

FIGURES

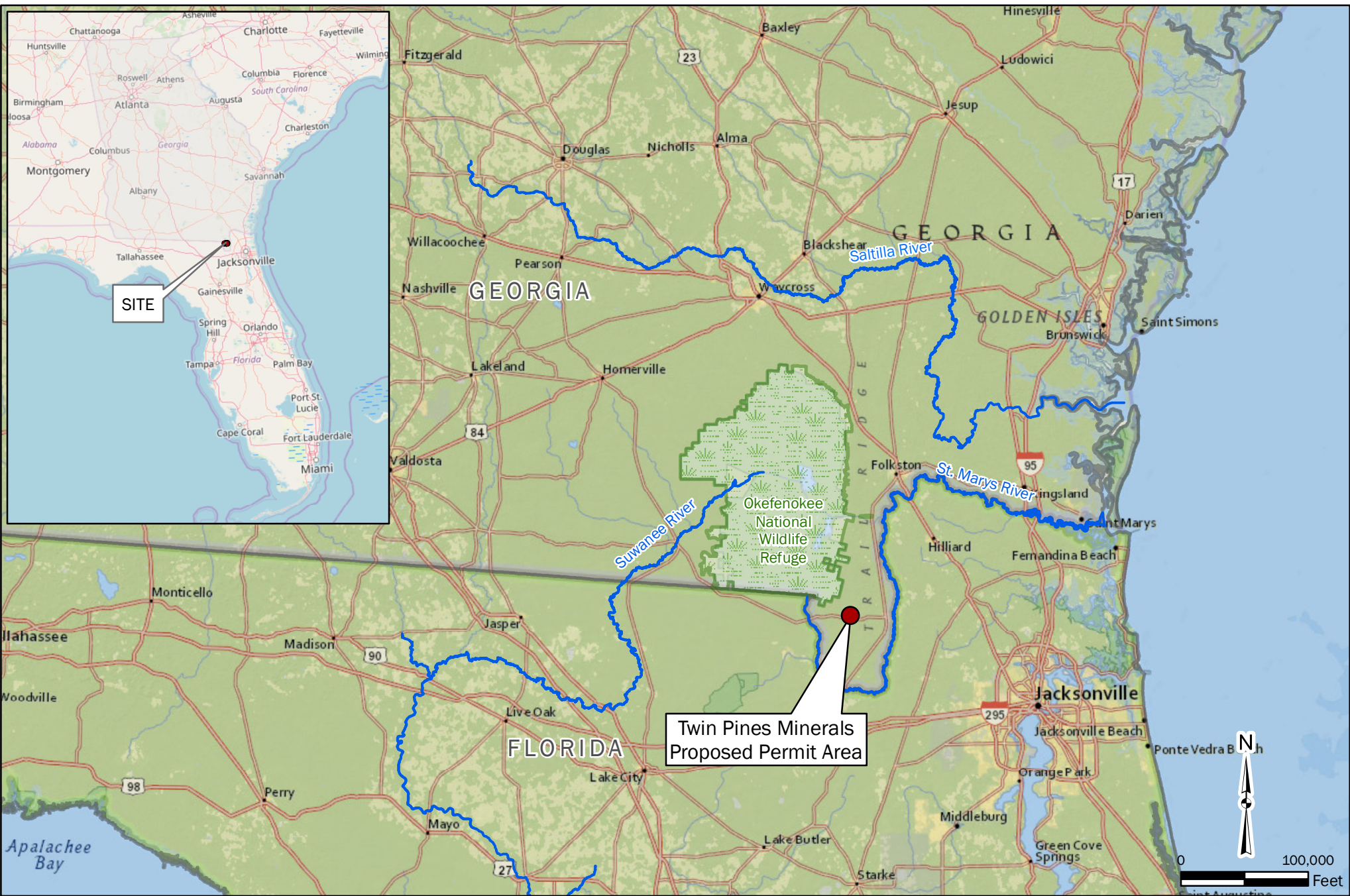


FIGURE 1: LOCATION OF THE PROPOSED TWIN PINES MINE
TWIN PINES MINERALS

ST. GEORGE, CHARLTON COUNTY, GEORGIA

INSET BASEMAP: Open Street Map. BASEMAP: National Geographic World Map.

| |
|----------------------------------|
| DRAWN BY: DEK |
| CHECKED BY: JMT |
| DRAWING DATE: 10/28/2019 |
| REVISION DATE: N/A |
| TTL JOB NO.: 000180200804.00 |
| APPROX. SCALE: 1 in = 100,000 ft |

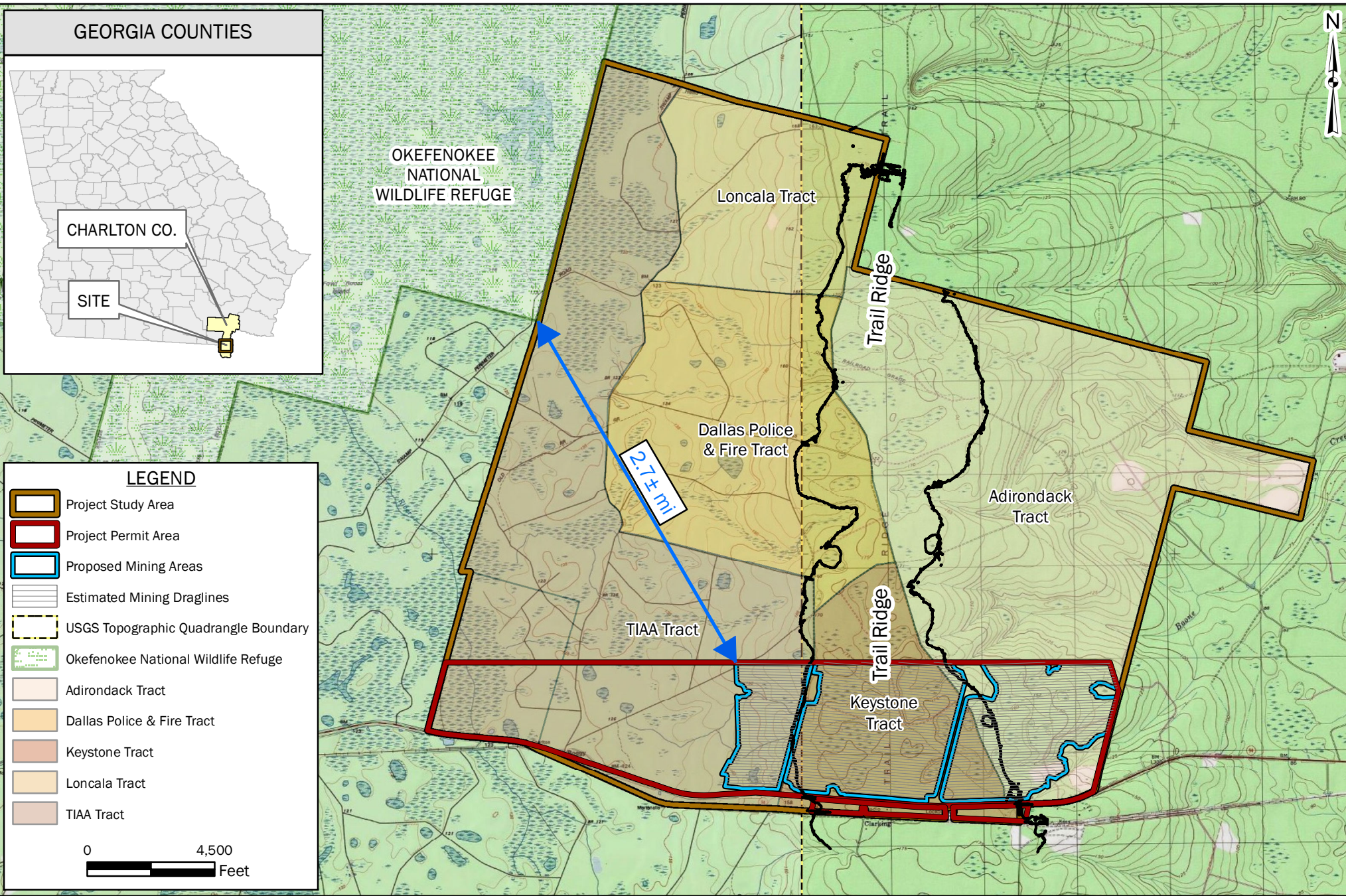


FIGURE 2: PROJECT STUDY & PROPOSED PERMIT AREA
TWIN PINES MINERALS
 ST. GEORGE, CHARLTON COUNTY, GEORGIA

BASEMAP: USGS 7.5 Minute Quadrangle Map, Florida & Georgia, (West) Moniac 1968 (10-ft Contour Interval), (East) Saint George 1982 (5-ft Contour Interval).

| |
|--------------------------------|
| DRAWN BY: DEK |
| CHECKED BY: JMT |
| DRAWING DATE: 10/28/2019 |
| REVISION DATE: N/A |
| TTL JOB NO.: 000180200804.00 |
| APPROX. SCALE: 1 in = 4,500 ft |

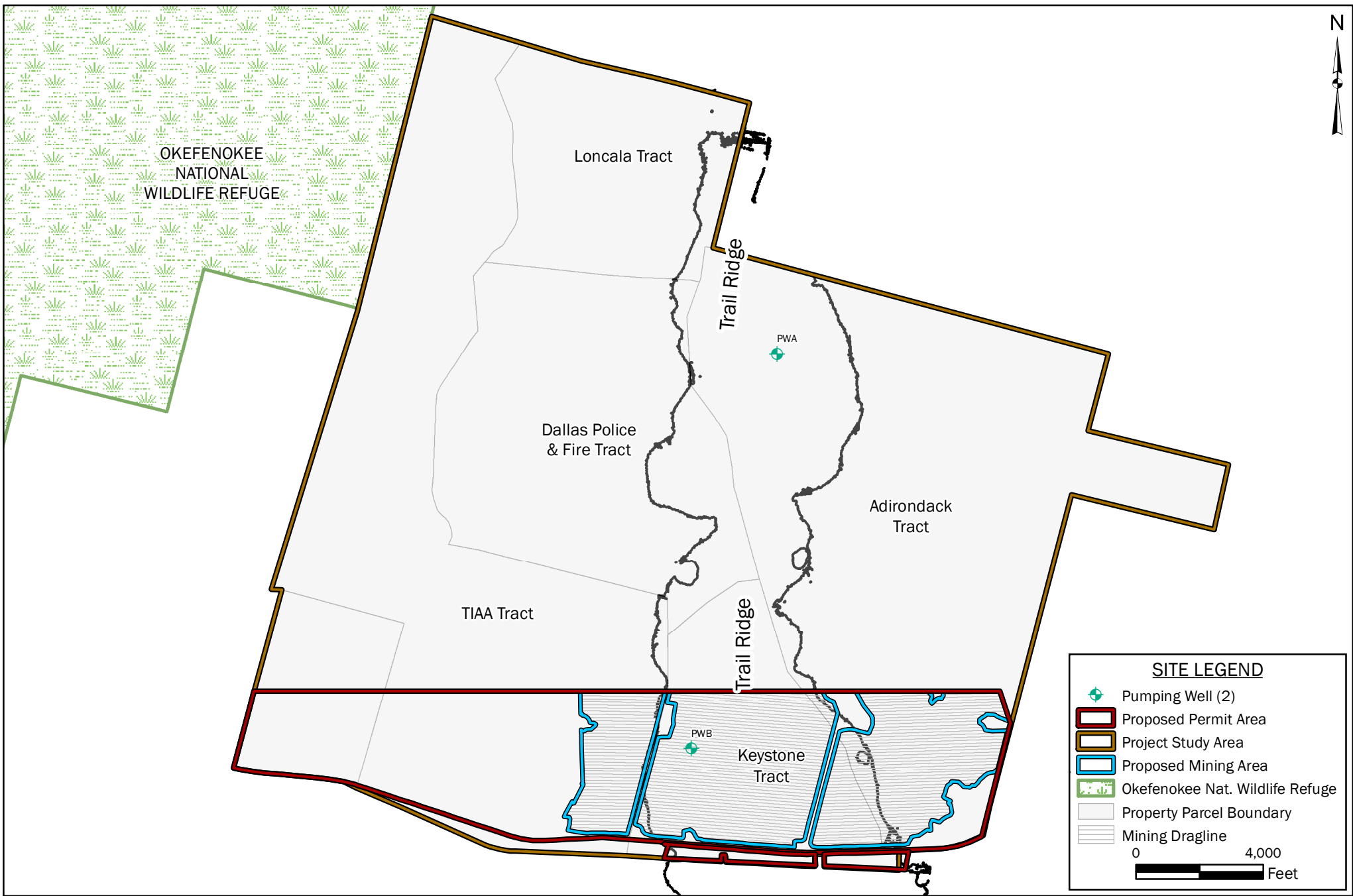
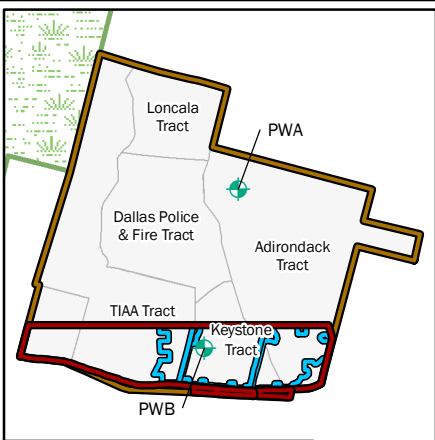


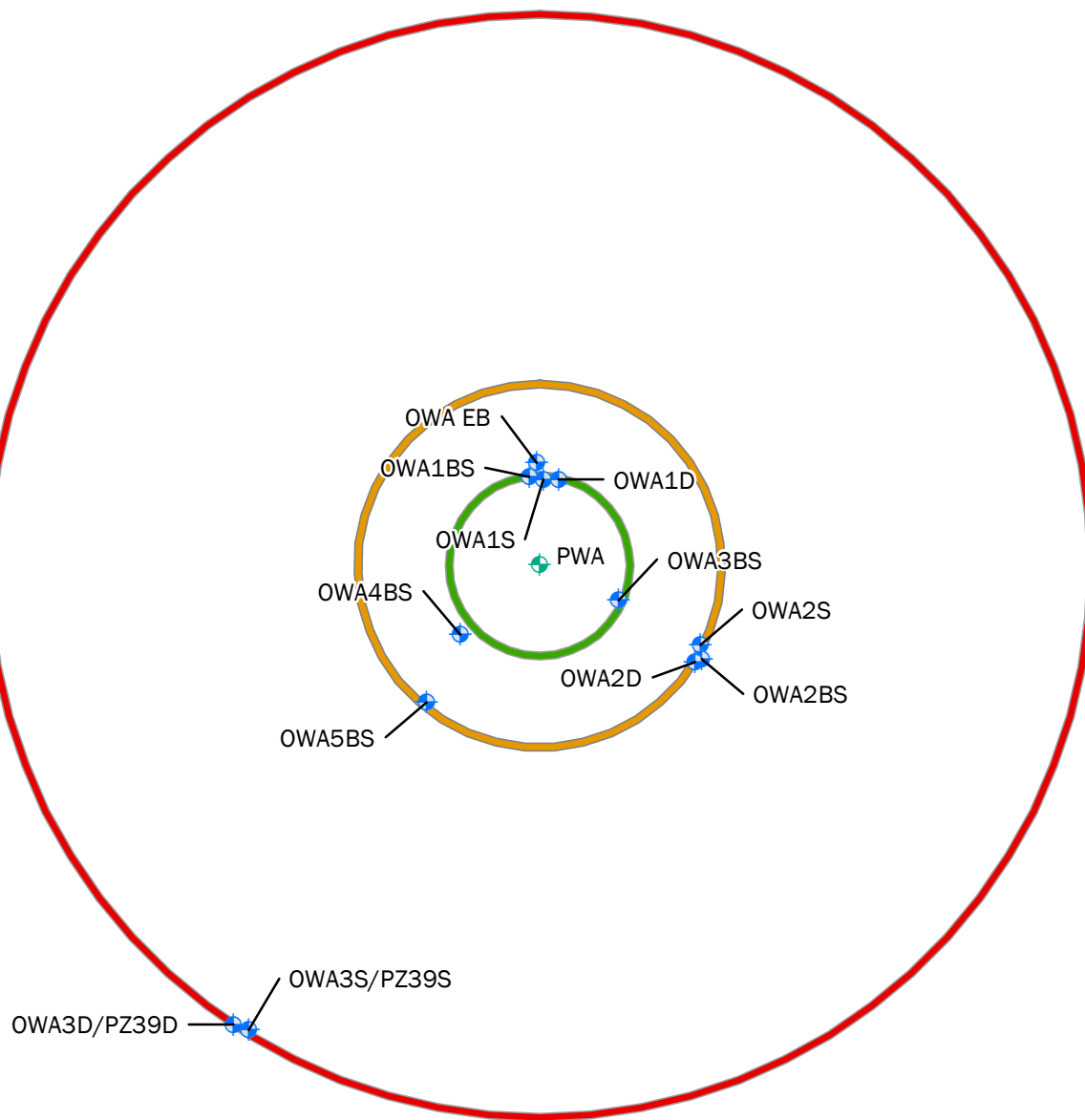
FIGURE 3: PUMPING WELL LOCATION MAP
TWIN PINES MINERALS
 ST. GEORGE, CHARLTON COUNTY, GEORGIA

| |
|--------------------------------|
| DRAWN BY: DEK |
| CHECKED BY: JRS |
| DRAWING DATE: 10/28/2019 |
| REVISION DATE: N/A |
| TTL JOB NO.: 000180200804.00 |
| APPROX. SCALE: 1 in = 4,000 ft |



INSET LEGEND

-  Pumping Well (2)
-  Proposed Permit Area
-  Project Study Area
-  Proposed Mining Area
-  Okefenokee Nat. Wildlife Refuge
-  Property Parcel Boundary



SITE LEGEND






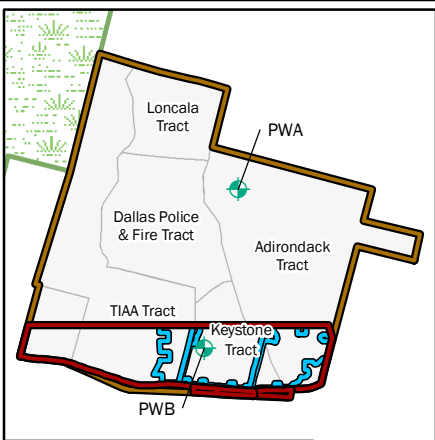
-  Pumping Well "A"
 -  Observation Well
 -  50 ft Radius
 -  100 ft Radius
 -  300 ft Radius
- 0 100
Feet



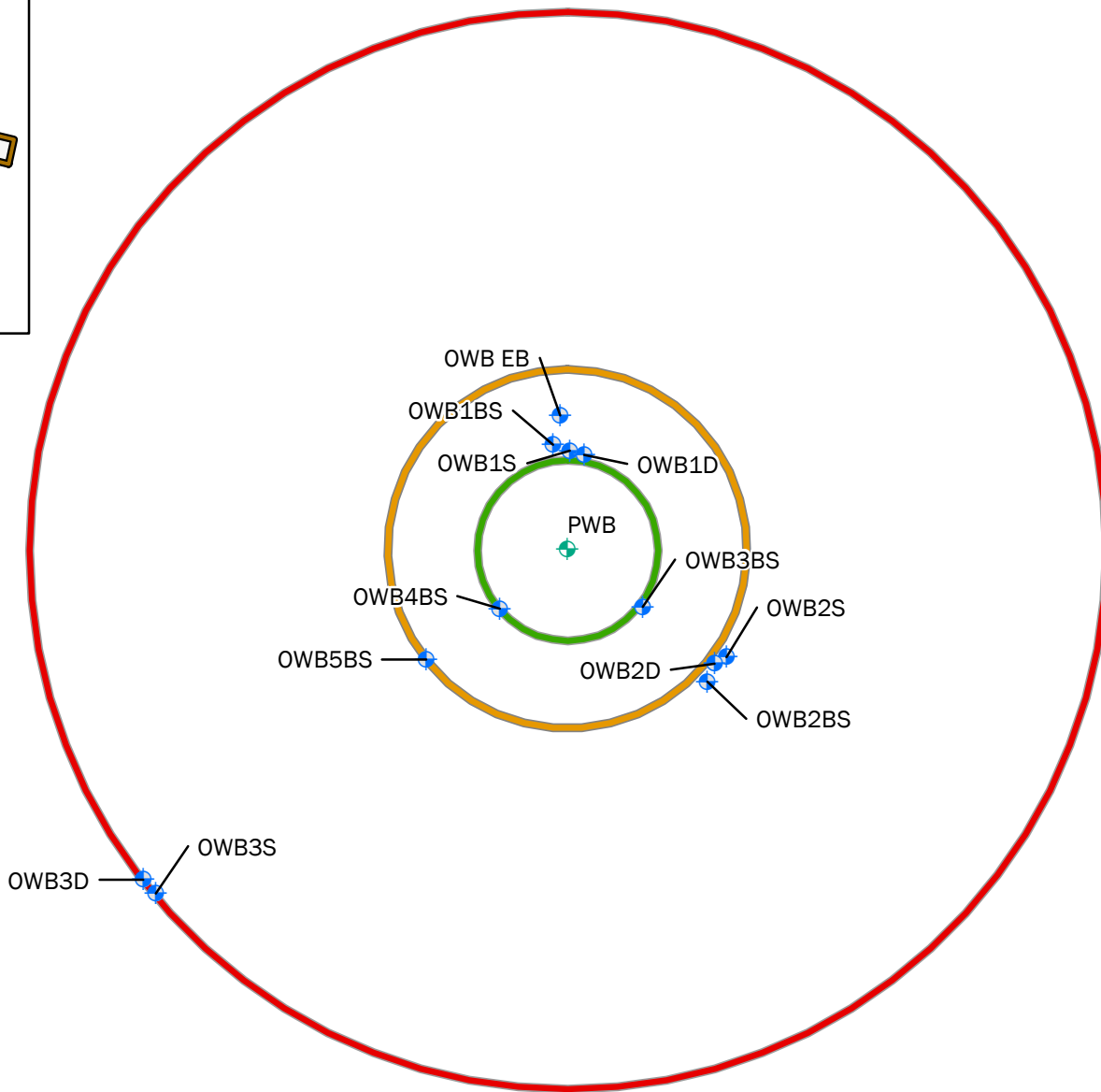
FIGURE 4: PUMPING WELL "A" LOCATION MAP
TWIN PINES MINERALS
ST. GEORGE, CHARLTON COUNTY, GEORGIA

| |
|------------------------------|
| DRAWN BY: DEK |
| CHECKED BY: JRS |
| DRAWING DATE: 10/28/2019 |
| REVISION DATE: N/A |
| TTL JOB NO.: 000180200804.00 |
| APPROX. SCALE: 1 in = 100 ft |



INSET LEGEND

-  Pumping Well (2)
-  Proposed Permit Area
-  Project Study Area
-  Proposed Mining Area
-  Okefenokee Nat. Wildlife Refuge
-  Property Parcel Boundary



SITE LEGEND






-  Pumping Well "B"
 -  Observation Well
 -  50 ft Radius
 -  100 ft Radius
 -  300 ft Radius
- 0 100
Feet



FIGURE 5: PUMPING WELL "B" LOCATION MAP
TWIN PINES MINERALS
ST. GEORGE, CHARLTON COUNTY, GEORGIA

| |
|------------------------------|
| DRAWN BY: DEK |
| CHECKED BY: JRS |
| DRAWING DATE: 10/28/2019 |
| REVISION DATE: N/A |
| TTL JOB NO.: 000180200804.00 |
| APPROX. SCALE: 1 in = 100 ft |

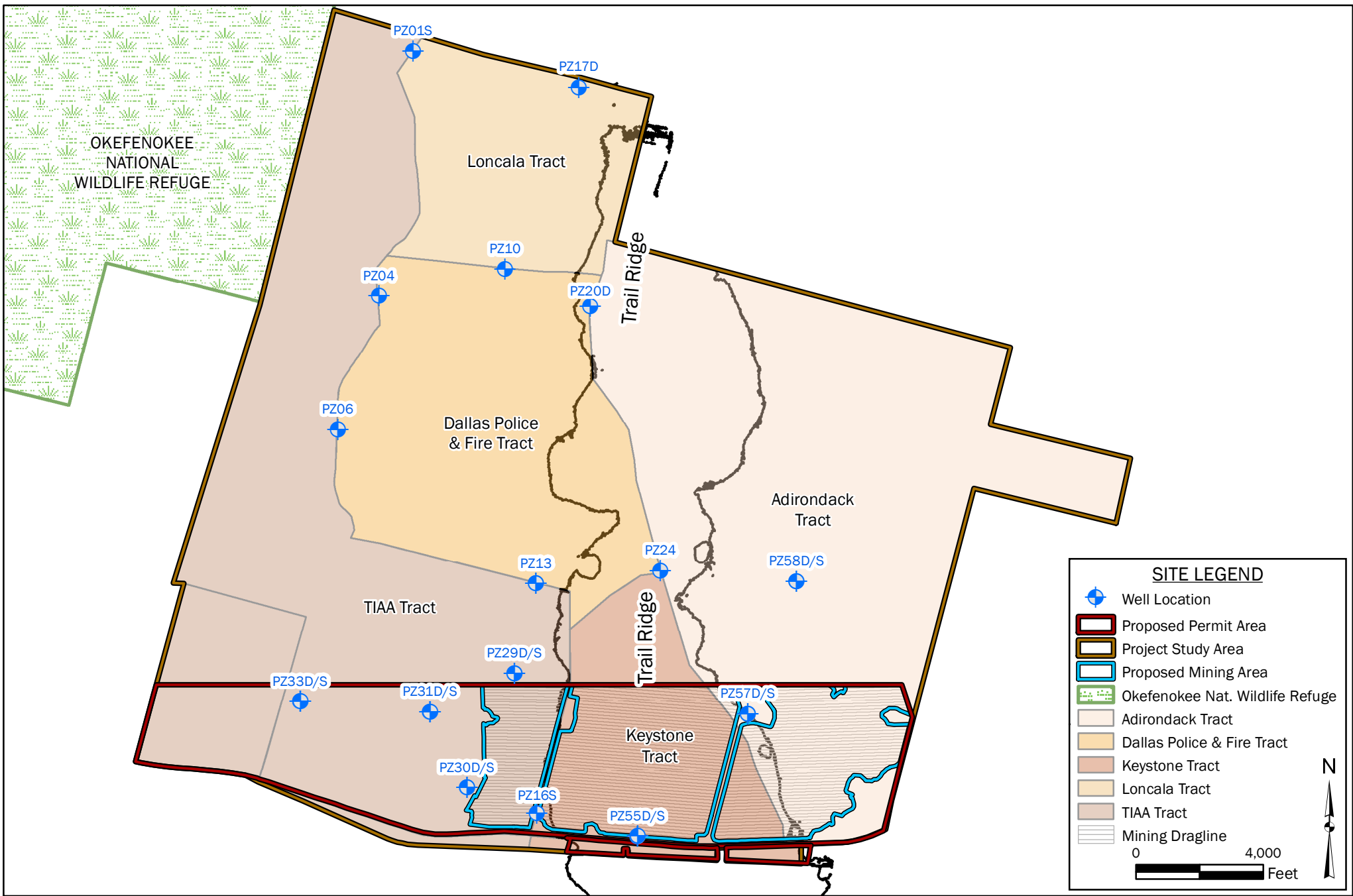


FIGURE 6: SLUG & BAIL TEST PIEZOMETER LOCATION MAP
TWIN PINES MINERALS
 ST. GEORGE, CHARLTON COUNTY, GEORGIA



| |
|--------------------------------|
| DRAWN BY: DEK |
| CHECKED BY: JRS |
| DRAWING DATE: 10/28/2019 |
| REVISION DATE: N/A |
| TTL JOB NO.: 000180200804.00 |
| APPROX. SCALE: 1 in = 4,000 ft |

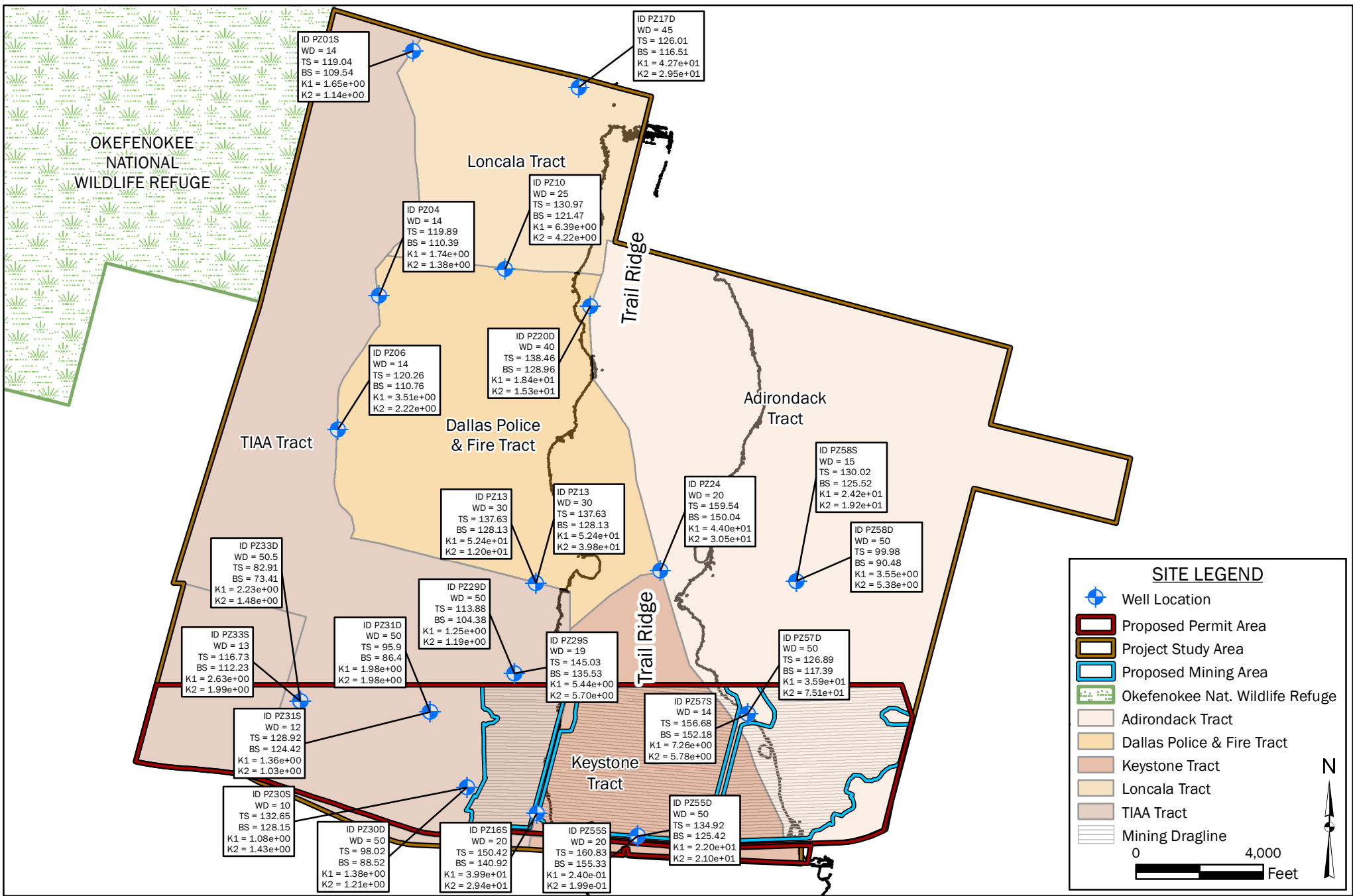


FIGURE 7: HYDRAULIC CONDUCTIVITY (SLUG TESTS)
TWIN PINES MINERALS
 ST. GEORGE, CHARLTON COUNTY, GEORGIA

| |
|--------------------------------|
| DRAWN BY: DEK |
| CHECKED BY: JRS |
| DRAWING DATE: 10/28/2019 |
| REVISION DATE: N/A |
| TTL JOB NO.: 000180200804.00 |
| APPROX. SCALE: 1 in = 4,000 ft |

