships, for example. To some extent, the reservoir characterization results from the first model were honored to minimize the number of variables needed to achieve a "history-match" in the second model. Results from "history-matching" this model indicated a coal porosity of about 1%, an initial permeability of 80 md (with some directional anisotropy indicated), a difference between initial pressure and gas desorption pressure of 145 psi (constant across the model area, and represents an average sorbed gas saturation level of 75% relative to the isotherm), and a set of two-phase relative permeability curves that could be used for subsequent production forecasting. Most wells were modeled to have a significant level of damage restricting production performance.

Forward forecasting of the second model was performed to provide insights into long-term performance of the pilot, as it currently exists. Using essentially unchanged reservoir properties and

well conditions, due to well damage and the unconfined nature of the pilot, substantial improvements in gas flow from the pilot in the future are not predicted. Remedial well treatments and/or new wells could change this outcome however.

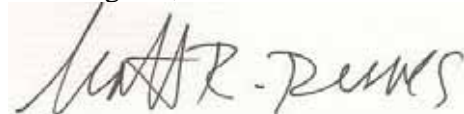
Using the results from both models, production forecasting of hypothetical new wells in a full-field development scenario was performed. These models assumed a fully confined well condition (i.e., no-flow boundaries at the edge of the drainage boundary), a stimulated well condition (i.e., skin factor of -2), and a low flowing bottomhole pressure (20 psi), all of which are “best-case” (yet achievable) conditions. A slightly deeper depth to coal was also assumed, since much of the block area outside the pilot is to this trend. Forecasting was performed in a probabilistic manner randomly varying for various reservoir properties such as initial permeability (between 80 md and 120 md), porosity (between 0.8% and 1.2%), and relative permeability curve exponents, and for both (single) vertical and horizontal (900 meter long) wells on various well spacings. Only development of the #15 coal seam was considered, yet other coal seams are known to exist in the block that could also be targets for completion and production in the future.

Results from these forecasts suggested individual vertical well (20-year, P50) gas recovery estimates of 487 to 1,186 MMcf, depending upon well spacing (from 40 to 160 acres per well), corresponding to recovery factors of 71% to 43% respectively. Individual horizontal well (20-year, P50) gas recoveries of 3,361 to 5,341 MMcf were also forecast, depending upon well spacing (from 250 to 550 acres per well), corresponding to recovery factors of 77% to 56% respectively.

It is important to recognize that in all models utilized for this study, reservoir properties such as porosity, permeability, gas content, relative permeability relationships, etc. were assumed to be homogeneous and isotropic, and thus the precise production behavior of each individual well could not be exactly replicated. Thus while this compromising assumption necessarily introduces uncertainty in the “history-matching” and subsequent production forecasting results, we believe that the results obtained do provide a reasonable indication of the reservoir conditions and production potential that exist in the pilot area. No information was provided, nor an analysis performed, on how the reservoir characterization for the pilot area might change across the entire block, and therefore extrapolating these results to the entire block must be viewed with caution.

I hope that this summary accurately reflects the work performed and results obtained from our study. We at ARI appreciate the opportunity to be of service to Far East Energy Corporation.

