MARTIN YATES, III 1912 - 1985 FRANK W. YATES 1936 - 1986



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November 25, 1992

Exxon
P. O. Box 3116
Midland, Texas 79702-3116

ATTN: Larry Long

RE: Avalon Delaware Unit

Dear Larry,

Yates has reviewed in detail the comprehensive Engineering Report prepared by Exxon for the proposed Avalon Delaware Unit. Your people have done an excellent job, and we hope to proceed with formation of the unit. There are several items that merit discussion for possible clarification or modification. Yates has discussed these items with the Coquina people, and their concerns are similar to ours.

Area Outside Primary Production

We are not convinced that the areas outside the wells where primary production has been established in the Upper Cherry/Upper Brushy can be developed economically with CO_2 . My preferred plan would be to unitize the whole area and to develop the CO_2 flood only in the area of primary production. When response is acceptable, conduct a small CO_2 pilot in a promising portion of the outside area. Then expand to the entire outside area only when this pilot succeeds.

We have attempted to divide the economics in your report into two pieces. Our estimates are that the costs to flood the primary area are \$45 million and the costs to flood the outside area are \$39 million. The result is that the CO₂ project in the primary area has an attractive rate of return equal to 25⁺ percent, while the project in the outside area returns an unrisked 13 percent. We may have mishandled some of your numbers, but our concern over development of the outside area seems justified.

I admit that your report could be understood to be compatible with the plan I suggest. The tone of the report allows no uncertainty of success in the outside area, but we should talk about your actual plan of development.

Primary Reserves

Yates calculated primary reserves for all wells in the Avalon Delaware pool. Our numbers agree with the Exxon numbers for all wells except four. Naturally, we get higher reserves than Exxon gets for two Yates wells (Stonewal "EP" #5 and "EP" #8) and lower reserves for two Exxon wells (Yates C #3 and #4). I think we feel that the Exxon GOR limit artificially shuts down the two Yates wells at a time when economic reserves could still be produced. The problem with the two Exxon wells apparently is an adjustment we do not understand. In any case, I believe we should talk about the primary reserves of these four wells.

Geology and Modeling

You've heard us say before that the geological study is very complete while the Engineering work cut a few corners in comparison. I am a little concerned that the modeling work required that permeability be increased by a factor of two or more. This is not unusual in itself, but it might cast doubt on the shaly-sand analysis of the logs which reduced log porosity and indirectly log permeability. Maybe a different log analysis would have given permeabilities that fit the computer model without modification. Probably you all believe there is no chance that the basic geological picture can be wrong.

Workover Reserves

The workover reserves greatly benefit Yates, but they may be overestimated in the Report.

Summary

I hope we can discuss with you the few major concerns we have about the Engineering Report. Yates wants this CO₂ project to happen and we'd like to resolve our concerns with the Report and move on to the details of unitization.

Sincerely,

David F. Boneau

Reservoir Engineering Manager

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