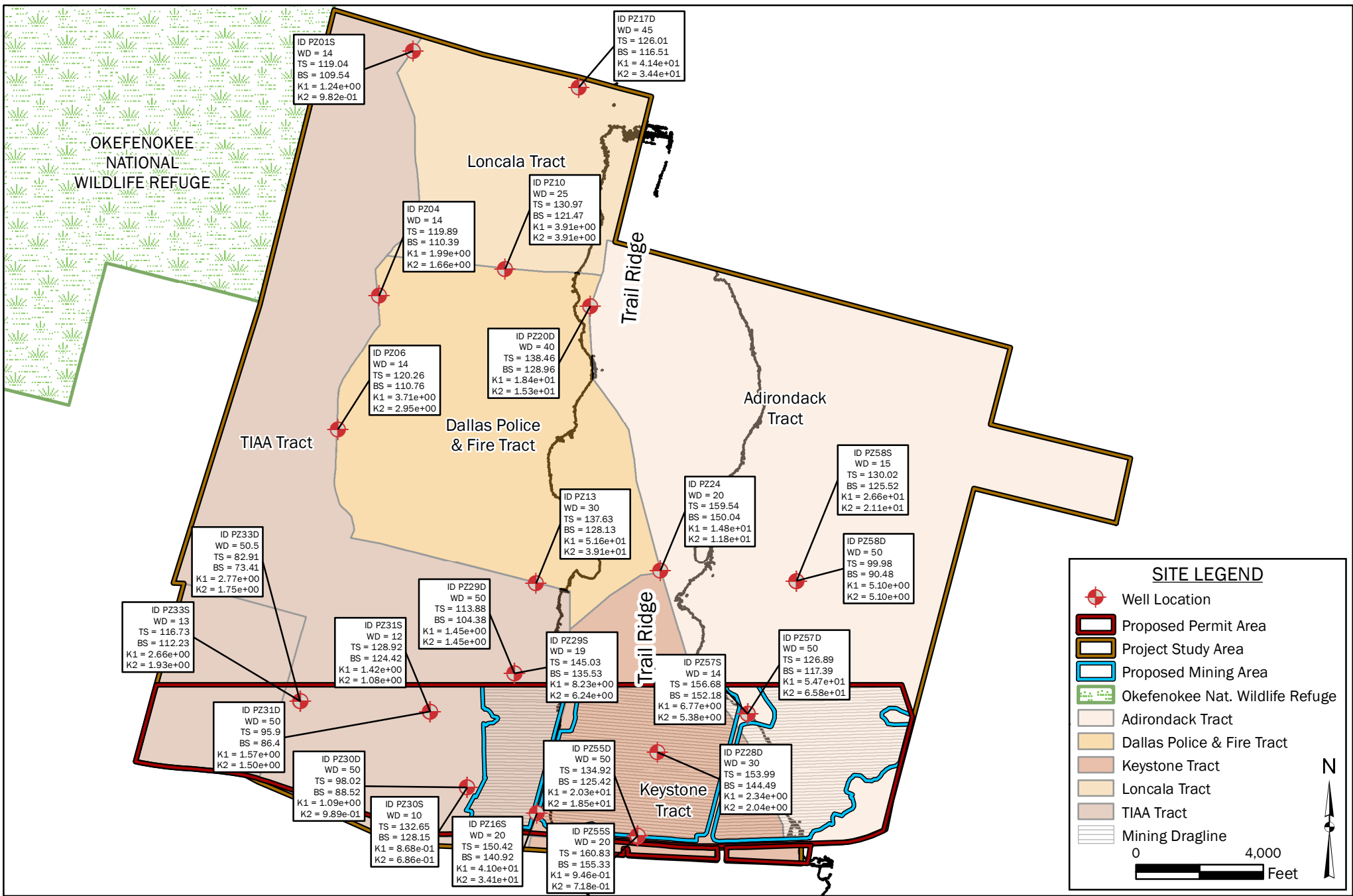


FIGURE 8: HYDRAULIC CONDUCTIVITY (BAIL TESTS)
 TWIN PINES MINERALS
 ST. GEORGE, CHARLTON COUNTY, GEORGIA

| |
|--------------------------------|
| DRAWN BY: DEK |
| CHECKED BY: JRS |
| DRAWING DATE: 10/28/2019 |
| REVISION DATE: N/A |
| TTL JOB NO.: 000180200804.00 |
| APPROX. SCALE: 1 in = 4,000 ft |

TABLES

Table 1. Summary of Observation Well Construction Depths and Distances from Pumping Wells PWA and PWB. Hydrologic Field Characterization at Twin Pines Mine; Twin Pines Minerals, LLC; St. George, Charlton County, Georgia. TTL Project No. 000180200804.00

| Pumping Well PWA | | |
|-------------------------|---------------------------------|------------------------------|
| Observation Well | Distance from PWA (feet) | Well Depth (ft bgs) |
| OWA1BS | 50 | 12 |
| OWA1S | 50 | 35 |
| OWA1D | 50 | 90 |
| OWA3BS | 50 | 12 |
| OWA4BS | 50 | 12 |
| OWA2BS | 100 | 12 |
| OWA2S | 100 | 35 |
| OWA2D | 100 | 90 |
| OWA5BS | 100 | 12 |
| OWA3S/PZ39S | 300 | 35 |
| OWA3D/PZ39D | 300 | 90 |
| Pumping Well PWB | | |
| Observation Well | Distance from PWB (feet) | Well Depth (feet bgs) |
| OWB1BS | 50 | 12 |
| OWB1S | 50 | 35 |
| OWB1D | 50 | 90 |
| OWB3BS | 50 | 12 |
| OWB4BS | 50 | 12 |
| OWB2BS | 100 | 12 |
| OWB2S | 100 | 35 |
| OWB2D | 100 | 90 |
| OWB5BS | 100 | 12 |
| OWB3S | 300 | 35 |
| OWB3D | 300 | 90 |

Table 2. Well Construction Summary Table; Hydrologic Field Characteristics at Twin Pines Mine; Twin Pines Minerals, LLC; St. George, Charlton County, Georgia. TTL Project No. 000180200804.00

| Well I.D. | Installation Start Date | Screened Interval (feet bgs ¹) | Natural Fill Sand Pack (feet bgs) | Bentonite Plug (feet bgs) | Portland Cement Grout (feet bgs) | Construction Depth of Piezometer (feet bgs) | Total Boring Depth (feet bgs) |
|--|-------------------------|--|-----------------------------------|---------------------------|----------------------------------|---|-------------------------------|
| Pumping & Observation Wells | | | | | | | |
| OWA1S | 11/9/2018 | 35-25 | 35-22 | 22-20 | 20-0.5 | 35 | 35 |
| OWA1D | 11/9/2018 | 90-80 | 90-76 | 76-74 | 74-0 | 90 | 90 |
| OWA1BS | 12/11/2018 | 12-2 | 12-1 | 1-0.5 | -- | 12 | 12 |
| OWA2S | 11/14/2018 | 35-25 | 35-22 | 22-20 | 20-0.5 | 35 | 35 |
| OWA2D | 11/13/2018 | 90-80 | 90-76 | 76-74 | 74-0 | 90 | 90 |
| OWA2BS | 12/7/2018 | 12-2 | 12-1 | 1-0.5 | -- | 12 | 12 |
| OWA3BS | 1/30/2019 | 12-7 | 12-0 | -- | -- | 12 | 12 |
| OWA4BS | 1/30/2019 | 12-7 | 12-0 | -- | -- | 12 | 12 |
| OWA5BS | 1/30/2019 | 12-7 | 12-0 | -- | -- | 12 | 12 |
| PWA | 12/20/2018 | 115-55 | 115-45 | 45-40 | 40-0 | 115 | 115 |
| OWB1S | 11/27/2018 | 35-25 | 35-22 | 22-20 | 20-0.5 | 35 | 35 |
| OWB1D | 11/27/2018 | 90-80 | 90-76 | 76-74 | 74-0 | 90 | 90 |
| OWB1BS | 12/7/2018 | 12-2 | 12-1 | 1-0.5 | -- | 12 | 12 |
| OWB2S | 11/30/18 | 35-25 | 35-22 | 22-20 | 20-0.5 | 35 | 35 |
| OWB2D | 11/28/2018 | 90-80 | 90-76 | 76-74 | 74-0 | 90 | 90 |
| OWB2BS | 12/7/2018 | 12-2 | 12-1 | 1-0.5 | -- | 12 | 12 |
| OWB3S | 12/5/2018 | 35-25 | 35-22 | 22-20 | 20-0.5 | 35 | 35 |
| OWB3D | 12/5/2018 | 90-80 | 90-76 | 76-74 | 74-0 | 90 | 90 |
| OWB3BS | 1/30/2019 | 12-7 | 12-0 | -- | -- | 12 | 12 |
| OWB4BS | 1/30/2019 | 12-7 | 12-0 | -- | -- | 12 | 12 |
| OWB5BS | 1/30/2019 | 12-7 | 12-0 | -- | -- | 12 | 12 |
| PWB | 12/10/2018 | 115-55 | 115-45 | 45-40 | 40-0 | 115 | 115 |

¹ Below ground surface

² Not applicable or missing data

³ Undisturbed sample borings converted to piezometers for downhole geophysical survey

Table 3. Slug and Bail Test Location Summary. Hydrologic Field Characterization at Twin Pines Mine; Twin Pines Minerals, LLC; St. George, Charlton County, Georgia. TTL Project No. 000180200804.00

| Piezometer | Date of Test |
|------------|--------------|
| PZ01S | 10/10/18 |
| PZ04 | 10/10/18 |
| PZ06 | 10/10/18 |
| PZ10 | 10/10/18 |
| PZ13 | 10/10/18 |
| PZ16S | 10/11/18 |
| PZ17D | 10/11/18 |
| PZ20D | 10/11/18 |
| PZ24 | 10/11/18 |
| PZ28D | 10/10/18 |
| PZ29S/D | 5/16/19 |
| PZ30S/D | 5/16/19 |
| PZ31S/D | 5/16/19 |
| PZ33S/D | 5/16/19 |
| PZ55S/D | 5/16/19 |
| PZ57S/D | 5/16/19 |
| PZ58S/D | 5/16/19 |

S/D = Shallow and Deep Piezometer

TABLE 4
PWA Aquifer Test Hydraulic Parameter Estimates

| Observation Well (s) | Bottom of Screen Depth (ft) | Solution | T (ft ² /day) | S | Specific Yield | Kv (ft/day) | Kv aquitard (ft/day) | b (ft) | Kh (ft/day) | recom- mended | Comment |
|----------------------|-----------------------------|---------------------------------|--------------------------|---------|----------------|-------------|----------------------|--------|-------------|---------------|---|
| PW-A | 115 | Neuman Unconfined | 1967 | 3.5E-04 | 2.9E-03 | 0.2 | NA | 115 | 17.1 | x | |
| PW-A | 115 | Vert. Anisotropic Leaky | 1490 | 1.1E-02 | NA | 1.0 | 0.40 | 115 | 13.0 | x | analysis using WHIP |
| OWA-1D | 90 | Neuman Unconfined | 1475 | 8.5E-03 | 0.50 | 0.3 | NA | 115 | 12.8 | x | |
| OWA-2D | 90 | Neuman Unconfined | 1319 | 4.8E-03 | 2.9E-02 | 0.3 | NA | 115 | 11.5 | x | |
| OWA-3D | 90 | Neuman Unconfined | 2288 | 1.7E-02 | 0.03 | 1.08 | NA | 115 | 19.9 | x | |
| OWA-1S | 35 | Neuman Unconfined | 1351 | 4.3E-03 | 0.50 | 1.8 | NA | 115 | 11.7 | x | |
| OWA-2S | 35 | Neuman Unconfined | 1820 | 3.4E-03 | 0.50 | 1.6 | NA | 115 | 15.8 | | |
| OWA-3S | 35 | Neuman Unconfined | 680 | 5.5E-05 | 2.2E-02 | 0.06 | NA | 115 | 5.9 | x | |
| OWA-1D | 90 | ¹ Neuman-Witherspoon | 914 | 2.2E-03 | NA | NA | 3.7E-06 | 100 | 9.1 | | T2=1.44e8 ft ² /d; S2=1e-10 |
| OWA-1D | 90 | ¹ Neuman-Witherspoon | 356 | 7.3E-05 | NA | NA | 4.4E-01 | 100 | 3.6 | x | T2=4170 ft ² /d; S2=0.0149; improved fit |
| OWA-2D | 90 | ¹ Neuman-Witherspoon | 1017 | 1.2E-03 | NA | NA | 4.1E-06 | 100 | 10.2 | | T2=1.44e8 ft ² /d; S2=1e-10 |
| OWA-2D | 90 | ¹ Neuman-Witherspoon | 422 | 8.8E-04 | NA | NA | 0.152 | 100 | 4.2 | x | T2=4850 ft ² /d; S2=1.01e-10; improved fit |
| OWA-3D | 90 | ¹ Neuman-Witherspoon | 1700 | 7.0E-03 | NA | NA | 6.8E-06 | 100 | 17.0 | | T2=1.44e8 ft ² /d; S2=2.7e-5 |
| OWA-3D | 90 | ¹ Neuman-Witherspoon | 331 | 3.4E-03 | NA | NA | 0.383 | 100 | 3.3 | x | T2=4272 ft ² /d; S2=9.91e-3; improved fit |
| OWA-3D | 90 | ¹ Neuman-Witherspoon | 1.3 | 1.0E-04 | NA | NA | 0.396 | 100 | 0.013 | | T2=4520 ft ² /d; S2=0.005 |
| OWA-1D | 90 | Vert. Anisotropic Leaky | 360 | 1.6E-05 | NA | 0.70 | 0.68 | 100 | 3.6 | x | analysis using WHIP; Ss aqt = 5.39e-3 |
| OWA-1D | 90 | Vert. Anisotropic Leaky | 543 | 1.4E-03 | NA | 1.01 | 0.32 | 100 | 5.4 | x | fit recovery w/WHIP; Ss aqt = 5.04e-3 |
| OWA-2D | 90 | Vert. Anisotropic Leaky | 337 | 1.6E-05 | NA | 0.29 | 0.24 | 100 | 3.4 | x | analysis using WHIP; Ss aqt = 2.01e-3 |
| OWA-2D | 90 | Vert. Anisotropic Leaky | 665 | 9.8E-04 | NA | 0.19 | 0.13 | 100 | 6.7 | x | fit recovery w/WHIP; Ss aqt = 1.85e-3 |
| OWA-3D | 90 | Vert. Anisotropic Leaky | 323 | 1.6E-05 | NA | 0.17 | 0.17 | 100 | 3.2 | x | analysis using WHIP; Ss aqt = 2.10e-3 |
| OWA-1S | 35 | Vert. Anisotropic Leaky | 592 | 1.6E-05 | NA | 0.8 | 0.73 | 100 | 5.9 | x | analysis using WHIP; Ss aqt = 1.77e-3 |
| OWA-2S | 35 | Vert. Anisotropic Leaky | 354 | 1.6E-05 | NA | 0.4 | 0.67 | 100 | 3.5 | x | analysis using WHIP; Ss aqt = 9.54e-4 |
| OWA-3S | 35 | Vert. Anisotropic Leaky | 326 | 1.6E-05 | NA | 0.11 | 0.05 | 100 | 3.3 | x | analysis using WHIP; Ss aqt = 2.76e-5 |
| OWA-1D/3D | 90/90 | Neuman Unconfined | 946 | 1.2E-02 | 0.06 | 1.27 | NA | 115 | 8.2 | x | |
| OWA-1D/3D | 90/90 | ¹ Neuman-Witherspoon | 596 | 9.8E-04 | NA | NA | 2.4E-06 | 100 | 6.0 | x | T2=1.44e8 ft ² /d; S2=1e-10 |
| OWA-1S/D | 35/90 | Neuman Unconfined | 1136 | 1.1E-02 | 0.5 | 0.8 | NA | 115 | 9.9 | x | |
| OWA-1S/D | 35/90 | Neuman Unconfined | 1154 | 1.0E-02 | 0.25 | 0.8 | NA | 115 | 10.0 | | alt interp |
| OWA-1S/D | 35/90 | Neuman Unconfined | 926 | 1.1E-02 | 0.50 | 1.6 | NA | 115 | 8.1 | | early time interp |
| OWA-2S/D | 35/90 | Neuman Unconfined | 866 | 5.3E-03 | 3.3E-02 | 0.8 | NA | 115 | 7.5 | | |
| OWA-2S/D | 35/90 | Neuman Unconfined | 1141 | 5.8E-03 | 0.50 | 1.0 | NA | 115 | 9.9 | | early time interp |
| OWA-2S/D | 35/90 | Neuman Unconfined | 1319 | 4.8E-03 | 0.029 | 0.29 | NA | 115 | 11.5 | x | alt interp |
| OWA-2S/D | 35/90 | Neuman Unconfined | 1800 | 2.0E-03 | 0.50 | 1.6 | NA | 115 | 15.7 | | alt interp |
| OWA-1S/D | 35/90 | Vert. Anisotropic Leaky | 355 | 1.6E-05 | NA | 0.5 | 0.75 | 100 | 3.6 | x | analysis using WHIP; Ss aqt = 5.12e-3 |
| OWA-2S/D | 35/90 | Vert. Anisotropic Leaky | 329 | 1.6E-05 | NA | 0.1 | 0.30 | 100 | 3.3 | x | analysis using WHIP; Ss aqt = 2.05e-3 |
| OWA-1D/2D/3D | 90/90/90 | Neuman Unconfined | 1307 | 7.7E-03 | 0.50 | 0.43 | NA | 115 | 11.4 | x | |
| OWA-1D/2D/3D | 90/90/90 | ¹ Neuman-Witherspoon | 718 | 1.3E-03 | NA | NA | 2.9E-06 | 100 | 7.2 | x | T2=1.44e8 ft ² /d; S2=1e-10 |

Notes:

- ¹ = leaky aquifer; partial penetration of wells not represented
- T = Transmissivity in feet squared per day (ft²/day)
- T2 = Transmissivity of unpumped aquifer
- S = Storage coefficient
- S2 = Storage coefficient of unpumped aquifer
- Ss = Specific storage of aquitard (storage per foot of thickr
- Kh = horizontal hydraulic conductivity in feet per day (ft/day) calculated as T/b
- Kv =vertical hydraulic conductivity in feet per day (ft/day)
- b = Assumed aquifer thickness in feet

TABLE 5
PWB Aquifer Test Hydraulic Parameter Estimates

| Observation Well (s) | Bottom of Screen Depth (ft) | Solution | T (ft ² /day) | S | Specific Yield | Kv (ft/day) | Kv aquitard (ft/day) | b (feet) | Kh (ft/day) | recommended | Comment |
|----------------------|-----------------------------|---------------------------------|--------------------------|----------|----------------|-------------|----------------------|----------|-------------|-------------|---|
| PW-B | 115 | Neuman Unconfined | 697 | 2.42E-03 | 1.00E-03 | 0.61 | NA | 115 | 6.1 | x | |
| PW-B | 115 | Vert. Anisotropic Leaky | 530 | 0.11 | NA | 0.55 | 0.10 | 115 | 4.6 | x | analysis using WHIP; Ss aqt = 0.01 |
| OWB-1D | 90 | Neuman Unconfined | 478 | 2.92E-03 | 1.00E-03 | 1.42 | NA | 115 | 4.2 | | |
| OWB-1D | 90 | Neuman Unconfined | 530 | 4.96E-03 | 1.00E-03 | 0.47 | NA | 115 | 4.6 | | alternate interp; improved fit |
| OWB-1D | 90 | Neuman Unconfined | 901 | 3.20E-03 | 1.00E-03 | 9.29E-03 | NA | 115 | 7.8 | x | alternate interp; additionally improved fit |
| OWB-2D | 90 | Neuman Unconfined | 442 | 2.95E-03 | 1.00E-03 | 0.88 | NA | 115 | 3.8 | | |
| OWB-2D | 90 | Neuman Unconfined | 808 | 4.78E-03 | 0.25 | 1.79E-02 | NA | 115 | 7.0 | x | alternate interp; improved fit |
| OWB-3D | 90 | Neuman Unconfined | 475 | 1.32E-03 | 0.50 | 4.34E-02 | NA | 115 | 4.1 | x | |
| OWB-3D | 90 | Neuman Unconfined | 674 | 3.43E-03 | 0.25 | 9.20E-03 | NA | 115 | 5.9 | | alternate interp; poorer fit |
| OWB-1S | 35 | Neuman Unconfined | 224 | 1.19E-04 | 4.58E-03 | 2.12E-02 | NA | 115 | 1.9 | x | |
| OWB-2S | 35 | Neuman Unconfined | 221 | 2.96E-05 | 1.13E-03 | 5.17E-03 | NA | 115 | 1.9 | x | |
| OWB-3S | 35 | Neuman Unconfined | 246 | 3.09E-05 | 1.00E-03 | 4.88E-03 | NA | 115 | 2.1 | x | |
| OWB-2BS | 12 | Neuman Unconfined | 5455 | 1.37E-04 | 1.78E-02 | 1.02E-02 | NA | 115 | 47.4 | | unreasonably high T |
| OWB-3BS | 12 | Neuman Unconfined | 6148 | 5.00E-05 | 2.00E-03 | 3.50E-03 | NA | 115 | 53.5 | | unreasonably high T |
| OWB-4BS | 12 | Neuman Unconfined | 6918 | 4.84E-05 | 0.25 | 3.50E-03 | NA | 115 | 60.2 | | unreasonably high T |
| OWB-5BS | 12 | Neuman Unconfined | 9499 | 3.75E-05 | 0.25 | 3.50E-03 | NA | 115 | 82.6 | | unreasonably high T |
| OWB-1D | 90 | ¹ Neuman-Witherspoon | 445 | 1.79E-03 | NA | NA | 5.41E-03 | 100 | 4.5 | x | T2=1.44e8 ft ² /d; S2=1.0 |
| OWB-2D | 90 | ¹ Neuman-Witherspoon | 405 | 2.34E-03 | NA | NA | 7.70E-03 | 100 | 4.1 | x | T2=1.44e8 ft ² /d; S2=1.0 |
| OWB-3D | 90 | ¹ Neuman-Witherspoon | 285 | 1.32E-03 | NA | NA | 1.14E-06 | 100 | 2.9 | | T2=1.44e8 ft ² /d; S2=6.03e-9 |
| OWB-3D | 90 | ¹ Neuman-Witherspoon | 211 | 1.11E-03 | NA | NA | 1.40E-02 | 100 | 2.1 | x | alt. interp; T2=1050 ft ² /d; S2=1.0e-10 |
| OWB-3D | 90 | ¹ Neuman-Witherspoon | 52.9 | 1.38E-04 | NA | NA | 2.88E-02 | 100 | 0.5 | x | alt. interp.; T2=671 ft ² /d; S2=1.39e-3 |
| OWB-3BS | 12 | ¹ Neuman-Witherspoon | 1100 | 4.23E-04 | NA | NA | 0.309 | 100 | 11.0 | | T2=5.7e4 ft ² /d; S2=0.011, high T |
| OWB-4BS | 12 | ¹ Neuman-Witherspoon | 204 | 1.16E-05 | NA | NA | 2.16E-03 | 100 | 2.0 | x | T2=2.56e5 ft ² /d; S2=1.19e-5 |
| OWB-5BS | 12 | ¹ Neuman-Witherspoon | 206 | 1.16E-05 | NA | NA | 1.97E-03 | 100 | 2.1 | x | T2=3.67e5 ft ² /d; S2=1.9e-5 |
| OWB-1D | 90 | Vert. Anisotropic Leaky | 201 | 1.05E-05 | NA | 0.367 | 6.16E-02 | 100 | 2.0 | x | analysis using WHIP; Ss aqt = 0.0115 |
| OWB-2D | 90 | Vert. Anisotropic Leaky | 134 | 1.06E-05 | NA | 0.477 | 7.25E-02 | 100 | 1.3 | x | analysis using WHIP; Ss aqt = 1.88e-3 |
| OWB-3D | 90 | Vert. Anisotropic Leaky | 67 | 3.56E-05 | NA | 8.92E-02 | 1.61E-02 | 100 | 0.7 | x | analysis using WHIP; Ssaqt = 4.30e-4 |
| OWB-1S | 35 | Vert. Anisotropic Leaky | 121 | 1.05E-05 | NA | 0.955 | 0.299 | 100 | 1.2 | x | analysis using WHIP; Ss aqt = 1.42e-3 |
| OWB-2S | 35 | Vert. Anisotropic Leaky | 174 | 1.00E-05 | NA | 1.00 | 8.26E-02 | 100 | 1.7 | x | analysis using WHIP; Ss aqt = 5.84e-4 |
| OWB-3S | 35 | Vert. Anisotropic Leaky | 312 | 1.07E-10 | NA | 0.252 | 1.77E-03 | 100 | 3.1 | x | analysis using WHIP; Ss aqt = 5.04e-4 |
| OWB-1D/-2D | 90/90 | Neuman Unconfined | 960 | 3.31E-03 | 1.00E-03 | 8.62E-05 | NA | 115 | 8.3 | x | |
| OWB-1D/-3D | 90/90 | Neuman Unconfined | 924 | 3.01E-03 | 0.25 | 3.00E-03 | NA | 115 | 8.0 | x | |
| OWB-1S/-1D | 35/90 | Neuman Unconfined | 593 | 1.00E-03 | 1.00E-03 | 1.51 | NA | 115 | 5.2 | x | |
| OWB-1S/-1D | 35/90 | Neuman Unconfined | 575 | 1.30E-03 | 1.00E-03 | 1.51 | NA | 115 | 5.0 | x | alternate interp |
| OWB-2S/-2BS | 35/12 | ¹ Neuman-Witherspoon | 517 | 1.13E-03 | NA | NA | 1.80E-02 | 100 | 5.2 | x | T2=5.03e4 ft ² /d; S2=2.59e-3 |
| OWB-1S/-1D | 35/90 | Vert. Anisotropic Leaky | 120 | 1.05E-05 | NA | 0.958 | 0.276 | 100 | 1.2 | x | analysis using WHIP; Ss aqt = 2.04e-3 |

Notes:

- ¹ = leaky aquifer; partial penetration of wells not represented
- T = Transmissivity in feet squared per day (ft²/day)
- T2 = Transmissivity of unpumped aquifer
- S = Storage coefficient
- S2 = Storage coefficient of unpumped aquifer
- Ss = Specific storage of aquitard (storage per foot of thickness [1/ft])
- Kh = horizontal hydraulic conductivity in feet per day (ft/day) calculated as T/b
- Kv = vertical hydraulic conductivity in feet per day (ft/day)
- b = Assumed aquifer thickness in feet

