

COMPUTERIZED DATA ANALYSIS

APRIL 17, 1975

GENTLEMEN:

THE ENCLOSED TEST APPEARS TO BE A GOOD MECHANICAL DRILL STEM TEST DURING WHICH THE TOOLS DID FUNCTION PROPERLY. THE FORMATION PRODUCED ENOUGH RESERVOIR FLUID FOR PROPER IDENTIFICATION. RESERVOIR PRESSURE DRAWDOWN WAS SUFFICIENT AND ADEQUATE SHUT-IN BUILD-UPS DID OCCUR FOR RELIABLE QUANTITATIVE ANALYSIS.

1. FLOW RATE: A FLOW RATE OF 8.3 BBL/S/DAY OF TOTAL LIQUID WAS NOTED DURING THIS TEST.
2. RESERVOIR PRESSURE: EXTRAPOLATION OF THE INITIAL SHUT-IN PRESSURE BUILD-UP INDICATES A MAXIMUM RESERVOIR PRESSURE OF 2269 P.S.I.G. AT RECORDER DEPTH. EXTRAPOLATION OF THE FINAL SHUT-IN PRESSURE BUILD-UP INDICATES A MAXIMUM RESERVOIR PRESSURE OF 2219 P.S.I.G. AT RECORDER DEPTH. THE DIFFERENCE BETWEEN THE INITIAL AND FINAL SHUT-IN PRESSURE OF 50 P.S.I.G. IS INDICATIVE OF DEPLETION. A LIMITED RESERVOIR IS INDICATED IF DEPLETION IS ACTUALLY TAKING PLACE.
3. PERMEABILITY: THE CALCULATED TRANSMISSIBILITY FACTOR OF 5.51 MD.-FT./CP. INDICATES AN AVERAGE EFFECTIVE PERMEABILITY TO LIQUID OF .50 MD. FOR THE REPORTED 11 FOOT TEST INTERVAL. THE CALCULATIONS WERE BASED ON A SLOPE OF 245 P.S.I./LOG CYCLE OBTAINED FROM THE FINAL SHUT-IN BUILD-UP PLOT. IT WAS ASSUMED FOR THESE CALCULATIONS THE PRODUCT OF THE LIQUID VISCOSITY AND FORMATION VOLUME FACTOR TO BE 1.0.
4. WELL BORE DAMAGE: THE CALCULATED ESTIMATED DAMAGE RATIO OF 1.77 INDICATES THAT MINOR WELL BORE DAMAGE IS PRESENT AT THE TIME AND CONDITIONS OF THIS TEST. THIS VALUE INFERS THAT THE RATE OF PRODUCTION OBSERVED AT THE FORMATION FACE DURING THIS TEST MAY BE INCREASED 1.77 TIMES IF THE WELL BORE DAMAGE ALONE WERE REMOVED.
5. RADIUS OF INVESTIGATION: THE CALCULATED RADIUS OF INVESTIGATION OF THIS TEST IS 38 FEET BASED ON AN ASSUMED POROSITY OF 10%, COMPRESSIBILITY OF 8.0×10^{-6} , AND OTHER ASSUMPTIONS MADE IN NUMBER 3 ABOVE.
6. GENERAL COMMENTS: THE FORMATION EXHIBITS THE CHARACTERISTICS OF RELATIVELY LOW PERMEABILITY EFFECTIVE TO THE RESERVOIR FLUID AND INDICATES THE PRESENCE OF WELL BORE DAMAGE.

A LOW PRESSURE GRADIENT WAS NOTED IN THE CALCULATIONS. THIS COULD BE THE RESULT OF PREVIOUS PRODUCTION IN THE FORMATION. IN ADDITION, THE FINAL SHUT-IN BUILD-UP PLOT INDICATED A HETEROGENEOUS FORMATION. THIS REACTION COULD BE DUE TO A BOUNDARY CONDITION IN THE FORM OF A LIMITED RESERVOIR. IF THIS IS THE CASE, THEN A SUSTAINED RATE WILL NOT CONTINUE FOR ANY LENGTH OF TIME. HOWEVER, THIS ANOMALY CAN NOT BE DEFINITELY IDENTIFIED, DUE TO INSUFFICIENT DATA. FURTHERMORE, A TWO PHASE SYSTEM COULD BE PRESENT. SINCE THE PRESSURE GRADIENT IS SO LOW, IT IS POSSIBLE THAT BELOW BUBBLE POINT CONDITIONS ARE PRESENT. THIS CONDITION WOULD NOT BE IDEAL FOR THE EQUATIONS

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