BLINEBRY-DRINKARD SALT WATER DISPOSAL SYSTEM
SWD Well No. H-35
Step Rate Test Attachment 1

DERIVATION OF FORMULA TO CONVERT BHP TO SP

$$SP = BHP@4000' - HHw@4000' + dPf - Pa$$

$$SP = BHP@4000' - 1692$$

Where: SP   = Corrected Surface Pressure, psig

      BHP@4000' = Bottom Hole Pressure at 4000 feet, psia

      HHw@4000' = Hydrostatic Head of Water at 4000 feet, psi

      dPf   = Frictional Pressure Loss, psi

      Pa   = Atmospheric Pressure, 14.7 psi

Hydrostatic Head of Water

$$HHw@4000' = D \times SG$$

$$HHw@4000' = 1828 \text{ psi}$$

Where: HHw@4000' = Hydrostatic Head of Water at 4000 feet, psi

      D   = Depth to Bottom Hole Pressure Guage, 4000 ft

      SG   = Pressure Gradient of Water, 0.457 psi/ft

Frictional Losses

(Using HAZEN-WILLIAMS Formula)

$$dPf = L [Q / (0.442 \times d^{2.63} \times C)]^{1.85}$$

$$dPf = 150.7 \text{ psi}$$

Where: dPf   = Frictional Pressure Loss, psi

      L   = Length of Pipe, 3981 ft

      Q   = Flow Rate, (159.4 bph x 42 gpb / 60 minph) = 111.6 gpm

      d   = Inside Diameter of Pipe, 2.42 in

      C   = Flow Coefficient, 145