Table 6. Slug and Bail Test Results Summary Table; Hydrologic Field Characteristics at Twin Pines Mine; Twin Pines Minerals, LLC; St. George, Charlton County, Georgia. TTL Project No. 000180200804.00

| Sample Location | Type Test | Easting | Northing | Top of Casing Elevation (ft. amsl) | Well Depth (ft. bgs) | Screen Depth Top (ft. bgs) | Screen Depth Bottom (ft. bgs) | Screen Depth Top (ft. amsl) | Screen Depth Bottom (ft. amsl) | KGS Method | | Bouwer-Rice Method |
|-----------------|-----------|-------------|-------------|------------------------------------|----------------------|----------------------------|-------------------------------|-----------------------------|--------------------------------|------------|-----------|--|
| | | | | | | | | | | Kh (ft/d) | Ss (1/ft) | Kh (ft/d) |
| PZ01S | Bail | 664792.9515 | 213145.725 | 123.04 | 14.0 | 4.0 | 13.5 | 119.04 | 109.54 | 1.24E+00 | 3.30E-05 | 9.82E-01 |
| PZ01S | Slug | 664792.9515 | 213145.725 | 123.04 | 14.0 | 4.0 | 13.5 | 119.04 | 109.54 | 1.65E+00 | 2.60E-06 | 1.14E+00 |
| PZ04 | Bail | 663720.3298 | 205447.0841 | 123.89 | 14.0 | 4.0 | 13.5 | 119.89 | 110.39 | 1.99E+00 | 4.40E-05 | 1.66E+00 |
| PZ04 | Slug | 663720.3298 | 205447.0841 | 123.89 | 14.0 | 4.0 | 13.5 | 119.89 | 110.39 | 1.74E+00 | 1.67E-03 | 1.38E+00 |
| PZ06 | Bail | 662436.2138 | 201256.8347 | 124.26 | 14.0 | 4.0 | 13.5 | 120.26 | 110.76 | 3.71E+00 | 2.41E-05 | 2.95E+00 |
| PZ06 | Slug | 662436.2138 | 201256.8347 | 124.26 | 14.0 | 4.0 | 13.5 | 120.26 | 110.76 | 3.51E+00 | 1.26E-04 | 2.22E+00 |
| PZ10 | Bail | 667689.3258 | 206292.4778 | 145.97 | 25.0 | 15.0 | 24.5 | 130.97 | 121.47 | 3.91E+00 | 1.11E-03 | 3.91E+00 |
| PZ10 | Slug | 667689.3258 | 206292.4778 | 145.97 | 25.0 | 15.0 | 24.5 | 130.97 | 121.47 | 6.39E+00 | 5.49E-05 | 4.22E+00 |
| PZ13 | Bail | 668652.4560 | 196413.6877 | 157.63 | 30.0 | 20.0 | 29.5 | 137.63 | 128.13 | 5.16E+01 | 1.61E-12 | 3.91E+01 |
| PZ13 | Slug | 668652.4560 | 196413.6877 | 157.63 | 30.0 | 20.0 | 29.5 | 137.63 | 128.13 | 5.24E+01 | 1.61E-12 | 39.8 (middle time) 12.0 (late time) |
| PZ16S | Bail | 668683.7808 | 189192.1062 | 160.42 | 20.0 | 10.0 | 19.5 | 150.42 | 140.92 | 4.10E+01 | 3.34E-05 | 3.41E+01 |
| PZ16S | Slug | 668683.7808 | 189192.1062 | 160.42 | 20.0 | 10.0 | 19.5 | 150.42 | 140.92 | 3.99E+01 | 5.09E-05 | 2.94E+01 |
| PZ17D | Bail | 670005.1448 | 212015.6518 | 161.01 | 45.0 | 35.0 | 44.5 | 126.01 | 116.51 | 4.14E+01 | 8.55E-13 | 3.44E+01 |
| PZ17D | Slug | 670005.1448 | 212015.6518 | 161.01 | 45.0 | 35.0 | 44.5 | 126.01 | 116.51 | 4.27E+01 | 8.55E-13 | 2.95E+01 |
| PZ20D | Bail | 670360.6665 | 205134.8784 | 168.46 | 40.0 | 30.0 | 39.5 | 138.46 | 128.96 | 1.84E+01 | 8.18E-06 | 1.53E+01 |
| PZ20D | Slug | 670360.6665 | 205134.8784 | 168.46 | 40.0 | 30.0 | 39.5 | 138.46 | 128.96 | 1.84E+01 | 2.17E-04 | 1.53E+01 |
| PZ24 | Bail | 672562.2118 | 196807.9532 | 169.54 | 20.0 | 10.0 | 19.5 | 159.54 | 150.04 | 1.48E+01 | 2.19E-05 | 1.18E+01 |
| PZ24 | Slug | 672562.2118 | 196807.9532 | 169.54 | 20.0 | 10.0 | 19.5 | 159.54 | 150.04 | 4.40E+01 | 3.19E-06 | 3.05E+01 |
| PZ28D | Bail | 672470.6111 | 191101.7018 | 173.99 | 30.0 | 20.0 | 29.5 | 153.99 | 144.49 | 2.34E+00 | 6.99E-05 | 2.04E+00 |
| PZ29D | Bail | 667975.5644 | 193583.6283 | 153.88 | 50.0 | 40 | 49.5 | 113.88 | 104.38 | 1.45E+00 | 1.32E-04 | 1.45E+00 |
| PZ29D | Slug | 667975.5644 | 193583.6283 | 153.88 | 50.0 | 40 | 49.5 | 113.88 | 104.38 | 1.25E+00 | 2.28E-04 | 1.19E+00 |
| PZ29S | Bail | 667981.0292 | 193588.0244 | 154.035 | 19.0 | 9.0 | 18.5 | 145.04 | 135.54 | 8.23E+00 | 7.00E-06 | 6.24E+00 |
| PZ29S | Slug | 667981.0292 | 193588.0244 | 154.035 | 19.0 | 9.0 | 18.5 | 145.04 | 135.54 | 5.44E+00 | 5.13E-04 | 5.70E+00 |
| PZ30D | Bail | 666484.959 | 189997.8257 | 138.02 | 50.0 | 40.0 | 49.5 | 98.02 | 88.52 | 1.09E+00 | 1.14E-05 | 9.89E-01 |
| PZ30D | Slug | 666484.959 | 189997.8257 | 138.02 | 50.0 | 40.0 | 49.5 | 98.02 | 88.52 | 1.38E+00 | 2.23E-05 | 1.21E+00 |
| PZ30S | Bail | 666491.4469 | 190004.5697 | 137.65 | 10.0 | 5.0 | 9.5 | 132.65 | 128.15 | 8.68E-01 | 1.07E-05 | 6.86E-01 |
| PZ30S | Slug | 666491.4469 | 190004.5697 | 137.65 | 10.0 | 5.0 | 9.5 | 132.65 | 128.15 | 1.09E+00 | 1.97E-16 | 1.43E+00 |
| PZ31D | Bail | 665327.2418 | 192381.7249 | 135.90 | 50.0 | 40.0 | 49.5 | 95.90 | 86.40 | 1.57E+00 | 5.94E-05 | 1.50E+00 |
| PZ31D | Slug | 665327.2418 | 192381.7249 | 135.90 | 50.0 | 40.0 | 49.5 | 95.90 | 86.40 | 1.98E+00 | 1.22E-04 | 1.98E+00 |
| PZ31S | Bail | 665331.907 | 192374.4898 | 135.92 | 12.0 | 7.0 | 11.5 | 128.92 | 124.42 | 1.42E+00 | 2.69E-05 | 1.08E+00 |
| PZ31S | Slug | 665331.907 | 192374.4898 | 135.92 | 12.0 | 7.0 | 11.5 | 128.92 | 124.42 | 1.36E+00 | 2.34E-06 | 1.03E+00 |
| PZ33D | Bail | 661249.6461 | 192704.3174 | 123.91 | 50.5 | 41.0 | 50.5 | 82.91 | 73.41 | 2.77E+00 | 8.22E-06 | 1.75E+00 |
| PZ33D | Slug | 661249.6461 | 192704.3174 | 123.91 | 50.5 | 41.0 | 50.5 | 82.91 | 73.41 | 2.23E+00 | 2.55E-05 | 1.48E+00 |
| PZ33S | Bail | 661258.6777 | 192703.2169 | 123.73 | 13.0 | 7.0 | 11.5 | 116.73 | 112.23 | 2.66E+00 | 5.85E-06 | 1.93E+00 |
| PZ33S | Slug | 661258.6777 | 192703.2169 | 123.73 | 13.0 | 7.0 | 11.5 | 116.73 | 112.23 | 2.63E+00 | 7.72E-06 | 1.99E+00 |
| PZ55D | Bail | 663504.9654 | 187429.6642 | 174.92 | 50.0 | 40.0 | 49.5 | 134.92 | 125.42 | 2.03E+01 | 1.16E-05 | 1.85E+01 |
| PZ55D | Slug | 663504.9654 | 187429.6642 | 174.92 | 50.0 | 40.0 | 49.5 | 134.92 | 125.42 | 2.20E+01 | 6.23E-05 | 2.10E+01 |
| PZ55S | Bail | 671858.651 | 188474.3774 | 174.83 | 20.0 | 14.0 | 19.5 | 160.83 | 155.33 | 9.46E-01 | 1.40E-06 | 7.18E-01 |
| PZ55S | Slug | 671858.651 | 188474.3774 | 174.83 | 20.0 | 14.0 | 19.5 | 160.83 | 155.33 | 2.40E-01 | 1.63E-05 | 1.99E-01 |
| PZ57D | Bail | 675314.5224 | 192314.0733 | 165.89 | 50.0 | 39.0 | 48.5 | 126.89 | 117.39 | 5.47E+01 | 3.79E-20 | 6.58E+01 |
| PZ57D | Slug | 675314.5224 | 192314.0733 | 165.89 | 50.0 | 39.0 | 48.5 | 126.89 | 117.39 | 3.59E+01 | 2.03E-04 | 7.51E+01 |
| PZ57S | Bail | 675311.1832 | 192310.6915 | 165.68 | 14.0 | 9.0 | 13.5 | 156.68 | 152.18 | 6.77E+00 | 6.37E-05 | 5.38E+00 |
| PZ57S | Slug | 675311.1832 | 192310.6915 | 165.68 | 14.0 | 9.0 | 13.5 | 156.68 | 152.18 | 7.26E+00 | 5.75E-05 | 5.78E+00 |
| PZ58D | Bail | 676850.4859 | 196491.6367 | 139.98 | 50.0 | 40.0 | 49.5 | 99.98 | 90.48 | 5.10E+00 | 2.24E-04 | 5.10E+00 |
| PZ58D | Slug | 676850.4859 | 196491.6367 | 139.98 | 50.0 | 40.0 | 49.5 | 99.98 | 90.48 | 3.55E+00 | 2.18E-03 | 5.38E+00 |
| PZ58S | Bail | 676849.7667 | 196495.5787 | 140.02 | 15.0 | 10.0 | 14.5 | 130.02 | 125.52 | 2.66E+01 | 7.87E-05 | 2.11E+01 |
| PZ58S | Slug | 676849.7667 | 196495.5787 | 140.02 | 15.0 | 10.0 | 14.5 | 130.02 | 125.52 | 2.42E+01 | 8.67E-05 | 1.92E+01 |

Bouwer-Rice = Unconfined Bouwer-Rice solution method in Aqtesolv™

ft/d = feet per day

Kh = hydraulic conductivity

KGS = Unconfined KGS solution method in Aqtesolv™

Ss = specific storage

ft bgs = feet below ground surface

ft amsl = feet above mean sea level

APPENDIX A

Attached Documents:
Boring Logs

APPENDIX A
BORING LOGS

PUMPING TEST AREA A



TWIN PINES MINERALS SAUNDERS-LONCALA RESERVE

SAINT GEORGE, GEORGIA

LOG OF PUMP WELL
PW A
& PUMP WELL
CONSTRUCTION

| | | | |
|------------------|-----------------------|------------------|-----------------------|
| PROJECT NUMBER | 000180200804.00 | PROFESSIONAL | A. Patton |
| LOCATION | Saint George, Georgia | DATE(S) DRILLED | 12/20/2018 |
| DRILLING COMPANY | Patridge Well Co. | CASING DIA./TYPE | 6" PVC |
| DRILLER | Randy Baker | SCREEN SLOT/TYPE | 0.020-inch |
| DRILLING METHOD | Rotary | FILTER PACK TYPE | 16/30 Colorado silica |
| REMARKS | | TOP OF CASING | 174.74 Ft. AMSL |
| | | GROUND ELEVATION | 171.56 Ft. AMSL |
| | | DEPTH TO WATER | |
| | | WATER ELEVATION | |

7/2/19 Report ENV LOG - WELL
M:\PROJECTS\2018\000180200804.00 - TWIN PINES MINERALS PERMITTING SERVICES\804-LOGS RESTORED FROM 8-71804-LOGS WITH WELLS (TUSCOM RESTORE).GPJ

| DEPTH (feet) | GRAPHIC LOG | U.S.C.S. | SAMPLE | | | LITHOLOGIC DESCRIPTION | WATER LEVEL & DATE | PUMP WELL DIAGRAM |
|--------------|-------------|----------|-----------------|------------|-----------|---|--------------------|-------------------|
| | | | INTERVAL (feet) | % RECOVERY | PID (ppm) | | | |
| 5 | | SP | | | | SAND: light brown to tan; med; subround | | |
| 10 | | SM | | | | SAND, silty: black (quartz); fine; argillaceous; hardpan | | |
| 20 | | SP | | | | SAND: light brown, tan, yellowish grey; med; clean | | |
| 30 | | SP | | | | SAND: dark brown, tan, yellowish grey; med | | |
| 40 | | | | | | SAND: darker brown (5YR 3/2); fine; well sorted; subround | | |

Continued Next Page

This well log shall not be separated from the corresponding Instrument of Service; no third party may rely upon this well log for the corresponding Instrument of Service absent a written TTL Secondary Client Agreement.



TWIN PINES MINERALS SAUNDERS-LONCALA RESERVE

SAINT GEORGE, GEORGIA

LOG OF PUMP WELL
PW A
& PUMP WELL
CONSTRUCTION

PROJECT NUMBER 000180200804.00 PROFESSIONAL A. Patton
LOCATION Saint George, Georgia DATE(S) DRILLED 12/20/2018

Continued from Previous Page

| DEPTH (feet) | GRAPHIC LOG | U.S.C.S. | SAMPLE | | | LITHOLOGIC DESCRIPTION | WATER LEVEL & DATE | PUMP WELL DIAGRAM |
|--------------|--------------------------------|----------|-----------------|------------|-----------|--|---|-------------------|
| | | | INTERVAL (feet) | % RECOVERY | PID (ppm) | | | |
| 50 | [Purple dotted pattern] | SP | | | | | [Well diagram showing filter pack sand (16/30) from 50 to 75 feet] | |
| 55 | | | | | | | | |
| 60 | [Purple dotted pattern] | | | | | SAND: darker brown (5YR 3/2); fine; well sorted; subround | [Well diagram showing screened interval (0.01-inch PVC) from 55 to 90 feet] | |
| 65 | | SP | | | | | | |
| 70 | [Purple dotted pattern] | | | | | CLAY, sandy: dark yellowish brown (10YR 4/2); fine to med; saturated | [Well diagram showing screened interval (0.01-inch PVC) from 55 to 90 feet] | |
| 75 | | CL | | | | SAND: well sorted | | |
| 80 | [Purple dotted pattern] | | | | | | [Well diagram showing screened interval (0.01-inch PVC) from 55 to 90 feet] | |
| 85 | | SP | | | | | | |
| 90 | [Red diagonal hatched pattern] | | | | | CLAY: dark green; fat | [Well diagram showing screened interval (0.01-inch PVC) from 55 to 90 feet] | |
| 95 | | CH | | | | CLAY, sandy: dark greenish grey; fat | | |

Continued Next Page

This well log shall not be separated from the corresponding Instrument of Service; no third party may rely upon this well log or the corresponding Instrument of Service absent a written TTL Secondary Client Agreement.



TWIN PINES MINERALS SAUNDERS-LONCALA RESERVE

SAINT GEORGE, GEORGIA

LOG OF PUMP WELL
PW A
& PUMP WELL
CONSTRUCTION

PROJECT NUMBER 000180200804.00 PROFESSIONAL A. Patton
LOCATION Saint George, Georgia DATE(S) DRILLED 12/20/2018

Continued from Previous Page

| DEPTH (feet) | GRAPHIC LOG | U.S.C.S. | SAMPLE | | | LITHOLOGIC DESCRIPTION | WATER LEVEL & DATE | PUMP WELL DIAGRAM |
|--------------------------------|----------------|----------|--------------------|---------------|--------------|------------------------|-----------------------------|-------------------|
| | | | INTERVAL (feet) | % RECOVERY | PID (ppm) | | | |
| 100 | | CL | | | | | | |
| 105 | | | | | | | | |
| 110 | | | | | | | | |
| 115 | | | | | | | | |
| BORING TERMINATED AT 116 FEET. | | | | | | | | |

7/2/19 Report ENV LOG - WELL
M:\PROJECTS\2018\000180200804.00 - TWIN PINES MINERALS PERMITTING SERVICES\804-LOGS RESTORED FROM 8-71804-LOGS WITH WELLS (TUSCOM RESTORE).GPJ



TWIN PINES MINERALS SAUNDERS-LONCALA RESERVE

SAINT GEORGE, GEORGIA

LOG OF OBSV. WELL
OWA1BS
& OBSV. WELL
CONSTRUCTION

| | | | |
|------------------|-------------------------|------------------|-----------------|
| PROJECT NUMBER | 000180200804.00 | PROFESSIONAL | T. Hall |
| LOCATION | Saint George, Georgia | DATE(S) DRILLED | 12/11/2018 |
| DRILLING COMPANY | Betts | CASING DIA./TYPE | |
| DRILLER | C. Pendarvis | SCREEN SLOT/TYPE | |
| DRILLING METHOD | Sonic | FILTER PACK TYPE | |
| REMARKS | Same as OWA-1S for 0-12 | TOP OF CASING | 172.16 Ft. AMSL |
| | | GROUND ELEVATION | 171.78 Ft. AMSL |
| | | DEPTH TO WATER | |
| | | WATER ELEVATION | |

M:\PROJECTS\2018\000180200804.00 - TWIN PINES MINERALS PERMITTING SERVICES\804-LOGS RESTORED FROM 8-7804-LOGS WITH WELLS (TUSCOM RESTORE) 10-1-2019.GPJ 10/28/19 Report:ENV LOG - WELL

| DEPTH (feet) | GRAPHIC LOG | U.S.C.S. | SAMPLE | | | LITHOLOGIC DESCRIPTION | WATER LEVEL & DATE | OBSV. WELL DIAGRAM |
|--------------|-------------|----------------------|-----------------|------------|-----------|--|--------------------|--------------------|
| | | | INTERVAL (feet) | % RECOVERY | PID (ppm) | | | |
| 0-10 | | | 0-10 | 60 | | No recovery | | |
| 5 | | SP SM SM SP | | | | <p>SAND: (quartz); fine (20%); med (40%); coarse (40%); well sorted; subround; unconsolidated; dry; organic (wood and roots)</p> <p>SAND, silty: very dark brown (quartz); fine (75%); med (20%); silt (<5%); well sorted; subround; unconsolidated; moist; organic (fibrous) material</p> <p>SAND, silty: dark yellowish brown (quartz); fine (50%); med (45%); silt (<5%); well sorted; subround; unconsolidated; moist; FBG (<1%)</p> <p>SAND: light brown (quartz); fine (50%); med (25%); coarse (25%); well sorted; subround; unconsolidated; moist</p> <p>SAND, silty: dark brown (quartz); fine (60%); med (25%); coarse (10%); silt (<5%); well sorted; subround; semi-consolidated; FBG (<1%)</p> | | |
| 10 | | SM | | | | | | |
| | | | | | | BORING TERMINATED AT 12 FEET. | | |



TWIN PINES MINERALS SAUNDERS-LONCALA RESERVE

SAINT GEORGE, GEORGIA

LOG OF OBSV. WELL
OWA1D
& OBSV. WELL
CONSTRUCTION

| | | | |
|------------------|-----------------------|------------------|-----------------------|
| PROJECT NUMBER | 000180200804.00 | PROFESSIONAL | T. Hall |
| LOCATION | Saint George, Georgia | DATE(S) DRILLED | 11/9/2018 |
| DRILLING COMPANY | Betts | CASING DIA./TYPE | 2" PVC |
| DRILLER | C. Pendarvis | SCREEN SLOT/TYPE | 0.010-in. slotted PVC |
| DRILLING METHOD | Sonic | FILTER PACK TYPE | |
| REMARKS | | TOP OF CASING | 172.23 Ft. AMSL |
| | | GROUND ELEVATION | 171.97 Ft. AMSL |
| | | DEPTH TO WATER | |
| | | WATER ELEVATION | |

Report: ENV LOG - WELL

10/28/19 10-1-2019.GPJ M:\PROJECTS\2018\000180200804.00 - TWIN PINES MINERALS PERMITTING SERVICES\804-LOGS RESTORED FROM 8-7\804-LOGS WITH WELLS (TUSCOM RESTORE)

| DEPTH (feet) | GRAPHIC LOG | U.S.C.S. | SAMPLE | | | LITHOLOGIC DESCRIPTION | WATER LEVEL & DATE | OBSV. WELL DIAGRAM |
|-----------------|----------------|----------|--------------------|---------------|--------------|---|-----------------------------|--------------------|
| | | | INTERVAL (feet) | % RECOVERY | PID (ppm) | | | |
| 0-5 | | | 0-10 | 60 | | No recovery | | |
| 5 | | SP | | | | SAND: grey (quartz); fine (20%); med (40%); coarse (40%); well sorted; subround; unconsolidated; organics (wood roots) | | |
| | | SM | | | | SAND, silty: very dark brown (quartz); fine (75%); med (20%); silt (<5%); well sorted; subround; unconsolidated; moist; organic material (wood) | | |
| | | SM | | | | SAND, silty: dark yellowish brown (quartz); fine (50%); med (45%); silt (<5%); well sorted; subround; unconsolidated; moist; FBG (<1%) | | |
| 10 | | SM | 10-20 | 100 | | SAND: light brown (quartz); fine (50%); med (25%); coarse (25%); well sorted; subround; unconsolidated; moist | | |
| | | SC-SM | | | | SAND, silty: dark brown; fine (60%); med (25%); coarse (10%); silt (<5%); well sorted; subround; semi-consolidated; moist; FBG (<1%) | | |
| 15 | | SC-SM | | | | SAND, silty, clayey: black (quartz); fine (75%); med (20%); silt/clay <5%, well sorted, subround, well consolidated, moist | | |
| | | SC-SM | | | | SAND, silty, clayey: dark brown (quartz); fine (15%); med (40%); coarse (40%); silt (<5%); well sorted; subround; consolidated; moist | | |
| 20 | | SM | 20-30 | 90 | | SAND, silty: brown (quartz); fine (40%); med (30%); coarse (25%); silt (<5%); well sorted; subround; unconsolidated; moist | | |
| | | SC-SM | | | | SAND, silty, clayey: black (quartz); fine (75%); med (20%); silt (<5%); well sorted; subround; well consolidated; moist | | |
| 30 | | SM | 30-40 | 100 | | SAND, silty: dark brown; fine (50%); med (45%); silt (<5%); well sorted; subround; unconsolidated; moist | | |
| | | SP | | | | SAND: dark yellowish brown (quartz); fine (30%); med (50%); coarse (20%); well sorted; subround; unconsolidated; moist; FBG (<1%) | | |
| 35 | | SP | | | | | | |
| 40 | | SM | 40-50 | 90 | | SAND, silty: black (quartz); fine (75%); med (20%); silt (<5%); well sorted; subround; well consolidated; moist | | |
| | | | | | | | ← Grout | |



TWIN PINES MINERALS SAUNDERS-LONCALA RESERVE

SAINT GEORGE, GEORGIA

LOG OF OBSV. WELL
OWA1D
& OBSV. WELL
CONSTRUCTION

PROJECT NUMBER 000180200804.00

PROFESSIONAL T. Hall

LOCATION Saint George, Georgia

DATE(S) DRILLED 11/9/2018

Continued from Previous Page

| DEPTH (feet) | GRAPHIC LOG | U.S.C.S. | SAMPLE | | | LITHOLOGIC DESCRIPTION | WATER LEVEL & DATE | OBSV. WELL DIAGRAM |
|-----------------|-------------------------|----------|--------------------|---------------|--------------|---|--|--------------------|
| | | | INTERVAL (feet) | % RECOVERY | PID (ppm) | | | |
| 50 | [Purple dotted pattern] | SP | 50-60 | 80 | | well sorted; subround; well consolidated; moist SAND: (quartz); fine (50%); med (25%); coarse (25%); well sorted; subround; unconsolidated; moist; increase in fine black grains (>1%) | [Well diagram showing purple dotted pattern] | |
| 55 | | | 60-70 | 80 | | | | |
| 65 | [Red diagonal lines] | SC-SM | | | | SAND, silty, clayey: dark brown; fine (80%); med (15%); silt (<5%); well sorted; subround; semi-consolidated; moist | [Well diagram showing various patterns: purple dotted, red diagonal, blue vertical, orange diagonal, dark grey, and red diagonal. Labels include Bentonite Seal, Filter Pack Sand (20/40), Screened Interval (0.01-inch PVC), and Well Tip.] | |
| | [Blue vertical lines] | SP | | | | | | |
| | [Orange diagonal lines] | CL | | | | SAND: brown (quartz); fine (75%); med (25%); well sorted; subround; unconsolidated; moist; FBG (<1%) CLAY, sandy: dark brown; fine | | |
| 70 | [Blue vertical lines] | SC-SM | 70-80 | 70 | | SAND, silty, clayey: grayish brown (quartz); fine (95%); silt/clay (<5%); well sorted; subround; semi-consolidated; FBG (<1%) | | |
| 75 | [Red diagonal lines] | | | | | | | |
| 80 | [Orange diagonal lines] | CL | | | | CLAY, sandy: dark grey; fine | | |
| 85 | [Red diagonal lines] | CH | | | | CLAY: dark grey; fat | | |
| | [Purple dotted pattern] | SP | | | | SAND: dark grey (quartz); fine (75%); med (25%); well sorted; subround; unconsolidated; moist; FBG (<1%) | | |
| | [Red diagonal lines] | CH | | | | CLAY: dark grey; fat | | |
| 90 | | | | | | BORING TERMINATED AT 90 FEET. | | |

M:\PROJECTS\2018\000180200804.00 - TWIN PINES MINERALS PERMITTING SERVICES\804-LOGS RESTORED FROM 8-7804-LOGS WITH WELLS (TUSCOM RESTORE) 10-1-2019.GPJ 10/28/19 Report:ENV LOG - WELL

This well log shall not be separated from the corresponding Instrument of Service; no third party may rely upon this well log or the corresponding Instrument of Service absent a written TTL Secondary Client Agreement.



TWIN PINES MINERALS SAUNDERS-LONCALA RESERVE

SAINT GEORGE, GEORGIA

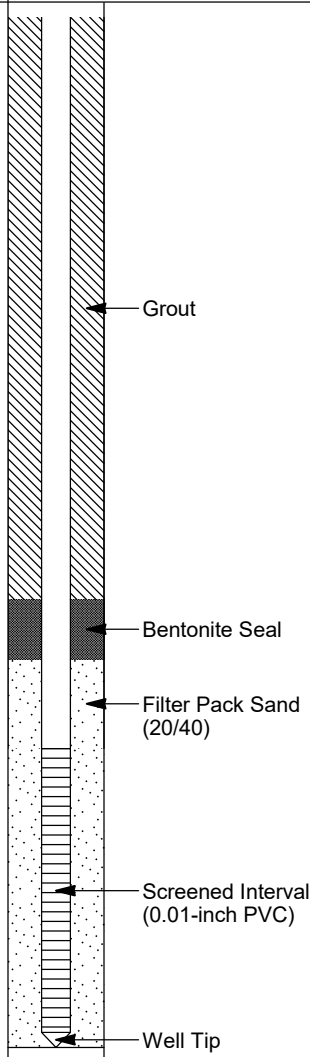
LOG OF OBSV. WELL
OWA1S
& OBSV. WELL
CONSTRUCTION

| | | | |
|------------------|-----------------------|------------------|-----------------------|
| PROJECT NUMBER | 000180200804.00 | PROFESSIONAL | T. Hall |
| LOCATION | Saint George, Georgia | DATE(S) DRILLED | 11/9/2018 |
| DRILLING COMPANY | Betts | CASING DIA./TYPE | 2" PVC |
| DRILLER | C. Pendarvis | SCREEN SLOT/TYPE | 0.010-in. slotted PVC |
| DRILLING METHOD | Sonic | FILTER PACK TYPE | |
| REMARKS | | TOP OF CASING | 172.12 Ft. AMSL |
| | | GROUND ELEVATION | 171.93 Ft. AMSL |
| | | DEPTH TO WATER | |
| | | WATER ELEVATION | |

7/2/19 Report ENV LOG - WELL

M:\PROJECTS\2018\000180200804.00 - TWIN PINES MINERALS PERMITTING SERVICES\804-LOGS RESTORED FROM 8-7804-LOGS WITH WELLS (TUSCOM RESTORE).GPJ

| DEPTH (feet) | GRAPHIC LOG | U.S.C.S. | SAMPLE | | | LITHOLOGIC DESCRIPTION | WATER LEVEL & DATE | OBSV. WELL DIAGRAM |
|-----------------|----------------|----------|--------------------|---------------|--------------|---|-----------------------------|--------------------|
| | | | INTERVAL (feet) | % RECOVERY | PID (ppm) | | | |
| 5 | | | | | | No recovery | | |
| 5-6 | SP | | | | | SAND: (quartz; fine (20%); med (40%); coarse (40%); well sorted; subround; unconsolidated; dry; organic (wood and roots) | | |
| 6-7 | SM | | | | | SAND: very dark brown (quartz); silty; fine (75%); med (20%); silt (<5%); well sorted; subround; unconsolidated; moist; organic (fibrous) material | | |
| 7-8 | SM | | | | | SAND: dark yellowish brown (quartz); silty; fine (50%); med (45%); silt (<5%); well sorted; subround; unconsolidated; moist; FBG (<1%) | | |
| 8-9 | SP | | | | | SAND: light brown (quartz); fine (50%); med (25%); coarse (25%); well sorted; subround; unconsolidated; moist | | |
| 9-10 | SM | | | | | SAND: dark brown (quartz); silty; fine (60%); med (25%); coarse (10%); silt (<5%); well sorted; subround; semi-consolidated; FBG (<1%) | | |
| 10-12 | SC-SM | | | | | SAND: black (quartz); silty; clayey; fine (75%); med (20%); silt/clay (<5%); well sorted; subround; well consolidated; moist | | |
| 12-14 | SC-SM | | | | | SAND: black (quartz); silty; clayey; fine (75%); med (20%); silt/clay (<5%); well sorted; subround; well consolidated; semi-consolidated; moist; strings dark brown | | |
| 14-16 | SM | | | | | SAND: brown (quartz); silty; fine (40%); med (30%); coarse (25%); silt (<5%); well sorted; subround; unconsolidated | | |
| 16-18 | SM | | | | | | | |
| 18-20 | SM | | | | | | | |
| 20-22 | SM | | | | | | | |
| 22-24 | SM | | | | | | | |
| 24-26 | SM | | | | | | | |
| 26-28 | SM | | | | | | | |
| 28-30 | SM | | | | | | | |
| 30-32 | SC-SM | | | | | SAND: black (quartz); silty; clayey; fine (75%); med (20%); silt (<5%); well sorted; subround; well consolidated; moist | | |
| 32-34 | SM | | | | | SAND: dark brown (quartz); silty; fine (50%); med (45%); silt (<5%); well sorted; subround; unconsolidated; moist | | |
| 34-35 | SP | | | | | SAND: dark yellowish brown (quartz); fine (30%); med (50%); coarse (20%); well sorted; subround; unconsolidated; moist | | |
| 35 | | | | | | BORING TERMINATED AT 35 FEET. | | |





TWIN PINES MINERALS SAUNDERS-LONCALA RESERVE

SAINT GEORGE, GEORGIA

LOG OF OBSV. WELL
OWA2BS
& OBSV. WELL
CONSTRUCTION

| | | | |
|------------------|-----------------------|------------------|-----------------------|
| PROJECT NUMBER | 000180200804.00 | PROFESSIONAL | T. Hall |
| LOCATION | Saint George, Georgia | DATE(S) DRILLED | 12/12/2018 |
| DRILLING COMPANY | Betts | CASING DIA./TYPE | 2" PVC |
| DRILLER | C. Pendarvis | SCREEN SLOT/TYPE | 0.010-in. slotted PVC |
| DRILLING METHOD | Sonic | FILTER PACK TYPE | |
| REMARKS | | TOP OF CASING | 172.27 Ft. AMSL |
| | | GROUND ELEVATION | 172.04 Ft. AMSL |
| | | DEPTH TO WATER | |
| | | WATER ELEVATION | |

7/2/19 Report ENV LOG - WELL

M:\PROJECTS\2018\000180200804.00 - TWIN PINES MINERALS PERMITTING SERVICES\804-LOGS RESTORED FROM 8-7\804-LOGS WITH WELLS (TUSCOM RESTORE).GPJ

| DEPTH (feet) | GRAPHIC LOG | U.S.C.S. | SAMPLE | | | LITHOLOGIC DESCRIPTION | WATER LEVEL & DATE | OBSV. WELL DIAGRAM |
|-----------------|----------------|----------|--------------------|---------------|--------------|---|-----------------------------|--------------------|
| | | | INTERVAL (feet) | % RECOVERY | PID (ppm) | | | |
| 0-10 | | | 0-10 | 60 | | No Recovery | | |
| 5 | | SP | | | | SAND: grey (quartz); fine (50%); med (40%); coarse (10%); well sorted; subround; unconsolidated; dry; FBG (<1%); organic material (roots) | | |
| 10 | | SM | | | | SAND, silty; very dark brown (quartz); fine (75%); med (20%); silt (<5%); well sorted; subround; unconsolidated; moist | | |
| | | | | | | BORING TERMINATED AT 12 FEET. | | |



TWIN PINES MINERALS SAUNDERS-LONCALA RESERVE

SAINT GEORGE, GEORGIA

LOG OF OBSV. WELL
OWA2D
& OBSV. WELL
CONSTRUCTION

| | | | |
|------------------|-----------------------|------------------|-----------------------|
| PROJECT NUMBER | 000180200804.00 | PROFESSIONAL | T. Hall |
| LOCATION | Saint George, Georgia | DATE(S) DRILLED | 11/13/2018 |
| DRILLING COMPANY | Betts | CASING DIA./TYPE | 2" PVC |
| DRILLER | C. Pendarvis | SCREEN SLOT/TYPE | 0.010-in. slotted PVC |
| DRILLING METHOD | Sonic | FILTER PACK TYPE | |
| REMARKS | | TOP OF CASING | 172.34 Ft. AMSL |
| | | GROUND ELEVATION | 172.10 Ft. AMSL |
| | | DEPTH TO WATER | |
| | | WATER ELEVATION | |

