Calculated Reservoir Fracture Pressures

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FG = ISIP/TVD
FG = Fracture Gradient (psi/ft)

ISIP = Instantaneous Shut-In Pressure (psi)

The documented ISIPs during completion operations were based on hydrostatic pressure and applied surface pressure.

Griswold 27N-11HZ, API = 0512340914 Niobrara Depth (TVD) = 7,422 ft
Griswold 2C-11HZ, API = 0512340930 Codell Depth (TVD) = 7,585 ft
Griswold 26C-11HZ, API = 0512340906 Ft Hays Depth (TVD) = 7,572 ft
Griswold 26C-11HZ, API = 0512340906 Carlile Depth (TVD) = 7,587 ft

Water specific gravity (Verde 13-1HZ, API = 0512346015) = 1.0203

Hydrostatic gradient = 0.433 psi/ft * 1.0203 = 0.442 psi/ft

Griswold 27N-11HZ, Niobrara Hydrostatic Pressure, Ph= 0.442 psi/ft * 7,422 ft = 3,280 psi
Griswold 2C-11HZ, Codell Hydrostatic Pressure, Ph= 0.442 psi/ft * 7,585 ft = 3,350 psi
Griswold 26C-11HZ, Ft Hays Hydrostatic Pressure, Ph= 0.442 psi/ft * 7,572 ft = 3,345 psi
Griswold 26C-11HZ, Carlile Hydrostatic Pressure, Ph= 0.442 psi/ft * 7,587 ft = 3,353 psi

Griswold 27N-11HZ, Niobrara Instantaneous Shut-In Pressure, ISIP = 6,086 psi
Griswold 2C-11HZ, Codell Instantaneous Shut-In Pressure, ISIP = 6,978 psi
Griswold 26C-11HZ, Ft Hays Instantaneous Shut-In Pressure, ISIP = 6,845 psi
Griswold 26C-11HZ, Carlile Instantaneous Shut-In Pressure, ISIP = 7,318 psi

Griswold 27N-11HZ, Niobrara Fracture Gradient, FG = 6,086 psi / 7,422 ft = 0.82 psi/ft
Griswold 2C-11HZ, Codell Fracture Gradient, FG = 6,978 psi / 7,585 ft = 0.92 psi/ft
Griswold 26C-11HZ, Ft Hays Fracture Gradient, FG = 6,845 psi / 7,572 ft = 0.90 psi/ft
Griswold 26C-11HZ, Carlile Fracture Gradient, FG = 7,318 psi / 7,587 ft = 0.96 psi/ft

Calculated Fracture Pressure:

- Niobrara Fracture Pressure = 6,086 psi
- Codell Fracture Pressure = 6,978 psi
- Ft Hays Fracture Pressure = 6,845 psi
- Carlile Fracture Pressure = 7,318 psi