



ACT OPERATING COMPANY

April 18, 2000

CERTIFIED-RETURN RECEIPT REQUESTED
P 101 779 733

Mr. Billy Pritchard
Oil Conservation Division
District 1
1625 N. French Drive
Hobbs, NM 88241

Re: Milnesand San Andres Unit, Roosevelt County, New Mexico

Dear Mr. Pritchard;

Enclosed, please find the requested C103's on certain Milnesand San Andres Unit wells. In addition, you requested a letter last month stating our general plans for the referenced Unit. Generally speaking, the plan is to evaluate a new fracturing technique and increase injection rates substantially by development of our water make up source and repairing injection wells.

As stated in the C103's, it is our intention to get the wells back into compliance as active injectors. Without the injectors, reserves would be lost, thus creating waste. However, A.C.T. does not wish to invest the money into the injection wells if we cannot prove the fracturing technology first. In the case where the fracturing technology does not pan out, we would choose to plug and abandon the injectors.

In order to evaluate the above, we are asking postponement of any injector work until September of this year. To give you a technical overview, I submit the following outline of my technical assessment of the Milnesand San Andres unit.

1. The following are some of the past and current Milnesand Unit problems:
 - a. Only 0.1 pore volumes of water have been injected into the unitized San Andres reservoir.
 - b. No substantial water source for injection has ever been developed.
 - c. All pay zones are not open in several wells.
 - d. No understanding of flow units with each sub-zone.
 - e. Poor completion techniques with old, very small, fracture treatments.
 - f. Poor remedial clean up techniques.
 - g. Uncontrolled injection profile/rates/pressures with little surveillance. The P1 zone in the southern quarter of the field is flooded out causing wasted operating cost to "circulate" the production.

- h. Current net injection rates into the oil reservoir are negligible and have been since 1983.
 - i. Some zones are totally unstimulated due to lack of isolation and/or fracture design.
- 2. A.C.T. has procured a water source contract as of February 2000. A water source well has recently been drilled by A.C.T. and can produce over 1700 BBLS/day of fresh (1000 ppm TDS) water. Many more wells can be drilled as needed. Water compatibility with San Andres water has been confirmed.
- 3. The in place volume of oil ranges from 55 to 75 MMBO was estimated by both material balance and volumetric methods by several consultants and companies. A most likely value given the most modern data and techniques is 65 MMBO. Waterflood reserves were estimated numerous ways and Watson weighted the results on the validity of the application. Methods used were Modified Stiles, Dykstra-Parson, analogy with offset floods, and recently reported statistical methods for West Texas San Andres reservoirs given in SPE papers. Typical San Andres recoveries, with waterflooding, range from 20 to 30% of the original oil in place. Given the current cumulative production, remaining recoverable reserves would be 6 to 12 MMBO.
- 4. The Milnesand Unit is being "outperformed" since 1983 by a factor of 6.7 by offset waterflood project, operated by Amoco, in the same field and reservoir. This is simply due to the injecting 6 times the pore volumes than that of the Milnesand Unit.
- 5. In the last few years much of the data has been digitized or set up on a computer database. Log and core data have been digitized in 15 wells and evaluated in Hydrocarbon Data Systems log analysis program. The log analysis demonstrates that there are very distinct flow units and recent wells show that only one of the "P" zones is being flooded. Pressure build up and fall off test from 20 wells have been studied using Landmark's Automate for windows program (was Munroe Garret). The pressure transient analysis verifies the permeability from the core data and demonstrates that the 20,000-lbs. frac jobs have only a 20 to 50 ft. frac length. The pressure analysis also verifies fractures in the injectors; however, most are very short and range only up to approximately 100 ft. All production and injection data since the beginning of the flood or unitization has been inputted in Petrocomp's production administration package which handles all regulatory reporting, production plotting, well test allocation, well data and test, and much more. All wells in the field can be plotted individually from 1970 forward. All the maps are in AutoCAD format.
- 6. One frac job has been attempted in the last 15 years. A.C.T. fracture treated MSU #34 and resulted in a 5-fold increase. Due to sand flow back, it could only sustain a 3-fold

increase. In the future it is recommended that Halliburton's Sandwedge and force closure techniques be used. Recent Society of Petroleum Engineers (SPE) papers has addressed the fracturing potential of low permeability San Andres waterfloods. The most recent being a paper entitled "Advanced Decline Curve Analysis Identifies Fracture Stimulation Potential" by E. J. Fetkovich, Phillips Petroleum Company. Other recent papers by Texaco have solved the sand flow back problems. A paper on fracture treatments in the Levelland and Wasson fields studied 35 treatments. The 14 Levelland wells, most similar to Milnesand, had average before and after rate of 8.5 and 32 BBLS oil per day respectively. Another SPE paper (#56880) quantified a productivity decrease of 88.5% due to sand flowback leaving a 70% filled fracture.

Sincerely,



Marshall Watson, P.E.