7/2/19 Report ENV LOG - WELL

M:\PROJECTS\2018\000180200804.00 - TWIN PINES MINERALS PERMITTING SERVICES\804-LOGS RESTORED FROM 8-7\804-LOGS WITH WELLS (TUSCOM RESTORE).GFPJ

| DEPTH (feet) | GRAPHIC LOG | U.S.C.S. | SAMPLE | | | LITHOLOGIC DESCRIPTION | WATER LEVEL & DATE | OBSV. WELL DIAGRAM |
|--------------|-------------|----------|-----------------|------------|-----------|---|--------------------|--------------------|
| | | | INTERVAL (feet) | % RECOVERY | PID (ppm) | | | |
| 0-5 | | | 0-10 | 60 | | No Recovery | | |
| 5-10 | | SP | | | | SAND grey (quartz), fine 50%, med 40%, coarse 10%, well sorted, subround, unconsolidated, dry, FBG (<1%), organics (roots) | | |
| 10-15 | | SM | 10-20 | 80 | | SAND, silty: very dark brown (quartz); fine (75%); med (20%); silt (<5%); well sorted; subround; unconsolidated; moist | | |
| 15-20 | | SC-SM | | | | SAND, silty, clayey: black (quartz); fine (75%); med (20%); silt/clay (<5%); well sorted; subround; well consolidated; moist | | |
| 20-25 | | SM | 20-30 | 80 | | SAND, silty: dark brown (quartz); fine (60%); med (25%); coarse (10%); silt (<5%); well sorted; subround; unconsolidated; moist | | |
| 25-30 | | SP | | | | SAND: yellowish brown (quartz); fine (50%); med (25%); coarse (25%); well sorted; subround; unconsolidated; moist; FBG (<1%) | | |
| 30-35 | | SP | | | | SAND: (quartz); fine (60%); med (30%); coarse (10%); well sorted; subround; unconsolidated; moist | | |
| 35-40 | | SC-SM | | | | SAND, silty, clayey: black (quartz); fine (75%); med (20%); silt/clay (<5%); well sorted; subround; well consolidated; moist | | |
| 40-45 | | SP | 30-40 | 100 | | SAND: dark yellowish brown (quartz); fine (50%); med (25%); coarse (25%); well sorted; subround; unconsolidated; FBG (<1%) | | |

Continued Next Page



TWIN PINES MINERALS SAUNDERS-LONCALA RESERVE

SAINT GEORGE, GEORGIA

LOG OF OBSV. WELL
OWA2D
& OBSV. WELL
CONSTRUCTION

PROJECT NUMBER 000180200804.00

PROFESSIONAL T. Hall

LOCATION Saint George, Georgia

DATE(S) DRILLED 11/13/2018

Continued from Previous Page

| DEPTH (feet) | GRAPHIC LOG | U.S.C.S. | SAMPLE | | | LITHOLOGIC DESCRIPTION | WATER LEVEL & DATE | OBSV. WELL DIAGRAM |
|--------------|-------------------------|----------|-----------------|------------|--|---|---|--------------------|
| | | | INTERVAL (feet) | % RECOVERY | PID (ppm) | | | |
| 40 | [Purple dotted pattern] | SP | 40-50 | 90 | | SAND: yellowish brown (quartz); fine (50%); med (50%); well sorted; subround; unconsolidated; moist; FBG (<1%) | [Well diagram showing casing and grout] | |
| 45 | | | SP | | | SAND: yellowish brown (quartz); fine (50%); med (25%); coarse (25%); well sorted; subround; unconsolidated; FBG (<1%) | | |
| 50 | [Purple dotted pattern] | SC-SM | 50-60 | 70 | | SAND, silty, clayey: very dark brown (quartz); fine (80%); med (15%); silt/clay (<5%); well sorted; subround; semi-consolidated; moist | [Well diagram showing casing and grout] | |
| 55 | | SM | | | | SAND: yellowish brown (quartz); fine (50%); med (25%); coarse (25%); well sorted; subround; unconsolidated; FBG (<1%) SAND, silty, clayey: very dark brown (quartz); fine (50%); med (45%); silt (<5%); well sorted; subround; semi-consolidated; moist SAND, silty: (quartz); fine (50%); med (25%); coarse (25%); well sorted; subround; unconsolidated; moist; FBG (<1%) | | |
| 60 | [Purple dotted pattern] | SM | 60-70 | 80 | | SAND, silty: very dark brown (quartz); fine (75%); med (20%); silt (<5%); well sorted; subround; unconsolidated | [Well diagram showing casing and grout] | |
| 65 | | SC-SM | | | | SAND, silty, clayey: dark brown (quartz); fine (95%); silt/clay (>5%); well sorted; subround; semi-consolidated | | |
| 70 | [Purple dotted pattern] | SP | | | | SAND: grayish brown (quartz); fine (75%); med (25%); well sorted; subround; unconsolidated; FBG (<1%) SAND, silty, clayey: dark grayish brown (quartz); fine (95%); silt/clay (<5%); well sorted; subround; semi-consolidated; moist SAND: light grey (quartz); fine (75%); med (25%); well sorted; subround; unconsolidated; moist; FBG (<1%) | [Well diagram showing casing and grout] | |
| 75 | | SC-SM | | | SAND: grey (quartz); fine (50%); med (25%); coarse (25%); well sorted; subround; unconsolidated; moist; FBG (<1%) SAND, silty, clayey: light grayish brown (quartz); fine (75%); med (20%); silt (<5%); well sorted; subround; unconsolidated; FBG (<1%); organic material (wood fragments) | | | |

Continued Next Page



TWIN PINES MINERALS SAUNDERS-LONCALA RESERVE

SAINT GEORGE, GEORGIA

LOG OF OBSV. WELL
OWA2D
& OBSV. WELL
CONSTRUCTION

PROJECT NUMBER 000180200804.00 PROFESSIONAL T. Hall
LOCATION Saint George, Georgia DATE(S) DRILLED 11/13/2018

Continued from Previous Page

M:\PROJECTS\2018\000180200804.00 - TWIN PINES MINERALS PERMITTING SERVICES\804-LOGS RESTORED FROM 8-71804-LOGS WITH WELLS (TUSCOM RESTORE).GPJ 7/2/19 Report ENV LOG - WELL

| DEPTH (feet) | GRAPHIC LOG | U.S.C.S. | SAMPLE | | | LITHOLOGIC DESCRIPTION | WATER LEVEL & DATE | OBSV. WELL DIAGRAM |
|-------------------------------|-------------|-------------------------------|-----------------|------------|-----------|---|--------------------|--|
| | | | INTERVAL (feet) | % RECOVERY | PID (ppm) | | | |
| 80-90 | | SC-SM SP SC CH SP | 80-90 | 70 | | <p>SAND, silty, clayey: dark grayish brown (quartz); fine (60%); med (35%); silt/clay (<5%); well sorted; subround; semi-consolidated; moist; FBG (<1%)</p> <p>SAND: white (quartz); fine (50%); med (50%); FBG (<1%)</p> <p>SAND, clayey: dark grey (quartz); fine (50%); med (25%); coarse (20%); clay (<5%); well sorted; subround; unconsolidated; moist; FBG (<1%); fat clay nodules</p> <p>CLAY: dark grey; fat</p> <p>SAND: dark grey (quartz); fine (50%); med (25%); coarse (25%); well sorted; subround; unconsolidated; moist; FBG (<1%)</p> | | <p>Bentonite Seal</p> <p>Filter Pack Sand (20/40)</p> <p>Screened Interval (0.01-inch PVC)</p> <p>Well Tip</p> |
| BORING TERMINATED AT 90 FEET. | | | | | | | | |



TWIN PINES MINERALS SAUNDERS-LONCALA RESERVE

SAINT GEORGE, GEORGIA

LOG OF OBSV. WELL
OWA2S
& OBSV. WELL
CONSTRUCTION

| | | | |
|------------------|-----------------------|------------------|-----------------------|
| PROJECT NUMBER | 000180200804.00 | PROFESSIONAL | T. Hall |
| LOCATION | Saint George, Georgia | DATE(S) DRILLED | 11/14/2018 |
| DRILLING COMPANY | Betts | CASING DIA./TYPE | 2" PVC |
| DRILLER | C. Pendarvis | SCREEN SLOT/TYPE | 0.010-in. slotted PVC |
| DRILLING METHOD | Sonic | FILTER PACK TYPE | |
| REMARKS | | TOP OF CASING | 172.01 Ft. AMSL |
| | | GROUND ELEVATION | 171.91 Ft. AMSL |
| | | DEPTH TO WATER | |
| | | WATER ELEVATION | |

7/2/19 Report ENV LOG - WELL

M:\PROJECTS\2018\000180200804.00 - TWIN PINES MINERALS PERMITTING SERVICES\804-LOGS RESTORED FROM 8-7\804-LOGS WITH WELLS (TUSCOM RESTORE).GPJ

| DEPTH (feet) | GRAPHIC LOG | U.S.C.S. | SAMPLE | | | LITHOLOGIC DESCRIPTION | WATER LEVEL & DATE | OBSV. WELL DIAGRAM |
|-----------------|----------------|----------|--------------------|---------------|--------------|---|-----------------------------|--------------------|
| | | | INTERVAL (feet) | % RECOVERY | PID (ppm) | | | |
| | | | 0-10 | 70 | | No Recovery | | |
| 5 | | SP | | | | SAND: grey (quartz); fine (50%); med (40%); coarse (10%); well sorted; subround; unconsolidated; dry; FBG (<1%); organic material (roots) | | |
| 10 | | SM | | | | SAND, silty: very dark brown (quartz); fine (75%); med (20%); silt (<5%); well sorted; subround; unconsolidated; moist | | |
| 15 | | SC-SM | | | | SAND, silty, clayey: black (quartz); fine (75%); med (20%); silt/clay (<5%); well sorted; subround; well consolidated; moist | | |
| 20 | | SM | | | | SAND, silty: dark brown (quartz); fine (60%); med (25%); coarse (10%); silt (<5%); well sorted; subround; unconsolidated; moist | | |
| 25 | | SP | | | | SAND: yellowish brown (quartz); fine (50%); med (25%); coarse (25%); well sorted; subround; unconsolidated; moist; FBG (<1%) | | |
| 30 | | SP | | | | SAND: (quartz); fine (60%); med (30%); coarse (10%); well sorted; subround; unconsolidated; moist; FBG (<1%) | | |
| 30 | | SC-SM | | | | SAND, silty, clayey: black (quartz); fine (75%); med (20%); silt/clay (<5%); well sorted; subround; well consolidated; moist | | |
| 35 | | SP | | | | SAND: dark yellowish brown (quartz); fine (50%); med (25%); coarse (25%); well sorted; subround; unconsolidated; FBG (<1%) | | |
| 35 | | | | | | BORING TERMINATED AT 35 FEET. | | |



TWIN PINES MINERALS SAUNDERS-LONCALA RESERVE

SAINT GEORGE, GEORGIA

LOG OF OBSV. WELL
OWA3BS
& OBSV. WELL
CONSTRUCTION

| | | | |
|------------------|-----------------------|------------------|-----------------------|
| PROJECT NUMBER | 000180200804.00 | PROFESSIONAL | A. Wiggins |
| LOCATION | Saint George, Georgia | DATE(S) DRILLED | 1/30/2019 |
| DRILLING COMPANY | Betts | CASING DIA./TYPE | 2" PVC |
| DRILLER | C. Pendarvis | SCREEN SLOT/TYPE | 0.010-in. slotted PVC |
| DRILLING METHOD | Sonic | FILTER PACK TYPE | Natural |
| REMARKS | | TOP OF CASING | 172.35 Ft. AMSL |
| | | GROUND ELEVATION | 172.11 Ft. AMSL |
| | | DEPTH TO WATER | 1.03 Ft. BMP |
| | | WATER ELEVATION | |

7/2/19 Report ENV LOG - WELL
M:\PROJECTS\2018\000180200804.00 - TWIN PINES MINERALS PERMITTING SERVICES\804-LOGS RESTORED FROM 8-7\804-LOGS WITH WELLS (TUSCOM RESTORE).GPJ

| DEPTH (feet) | GRAPHIC LOG | U.S.C.S. | SAMPLE | | | LITHOLOGIC DESCRIPTION | WATER LEVEL & DATE | OBSV. WELL DIAGRAM |
|-----------------|----------------|----------|--------------------|---------------|--------------|---|-----------------------------|--------------------|
| | | | INTERVAL (feet) | % RECOVERY | PID (ppm) | | | |
| 0-5 | | SP | 0-5 | 100 | | SAND: black (10YR 2/1); poorly graded; med; saturated | | |
| 5-10 | | SP | 5-10 | 100 | | SAND: light reddish grey (2.5YR 7/1); med; saturated; organics (5.5-6) | | |
| | | SP | | | | SAND: weak red (2.5YR 5/2); poorly graded; med; saturated | | |
| | | SP | | | | SAND: very dark brown (2.5YR 2.5/2); poorly graded; med; saturated | | |
| 10-15 | | SP | 10-15 | 100 | | SAND: very dark brown (2.5YR 2.5/2); poorly graded; med; saturated | | |
| 15 | | | | | | BORING TERMINATED AT 15 FEET. | | |



TWIN PINES MINERALS SAUNDERS-LONCALA RESERVE

SAINT GEORGE, GEORGIA

LOG OF OBSV. WELL
OWA4BS
& OBSV. WELL
CONSTRUCTION

| | | | |
|------------------|-----------------------|------------------|-----------------|
| PROJECT NUMBER | 000180200804.00 | PROFESSIONAL | A. Wiggins |
| LOCATION | Saint George, Georgia | DATE(S) DRILLED | 1/30/2019 |
| DRILLING COMPANY | Betts | CASING DIA./TYPE | 2" PVC |
| DRILLER | C. Pendarvis | SCREEN SLOT/TYPE | 0.010-inch. |
| DRILLING METHOD | Sonic | FILTER PACK TYPE | Natural |
| REMARKS | | TOP OF CASING | 172.44 Ft. AMSL |
| | | GROUND ELEVATION | 172.16 Ft. AMSL |
| | | DEPTH TO WATER | 1.25 Ft. BMP |
| | | WATER ELEVATION | |

7/2/19 Report ENV LOG - WELL
M:\PROJECTS\2018\000180200804.00 - TWIN PINES MINERALS PERMITTING SERVICES\804-LOGS RESTORED FROM 8-7\804-LOGS WITH WELLS (TUSCOM RESTORE).GPJ

| DEPTH (feet) | GRAPHIC LOG | U.S.C.S. | SAMPLE | | | LITHOLOGIC DESCRIPTION | WATER LEVEL & DATE | OBSV. WELL DIAGRAM |
|--------------|-------------|----------|-----------------|------------|-----------|---|--------------------|--------------------|
| | | | INTERVAL (feet) | % RECOVERY | PID (ppm) | | | |
| 0-5 | | SP | 0-5 | 100 | | SAND: black (10R 2/1); poorly graded; med; moist | | |
| 5-10 | | SP | 5-10 | 100 | | SAND: reddish grey (2.5YR 7/1); poorly graded; med; moist SAND: weak red (2.5YR 5/2); poorly graded; med; moist; organics (5.5-6 feet) | | |
| | | SP | | | | SAND: very dark brown (2.5YR 2.5/2); poorly graded; med; moist | | |
| 10-15 | | SP | 10-15 | 100 | | SAND: black (10R 2/1); poorly graded; med; saturated | | |
| 15 | | | | | | BORING TERMINATED AT 15 FEET. | | |



TWIN PINES MINERALS SAUNDERS-LONCALA RESERVE

SAINT GEORGE, GEORGIA

LOG OF OBSV. WELL
OWA5BS
& OBSV. WELL
CONSTRUCTION

| | | | |
|------------------|-----------------------|------------------|-----------------|
| PROJECT NUMBER | 000180200804.00 | PROFESSIONAL | A. Wiggins |
| LOCATION | Saint George, Georgia | DATE(S) DRILLED | 1/30/2019 |
| DRILLING COMPANY | Betts | CASING DIA./TYPE | 2" PVC |
| DRILLER | C. Pendarvis | SCREEN SLOT/TYPE | 0.010-in. |
| DRILLING METHOD | Sonic | FILTER PACK TYPE | Natural |
| REMARKS | | TOP OF CASING | 172.28 Ft. AMSL |
| | | GROUND ELEVATION | 172.09 Ft. AMSL |
| | | DEPTH TO WATER | 0.7 Ft. BMP |
| | | WATER ELEVATION | |

7/2/19 Report ENV LOG - WELL
M:\PROJECTS\2018\000180200804.00 - TWIN PINES MINERALS PERMITTING SERVICES\804-LOGS RESTORED FROM 8-7\804-LOGS WITH WELLS (TUSCOM RESTORE).GPJ

| DEPTH (feet) | GRAPHIC LOG | U.S.C.S. | SAMPLE | | | LITHOLOGIC DESCRIPTION | WATER LEVEL & DATE | OBSV. WELL DIAGRAM |
|-----------------|----------------|----------|--------------------|---------------|--------------|--|-----------------------------|--------------------|
| | | | INTERVAL (feet) | % RECOVERY | PID (ppm) | | | |
| 0-5 | | SP | 0-5 | 100 | | SAND: black (5YR 2.5/1); poorly graded; med | | |
| 5-10 | | SP | 5-10 | 100 | | SAND: grey (5yr 6/1); poorly graded; med; organics | | |
| | | SP | | | | SAND: dark yellowish brown (10YR 3/6) and brown (10YR 4/3); poorly graded | | |
| | | SP | | | | SAND: very pale brown (10YR 7/3) and greyish brown (10YR 5/2); poorly graded | | |
| 10-15 | | SP | 10-15 | 100 | | SAND: black (5YR 2.5/1); poorly graded; med; saturated | | |
| 15 | | | | | | BORING TERMINATED AT 15 FEET. | | |

PUMPING TEST AREA B



TWIN PINES MINERALS SAUNDERS-LONCALA RESERVE

SAINT GEORGE, GEORGIA

LOG OF PUMP WEL
PW B
& PUMP WELL
CONSTRUCTION

| | | | |
|------------------|-----------------------|------------------|-------------------------|
| PROJECT NUMBER | 000180200804.00 | PROFESSIONAL | A. Patton |
| LOCATION | Saint George, Georgia | DATE(S) DRILLED | 12/10/2018 - 12/14/2018 |
| DRILLING COMPANY | Patridge Well Co. | CASING DIA./TYPE | 6" PVC |
| DRILLER | Randy Baker | SCREEN SLOT/TYPE | 0.020-inch |
| DRILLING METHOD | Rotary | FILTER PACK TYPE | 16/30 Colorado silica |
| REMARKS | | TOP OF CASING | 174.41 Ft. AMSL |
| | | GROUND ELEVATION | 172.46 Ft. AMSL |
| | | DEPTH TO WATER | |
| | | WATER ELEVATION | |

7/2/19 Report ENV LOG - WELL
M:\PROJECTS\2018\000180200804.00 - TWIN PINES MINERALS PERMITTING SERVICES\804-LOGS RESTORED FROM 8-7\804-LOGS WITH WELLS (TUSCOM RESTORE).GPJ

| DEPTH (feet) | GRAPHIC LOG | U.S.C.S. | SAMPLE | | | LITHOLOGIC DESCRIPTION | WATER LEVEL & DATE | PUMP WELL DIAGRAM |
|--------------|-------------|----------|-----------------|------------|-----------|---|--------------------|-------------------|
| | | | INTERVAL (feet) | % RECOVERY | PID (ppm) | | | |
| 0 - 5 | | SP | | | | SAND: light brown to black | | |
| 5 - 10 | | | | | | SAND, sandy: black; med to fine; consolidated; hardpan at 15' | | |
| 10 - 20 | | SM | | | | SAND: very dark brown to almost black; few organics | | |
| 20 - 30 | | | | | | | | |
| 30 - 40 | | SP | | | | SAND, sandy: light brown to tan (yellowish brown); fine to med; well sorted; subround | | |

Continued Next Page



TWIN PINES MINERALS SAUNDERS-LONCALA RESERVE

SAINT GEORGE, GEORGIA

LOG OF PUMP WEL
PW B
& PUMP WELL
CONSTRUCTION

PROJECT NUMBER 000180200804.00 PROFESSIONAL A. Patton
LOCATION Saint George, Georgia DATE(S) DRILLED 12/10/2018 - 12/14/2018

Continued from Previous Page

| DEPTH (feet) | GRAPHIC LOG | U.S.C.S. | SAMPLE | | | LITHOLOGIC DESCRIPTION | WATER LEVEL & DATE | PUMP WELL DIAGRAM |
|--------------|-------------|----------|-----------------|------------|-----------|---|--------------------|-------------------|
| | | | INTERVAL (feet) | % RECOVERY | PID (ppm) | | | |
| 50 | | SM | | | | | | |
| 60 | | SC | | | | SAND, clayey; medium bluish grey to medium dark grey; fine; well sorted; argillaceous | | |
| 80 | | SC | | | | SAND, clayey; black; no reaction | | |
| 90 | | SC | | | | | | |

Continued Next Page



TWIN PINES MINERALS SAUNDERS-LONCALA RESERVE

SAINT GEORGE, GEORGIA

LOG OF PUMP WEL
PW B
& PUMP WELL
CONSTRUCTION

PROJECT NUMBER 000180200804.00 PROFESSIONAL A. Patton
 LOCATION Saint George, Georgia DATE(S) DRILLED 12/10/2018 - 12/14/2018

Continued from Previous Page

M:\PROJECTS\2018\000180200804.00 - TWIN PINES MINERALS PERMITTING SERVICES\804-LOGS RESTORED FROM 8-71804-LOGS WITH WELLS (TUSCOM RESTORE).GPJ 7/2/19 Report ENV LOG - WELL

| DEPTH (feet) | GRAPHIC LOG | U.S.C.S. | SAMPLE | | | LITHOLOGIC DESCRIPTION | WATER LEVEL & DATE | PUMP WELL DIAGRAM |
|-----------------|----------------|----------|--------------------|---------------|--------------|--------------------------------|-----------------------------|-------------------|
| | | | INTERVAL (feet) | % RECOVERY | PID (ppm) | | | |
| 100 | | | | | | SAND: black | | |
| 105 | | SP | | | | | | |
| 115 | | | | | | BORING TERMINATED AT 115 FEET. | | Well Tip |



TWIN PINES MINERALS SAUNDERS-LONCALA RESERVE

SAINT GEORGE, GEORGIA

LOG OF OBSV. WELL
OWB1BS
& OBSV. WELL
CONSTRUCTION

| | | | |
|------------------|------------------------------------|------------------|-----------------------|
| PROJECT NUMBER | 000180200804.00 | PROFESSIONAL | T. Hall |
| LOCATION | Saint George, Georgia | DATE(S) DRILLED | 12/7/2018 |
| DRILLING COMPANY | Betts | CASING DIA./TYPE | 2" PVC |
| DRILLER | C. Pendarvis | SCREEN SLOT/TYPE | 0.010-in. slotted PVC |
| DRILLING METHOD | Sonic | FILTER PACK TYPE | |
| REMARKS | Same as OWB-1S and OWB-1D for 0-12 | TOP OF CASING | 172.38 Ft. AMSL |
| | | GROUND ELEVATION | 172.17 Ft. AMSL |
| | | DEPTH TO WATER | |
| | | WATER ELEVATION | |

7/2/19 Report ENV LOG - WELL
M:\PROJECTS\2018\000180200804.00 - TWIN PINES MINERALS PERMITTING SERVICES\804-LOGS RESTORED FROM 8-7\804-LOGS WITH WELLS (TUSCOM RESTORE).GPJ

| DEPTH (feet) | GRAPHIC LOG | U.S.C.S. | SAMPLE | | | LITHOLOGIC DESCRIPTION | WATER LEVEL & DATE | OBSV. WELL DIAGRAM |
|--------------|-------------|----------|-----------------|------------|-----------|---|--------------------|--------------------|
| | | | INTERVAL (feet) | % RECOVERY | PID (ppm) | | | |
| 0-10 | | SM | 0-10 | 80 | | No Recovery | | |
| 5 | | SM | | | | SAND, silty: dark grey (quartz); fine (60%); med (35%); silt (<5%); well sorted; subround; unconsolidated; moist; organics (wood/roots) | | |
| 10 | | SM | | | | SAND, silty: dark grayish brown (quartz); fine (50%); med (45%); silt (<5%); well sorted; subround; unconsolidated; moist | | |
| | | | | | | BORING TERMINATED AT 12 FEET. | | |



TWIN PINES MINERALS SAUNDERS-LONCALA RESERVE

SAINT GEORGE, GEORGIA

LOG OF OBSV. WELL
OWB1D
& OBSV. WELL
CONSTRUCTION

| | | | |
|------------------|-----------------------|------------------|-----------------------|
| PROJECT NUMBER | 000180200804.00 | PROFESSIONAL | T. Hall |
| LOCATION | Saint George, Georgia | DATE(S) DRILLED | 11/27/2018 |
| DRILLING COMPANY | Betts | CASING DIA./TYPE | 2" PVC |
| DRILLER | C. Golden | SCREEN SLOT/TYPE | 0.010-in. slotted PVC |
| DRILLING METHOD | Sonic | FILTER PACK TYPE | |
| REMARKS | | TOP OF CASING | 172.49 Ft. AMSL |
| | | GROUND ELEVATION | 172.36 Ft. AMSL |
| | | DEPTH TO WATER | |
| | | WATER ELEVATION | |

7/2/19 Report ENV LOG - WELL

M:\PROJECTS\2018\000180200804.00 - TWIN PINES MINERALS PERMITTING SERVICES\804-LOGS RESTORED FROM 8-71804-LOGS WITH WELLS (TUSCOM RESTORE).GPJ

| DEPTH (feet) | GRAPHIC LOG | U.S.C.S. | SAMPLE | | | LITHOLOGIC DESCRIPTION | WATER LEVEL & DATE | OBSV. WELL DIAGRAM |
|--------------|-------------|----------|-----------------|------------|-----------|--|--------------------|--------------------|
| | | | INTERVAL (feet) | % RECOVERY | PID (ppm) | | | |
| 0-10 | | | 0-10 | 80 | | No Recovery | | |
| 5 | | SM | | | | SAND, silty: dark grey (quartz); fine (60%); med (35%); silt (<5%); well sorted; subround; unconsolidated; moist; organic material (wood/roots/shoots) | | |
| 5-10 | | | | | | SAND, silty: dark grayish brown (quartz); fine (50%); med (45%); silt (<5%); well sorted; subround; unconsolidated; moist; FBG (<1%) | | |
| 10-20 | | SM | 10-20 | 80 | | | | |
| 15 | | SM | | | | SAND, silty: black (quartz); fine (75%); med (20%); silt (<5%); well sorted; subround; well consolidated; moist | | |
| 20 | | | | | | SAND, silty: brown (quartz); fine (60%); med (35%); silt (<5%); well sorted; subround; semi-consolidated; moist; FBG (<1%) | | |
| 20-30 | | SM | 20-30 | 80 | | | | |
| 25 | | SP | | | | SAND: light grayish brown (quartz); fine (50%); med (50%); well sorted; subround; unconsolidated; moist; FBG (<1%) | | |
| 25-30 | | | | | | SAND, silty: dark brown (quartz); fine (70%); med (20%); coarse (5%); silt (<5%); well sorted; subround; unconsolidated; moist; FBG (<1%) | | |
| 30 | | SM | | | | | | |
| 30-40 | | | 30-40 | 70 | | | | |
| | | SC-SM | | | | SAND, silty, clayey: black (quartz); fine (95%); silt/clay (<5%); | | |

Continued Next Page



TWIN PINES MINERALS SAUNDERS-LONCALA RESERVE

SAINT GEORGE, GEORGIA

LOG OF OBSV. WELL
OWB1D
& OBSV. WELL
CONSTRUCTION

PROJECT NUMBER 000180200804.00 PROFESSIONAL T. Hall
LOCATION Saint George, Georgia DATE(S) DRILLED 11/27/2018

Continued from Previous Page

| DEPTH (feet) | GRAPHIC LOG | U.S.C.S. | SAMPLE | | | LITHOLOGIC DESCRIPTION | WATER LEVEL & DATE | OBSV. WELL DIAGRAM |
|--------------|---------------------------|----------|-----------------|------------|-----------|--|--------------------------------|---|
| | | | INTERVAL (feet) | % RECOVERY | PID (ppm) | | | |
| 40 | [Purple dotted pattern] | SM | 40-50 | 80 | | well sorted; subround; well consolidated; moist SAND, silty: dark brown (quartz); fine (75%); med (20%); silt (<5%); well sorted; subround; unconsolidated; FBG (<1%) | [Well diagram with grout seal] | |
| 45 | | | | | | | | |
| 50 | [Purple dotted pattern] | SP | 50-60 | 80 | | SAND: grayish brown (quartz); fine (50%); med (40%); coarse (10%); well sorted; subround; unconsolidated; moist; FBG (<1%) | [Well diagram with grout seal] | |
| 55 | | | | | | | | |
| 60 | [Purple dotted pattern] | SP | 60-70 | 80 | | SAND: dark grayish brown (quartz); fine (50%); med (25%); coarse (25%); well sorted; subround; unconsolidated; moist; FBG (<1%) | [Well diagram with grout seal] | |
| 65 | | | | | | | | |
| 65 | [Orange diagonal pattern] | CL | | | | CLAY, sandy: grayish brown; fine; FBG (<1%) | [Well diagram with grout seal] | |
| 70 | [Red diagonal pattern] | SC | 70-80 | 60 | | SAND, clayey: light brownish grey (quartz); fine (95%); clay (5%); well sorted; subround; moist; FBG (<1%) | | [Well diagram with grout seal and Bentonite Seal] |
| 75 | | | | | | | | |

Continued Next Page

This well log shall not be separated from the corresponding Instrument of Service; no third party may rely upon this well log for the corresponding Instrument of Service absent a written TTL Secondary Client Agreement.