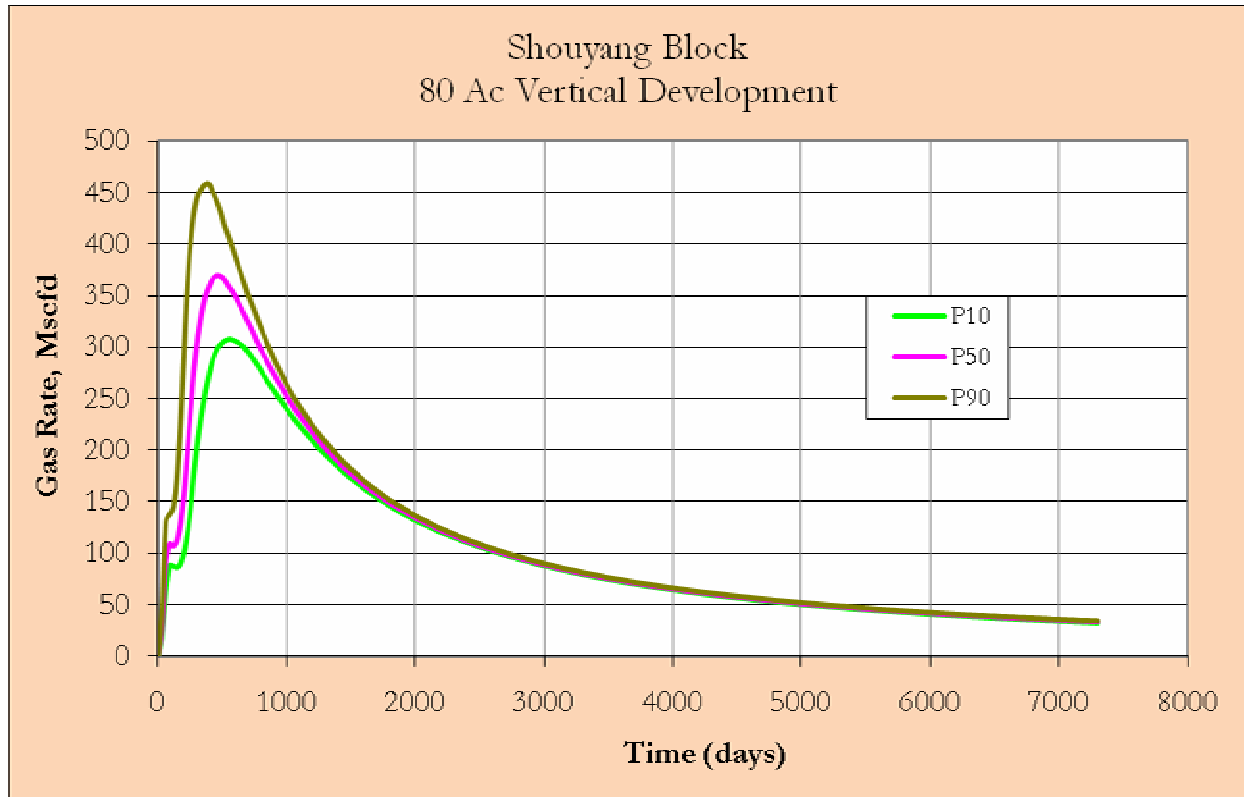
Best Regards,



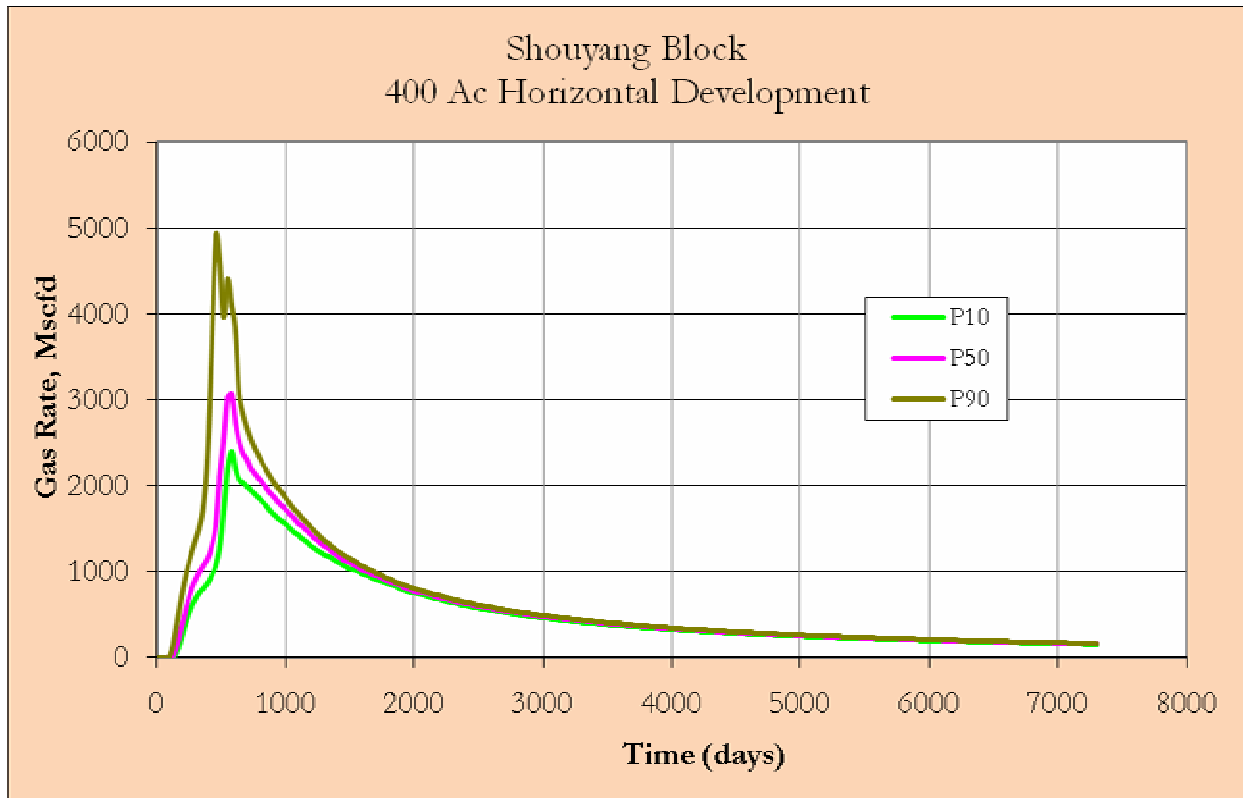
Scott R. Reeves  
Executive Vice President

SRR:sp

**Shouyang Block**  
**Shanxi Province, China**  
**#15 Coal Seam / Vertical Development**



**Shouyang Block**  
**Shanxi Province, China**  
**#15 Coal Seam / Horizontal Development**



# Shouyang Block Shanxi Province, China #15 Coal Seam / Pressure

