Pressure Front Calculation

Well Name	:	Proposed Gossett SWD # 1
Field Name	:	
Operator	:	High Roller Wells
Injection Interval:	:	2600-3340' (Proposed)

Initial BHP (Pi)	=	0	(psia)
Inj Rate (Q)	=	**17,500**	(Bbls/day)
Viscosity (U)	=	0.85	(cp)
Form Vol Factor (Bo)	=	1	(Res Bbl/STB)
Permeability (k)	=	**78**	(md)
Skin Factor (s)	=	0	
Thickness (h)	=	490	(feet)
Porosity (Por)	=	0.22	(fraction)
Total Compressibility (Ct)	=	6.00E-06	(1/psi)
Injection Time (t)	=	10	(years)
	=	3650	(days)
	=	87600	(hours)
Distance to Nearest Well (R)	=	2640	(feet)
Base Usable Quality Water	=	0	(feet)
Top of Inj Interval	=	2600	(feet)
Fluid Gradient	=	0.464	(psi/foot)

Equation for an infinite acting reservoir (from Lee, 1982, pg. 5)

$P(r,t) = Pi + (A * (B - 2 * s))$

$A = 70.6 * Q * U * Bo / (k * h)$
$= 27.47711$

$B = \ln (1688 * Por * U * Ct * R * R / (k * t))$
$= 6.25E+00$

P(r,t) = 171.7 (psia)

Equation for an infinite acting reservoir (from Mathews & Russell, 1967, pg. 16)

$P(r,t) = Pi + A * B$

$A = 162.6 * Q * U * B / (k * h)$
$= 63.28297$

$B = \log(k * t / (70.4 * Por * U * Ct * R * R))$
$= 2.713614$

P(r,t) = 171.7 (psia)

Exhibit No. 15
Case # 15278
Date: May 19, 2016
High Roller Wells, LLC

Pressure Front Calculation

Well Name	:	Proposed Gossett SWD # 1
Field Name	:	
Operator	:	High Roller Wells
Injection Interval:	:	2600-3340' (Proposed)
Initial BHP (Pi)	=	0 (psia)
Inj Rate (Q)	=	**8,000** (Bbls/day)
Viscosity (U)	=	0.85 (cp)
Form Vol Factor (Bo)	=	1 (Res Bbl/STB)
Permeability (k)	=	**78** (md)
Skin Factor (s)	=	0
Thickness (h)	=	490 (feet)
Porosity (Por)	=	0.22 (fraction)
Total Compressibility (Ct)	=	6.00E-06 (1/psi)
Injection Time (t)	=	10 (years)
	=	3650 (days)
	=	87600 (hours)
Distance to Nearest Well (R)	=	2640 (feet)
Base Usable Quality Water	=	0 (feet)
Top of Inj Interval	=	2600 (feet)
Fluid Gradient	=	0.464 (psi/foot)

Equation for an infinite acting reservoir (from Lee, 1982, pg. 5)

$P(r,t) = Pi + (A * (B - 2 * s))$

$A = 70.6 * Q * U * Bo / (k * h)$
$= 12.56096$

$B = \ln (1688 * Por * U * Ct * R * R / (k * t))$
$= 6.25E+00$

P(r,t) = 78.5 (psia)

Equation for an infinite acting reservoir (from Mathews & Russell, 1967, pg. 16)

$P(r,t) = Pi + A * B$

$A = 162.6 * Q * U * B / (k * h)$
$= 28.92936$

$B = \log(k * t / (70.4 * Por * U * Ct * R * R))$
$= 2.713614$

P(r,t) = 78.5 (psia)

Pressure Front Calculation

Well Name	:	Proposed Gossett SWD # 1
Field Name	:	
Operator	:	High Roller Wells
Injection Interval:	:	2600-3340' (Proposed)
Initial BHP (Pi)	=	0 (psia)
Inj Rate (Q)	=	**5,000** (Bbls/day)
Viscosity (U)	=	0.85 (cp)
Form Vol Factor (Bo)	=	1 (Res Bbl/STB)
Permeability (k)	=	**78** (md)
Skin Factor (s)	=	0
Thickness (h)	=	490 (feet)
Porosity (Por)	=	0.22 (fraction)
Total Compressibility (Ct)	=	6.00E-06 (1/psi)
Injection Time (t)	=	10 (years)
	=	3650 (days)
	=	87600 (hours)
Distance to Nearest Well (R)	=	2640 (feet)
Base Usable Quality Water	=	0 (feet)
Top of Inj Interval	=	*2600 (feet)*
Fluid Gradient	=	0.464 (psi/foot)

Equation for an infinite acting reservoir (from Lee, 1982, pg. 5)

$P(r,t) = Pi + (A * (B - 2 * s))$

$A = 70.6 * Q * U * Bo / (k * h)$
$= 7.850602$

$B = \ln (1688 * Por * U * Ct * R * R / (k * t))$
$= 6.25E+00$

P(r,t) = 49.1 (psia)

Equation for an infinite acting reservoir (from Mathews & Russell, 1967, pg. 16)

$P(r,t) = Pi + A * B$

$A = 162.6 * Q * U * B / (k * h)$
$= 18.08085$

$B = \log(k * t / (70.4 * Por * U * Ct * R * R))$
$= 2.713614$

P(r,t) = 49.1 (psia)

Pressure Front Calculation

Well Name	:	Proposed Gossett SWD # 1
Field Name	:	
Operator	:	High Roller Wells
Injection Interval:	:	2600-3340' (Proposed)
Initial BHP (Pi)	=	0 (psia)
Inj Rate (Q)	=	**4,000** (Bbls/day)
Viscosity (U)	=	0.85 (cp)
Form Vol Factor (Bo)	=	1 (Res Bbl/STB)
Permeability (k)	=	**78** (md)
Skin Factor (s)	=	0
Thickness (h)	=	490 (feet)
Porosity (Por)	=	0.22 (fraction)
Total Compressibility (Ct)	=	6.00E-06 (1/psi)
Injection Time (t)	=	10 (years)
	=	3650 (days)
	=	87600 (hours)
Distance to Nearest Well (R)	=	2640 (feet)
Base Usable Quality Water	=	0 (feet)
Top of Inj Interval	=	2600 (feet)
Fluid Gradient	=	0.464 (psi/foot)

Equation for an infinite acting reservoir (from Lee, 1982, pg. 5)

$P(r,t) = Pi + (A * (B - 2 * s))$

$A = 70.6 * Q * U * Bo / (k * h)$
$= 6.280481$

$B = ln (1688 * Por * U * Ct * R * R / (k * t))$
$= 6.25E+00$

P(r,t) = 39.2 (psia)

Equation for an infinite acting reservoir (from Mathews & Russell, 1967, pg. 16)

$P(r,t) = Pi + A * B$

$A = 162.6 * Q * U * B / (k * h)$
$= 14.46468$

$B = log(k * t / (70.4 * Por * U * Ct * R * R))$
$= 2.713614$

P(r,t) = 39.3 (psia)