TWIN PINES MINERALS SAUNDERS-LONCALA RESERVE

SAINT GEORGE, GEORGIA

LOG OF OBSV. WELL
OWB1D
& OBSV. WELL
CONSTRUCTION

PROJECT NUMBER 000180200804.00 PROFESSIONAL T. Hall
LOCATION Saint George, Georgia DATE(S) DRILLED 11/27/2018

Continued from Previous Page

M:\PROJECTS\2018\000180200804.00 - TWIN PINES MINERALS PERMITTING SERVICES\804-LOGS RESTORED FROM 8-71804-LOGS WITH WELLS (TUSCOM RESTORE).GPJ 7/2/19 Report ENV LOG - WELL

| DEPTH (feet) | GRAPHIC LOG | U.S.C.S. | SAMPLE | | | LITHOLOGIC DESCRIPTION | WATER LEVEL & DATE | OBSV. WELL DIAGRAM |
|--------------|-------------|----------|-----------------|------------|-----------|---|--|--------------------|
| | | | INTERVAL (feet) | % RECOVERY | PID (ppm) | | | |
| 80 | | SP | 80-90 | 80 | | SAND: fine (60%) med (30%); coarse (10%); well sorted; subround; unconsolidated; moist; FBG (<1%) | <p>Filter Pack Sand (20/40)</p> <p>Screened Interval (0.01-inch PVC)</p> <p>Well Tip</p> | |
| 85 | | SP | | | | SAND: fine (50%); med (50%); well sorted; subround; unconsolidated; moist; FBG (<1%) | | |
| | | SC-SM | | | | SAND, silty, clayey: (quartz); fine (75%); med (20%); silty/clay (<5%); well sorted; subround; moist; FBG (<1%) | | |
| | | SP | | | | SAND: (quartz); fine (75%); med (25%); well sorted; subround; unconsolidated; moist; FBG (<1%) | | |
| 90 | | | | | | BORING TERMINATED AT 90 FEET. | | |



TWIN PINES MINERALS SAUNDERS-LONCALA RESERVE

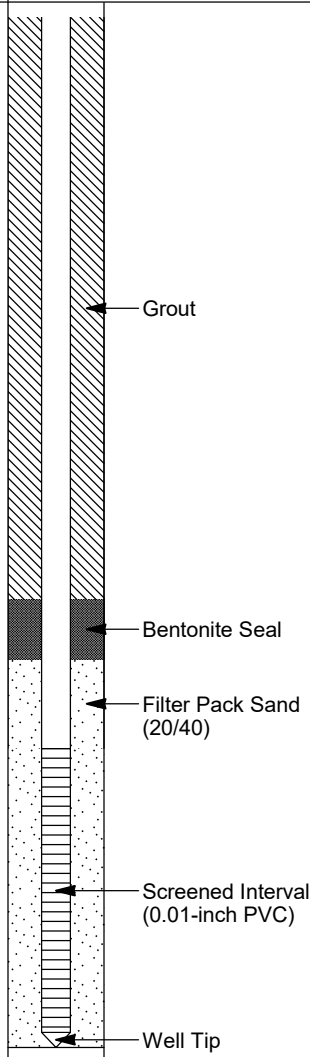
SAINT GEORGE, GEORGIA

LOG OF OBSV. WELL
OWB1S
& OBSV. WELL
CONSTRUCTION

| | | | |
|------------------|-----------------------|------------------|-----------------------|
| PROJECT NUMBER | 000180200804.00 | PROFESSIONAL | T. Hall |
| LOCATION | Saint George, Georgia | DATE(S) DRILLED | 11/27/2018 |
| DRILLING COMPANY | Betts | CASING DIA./TYPE | 2" PVC |
| DRILLER | C. Golden | SCREEN SLOT/TYPE | 0.010-in. slotted PVC |
| DRILLING METHOD | Sonic | FILTER PACK TYPE | |
| REMARKS | | TOP OF CASING | 172.43 Ft. AMSL |
| | | GROUND ELEVATION | 172.34 Ft. AMSL |
| | | DEPTH TO WATER | |
| | | WATER ELEVATION | |

7/2/19 Report ENV LOG - WELL
M:\PROJECTS\2018\000180200804.00 - TWIN PINES MINERALS PERMITTING SERVICES\804-LOGS RESTORED FROM 8-71804-LOGS WITH WELLS (TUSCOM RESTORE).GPJ

| DEPTH (feet) | GRAPHIC LOG | U.S.C.S. | SAMPLE | | | LITHOLOGIC DESCRIPTION | WATER LEVEL & DATE | OBSV. WELL DIAGRAM |
|--------------|-------------|----------|-----------------|------------|-----------|---|--------------------|--------------------|
| | | | INTERVAL (feet) | % RECOVERY | PID (ppm) | | | |
| 0-10 | | | 0-10 | 80 | | No Recovery | | |
| 5 | | SM | | | | SAND, silty: dark grey (quartz); fine (60%); med (35%); silt (<5%); well sorted; subround; unconsolidated; moist; organics (wood/roots) | | |
| 10 | | SM | | | | SAND, silty: dark grayish brown (quartz); fine (50%); med (45%); silt (<5%); well sorted; subround; unconsolidated; moist | | |
| 15 | | SM | | | | SAND, silty: black (quartz); fine (75%); med (20%); silt (<5%); well sorted; subround; well consolidated; moist | | |
| 20 | | SM | | | | SAND, silty: brown (quartz); fine (60%); med (35%); silt (<5%); well sorted; subround; semi-consolidated; moist; FBG (<1%) | | |
| 25 | | SM | | | | SAND, silty: light grayish brown (quartz); fine (50%); med (50%); well sorted; subround; unconsolidated; moist; FBG (<1%) | | |
| 30 | | SM | | | | SAND, silty: dark brown (quartz); fine (70%); med (20%); coarse (5%); silt (<5%); well sorted; subround; unconsolidated; moist; FBG (<1%) | | |
| 35 | | SC-SM | | | | SAND, silty, clayey: black (quartz); fine (95%); silt/clay (<5%); well sorted; subround; well consolidated; moist | | |
| | | | | | | BORING TERMINATED AT 35 FEET. | | |





TWIN PINES MINERALS SAUNDERS-LONCALA RESERVE

SAINT GEORGE, GEORGIA

LOG OF OBSV. WELL
OWB2BS
& OBSV. WELL
CONSTRUCTION

| | | | |
|------------------|---|------------------|-----------------------|
| PROJECT NUMBER | 000180200804.00 | PROFESSIONAL | T. Hall |
| LOCATION | Saint George, Georgia | DATE(S) DRILLED | 12/7/2018 |
| DRILLING COMPANY | Betts | CASING DIA./TYPE | 2" PVC |
| DRILLER | C. Pendarvis | SCREEN SLOT/TYPE | 0.010-in. slotted PVC |
| DRILLING METHOD | Sonic | FILTER PACK TYPE | |
| REMARKS | Same as OWB-2S and OWB-2D for 0-12 interval | TOP OF CASING | 172.47 Ft. AMSL |
| | | GROUND ELEVATION | 172.59 Ft. AMSL |
| | | DEPTH TO WATER | |
| | | WATER ELEVATION | |

7/2/19 Report ENV LOG - WELL
M:\PROJECTS\2018\000180200804.00 - TWIN PINES MINERALS PERMITTING SERVICES\804-LOGS RESTORED FROM 8-7\804-LOGS WITH WELLS (TUSCOM RESTORE).GPJ

| DEPTH (feet) | GRAPHIC LOG | U.S.C.S. | SAMPLE | | | LITHOLOGIC DESCRIPTION | WATER LEVEL & DATE | OBSV. WELL DIAGRAM |
|-----------------|----------------|----------|--------------------|---------------|--------------|--|-----------------------------|--------------------|
| | | | INTERVAL (feet) | % RECOVERY | PID (ppm) | | | |
| 0-10 | | SM | 0-10 | 80 | | No Recovery | | |
| 5 | | SM | | | | SAND, silty; dark yellowish brown (quartz); fine (60%); med (35%); silt (<5%); well sorted; subround; unconsolidated; moist | | |
| 10 | | SM | | | | SAND, silty; dark grayish brown (quartz); fine (75%); med (20%); silt (<5%); well sorted; subround; semi-consolidated; moist | | |
| 10-20 | | SM | 10-20 | 80 | | SAND, silty; dark brown (quartz); fine (50%); med (40%); silt (<5%); well sorted; subround; unconsolidated; moist | | |
| | | | | | | BORING TERMINATED AT 12 FEET. | | |



TWIN PINES MINERALS SAUNDERS-LONCALA RESERVE

SAINT GEORGE, GEORGIA

LOG OF OBSV. WELL
OWB2D
& OBSV. WELL
CONSTRUCTION

| | | | |
|------------------|-----------------------|------------------|-------------------------|
| PROJECT NUMBER | 000180200804.00 | PROFESSIONAL | T. Hall |
| LOCATION | Saint George, Georgia | DATE(S) DRILLED | 11/28/2018 - 11/29/2018 |
| DRILLING COMPANY | Betts | CASING DIA./TYPE | 2" PVC |
| DRILLER | C. Pendarvis | SCREEN SLOT/TYPE | 0.010-in. slotted PVC |
| DRILLING METHOD | Sonic | FILTER PACK TYPE | |
| REMARKS | | TOP OF CASING | 172.76 Ft. AMSL |
| | | GROUND ELEVATION | 172.75 Ft. AMSL |
| | | DEPTH TO WATER | |
| | | WATER ELEVATION | |

7/2/19 Report ENV LOG - WELL

M:\PROJECTS\2018\000180200804.00 - TWIN PINES MINERALS PERMITTING SERVICES\804-LOGS RESTORED FROM 8-7\804-LOGS WITH WELLS (TUSCOM RESTORE).GPJ

| DEPTH (feet) | GRAPHIC LOG | U.S.C.S. | SAMPLE | | | LITHOLOGIC DESCRIPTION | WATER LEVEL & DATE | OBSV. WELL DIAGRAM |
|--------------|-------------|----------|-----------------|------------|-----------|--|--------------------|--------------------|
| | | | INTERVAL (feet) | % RECOVERY | PID (ppm) | | | |
| 0-10 | | | 0-10 | 80 | | No Recovery | | |
| 5 | | SM | | | | SAND, silty: dark yellowish brown (quartz); fine (60%); med (35%); silt (<5%); well sorted; subround; unconsolidated; moist | | |
| | | SM | | | | SAND, silty: dark grayish brown (quartz); fine (75%); med (20%); silt (<5%); well sorted; subround; semi-consolidated; moist | | |
| 10 | | SM | 10-20 | 80 | | SAND, silty: dark brown (quartz); fine (50%); med (40%); silt (<5%); well sorted; subround; unconsolidated; moist | | |
| 15 | | SC-SM | | | | SAND: silty; clayey: black (quartz); fine (75%); med (20%); silt/clay (<5%); well sorted; subround; semi-consolidated | | |
| 20 | | | 20-30 | 80 | | SAND: grayish brown (quartz); fine (50%); med (50%); well sorted; subround; unconsolidated; moist; FBG (<1%) | | |
| 25 | | SP | | | | | | |
| 30 | | SM | 30-40 | 80 | | SAND, silty: (quartz); fine (75%); med (20%); silt (<5%); well sorted; subround; unconsolidated; moist; FBG (<1%) | | |
| | | SM | | | | SAND, silty: very dark brown (quartz); fine (60%); med (35%); silt (<5%); well sorted; subround; well consolidated; moist | | |
| 35 | | | | | | SAND, silty: (quartz); fine (75%); med (20%); silt (<5%); well sorted; subround; unconsolidated; moist; FBG (<1%) | | |
| | | SM | | | | | | |
| 40 | | | 40-50 | 80 | | SAND: dark yellowish brown (quartz); fine (60%); med (30%); coarse (10%); well sorted subround; moist; FBG (<1%) | | |

← Grout

Continued Next Page



TWIN PINES MINERALS SAUNDERS-LONCALA RESERVE

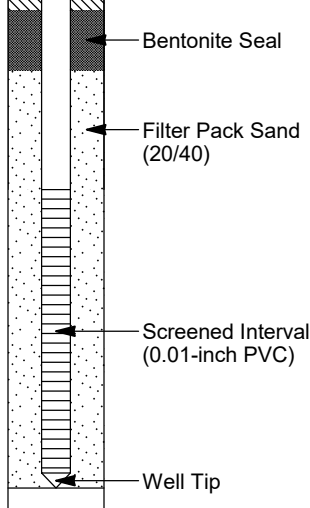
SAINT GEORGE, GEORGIA

LOG OF OBSV. WELL
OWB2D
& OBSV. WELL
CONSTRUCTION

PROJECT NUMBER 000180200804.00 PROFESSIONAL T. Hall
LOCATION Saint George, Georgia DATE(S) DRILLED 11/28/2018 - 11/29/2018

Continued from Previous Page

| DEPTH (feet) | GRAPHIC LOG | U.S.C.S. | SAMPLE | | | LITHOLOGIC DESCRIPTION | WATER LEVEL & DATE | OBSV. WELL DIAGRAM |
|--------------|-------------------------|----------|-----------------|------------|-----------|---|--------------------|--------------------|
| | | | INTERVAL (feet) | % RECOVERY | PID (ppm) | | | |
| 50 | [Purple dotted pattern] | SP | 50-60 | 80 | | | | |
| 60 | | | 60-70 | 80 | | | | |
| 65 | [Blue vertical lines] | SM | | | | SAND, silty: grayish brown (quartz); fine (75%); med (20%); silt (<5%); well sorted; subround; unconsolidated; FBG (<1%) | | |
| 65 | [Orange diagonal lines] | CL | | | | CLAY: dark grayish brown; sandy; fine | | |
| 70 | [Purple dotted pattern] | SM | 70-80 | 0 | | SAND, silty: grayish brown (quartz); fine (75%); med (20%); silt (<5%); well sorted; subround; unconsolidated; FBG (<1%) No Recovery | | |
| 80 | [Purple dotted pattern] | SP | 80-90 | 70 | | SAND: (quartz); fine (50%); med (50%); well sorted; subround; unconsolidated FBG (<1%) | | |
| 85 | [Blue vertical lines] | SC-SM | | | | SAND, silty, clayey: (quartz); fine (75%); med (20%); silt/clay (<5%); well sorted; subround; moist; FBG (<1%) | | |
| 90 | [Purple dotted pattern] | SP | | | | SAND: light grayish brown (quartz); fine (75%); med (25%); well sorted; subround; unconsolidated; moist | | |
| | | | | | | BORING TERMINATED AT 90 FEET. | | |



M:\PROJECTS\2018\000180200804.00 - TWIN PINES MINERALS PERMITTING SERVICES\804-LOGS RESTORED FROM 8-71804-LOGS WITH WELLS (TUSCOM RESTORE).GPJ 7/2/19 Report ENV LOG - WELL

This well log shall not be separated from the corresponding Instrument of Service; no third party may rely upon this well log for the corresponding Instrument of Service absent a written TTL Secondary Client Agreement.



TWIN PINES MINERALS SAUNDERS-LONCALA RESERVE

SAINT GEORGE, GEORGIA

LOG OF OBSV. WELL
OWB2S
& OBSV. WELL
CONSTRUCTION

| | | | |
|------------------|-----------------------|------------------|-----------------------|
| PROJECT NUMBER | 000180200804.00 | PROFESSIONAL | T. Hall |
| LOCATION | Saint George, Georgia | DATE(S) DRILLED | 11/30/2018 |
| DRILLING COMPANY | Betts | CASING DIA./TYPE | 2" PVC |
| DRILLER | C. Pendarvis | SCREEN SLOT/TYPE | 0.010-in. slotted PVC |
| DRILLING METHOD | Sonic | FILTER PACK TYPE | |
| REMARKS | | TOP OF CASING | 172.79 Ft. AMSL |
| | | GROUND ELEVATION | 172.86 Ft. AMSL |
| | | DEPTH TO WATER | |
| | | WATER ELEVATION | |

7/2/19 Report ENV LOG - WELL
M:\PROJECTS\2018\000180200804.00 - TWIN PINES MINERALS PERMITTING SERVICES\804-LOGS RESTORED FROM 8-7\804-LOGS WITH WELLS (TUSCOM RESTORE).GPJ

| DEPTH (feet) | GRAPHIC LOG | U.S.C.S. | SAMPLE | | | LITHOLOGIC DESCRIPTION | WATER LEVEL & DATE | OBSV. WELL DIAGRAM |
|-----------------|----------------|----------|--------------------|---------------|--------------|--|-----------------------------------|--------------------|
| | | | INTERVAL (feet) | % RECOVERY | PID (ppm) | | | |
| 0-10 | | | 0-10 | 70 | | No Recovery | | |
| 5 | | SM | | | | SAND, silty: dark grayish brown (quartz); fine (75%); med (20%); silt (<5%); well sorted; subround; semi-consolidated; moist | | |
| 10 | | SM | | | | SAND, silty: dark brown (quartz); fine (50%); med (45%); silt (<5%); well sorted; subround; unconsolidated; moist | Grout | |
| 15 | | SC-SM | | | | SAND, silty, clayey: black (quartz); fine (75%); med (20%); silt/clay (<5%); well sorted; subround; semi-consolidated; moist | | |
| 20 | | SP | | | | SAND: grayish brown (quartz); fine (50%); med (50%); well sorted; subround; unconsolidated; moist; FBG (<1%) | Bentonite Seal | |
| 25 | | | | | | | Filter Pack Sand (20/40) | |
| 30 | | SM | | | | SAND, silty: brown (quartz); fine (75%); med (20%); silt (<5%); well sorted; subround; unconsolidated; moist; FBG (<1%) | Screened Interval (0.01-inch PVC) | |
| 35 | | SM | | | | SAND, silty: very dark brown (quartz); fine (60%); med (35%); silt (<5%); well sorted; subround; well consolidated | | |
| | | SM | | | | SAND, silty: brown (quartz); fine (75%); med (20%); silt (<5%); well sorted; subround; unconsolidated; moist; FBG (<1%) | Well Tip | |
| | | | | | | BORING TERMINATED AT 35 FEET. | | |



TWIN PINES MINERALS SAUNDERS-LONCALA RESERVE

SAINT GEORGE, GEORGIA

LOG OF OBSV. WELL
OWB3BS
& OBSV. WELL
CONSTRUCTION

| | | | |
|------------------|-----------------------|------------------|-----------------|
| PROJECT NUMBER | 000180200804.00 | PROFESSIONAL | A. Wiggins |
| LOCATION | Saint George, Georgia | DATE(S) DRILLED | 1/30/2019 |
| DRILLING COMPANY | Betts | CASING DIA./TYPE | 2" PVC |
| DRILLER | C. Pendarcis | SCREEN SLOT/TYPE | 0.010-in. |
| DRILLING METHOD | Sonic | FILTER PACK TYPE | Natural |
| REMARKS | | TOP OF CASING | 172.84 Ft. AMSL |
| | | GROUND ELEVATION | 172.57 Ft. AMSL |
| | | DEPTH TO WATER | 0.3 Ft. BMP |
| | | WATER ELEVATION | |

7/2/19 Report ENV LOG - WELL
M:\PROJECTS\2018\000180200804.00 - TWIN PINES MINERALS PERMITTING SERVICES\804-LOGS RESTORED FROM 8-7\804-LOGS WITH WELLS (TUSCOM RESTORE).GPJ

| DEPTH (feet) | GRAPHIC LOG | U.S.C.S. | SAMPLE | | | LITHOLOGIC DESCRIPTION | WATER LEVEL & DATE | OBSV. WELL DIAGRAM |
|-----------------|----------------|----------|--------------------|---------------|--|---|-----------------------------|--------------------|
| | | | INTERVAL (feet) | % RECOVERY | PID (ppm) | | | |
| 0-5 | | SP | 0-5 | 100 | | SAND: black (10R 2/1); poorly graded; med; saturated | | |
| 5-10 | | SP | 5-10 | 100 | | SAND: grey (5YR 6/1); poorly graded; med; organics | | |
| | | SP | | | | SAND: dark yellowish brown (10YR 3/6) and brown (10YR 4/3); poorly graded | | |
| | | SP | | | SAND: very pale brown (10YR 7/3) and greyish brown (10YR 5/2); poorly graded | | | |
| 10-15 | | SP | 10-15 | 100 | | SAND: black (5YR 2.5/1); poorly graded; med; saturated | | |
| 15 | | | | | | BORING TERMINATED AT 15 FEET. | | |



TWIN PINES MINERALS SAUNDERS-LONCALA RESERVE

SAINT GEORGE, GEORGIA

LOG OF OBSV. WELL
OWB3D
& OBSV. WELL
CONSTRUCTION

| | | | |
|------------------|-----------------------|------------------|-----------------------|
| PROJECT NUMBER | 000180200804.00 | PROFESSIONAL | T. Hall |
| LOCATION | Saint George, Georgia | DATE(S) DRILLED | 12/5/2018 |
| DRILLING COMPANY | Betts | CASING DIA./TYPE | 2" PVC |
| DRILLER | C. Pendarvis | SCREEN SLOT/TYPE | 0.010-in. slotted PVC |
| DRILLING METHOD | Sonic | FILTER PACK TYPE | |
| REMARKS | | TOP OF CASING | 172.13 Ft. AMSL |
| | | GROUND ELEVATION | 172.09 Ft. AMSL |
| | | DEPTH TO WATER | |
| | | WATER ELEVATION | |

7/2/19 Report ENV LOG - WELL

M:\PROJECTS\2018\000180200804.00 - TWIN PINES MINERALS PERMITTING SERVICES\804-LOGS RESTORED FROM 8-71804-LOGS WITH WELLS (TUSCOM RESTORE).GPJ

| DEPTH (feet) | GRAPHIC LOG | U.S.C.S. | SAMPLE | | | LITHOLOGIC DESCRIPTION | WATER LEVEL & DATE | OBSV. WELL DIAGRAM |
|--------------|-------------|----------------------|-----------------|------------|-----------|---|--------------------|--------------------|
| | | | INTERVAL (feet) | % RECOVERY | PID (ppm) | | | |
| 0-10 | | | 0-10 | 80 | | No Recovery | | |
| 5 | | SM SM SP SM | | | | SAND, silty: light grayish brown (quartz); fine (50%); med (45%); silt (<5%); well sorted; subround; unconsolidated; moist; FBG (<1%); organics (roots/grass) SAND, silty: dark brown (quartz); fine (60%); med (35%); silt (<5%); well sorted; subround; unconsolidated; moist SAND: light grayish brown (quartz); fine (50%); med (50%); well sorted; subround; unconsolidated; moist; FBG (<1%) SAND, silty: dark yellowish brown (quartz); fine (60%); med (35%); silt (<5%); well sorted; subround; unconsolidated; moist SAND, silty: (quartz); fine (75%); med (20%); silt (<5%); well sorted; subround; unconsolidated; moist | | |
| 10-20 | | | 10-20 | 80 | | SAND, silty: black (quartz); fine (75%); med (20%); silt (<5%); well sorted; subround; well consolidated | | |
| 15 | | | | | | SAND, silty: very dark brown (quartz); fine (75%); med (20%); silt (<5%); well sorted; subround; semi-consolidated; moist | | |
| 20-30 | | | 20-30 | 60 | | SAND, silty: dark grayish brown (quartz); fine (60%); med (35%); silt (<5%); well sorted; subround; unconsolidated; moist | | |
| 25 | | | | | | SAND: grayish brown (quartz); fine (60%); med (40%); well sorted; subround; unconsolidated; FBG (<1%) | | |
| 30-40 | | | 30-40 | 80 | | SAND, silty: dark brown (quartz); fine (50%); med (40%); coarse (5%); silt (<5%); well sorted; subround; unconsolidated; moist; FBG (<1%) SAND: dark yellowish brown (quartz); fine (50%); med (40%); | | |

Continued Next Page



TWIN PINES MINERALS SAUNDERS-LONCALA RESERVE

SAINT GEORGE, GEORGIA

LOG OF OBSV. WELL
OWB3D
& OBSV. WELL
CONSTRUCTION

PROJECT NUMBER 000180200804.00 PROFESSIONAL T. Hall
LOCATION Saint George, Georgia DATE(S) DRILLED 12/5/2018

Continued from Previous Page

M:\PROJECTS\2018\000180200804.00 - TWIN PINES MINERALS PERMITTING SERVICES\804-LOGS RESTORED FROM 8-71804-LOGS WITH WELLS (TUSCOM RESTORE).GPJ 7/2/19 Report ENV LOG - WELL

| DEPTH (feet) | GRAPHIC LOG | U.S.C.S. | SAMPLE | | | LITHOLOGIC DESCRIPTION | WATER LEVEL & DATE | OBSV. WELL DIAGRAM |
|--------------|-------------|----------|-----------------|------------|-----------|---|--------------------|--------------------|
| | | | INTERVAL (feet) | % RECOVERY | PID (ppm) | | | |
| 40-50 | | SP | 40-50 | 90 | | coarse (10%); well sorted; subround; moist; FBG (<1%) | | |
| 50-60 | | | 50-60 | 90 | | | | |
| 55-56 | | SM | | | | SAND, silty: very dark brown (quartz); fine (75%); med (20%); silt (<5%); well sorted; subround; moist; well consolidated | | |
| 56-57 | | SP | | | | SAND: dark yellowish brown (quartz); fine (50%); med (40%); coarse (10%); well sorted; subround; moist; FBG (<1%) | | |
| 57-58 | | SM | | | | SAND, silty: very dark brown (quartz); fine (75%); med (20%); silt (<5%); well sorted; subround; moist; well consolidated | | |
| 58-60 | | SP | | | | SAND: yellowish brown (quartz); fine (60%); med (35%); coarse (5%); well sorted; subround; unconsolidated; moist; FBG (<1%) | | |
| 60-70 | | CL | 60-70 | 90 | | CLAY, sandy: grayish brown; fine; well sorted; subround; moist; FBG (<1%) | | |
| 70-71 | | | 70-80 | 0 | | No Recovery | | |

Continued Next Page

This well log shall not be separated from the corresponding Instrument of Service; no third party may rely upon this well log for the corresponding Instrument of Service absent a written TTL Secondary Client Agreement.



TWIN PINES MINERALS SAUNDERS-LONCALA RESERVE

SAINT GEORGE, GEORGIA

LOG OF OBSV. WELL
OWB3D
& OBSV. WELL
CONSTRUCTION

PROJECT NUMBER 000180200804.00 PROFESSIONAL T. Hall
 LOCATION Saint George, Georgia DATE(S) DRILLED 12/5/2018

Continued from Previous Page

M:\PROJECTS\2018\000180200804.00 - TWIN PINES MINERALS PERMITTING SERVICES\804-LOGS RESTORED FROM 8-71804-LOGS WITH WELLS (TUSCOM RESTORE).GPJ 7/2/19 Report ENV LOG - WELL

| DEPTH (feet) | GRAPHIC LOG | U.S.C.S. | SAMPLE | | | LITHOLOGIC DESCRIPTION | WATER LEVEL & DATE | OBSV. WELL DIAGRAM |
|-----------------|----------------|----------|--------------------|---------------|--------------|--|-----------------------------|--------------------|
| | | | INTERVAL (feet) | % RECOVERY | PID (ppm) | | | |
| 80 | | SP | 80-90 | 80 | | SAND: light grayish brown (quartz); fine (75%); med (25%); well sorted; subround; unconsolidated; moist; FBG (<1%) | | |
| 90 | | | | | | BORING TERMINATED AT 90 FEET. | | |



TWIN PINES MINERALS SAUNDERS-LONCALA RESERVE

SAINT GEORGE, GEORGIA

LOG OF OBSV. WELL
OWB3S
& OBSV. WELL
CONSTRUCTION

| | | | |
|------------------|-----------------------|------------------|-----------------------|
| PROJECT NUMBER | 000180200804.00 | PROFESSIONAL | T. Hall |
| LOCATION | Saint George, Georgia | DATE(S) DRILLED | 12/5/2018 |
| DRILLING COMPANY | Betts | CASING DIA./TYPE | 2" PVC |
| DRILLER | C. Pendarvis | SCREEN SLOT/TYPE | 0.010-in. slotted PVC |
| DRILLING METHOD | Sonic | FILTER PACK TYPE | |
| REMARKS | | TOP OF CASING | 171.76 Ft. AMSL |
| | | GROUND ELEVATION | 171.69 Ft. AMSL |
| | | DEPTH TO WATER | |
| | | WATER ELEVATION | |

7/2/19 Report ENV LOG - WELL
M:\PROJECTS\2018\000180200804.00 - TWIN PINES MINERALS PERMITTING SERVICES\804-LOGS RESTORED FROM 8-7\804-LOGS WITH WELLS (TUSCOM RESTORE).GPJ

| DEPTH (feet) | GRAPHIC LOG | U.S.C.S. | SAMPLE | | | LITHOLOGIC DESCRIPTION | WATER LEVEL & DATE | OBSV. WELL DIAGRAM |
|--------------|-------------|----------------|-----------------|------------|-----------|---|--------------------|-----------------------------------|
| | | | INTERVAL (feet) | % RECOVERY | PID (ppm) | | | |
| 0-10 | | | 0-10 | 70 | | No Recovery | | |
| 5 | | SM SP SM | | | | SAND, silty: dark brown (quartz); fine (60%); med (35%); silt (<5%); well sorted; subround; unconsolidated; moist | | |
| | | | | | | SAND: light grayish brown (quartz); fine (50%); med (50%); well sorted; subround; unconsolidated; moist; FBG (<1%) | | |
| | | | | | | SAND, silty: dark yellowish brown (quartz); fine (60%); med (35%); well sorted; subround; unconsolidated; moist | | |
| | | | | | | SAND, silty: brown (quartz); fine (75%); med (20%); silt (<5%); well sorted; subround; unconsolidated; moist | | |
| 10-20 | | SM | 10-20 | 80 | | | | Grout |
| 15 | | SM | | | | SAND, silty: black (quartz); fine (75%); med (20%); silt (<5%); well sorted; subround; well consolidated; moist | | |
| | | SM | | | | SAND, silty: very dark brown (quartz); fine (75%); med (20%); silt (<5%); well sorted; subround; semi-consolidated; moist | | |
| 20-30 | | SM | 20-30 | 70 | | SAND, silty: dark grayish brown (quartz); fine (60%); med (35%); silt (<5%); well sorted; subround; unconsolidated; moist | | Bentonite Seal |
| 25 | | SM | | | | | | Filter Pack Sand (20/40) |
| | | SP | | | | SAND: grayish brown (quartz); silty; fine (60%); med (40%); well sorted; subround; unconsolidated; moist; FBG (<1%) | | |
| 30-35 | | SP | 30-35 | 200 | | | | Screened Interval (0.01-inch PVC) |
| | | SM | | | | SAND, silty: dark brown (quartz); fine (50%); med (40%); silt (<5%); coarse (5%); well sorted; subround; unconsolidated; moist; FBG (<1%) | | |
| | | SP | | | | SAND: dark yellowish brown (quartz); silty; fine (50%); med (40%); coarse (10%); well sorted; subround; unconsolidated; FBG (<1%) | | Well Tip |
| 35 | | | | | | BORING TERMINATED AT 35 FEET. | | |



TWIN PINES MINERALS SAUNDERS-LONCALA RESERVE

SAINT GEORGE, GEORGIA

LOG OF OBSV. WELL
OWB4BS
& OBSV. WELL
CONSTRUCTION

| | | | |
|------------------|-----------------------|------------------|-----------------|
| PROJECT NUMBER | 000180200804.00 | PROFESSIONAL | A. Wiggins |
| LOCATION | Saint George, Georgia | DATE(S) DRILLED | 1/30/2019 |
| DRILLING COMPANY | Betts | CASING DIA./TYPE | 2" PVC |
| DRILLER | C. Pendarvis | SCREEN SLOT/TYPE | 0.010-in. |
| DRILLING METHOD | Sonic | FILTER PACK TYPE | Natural |
| REMARKS | | TOP OF CASING | 172.68 Ft. AMSL |
| | | GROUND ELEVATION | 172.40 Ft. AMSL |
| | | DEPTH TO WATER | 1 Ft. BMP |
| | | WATER ELEVATION | |

7/2/19 Report ENV LOG - WELL

M:\PROJECTS\2018\000180200804.00 - TWIN PINES MINERALS PERMITTING SERVICES\804-LOGS RESTORED FROM 8-7\804-LOGS WITH WELLS (TUSCOM RESTORE).GPJ

| DEPTH (feet) | GRAPHIC LOG | U.S.C.S. | SAMPLE | | | LITHOLOGIC DESCRIPTION | WATER LEVEL & DATE | OBSV. WELL DIAGRAM |
|-----------------|-------------------------|----------|--------------------|---------------|--------------|--|-----------------------------|--------------------|
| | | | INTERVAL (feet) | % RECOVERY | PID (ppm) | | | |
| 0-5 | [Purple dotted pattern] | SP | 0-5 | 100 | | SAND: black (10R 2/1); poorly graded; med; saturated | | |
| 5-10 | | SP | 5-10 | 100 | | SAND: yellowish brown (10YR 3/6) and brown (10YR 4/3); poorly graded; med; moist | | |
| 10-15 | | | 10-15 | 0 | | No Recovery | | |
| 15 | | | | | | BORING TERMINATED AT 15 FEET. | | |



TWIN PINES MINERALS SAUNDERS-LONCALA RESERVE

SAINT GEORGE, GEORGIA

LOG OF OBSV. WELL
OWB5BS
& OBSV. WELL
CONSTRUCTION

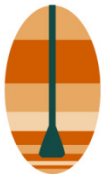
| | | | |
|------------------|-----------------------|------------------|-----------------|
| PROJECT NUMBER | 000180200804.00 | PROFESSIONAL | A. Wiggins |
| LOCATION | Saint George, Georgia | DATE(S) DRILLED | 1/30/2019 |
| DRILLING COMPANY | Betts | CASING DIA./TYPE | 2" PVC |
| DRILLER | C. Pendarvis | SCREEN SLOT/TYPE | 0.010-in. |
| DRILLING METHOD | Sonic | FILTER PACK TYPE | Natural |
| REMARKS | | TOP OF CASING | 172.80 Ft. AMSL |
| | | GROUND ELEVATION | 172.56 Ft. AMSL |
| | | DEPTH TO WATER | 0.8 Ft. BMP |
| | | WATER ELEVATION | |

7/2/19 Report ENV LOG - WELL

M:\PROJECTS\2018\000180200804.00 - TWIN PINES MINERALS PERMITTING SERVICES\804-LOGS RESTORED FROM 8-7\804-LOGS WITH WELLS (TUSCOM RESTORE).GPJ

| DEPTH (feet) | GRAPHIC LOG | U.S.C.S. | SAMPLE | | | LITHOLOGIC DESCRIPTION | WATER LEVEL & DATE | OBSV. WELL DIAGRAM |
|-----------------|----------------|----------|--------------------|---|--------------|---|-----------------------------|--------------------|
| | | | INTERVAL (feet) | % RECOVERY | PID (ppm) | | | |
| 0-5 | | SP | 0-5 | 100 | | SAND: black (10YR 2/1); poorly graded; med; saturated | | |
| 5-10 | | SP | 5-10 | 100 | | SAND: grey (5YR 6/1); poorly graded; med; organics | | |
| | | SP | | | | SAND: dark yellowish brown (10YR 3/6) and brown (10YR 4/3); poorly graded | | |
| | | SP | | SAND: very pale brown (10YR 7/3); and greyish brown (10YR 5/2); poorly graded | | | | |
| 10-15 | | | 10-15 | 0 | | No Recovery | | |
| 15 | | | | | | BORING TERMINATED AT 15 FEET. | | |

APPENDIX B
HYDRO GEO CHEM, INC REPORT



September 11, 2019

Via Email: mtanner@ttlusa.com

Mark J. Tanner, P.G.
TTL, Inc.
Senior Principal Geologist
3516 Greensboro Avenue
Tuscaloosa, AL 35401

Re: Analysis of Pumping Tests at Twin Pines Site, Charlton County, Georgia

Dear Mr. Tanner:

This report describes the analysis of pumping rate and drawdown data collected during February 2019 from two pumping tests at the Twin Pines Site in Charlton County, Georgia. Testing was performed by TTL with oversight by Hydro Geo Chem, Inc. (HGC).

