
INTEROFFICE CORRESPONDENCE

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to R. R. Stiger

from M. R. Dolenc, D. Goldman, S. Petty & S. G. Spencer

subject RECOMMENDED MAXIMUM WELLHEAD PRESSURE AT RRG1-6 & RRG1-7 -
MRD-3-80, DG-10-80, SP-9-80, SGS-4-80

As a result of recent inquiries, we have determined a maximum allowable wellhead pressure for the injection wells at Raft River. We are concerned that a significant increase in the injection pressure could result in hydrofracing. Hydrofrac research (Hubbert & Willis, 1957) indicates that the general state of stress at depth is that in which the three principal stresses are unequal. In tectonically relaxed areas characterized by normal faults, the least principal stress should be horizontal. Under these conditions, any fractures resulting should be vertical. If this occurs in Raft River as a result of injection, we could increase the connection between the injection zone and shallower aquifers. The increased connection could occur as a result of new fractures being opened or by increasing the permeability in existing fractures.

Some change in the existing fractures at depth is expected to occur when the hydrostatic pressure exceeds the overburden pressure. Previous injection tests indicate there is a hydraulic connection between the injection zone and a depth of 1000 feet in the vicinity of MW-4.

The estimated existing conditions at this depth are:

Total overburden pressure = 1000 psi (based on saturated
material of 20% porosity)

Hydrostatic pressure = 430 psi

Therefore, the hydrostatic pressure could be increased by 570 psi before hydrofracing or fracture expansion are expected to occur. This corresponds to a maximum wellhead pressure of 600 psi at RRG1-6. Because of uncertainties regarding the extent of existing fractures, the effects of temperature and the effect on unconsolidated, permeable formations, we recommend that the wellhead pressures at the injection wells be maintained below 500 psi.

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Due to the lack of long-term data from injection testing at RRG1-7,
it is necessary to extend the conclusions for RRG1-6 to RRG1-7.

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