Introduction

Pumping tests were conducted at two production wells (PW-A and PW-B) installed by TTL along the approximately north-south oriented linear feature known as the ‘Trail Ridge’. The Trail Ridge essentially bounds the east side of the Okefenokee Swamp.

The testing focused on saturated materials (the aquifer) extending from the water table (a few feet below land surface [ft bls] over most of the Site) to approximately 120 ft bls where a relatively impermeable unit is present. Both production wells were screened between approximately 55 and 115 ft bls and therefore partially penetrated the aquifer. Although the aquifer is generally considered unconfined, a ‘black sand’ present at depths between approximately 10 and 20 ft bls (5 and 15 feet below the water table) may act as a partial hydraulic barrier. Under these conditions the aquifer below the ‘black sand’ may be considered leaky confined.

Observation well nests were installed by TTL at distances of approximately 50, 100 and 300 feet from each production well. Observation wells in the two closest nests were completed at depths of approximately 12, 35 and 90 ft bls (designated BS, S, and D, respectively); the farthest (300 foot) nests contained only 35 and 90 ft bls completions (S and D, respectively).

The shallower wells (BS and S) were completed above the screened interval of the associated pumped well whereas the deep well (D) was completed within the screened interval of the associated pumped well. The shallowest wells (BS-series) were screened near or across the water table and above the ‘black sand’. Test A nests were designated OWA-1 BS/S/D (50 ft distant); OWA-2 BS/S/D (100 feet distant); and OWA-3 S/D (300 feet distant). Test B nests were

designated OWB-1 BS/S/D (50 ft distant); OWB-2 BS/S/D (100 feet distant); and OWB-3 S/D (300 feet distant).

Additional shallow (BS-series) wells were installed at distances of 50 and 100 feet at both test locations. For test A these were designated OWA-3BS and OWA-4BS (50 feet distant) and OWA-5BS (100 feet distant); For test B these were designated OWB-3BS and OWB-4BS (50 feet distant) and OWB-5BS (100 feet distant). Maps showing the locations of observation wells in relation to the pumping well for each test are provided in Appendix A.

Tests consisted of pumping each production well (PW-A and PW-B) at three rates (pumping steps) over a 24-hour period while monitoring water levels in the pumped wells and in the observation wells located (as described above) at distances of up to 300 feet. Water levels were continuously monitored using In-Situ LevelTroll 700 pressure transducer/data loggers supplied by TTL. Pumping rates were periodically monitored using in-line flow meters installed on the pump discharge lines. Pumped water was discharged at locations remote from the pumped wells (approximately 1000 feet away) to ensure that the discharge would not impact the tests. Rainfall occurred during a portion of the testing but did not appear to have a measurable impact on the water level data.

Upon cessation of pumping, data loggers remained within the monitored installations until sufficient water level recovery data were collected.

Pumping Test Data Reduction

Water level data collected from each monitored well during each pumping test were converted to water level displacements (drawdowns) by subtracting the measured depths to water from the depths to water measured immediately prior to each test.

Automatically-logged data collected by TTL at 5-second intervals (using the In-Situ pressure transducers/data loggers) were reduced in number to be compatible with software input requirements and to allow for reasonably rapid automatic parameter estimation. The first 10 measurements from each pumping step (or recovery period) were retained. Subsequently, the time interval between retained measurements was systematically increased. Figure 1 compares all automatically-logged data from observation well OWA-1D to the reduced data set for that well. As shown, the reduced data set adequately represents the complete data set, in particular, changes in the data at times that pumping rates changed.

Automatically-logged drawdown data were plotted and analyzed for quality and to determine if corrections were needed based on any background trends observed or for correlation with changes in atmospheric pressure. In some cases when behavior was not as expected automatically-logged data were compared with hand-collected data. For example, drawdowns at OWB-1S and OWB-2S appeared nearly identical even though OWB-2S is located twice as far from pumping well PW-B. However, as shown in Figures 2 and 3, automatically-logged and hand-collected data for OWB-1S and OWB-2S are nearly identical. Where comparisons were made, the automatically-logged data were judged sufficiently similar to the hand-collected data that there was no need to analyze the hand-collected data independently. However, should

significant differences have been present, the hand-collected data would have served as an independent back-up for the automatically-logged data.

In general, drawdowns obtained from all but the shallowest (water table) wells required no correction for trends or changes in barometric pressure, primarily because drawdowns were orders of magnitude larger than any ‘noise’ attributable to other factors. Data from PW-A test water table wells (OWA-1BS through OWA-5BS) showed either no responses to pumping or responses that were too small to be detected due to noise. However, data from PW-B test water table wells OWA-2BS, OWA-3BS, OWA-4BS, and OWA-5BS, although noisy, showed unambiguous responses to pumping, and were corrected for background trends prior to quantitative analysis as shown in Figure 4.

Pumping Test Analysis and Results

Qualitative analysis of water level drawdown data indicated that quantitatively analyzable data were obtained from PW-A, PW-B, and all observation wells equipped with In-Situ data loggers/pressure transducers except for water table wells OWA-1BS through OWA-5BS, and OWA-1BS, which, as discussed above, showed either no responses to pumping, or responses that were too small to be detected due to noise. Figures 5 and 6 plot drawdowns from test A and test B observation well nests, respectively, but do not include drawdowns from the water table wells.

Important results of the qualitative analysis are:

1. The ratio of shallow observation well drawdowns to deep observation well drawdowns increases substantially with distance from the pumping wells. This ratio is generally expected to approach 1.0 at large distance from the pumping well, but unexpectedly exceeds 1.0 at the more distant observation well nests at both test locations. This behavior contradicts expectation because the deep observation wells are completed within the screened depth of the pumping well, and the shallow observation wells are completed above the screened depth of the pumping well. At 50 and 100 feet from PW-A, the deep observation well drawdowns exceed the shallow observation well drawdowns as expected; however, at 300 feet from PW-A (OWA-3 nest), the shallow drawdowns consistently exceed the deep drawdowns. At 50 feet from PW-B, the deep observation well drawdowns exceed the shallow observation well drawdowns as expected; however at 100 feet from PW-B (OWA-2 nest), the early shallow drawdowns exceed the deep drawdowns; and at 300 feet (OWA-3 nest), the shallow drawdowns consistently exceed the deep drawdowns. The data suggest non-horizontal structure within the aquifer which may violate the assumption of horizontal flow used in the analytical solutions. In all cases, however, the shapes of the shallow drawdowns are similar, and flatten substantially during each step; likewise, the shapes of the deep drawdowns are similar, but flatten less than the shallow drawdowns. These characteristic shapes demonstrate that shallow and deep drawdown data did not get accidentally ‘mixed up’ at any of the nests.
2. Flattening of pumping and observation well drawdowns occur late in each pumping step. Flattening is consistent with another source of water: either local wetlands; vertical leakage from the shallowest groundwater through the underlying ‘black sand’; or both. A

substantial amount of water appears to be available for vertical leakage. Smaller flattening of the deep observation well drawdowns indicating that the deeper portion of the aquifer is less impacted by the additional source of water suggests a shallow source.

Quantitative analysis of pumping rate and water level drawdowns included use of AQTESOLVE (HydroSolve, 2000) and WHIPTM (HGC, 1988), a well hydraulics interpretation program developed and marketed by HGC. PW-A and PW-B pumping rates used as input in analyzing the test data are displayed in Figure 7.

Analytical solutions used in AQTESOLVE included the Neuman unconfined and Neuman-Witherspoon leaky confined solutions. Because small drawdowns were detectable at the water table during test B, and could not definitively be ruled out during test A, the aquifer can be considered unconfined. However, because the 'black sand' at depths between approximately 5 and 15 feet below the water table appears to be a partial hydraulic barrier, the aquifer may also be considered leaky confined. Assuming leaky confined conditions, the black sand is considered an 'aquitard', and the portions of the saturated zone above and beneath this layer are considered the 'unpumped' and 'pumped' aquifers, respectively. Under all conditions, the base of the aquifer was assumed to be 120 feet below land surface (bls), or approximately 115 feet beneath the water table.

The Neuman unconfined solution accounts for partial penetration of both pumping and observation wells within the aquifer. Although the Neuman-Witherspoon leaky aquifer solution cannot account for partial penetration of wells, it can compute drawdowns in both the pumped and unpumped aquifers.

The analytical solution used in WHIP was the vertically anisotropic leaky aquifer solution. This solution allows for automatic parameter estimation, accounts for wellbore storage at pumping wells, for partial penetration of both pumping and observation wells within the pumped aquifer, and for vertical leakage from the unpumped aquifer through an aquitard assuming constant head in the unpumped aquifer.

In performing the analyses, when assuming unconfined conditions, the pumped aquifer was taken to be 115 feet thick (water table to 120 feet bls); and when assuming leaky confined conditions the pumped aquifer was taken to be 100 feet thick (base of aquitard to 120 feet bls). In performing leaky confined analyses the shallow (screened approximately 25-35 feet bls [20 to 30 feet below the water table]) and deep (screened approximately 80-90 feet bls [75 to 85 feet beneath the water table]) observation wells were taken to be completed within the pumped aquifer; and the shallowest water table wells were taken to be completed within the shallow unpumped aquifer above the aquitard.

Estimates of transmissivity (T) and storage coefficient (S) were obtained by analyzing data from pumping and observation wells separately, and by considering pairs of observation wells. Because by design both pumping and observation wells partially penetrated the aquifer, analyses were sensitive to the vertical hydraulic conductivity of the aquifer, and estimates of vertical hydraulic conductivity were also obtained.

Good fits between measured and simulated water level drawdowns at pumping and observation wells could not be obtained using only one set of hydraulic parameters, consistent with heterogeneity. Likewise, at individual observation well nests, one set of hydraulic parameters could not provide good fits to both deep and shallow well drawdowns; a good fit to either a deep or shallow well drawdown generally means a poor fit to the drawdown at the other well.

Tables 1 and 2 provide the results of the analyses. Appendices B through E show the quality of fit between measured and simulated drawdowns, and reproduce the parameters used in each analysis. Appendices B and C provide fits for test A data using AQTESOLVE and WHIP, respectively; likewise Appendices D and E provide fits for test B data using AQTESOLVE and WHIP, respectively. T (and horizontal hydraulic conductivity [Kh]) estimates for test A are generally larger than for test B, consistent with the larger pumping rates achievable for test A. Estimates of aquifer vertical hydraulic conductivity (Kv) and aquitard vertical hydraulic conductivity (Kv aqt) range over several orders of magnitude, are nearly always lower than the corresponding Kh estimates, and are generally lower for test B than for test A. What appear to be unreasonably large transmissivity and storage coefficient (T2 and S2) estimates for the unpumped aquifer in some cases are consistent with flattening of drawdowns and a substantial source of water available for vertical leakage.

In general, when analyzing wells separately, good agreement between measured and simulated data at both pumping and observation wells can be obtained (Appendices B through E). The generally good agreement between measured and simulated data at both pumping wells PW-A and PW-B suggest that the hydraulic parameters obtained are representative of average aquifer conditions near the pumping wells. Good fits were obtained without specifying a well efficiency correction, indicating that the wells were properly designed, reasonably efficient and well developed.

For test A (Table 1), estimates of T and S from pumping well PW-A data range from 1490 ft²/day to 1967 ft²/day and from 3.5×10^{-4} to 1.1×10^{-2} . Although estimates of T from observation well data range from approximately 1 ft²/day to 2288 ft²/day, the majority of estimates are lower than for the pumping well and average 875 ft²/day. Estimates of S from observation well data range from approximately 1.6×10^{-5} to 1.7×10^{-2} ; estimates of Kh range from <1 to 20 ft/day; estimates of Kv range from 0.06 ft/day to 1.8 ft/day; and estimates of Kv aqt range from 2.4×10^{-6} ft/day to 0.75 ft/day. The lowest T of 1 ft²/day was derived from one interpretation of data from OWA-3D, where, due to non-uniqueness, T estimates from alternate interpretations ranged from 1 ft²/day to 1700 ft²/day.

For test B (Table 2), estimates of T and S from pumping well PW-B data range from 530 ft²/day to 697 ft²/day and from 2.4×10^{-3} to 0.11. T estimates from the shallowest water table well data that range from 5455 ft²/day to 9500 ft²/day based on Neuman unconfined analysis are considered unreasonably large and unreliable. Excluding these estimates, observation well data yield T estimates ranging from approximately 53 ft²/day to 1100 ft²/day; however, the majority of the estimates are lower than for the pumping well and average 432 ft²/day. Estimates of S from observation well data range from approximately 1×10^{-10} to 5×10^{-3} ; estimates of Kh range from <1 to 11 ft/day; estimates of Kv range from 8.6×10^{-5} ft/day to 1.5 ft/day; and estimates of Kv aqt range from 1.1×10^{-6} ft/day to 0.3 ft/day.

As discussed above, solutions to individual wells may be highly non-unique; for example at OWB-1D (Table 2), T estimates from alternate interpretations using the Neuman unconfined solution vary from 478 to 901 ft²/day and Kv estimates from 9.3×10^{-3} to 1.42 ft/day even though acceptable fits are obtained in each case (Appendix D). An extreme example from test A is OWA-3D (Table 1) where acceptable fits (Appendix B) using Neuman-Witherspoon are obtained with a T and Kv aqt of 1700 ft²/day and 6.8×10^{-6} ft/day; and with a T and Kv aqt of 1.3 ft²/day and 0.4 ft/day. Analyses incorporating multiple observation wells, which are presumably more constrained, need to be considered in deciding which of the alternate interpretations of individual well drawdowns are the most reasonable.

In addition, the Kh estimates obtained from the pumping well drawdowns are expected to be representative of overall 'average' behavior of the pumped aquifer. Furthermore, generally higher T estimates from pumping well data appear consistent with heterogeneity that results in a non-horizontal conductivity tensor. Such heterogeneity could be caused by non-horizontal structure within the sands. Pumping well drawdowns may be less impacted by any non-horizontal structure because water could be supplied mainly along (rather than across) such structure; and observation well drawdowns, which would result from flow across such structure, could be controlled by some average of the conductivities along and perpendicular to the structure.

Conclusions

The results of the both qualitative and quantitative analyses are consistent with the following observations/conclusions:

1. Results of quantitative analysis (Tables 1 and 2) indicate that both pumping wells are efficient and properly designed and developed (negligible skin effects or non-linear losses).
2. T estimates are generally higher at the test A site compared to the test B site, consistent with the larger achievable pumping rates at the test A site. Except for a few outliers, Kh estimates computed from T estimates generally range from several ft/day to nearly 20 ft/day for test A, and from a few ft/day to as much as 11 ft/day for test B, with some outliers exceeding 50 ft/day. These test B Kh outliers were computed based on data from the shallowest (water table) observation wells using the Neuman unconfined solution and are not considered reliable.
3. Heterogeneity possibly resulting from non-horizontal structure within the sands may be present within the pumped aquifer. Such heterogeneity may result in more direct connection between the pumping and shallow observation wells at larger distances from the pumping wells.
4. Such heterogeneity would be consistent with the substantial increase in the ratio of shallow observation well drawdowns to deep observation well drawdowns with distance from the pumping wells, and the unexpected increase in this ratio above 1.0 at the more distant observation well nests.

5. Due to such heterogeneity, the assumption that flow would be strictly horizontal were it not for partial penetration of pumping wells, is likely violated. Kh and Kv estimates from observation well data will represent some average of Kh along the structure and Kv perpendicular to the structure. However, analyses of observation well data likely yield the 'effective' horizontal conductivity that will control eastward migration of groundwater from the area of the Okefenokee swamp through Trial Ridge.
6. Flattening of pumping well and shallow observation well drawdowns is consistent with another (presumably shallow) source of water, either local wetlands or vertical leakage from the shallowest groundwater through the shallow 'black sand', or both. Substantially less flattening of the deep observation well drawdowns indicates that the deeper portion of the aquifer is less impacted by the additional source of water.

Although heterogeneity potentially resulting from non-horizontal structure may be present, eastward flow from the area of the Okefenokee swamp through Trail Ridge is expected to be sub-horizontal, and to be governed by the 'effective' horizontal conductivities yielded through analysis of pumping test observation well data.

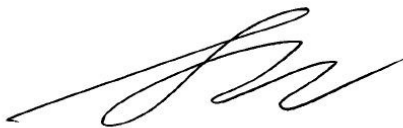
References

HGC. 1988. WHIP. Well Hydraulics Interpretation Program. Version 3.22. User's Manual. July 1988.

HydroSOLVE, Inc. 2000. AQTESOLV for Windows. User's Guide.

Please feel free to call me at (520) 293-1500 Ext. 122 or by email at stewarts@hgcinc.com if you have any questions.

Sincerely,
HYDRO GEO CHEM, INC.



Stewart J. Smith, P.G.
Associate Hydrogeologist

Attachments:

- Tables 1 and 2
- Figures 1 through 7
- Appendix A: Observation Well Locations
- Appendix B: AQTESOLVE PWA Test Plots
- Appendix C: WHIP PWA Test Plots
- Appendix D: AQTESOLVE PWB Test Plots
- Appendix E: WHIP PWB Test Plots

TABLES

TABLE 1
PW-A Aquifer Test Hydraulic Parameter Estimates

| Observation Well (s) | Bottom of Screen Depth (ft) | Solution | T (ft ² /day) | S | Specific Yield | Kv (ft/day) | Kv aquitard (ft/day) | b (ft) | Kh (ft/day) | recom- mended | Comment |
|----------------------|-----------------------------|---------------------------------|--------------------------|---------|----------------|-------------|----------------------|--------|-------------|---------------|---|
| PW-A | 115 | Neuman Unconfined | 1967 | 3.5E-04 | 2.9E-03 | 0.2 | NA | 115 | 17.1 | x | |
| PW-A | 115 | Vert. Anisotropic Leaky | 1490 | 1.1E-02 | NA | 1.0 | 0.40 | 115 | 13.0 | x | analysis using WHIP |
| OWA-1D | 90 | Neuman Unconfined | 1475 | 8.5E-03 | 0.50 | 0.3 | NA | 115 | 12.8 | x | |
| OWA-2D | 90 | Neuman Unconfined | 1319 | 4.8E-03 | 2.9E-02 | 0.3 | NA | 115 | 11.5 | x | |
| OWA-3D | 90 | Neuman Unconfined | 2288 | 1.7E-02 | 0.03 | 1.08 | NA | 115 | 19.9 | x | |
| OWA-1S | 35 | Neuman Unconfined | 1351 | 4.3E-03 | 0.50 | 1.8 | NA | 115 | 11.7 | x | |
| OWA-2S | 35 | Neuman Unconfined | 1820 | 3.4E-03 | 0.50 | 1.6 | NA | 115 | 15.8 | | |
| OWA-3S | 35 | Neuman Unconfined | 680 | 5.5E-05 | 2.2E-02 | 0.06 | NA | 115 | 5.9 | x | |
| OWA-1D | 90 | ¹ Neuman-Witherspoon | 914 | 2.2E-03 | NA | NA | 3.7E-06 | 100 | 9.1 | | T2=1.44e8 ft ² /d; S2=1e-10 |
| OWA-1D | 90 | ¹ Neuman-Witherspoon | 356 | 7.3E-05 | NA | NA | 4.4E-01 | 100 | 3.6 | x | T2=4170 ft ² /d; S2=0.0149; improved fit |
| OWA-2D | 90 | ¹ Neuman-Witherspoon | 1017 | 1.2E-03 | NA | NA | 4.1E-06 | 100 | 10.2 | | T2=1.44e8 ft ² /d; S2=1e-10 |
| OWA-2D | 90 | ¹ Neuman-Witherspoon | 422 | 8.8E-04 | NA | NA | 0.152 | 100 | 4.2 | x | T2=4850 ft ² /d; S2=1.01e-10; improved fit |
| OWA-3D | 90 | ¹ Neuman-Witherspoon | 1700 | 7.0E-03 | NA | NA | 6.8E-06 | 100 | 17.0 | | T2=1.44e8 ft ² /d; S2=2.7e-5 |
| OWA-3D | 90 | ¹ Neuman-Witherspoon | 331 | 3.4E-03 | NA | NA | 0.383 | 100 | 3.3 | x | T2=4272 ft ² /d; S2=9.91e-3; improved fit |
| OWA-3D | 90 | ¹ Neuman-Witherspoon | 1.3 | 1.0E-04 | NA | NA | 0.396 | 100 | 0.013 | | T2=4520 ft ² /d; S2=0.005 |
| OWA-1D | 90 | Vert. Anisotropic Leaky | 360 | 1.6E-05 | NA | 0.70 | 0.68 | 100 | 3.6 | x | analysis using WHIP; Ss aqt = 5.39e-3 |
| OWA-1D | 90 | Vert. Anisotropic Leaky | 543 | 1.4E-03 | NA | 1.01 | 0.32 | 100 | 5.4 | x | fit recovery w/WHIP; Ss aqt = 5.04e-3 |
| OWA-2D | 90 | Vert. Anisotropic Leaky | 337 | 1.6E-05 | NA | 0.29 | 0.24 | 100 | 3.4 | x | analysis using WHIP; Ss aqt = 2.01e-3 |
| OWA-2D | 90 | Vert. Anisotropic Leaky | 665 | 9.8E-04 | NA | 0.19 | 0.13 | 100 | 6.7 | x | fit recovery w/WHIP; Ss aqt = 1.85e-3 |
| OWA-3D | 90 | Vert. Anisotropic Leaky | 323 | 1.6E-05 | NA | 0.17 | 0.17 | 100 | 3.2 | x | analysis using WHIP; Ss aqt = 2.10e-3 |
| OWA-1S | 35 | Vert. Anisotropic Leaky | 592 | 1.6E-05 | NA | 0.8 | 0.73 | 100 | 5.9 | x | analysis using WHIP; Ss aqt = 1.77e-3 |
| OWA-2S | 35 | Vert. Anisotropic Leaky | 354 | 1.6E-05 | NA | 0.4 | 0.67 | 100 | 3.5 | x | analysis using WHIP; Ss aqt = 9.54e-4 |
| OWA-3S | 35 | Vert. Anisotropic Leaky | 326 | 1.6E-05 | NA | 0.11 | 0.05 | 100 | 3.3 | x | analysis using WHIP; Ss aqt = 2.76e-5 |
| OWA-1D/3D | 90/90 | Neuman Unconfined | 946 | 1.2E-02 | 0.06 | 1.27 | NA | 115 | 8.2 | x | |
| OWA-1D/3D | 90/90 | ¹ Neuman-Witherspoon | 596 | 9.8E-04 | NA | NA | 2.4E-06 | 100 | 6.0 | x | T2=1.44e8 ft ² /d; S2=1e-10 |
| OWA-1S/D | 35/90 | Neuman Unconfined | 1136 | 1.1E-02 | 0.5 | 0.8 | NA | 115 | 9.9 | x | |
| OWA-1S/D | 35/90 | Neuman Unconfined | 1154 | 1.0E-02 | 0.25 | 0.8 | NA | 115 | 10.0 | | alt interp |
| OWA-1S/D | 35/90 | Neuman Unconfined | 926 | 1.1E-02 | 0.50 | 1.6 | NA | 115 | 8.1 | | early time interp |
| OWA-2S/D | 35/90 | Neuman Unconfined | 866 | 5.3E-03 | 3.3E-02 | 0.8 | NA | 115 | 7.5 | | |
| OWA-2S/D | 35/90 | Neuman Unconfined | 1141 | 5.8E-03 | 0.50 | 1.0 | NA | 115 | 9.9 | | early time interp |
| OWA-2S/D | 35/90 | Neuman Unconfined | 1319 | 4.8E-03 | 0.029 | 0.29 | NA | 115 | 11.5 | x | alt interp |
| OWA-2S/D | 35/90 | Neuman Unconfined | 1800 | 2.0E-03 | 0.50 | 1.6 | NA | 115 | 15.7 | | alt interp |
| OWA-1S/D | 35/90 | Vert. Anisotropic Leaky | 355 | 1.6E-05 | NA | 0.5 | 0.75 | 100 | 3.6 | x | analysis using WHIP; Ss aqt = 5.12e-3 |
| OWA-2S/D | 35/90 | Vert. Anisotropic Leaky | 329 | 1.6E-05 | NA | 0.1 | 0.30 | 100 | 3.3 | x | analysis using WHIP; Ss aqt = 2.05e-3 |
| OWA-1D/2D/3D | 90/90/90 | Neuman Unconfined | 1307 | 7.7E-03 | 0.50 | 0.43 | NA | 115 | 11.4 | x | |
| OWA-1D/2D/3D | 90/90/90 | ¹ Neuman-Witherspoon | 718 | 1.3E-03 | NA | NA | 2.9E-06 | 100 | 7.2 | x | T2=1.44e8 ft ² /d; S2=1e-10 |

Notes:

- ¹ = leaky aquifer; partial penetration of wells not represented
- T = Transmissivity in feet squared per day (ft²/day)
- T2 = Transmissivity of unpumped aquifer
- S = Storage coefficient
- S2 = Storage coefficient of unpumped aquifer
- Ss = Specific storage of aquitard (storage per foot of thickness [1/ft])
- Kh = horizontal hydraulic conductivity in feet per day (ft/day) calculated as T/b
- Kv = vertical hydraulic conductivity in feet per day (ft/day)
- b = Assumed aquifer thickness in feet

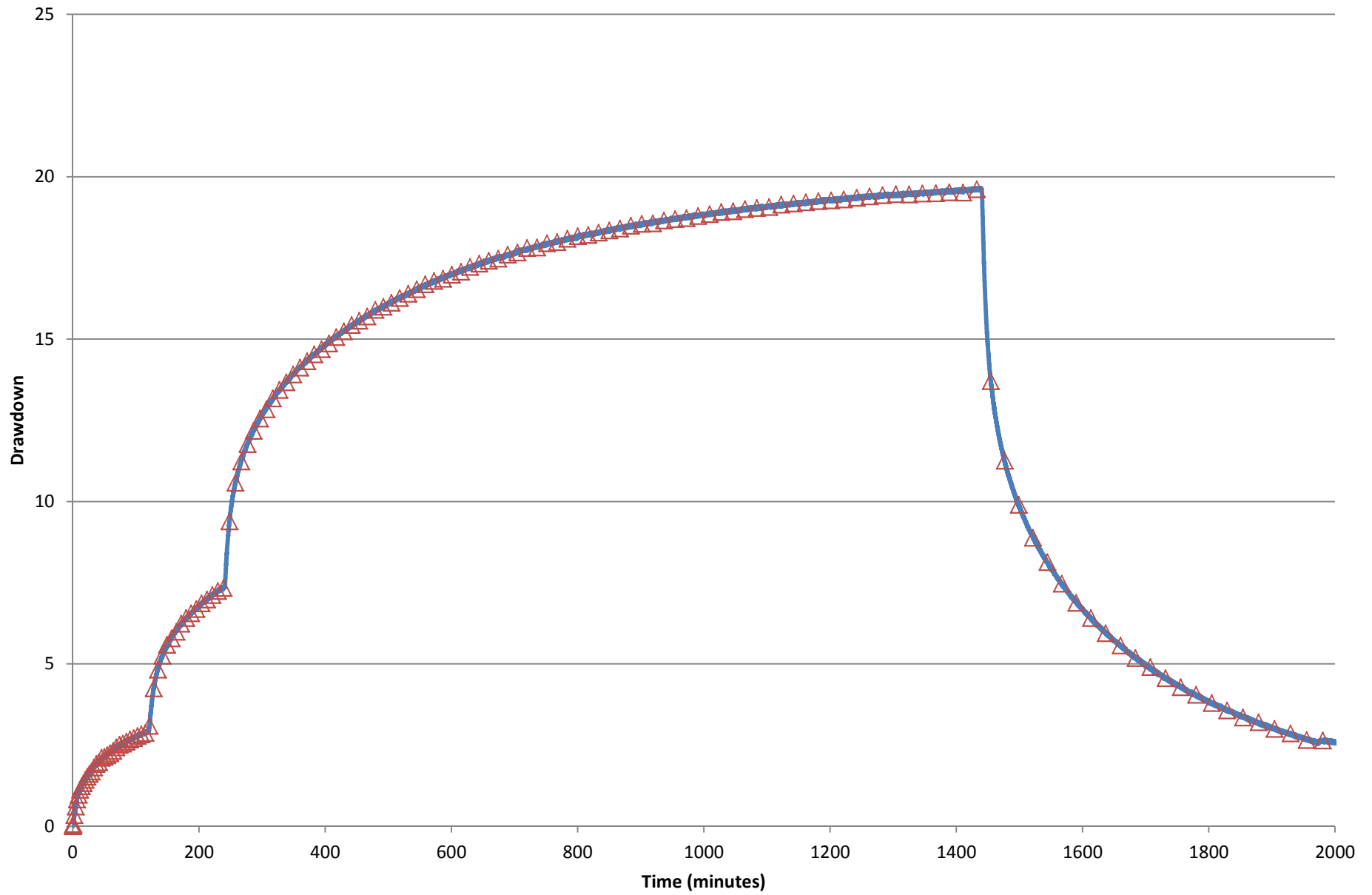
TABLE 2
PW-B Aquifer Test Hydraulic Parameter Estimates

| Observation Well (s) | Bottom of Screen Depth (ft) | Solution | T (ft ² /day) | S | Specific Yield | Kv (ft/day) | Kv aquitard (ft/day) | b (feet) | Kh (ft/day) | recommended | Comment |
|----------------------|-----------------------------|---------------------------------|--------------------------|----------|----------------|-------------|----------------------|----------|-------------|-------------|---|
| PW-B | 115 | Neuman Unconfined | 697 | 2.42E-03 | 1.00E-03 | 0.61 | NA | 115 | 6.1 | x | |
| PW-B | 115 | Vert. Anisotropic Leaky | 530 | 0.11 | NA | 0.55 | 0.10 | 115 | 4.6 | x | analysis using WHIP; Ss aqt = 0.01 |
| OWB-1D | 90 | Neuman Unconfined | 478 | 2.92E-03 | 1.00E-03 | 1.42 | NA | 115 | 4.2 | | |
| OWB-1D | 90 | Neuman Unconfined | 530 | 4.96E-03 | 1.00E-03 | 0.47 | NA | 115 | 4.6 | | alternate interp; improved fit |
| OWB-1D | 90 | Neuman Unconfined | 901 | 3.20E-03 | 1.00E-03 | 9.29E-03 | NA | 115 | 7.8 | x | alternate interp; additionally improved fit |
| OWB-2D | 90 | Neuman Unconfined | 442 | 2.95E-03 | 1.00E-03 | 0.88 | NA | 115 | 3.8 | | |
| OWB-2D | 90 | Neuman Unconfined | 808 | 4.78E-03 | 0.25 | 1.79E-02 | NA | 115 | 7.0 | x | alternate interp; improved fit |
| OWB-3D | 90 | Neuman Unconfined | 475 | 1.32E-03 | 0.50 | 4.34E-02 | NA | 115 | 4.1 | x | |
| OWB-3D | 90 | Neuman Unconfined | 674 | 3.43E-03 | 0.25 | 9.20E-03 | NA | 115 | 5.9 | | alternate interp; poorer fit |
| OWB-1S | 35 | Neuman Unconfined | 224 | 1.19E-04 | 4.58E-03 | 2.12E-02 | NA | 115 | 1.9 | x | |
| OWB-2S | 35 | Neuman Unconfined | 221 | 2.96E-05 | 1.13E-03 | 5.17E-03 | NA | 115 | 1.9 | x | |
| OWB-3S | 35 | Neuman Unconfined | 246 | 3.09E-05 | 1.00E-03 | 4.88E-03 | NA | 115 | 2.1 | x | |
| OWB-2BS | 12 | Neuman Unconfined | 5455 | 1.37E-04 | 1.78E-02 | 1.02E-02 | NA | 115 | 47.4 | | unreasonably high T |
| OWB-3BS | 12 | Neuman Unconfined | 6148 | 5.00E-05 | 2.00E-03 | 3.50E-03 | NA | 115 | 53.5 | | unreasonably high T |
| OWB-4BS | 12 | Neuman Unconfined | 6918 | 4.84E-05 | 0.25 | 3.50E-03 | NA | 115 | 60.2 | | unreasonably high T |
| OWB-5BS | 12 | Neuman Unconfined | 9499 | 3.75E-05 | 0.25 | 3.50E-03 | NA | 115 | 82.6 | | unreasonably high T |
| OWB-1D | 90 | ¹ Neuman-Witherspoon | 445 | 1.79E-03 | NA | NA | 5.41E-03 | 100 | 4.5 | x | T2=1.44e8 ft ² /d; S2=1.0 |
| OWB-2D | 90 | ¹ Neuman-Witherspoon | 405 | 2.34E-03 | NA | NA | 7.70E-03 | 100 | 4.1 | x | T2=1.44e8 ft ² /d; S2=1.0 |
| OWB-3D | 90 | ¹ Neuman-Witherspoon | 285 | 1.32E-03 | NA | NA | 1.14E-06 | 100 | 2.9 | | T2=1.44e8 ft ² /d; S2=6.03e-9 |
| OWB-3D | 90 | ¹ Neuman-Witherspoon | 211 | 1.11E-03 | NA | NA | 1.40E-02 | 100 | 2.1 | x | alt. interp; T2=1050 ft ² /d; S2=1.0e-10 |
| OWB-3D | 90 | ¹ Neuman-Witherspoon | 52.9 | 1.38E-04 | NA | NA | 2.88E-02 | 100 | 0.5 | x | alt. interp.; T2=671 ft ² /d; S2=1.39e-3 |
| OWB-3BS | 12 | ¹ Neuman-Witherspoon | 1100 | 4.23E-04 | NA | NA | 0.309 | 100 | 11.0 | | T2=5.7e4 ft ² /d; S2=0.011, high T |
| OWB-4BS | 12 | ¹ Neuman-Witherspoon | 204 | 1.16E-05 | NA | NA | 2.16E-03 | 100 | 2.0 | x | T2=2.56e5 ft ² /d; S2=1.19e-5 |
| OWB-5BS | 12 | ¹ Neuman-Witherspoon | 206 | 1.16E-05 | NA | NA | 1.97E-03 | 100 | 2.1 | x | T2=3.67e5 ft ² /d; S2=1.9e-5 |
| OWB-1D | 90 | Vert. Anisotropic Leaky | 201 | 1.05E-05 | NA | 0.367 | 6.16E-02 | 100 | 2.0 | x | analysis using WHIP; Ss aqt = 0.0115 |
| OWB-2D | 90 | Vert. Anisotropic Leaky | 134 | 1.06E-05 | NA | 0.477 | 7.25E-02 | 100 | 1.3 | x | analysis using WHIP; Ss aqt = 1.88e-3 |
| OWB-3D | 90 | Vert. Anisotropic Leaky | 67 | 3.56E-05 | NA | 8.92E-02 | 1.61E-02 | 100 | 0.7 | x | analysis using WHIP; Ssaqt = 4.30e-4 |
| OWB-1S | 35 | Vert. Anisotropic Leaky | 121 | 1.05E-05 | NA | 0.955 | 0.299 | 100 | 1.2 | x | analysis using WHIP; Ss aqt = 1.42e-3 |
| OWB-2S | 35 | Vert. Anisotropic Leaky | 174 | 1.00E-05 | NA | 1.00 | 8.26E-02 | 100 | 1.7 | x | analysis using WHIP; Ss aqt = 5.84e-4 |
| OWB-3S | 35 | Vert. Anisotropic Leaky | 312 | 1.07E-10 | NA | 0.252 | 1.77E-03 | 100 | 3.1 | x | analysis using WHIP; Ss aqt = 5.04e-4 |
| OWB-2D/-3D | 90/90 | Neuman Unconfined | 960 | 3.31E-03 | 1.00E-03 | 8.62E-05 | NA | 115 | 8.3 | x | |
| OWB-1D/-3D | 90/90 | Neuman Unconfined | 924 | 3.01E-03 | 0.25 | 3.00E-03 | NA | 115 | 8.0 | x | |
| OWB-1S/-1D | 35/90 | Neuman Unconfined | 593 | 1.00E-03 | 1.00E-03 | 1.51 | NA | 115 | 5.2 | x | |
| OWB-1S/-1D | 35/90 | Neuman Unconfined | 575 | 1.30E-03 | 1.00E-03 | 1.51 | NA | 115 | 5.0 | x | alternate interp |
| OWB-2S/-2BS | 35/12 | ¹ Neuman-Witherspoon | 517 | 1.13E-03 | NA | NA | 1.80E-02 | 100 | 5.2 | x | T2=5.03e4 ft ² /d; S2=2.59e-3 |
| OWB-1S/-1D | 35/90 | Vert. Anisotropic Leaky | 120 | 1.05E-05 | NA | 0.958 | 0.276 | 100 | 1.2 | x | analysis using WHIP; Ss aqt = 2.04e-3 |

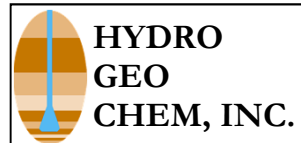
Notes:

- ¹ = leaky aquifer; partial penetration of wells not represented
- T = Transmissivity in feet squared per day (ft²/day)
- T2 = Transmissivity of unpumped aquifer
- S = Storage coefficient
- S2 = Storage coefficient of unpumped aquifer
- Ss = Specific storage of aquitard (storage per foot of thickness [1/ft])
- Kh = horizontal hydraulic conductivity in feet per day (ft/day) calculated as T/b
- Kv = vertical hydraulic conductivity in feet per day (ft/day)
- b = Assumed aquifer thickness in feet

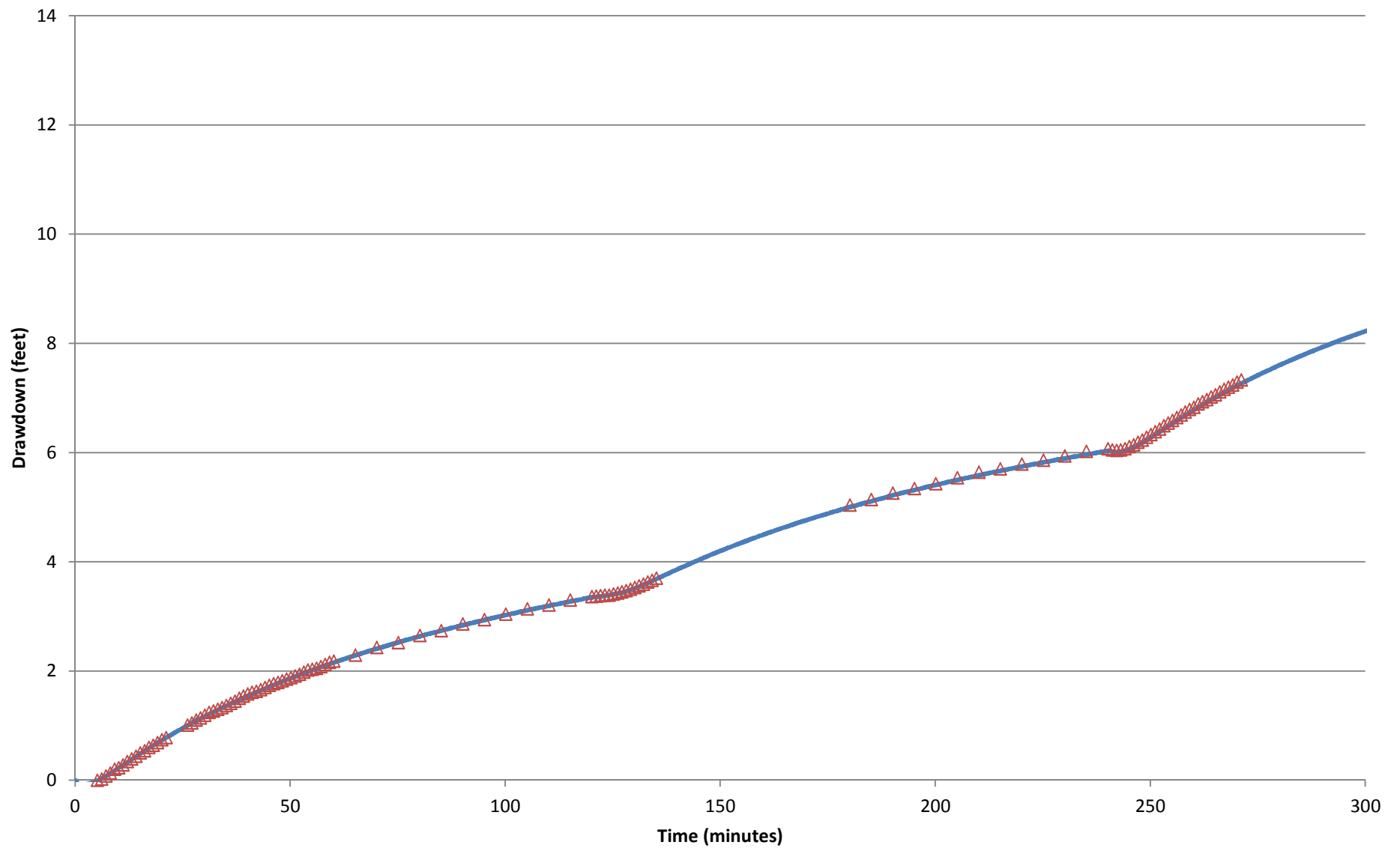
FIGURES



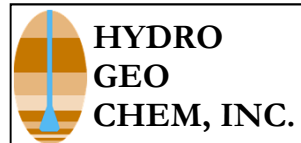
— all data
 △ reduced data



| COMPARISON OF RAW AND REDUCED DRAWDOWNS AT OWA-1D | | | | | |
|---|---------|--------|---------|-----------|--------|
| Approved | Date | Author | Date | File Name | Figure |
| SJS | 4/16/19 | SJS | 4/16/19 | | 1 |

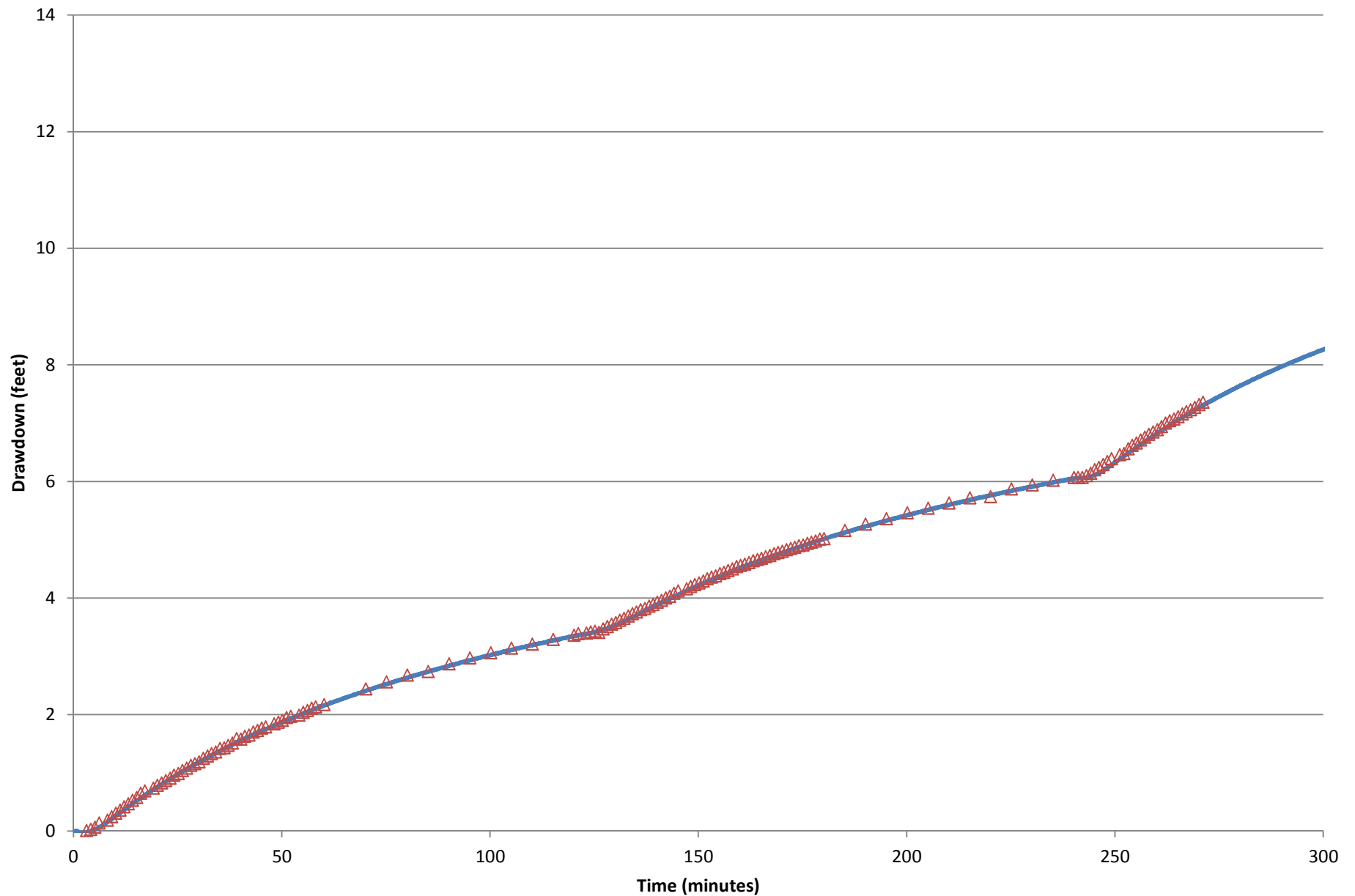


— auto logged
 △ hand-collected

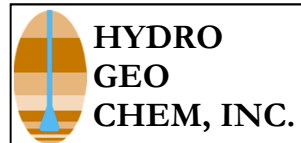


COMPARISON OF AUTOMATICALLY LOGGED AND HAND-COLLECTED DRAWDOWNS AT OWB-1S

| Approved | Date | Author | Date | File Name | Figure |
|----------|---------|--------|---------|-----------|--------|
| SJS | 4/16/19 | SJS | 4/16/19 | | 2 |

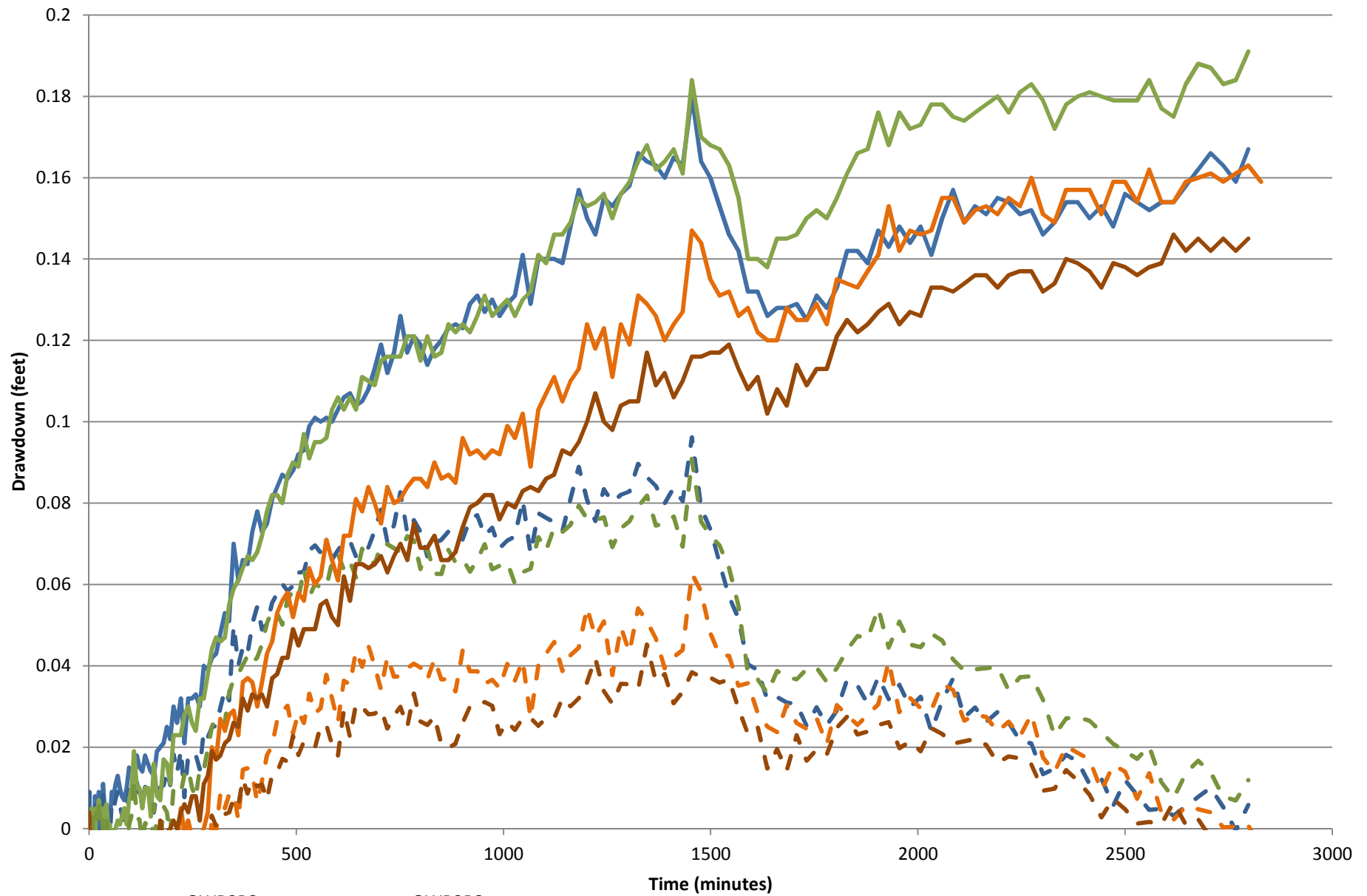


— auto logged
 △ hand-collected

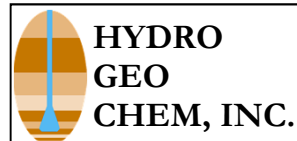


COMPARISON OF AUTOMATICALLY LOGGED AND HAND-COLLECTED DRAWDOWNS AT OWB-2S

| Approved | Date | Author | Date | File Name | Figure |
|----------|---------|--------|---------|-----------|--------|
| SJS | 4/16/19 | SJS | 4/16/19 | | 3 |

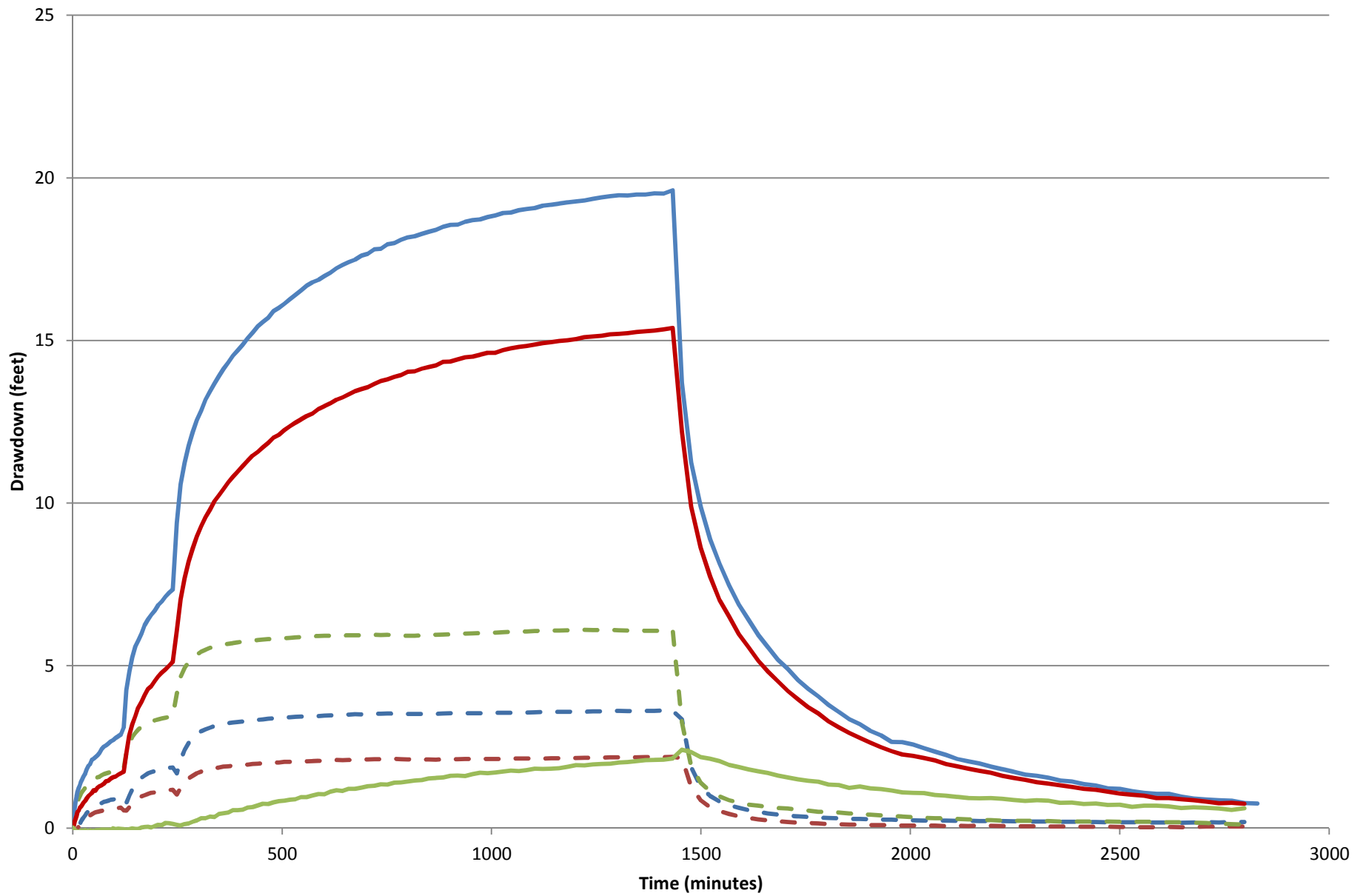


- OWB2BS
- OWB2BS corr
- OWB3BS
- OWB3BS corr
- OWB4BS
- OWB4BS corr
- OWB5BS
- OWB5BS corr

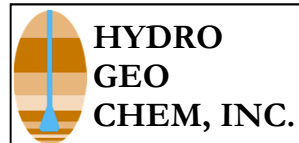


RAW AND CORRECTED DRAWDOWNS AT WATER TABLE (BS) WELLS DURING PUMPING OF PW-B

| Approved | Date | Author | Date | File Name | Figure |
|----------|---------|--------|---------|-----------|--------|
| SJS | 4/16/19 | SJS | 4/16/19 | | 4 |

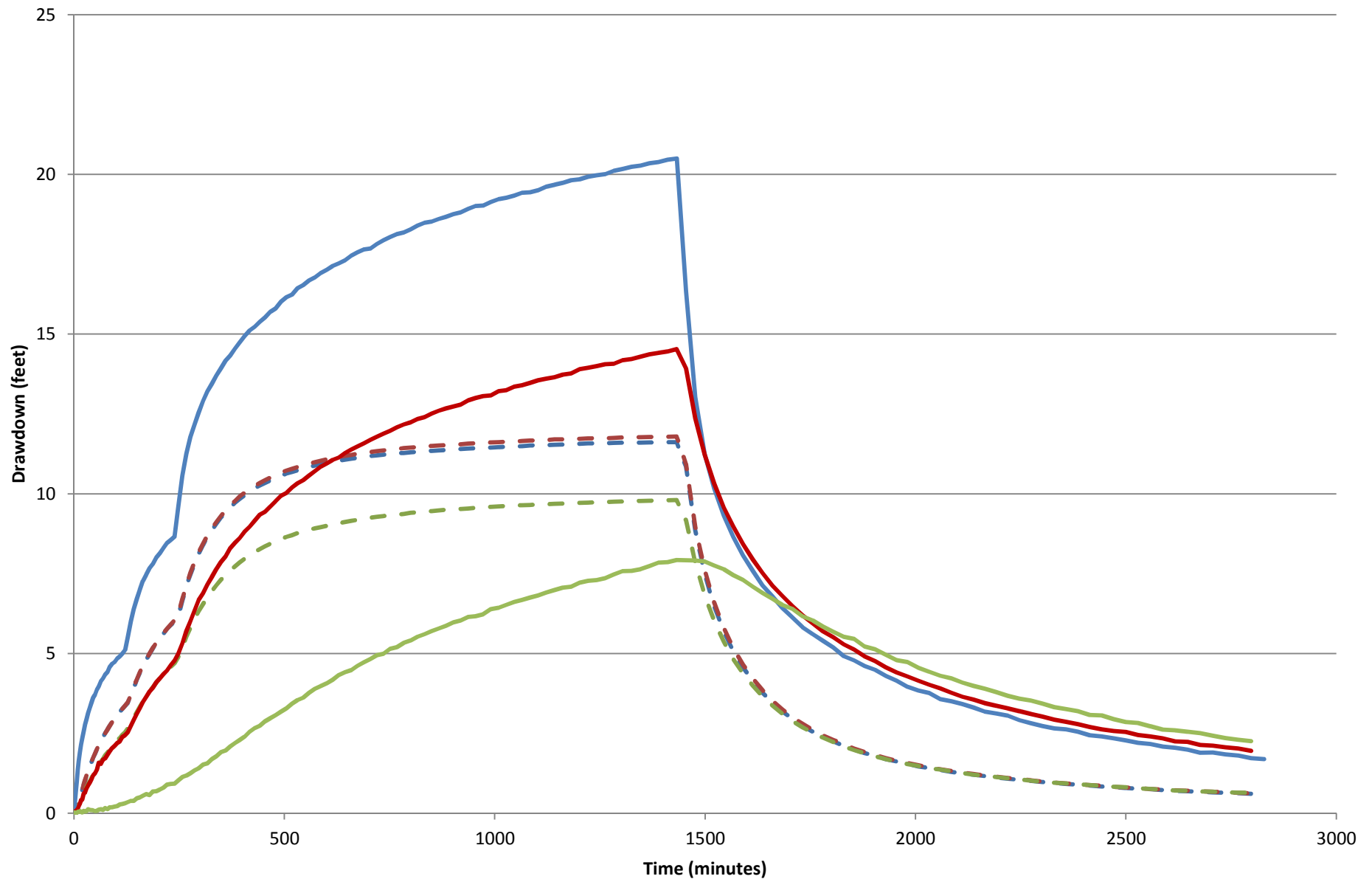


- OWA-1S - - OWA-2S
- OWA-3S — OWA-1D
- OWA-2D — OWA-3D

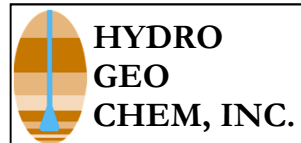


**DRAWDOWNS AT DEEP (D) AND SHALLOW (S)
OBSERVATION WELLS DURING PUMPING OF PW-A**

| | | | | | |
|-----------------|-----------------|---------------|-----------------|-----------|-------------|
| Approved SJS | Date 4/16/19 | Author SJS | Date 4/16/19 | File Name | Figure 5 |
|-----------------|-----------------|---------------|-----------------|-----------|-------------|

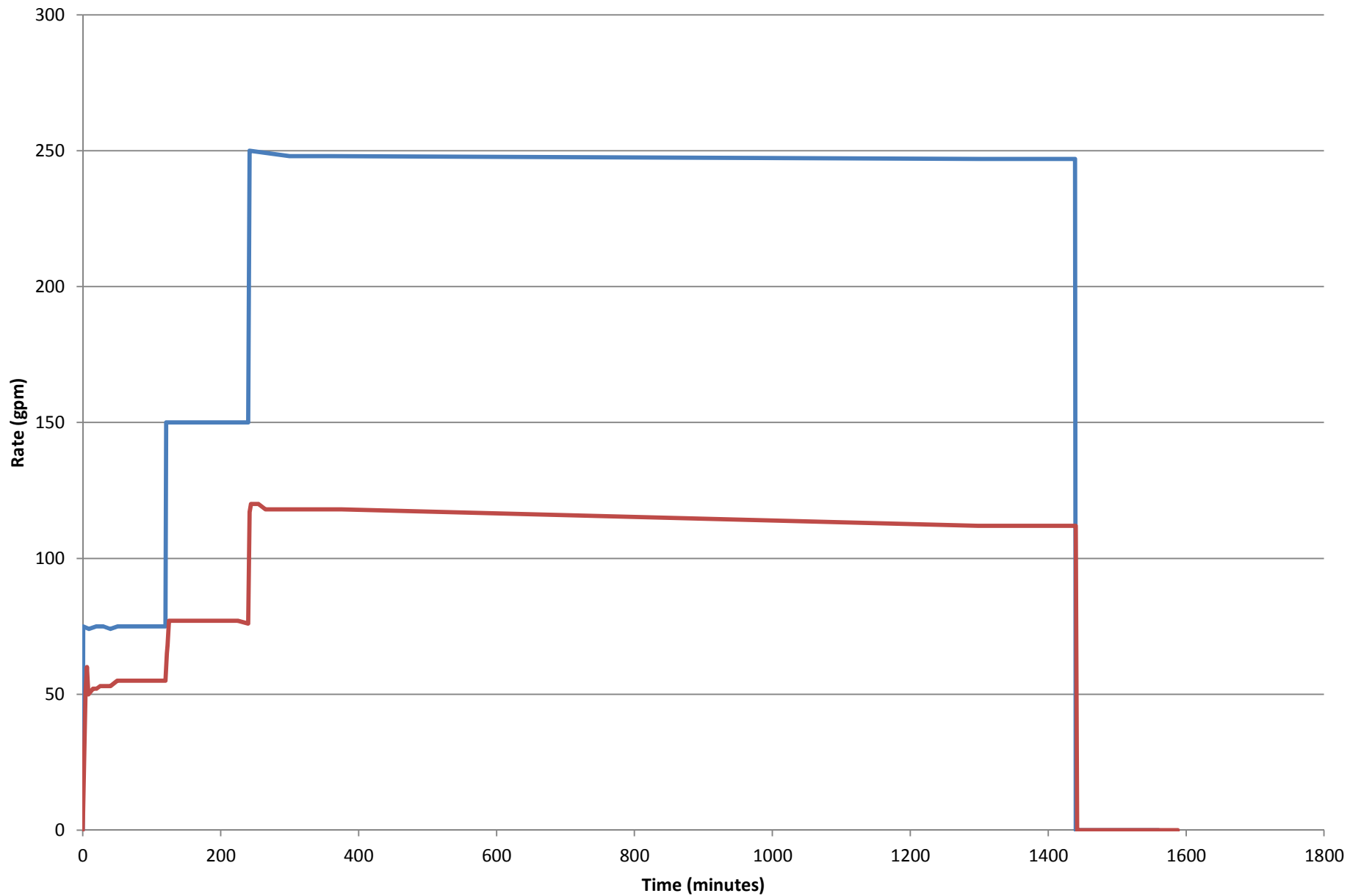


- OWB-1S - - OWB-2S
- OWB-3S — OWB-1D
- OWB-2D — OWB-3D

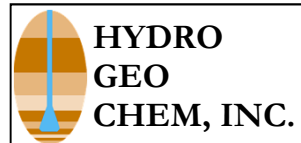


**DRAWDOWNS AT DEEP (D) AND SHALLOW (S)
OBSERVATION WELLS DURING PUMPING OF PW-B**

| | | | | | |
|-----------------|-----------------|---------------|-----------------|-----------|-------------|
| Approved SJS | Date 4/16/19 | Author SJS | Date 4/16/19 | File Name | Figure 6 |
|-----------------|-----------------|---------------|-----------------|-----------|-------------|



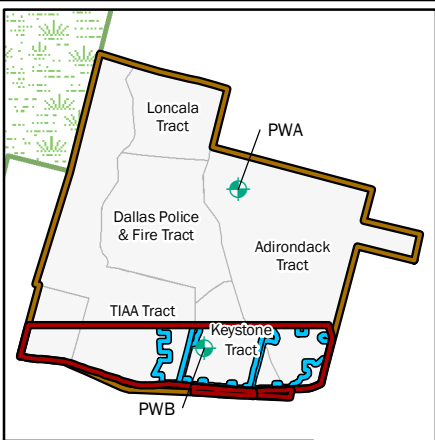
— PW-A
— PW-B



PW-A AND PW-B PUMPING RATES USED IN THE ANALYSES

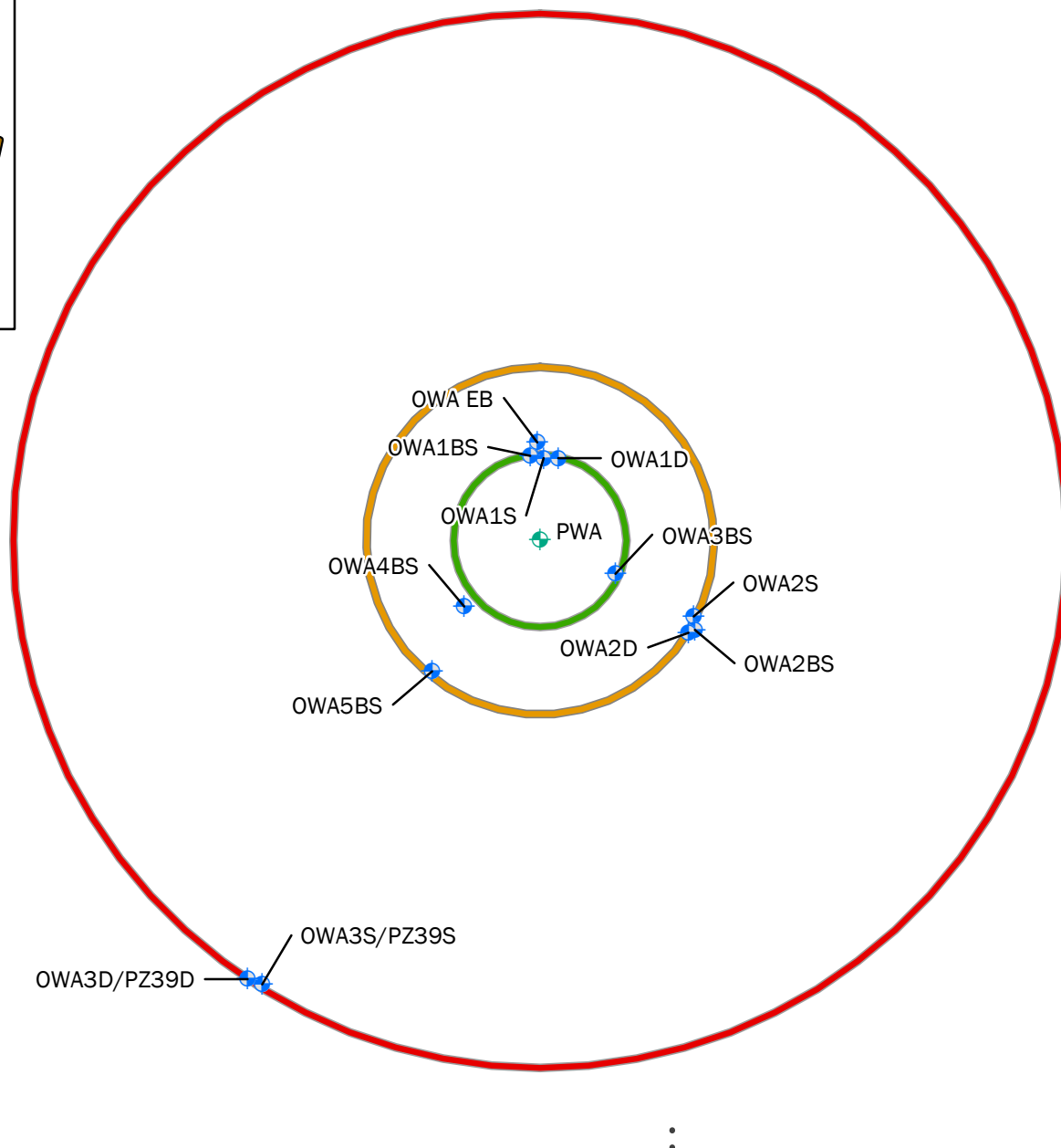
| Approved | Date | Author | Date | File Name | Figure |
|----------|---------|--------|---------|-----------|--------|
| SJS | 4/16/19 | SJS | 4/16/19 | | 7 |

APPENDIX A
OBSERVATION WELL LOCATIONS



INSET LEGEND

-  Pumping Well (2)
-  Proposed Permit Area
-  Project Study Area
-  Proposed Mining Area
-  Okefenokee Nat. Wildlife Refuge
-  Property Parcel Boundary



SITE LEGEND







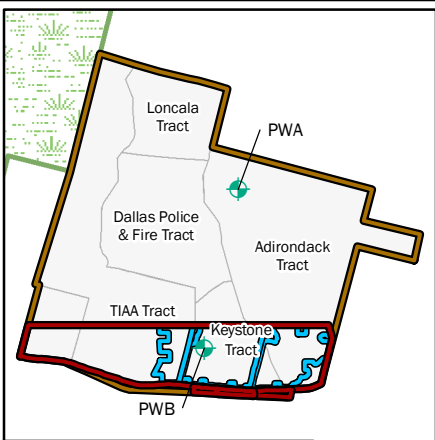
-  Pumping Well "A"
-  Observation Well
-  50 ft Radius
-  100 ft Radius
-  300 ft Radius
- 0 100
 Feet



FIGURE: PUMPING WELL "A" LOCATION MAP
HYDROGEOLOGY OF THE TWIN PINES PROJECT AREA
TWIN PINES MINERALS
ST. GEORGE, CHARLTON COUNTY, GEORGIA

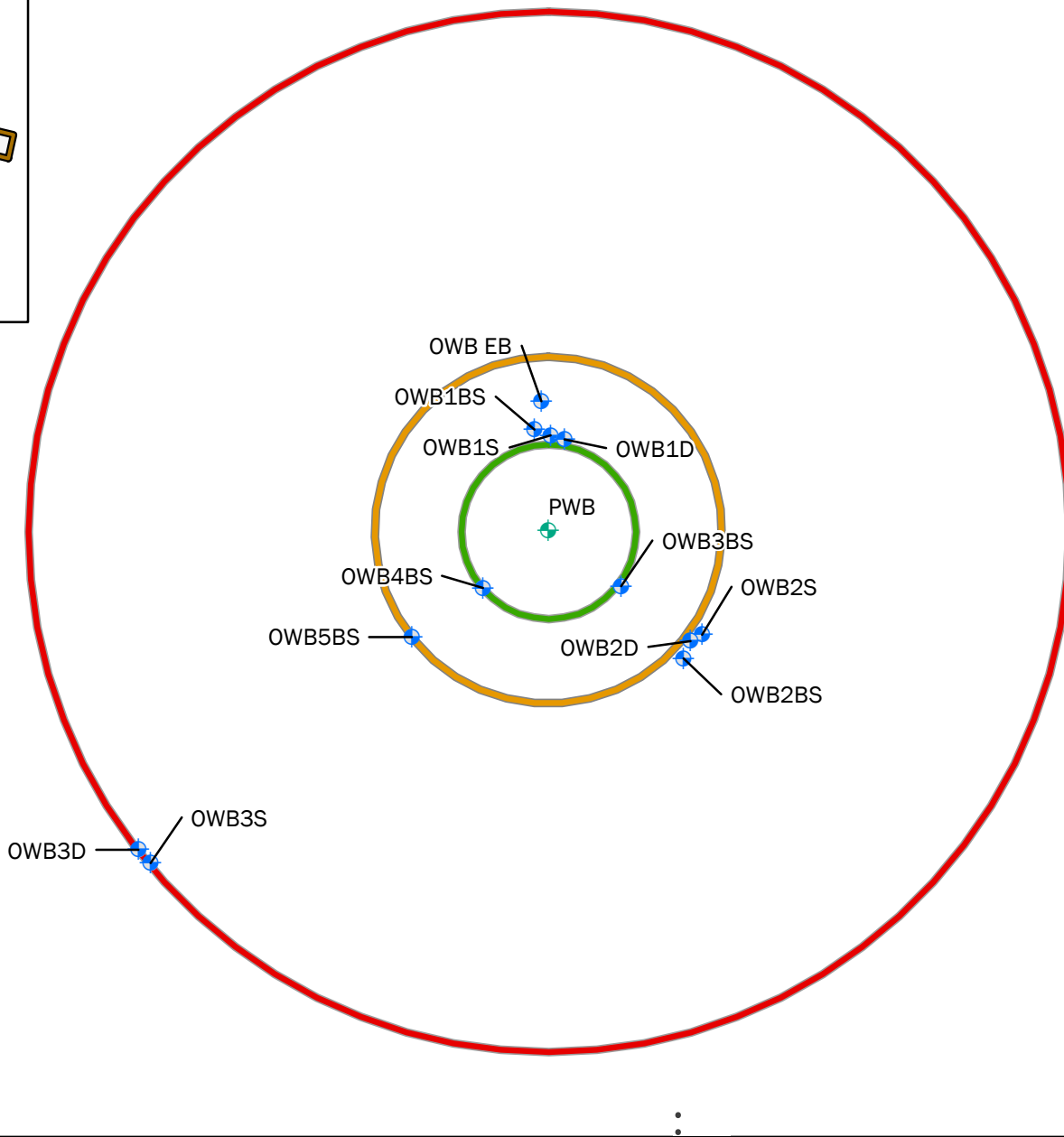
BASEMAP: DigitalGlobe, 3/24/2018.

| |
|------------------------------|
| DRAWN BY: DEK |
| CHECKED BY: JRS |
| DRAWING DATE: 9/27/2019 |
| REVISION DATE: N/A |
| TTL JOB NO.: 000180200804.00 |
| APPROX. SCALE: 1 in = 100 ft |



INSET LEGEND

-  Pumping Well (2)
-  Proposed Permit Area
-  Project Study Area
-  Proposed Mining Area
-  Okefenokee Nat. Wildlife Refuge
-  Property Parcel Boundary



SITE LEGEND






-  Pumping Well "B"
 -  Observation Well
 -  50 ft Radius
 -  100 ft Radius
 -  300 ft Radius
- 0 100
Feet



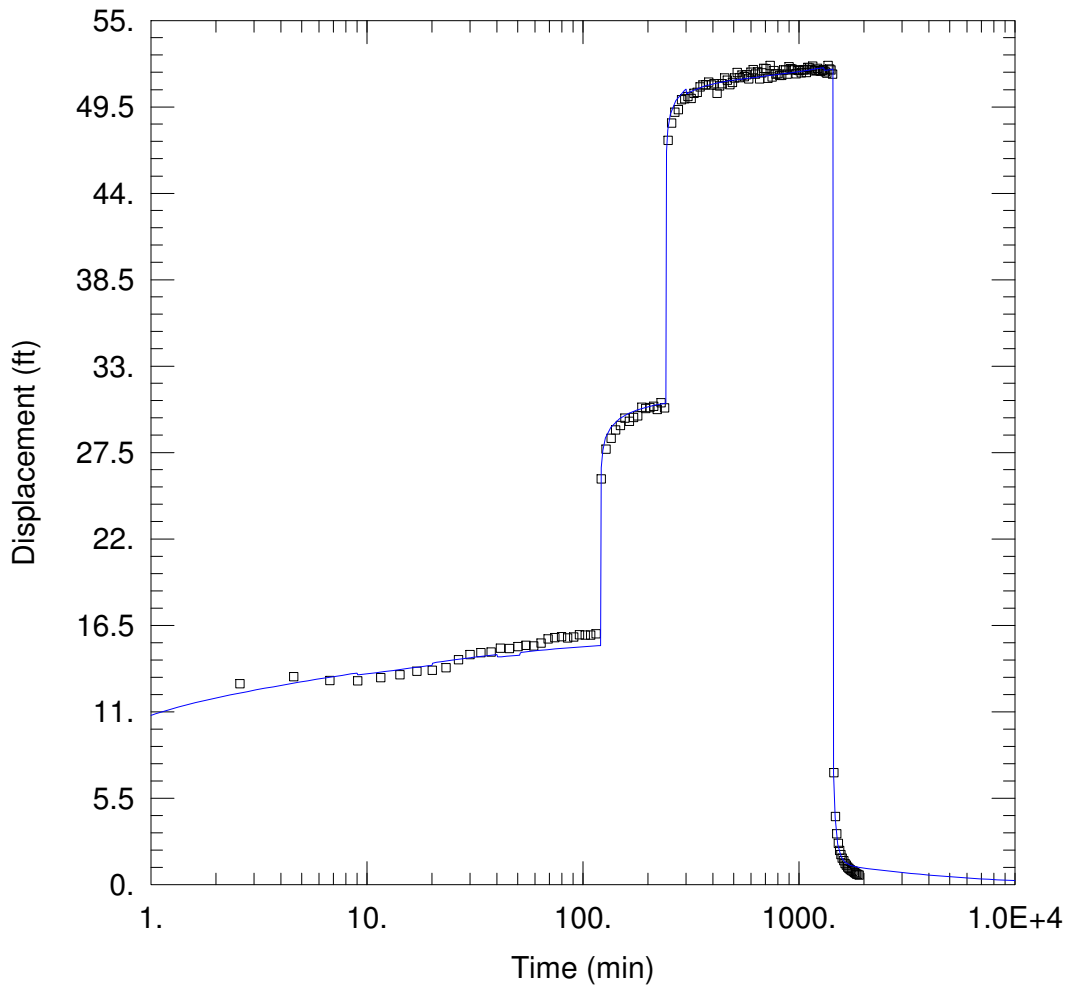
FIGURE: PUMPING WELL "B" LOCATION MAP
HYDROGEOLOGY OF THE TWIN PINES PROJECT AREA
TWIN PINES MINERALS
ST. GEORGE, CHARLTON COUNTY, GEORGIA

BASEMAP: DigitalGlobe, 3/24/2018.

| |
|------------------------------|
| DRAWN BY: DEK |
| CHECKED BY: JRS |
| DRAWING DATE: 9/27/2019 |
| REVISION DATE: N/A |
| TTL JOB NO.: 000180200804.00 |
| APPROX. SCALE: 1 in = 100 ft |

APPENDIX B

AQTESOLV PWA TEST PLOTS



WELL TEST ANALYSIS

Data Set: M:\2018033.00 TTL Twin Pines\Aquifer Tests\PWA\unconf\1well\PWA.aqt
 Date: 03/28/19 Time: 15:40:35

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-A

AQUIFER DATA

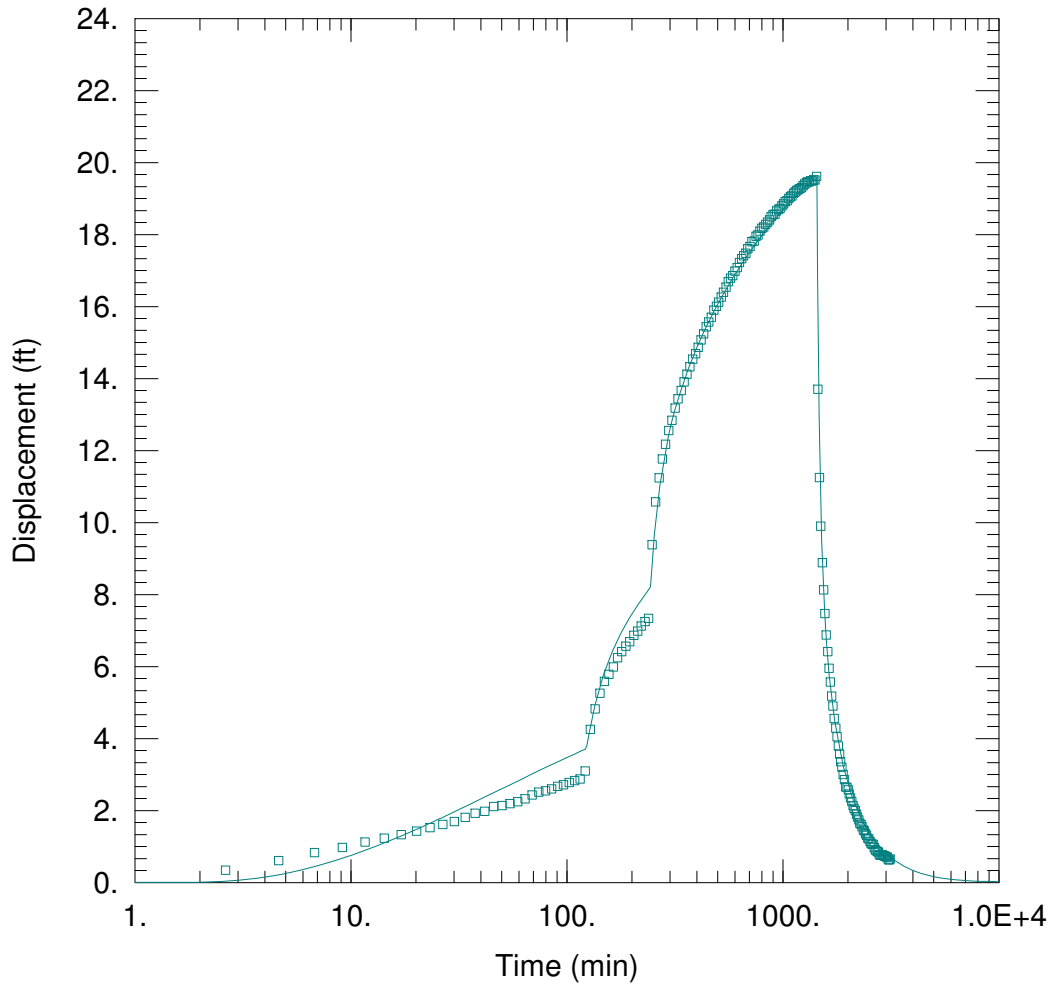
Saturated Thickness: 115. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-A | 0 | 0 | □ PW-A | 0 | 0 |

SOLUTION

| | |
|--------------------------------------|--------------------------------|
| Aquifer Model: <u>Unconfined</u> | Solution Method: <u>Neuman</u> |
| T = <u>1967.4 ft²/day</u> | S = <u>0.0003455</u> |
| Sy = <u>0.002855</u> | Kz/Kr = <u>0.01</u> |



WELL TEST ANALYSIS

Data Set: M:\2018033.00 TTL Twin Pines\Aquifer Tests\PWA\unconf\1well\PWA_OWA1D.aqt
 Date: 03/28/19 Time: 15:43:26

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-A

AQUIFER DATA

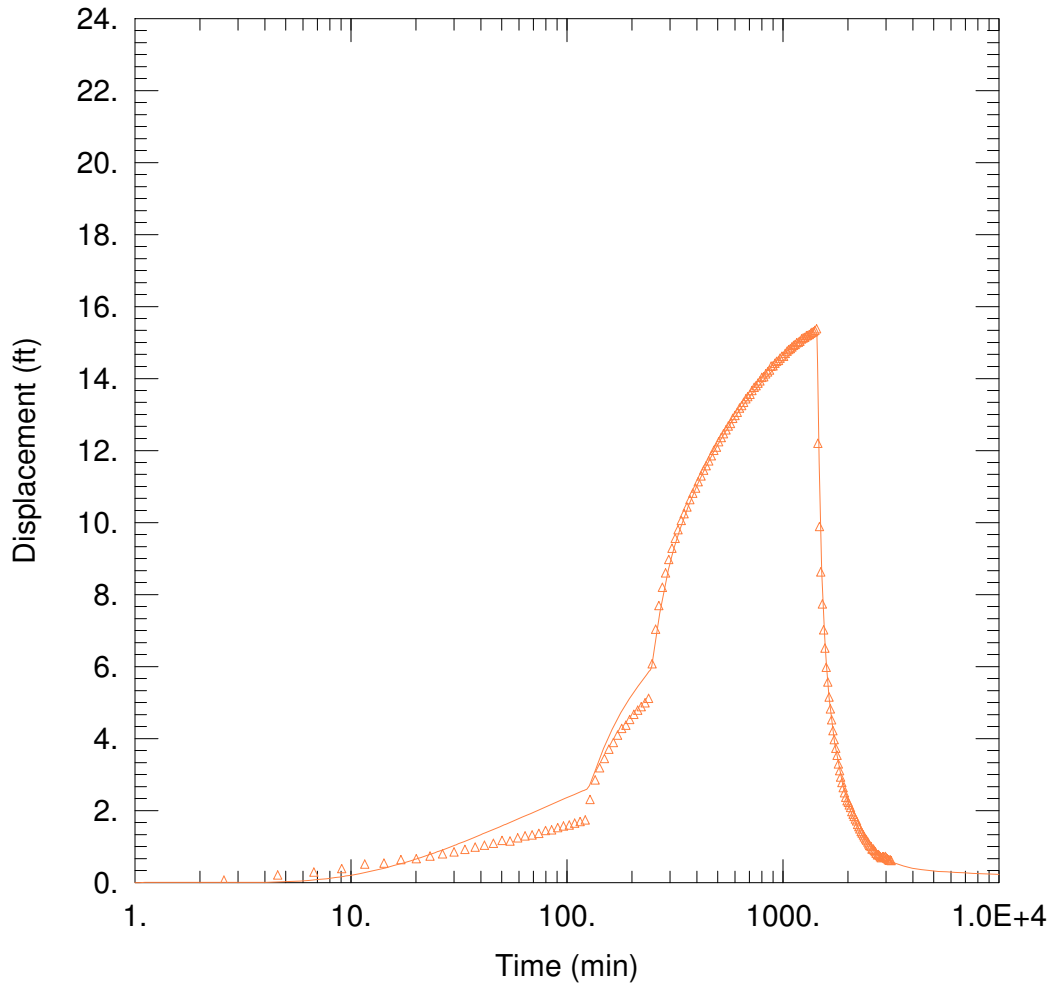
Saturated Thickness: 115. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-A | 0 | 0 | □ OWA1d | 0 | 50 |

SOLUTION

| | |
|--|--------------------------------|
| Aquifer Model: <u>Unconfined</u> | Solution Method: <u>Neuman</u> |
| T = <u>1475.1</u> ft ² /day | S = <u>0.008542</u> |
| Sy = <u>0.5</u> | Kz/Kr = <u>0.02302</u> |



WELL TEST ANALYSIS

Data Set: M:\2018033.00 TTL Twin Pines\Aquifer Tests\PWA\unconf\1well\PWA_OWA2D.aqt
 Date: 03/29/19 Time: 10:26:39

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-A

AQUIFER DATA

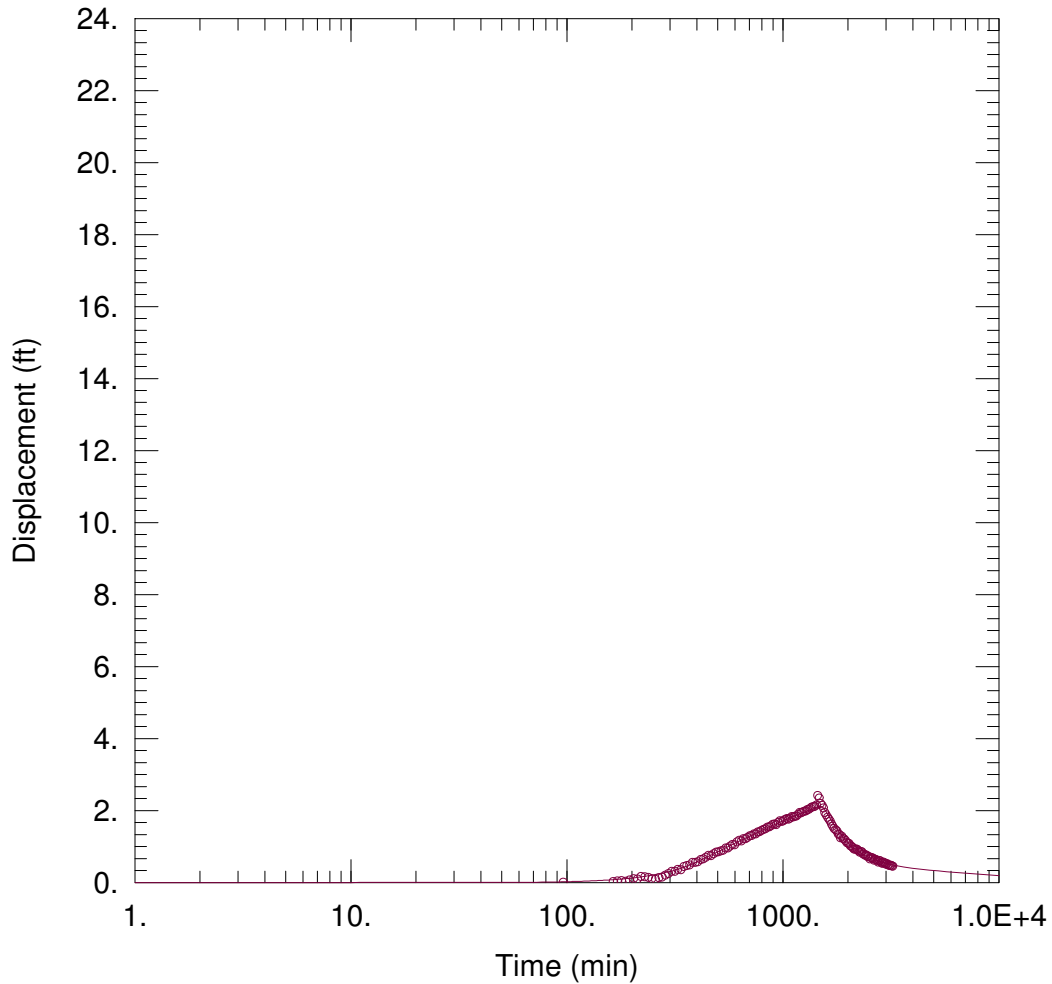
Saturated Thickness: 115. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-A | 0 | 0 | △ OWA2d | 0 | 100 |

SOLUTION

| | |
|--------------------------------------|--------------------------------|
| Aquifer Model: <u>Unconfined</u> | Solution Method: <u>Neuman</u> |
| T = <u>1319.1 ft²/day</u> | S = <u>0.004789</u> |
| Sy = <u>0.02874</u> | Kz/Kr = <u>0.02569</u> |



WELL TEST ANALYSIS

Data Set: M:\2018033.00 TTL Twin Pines\Aquifer Tests\PWA\unconf\1well\PWA_OWA3D.aqt
 Date: 03/28/19 Time: 15:46:33

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-A

AQUIFER DATA

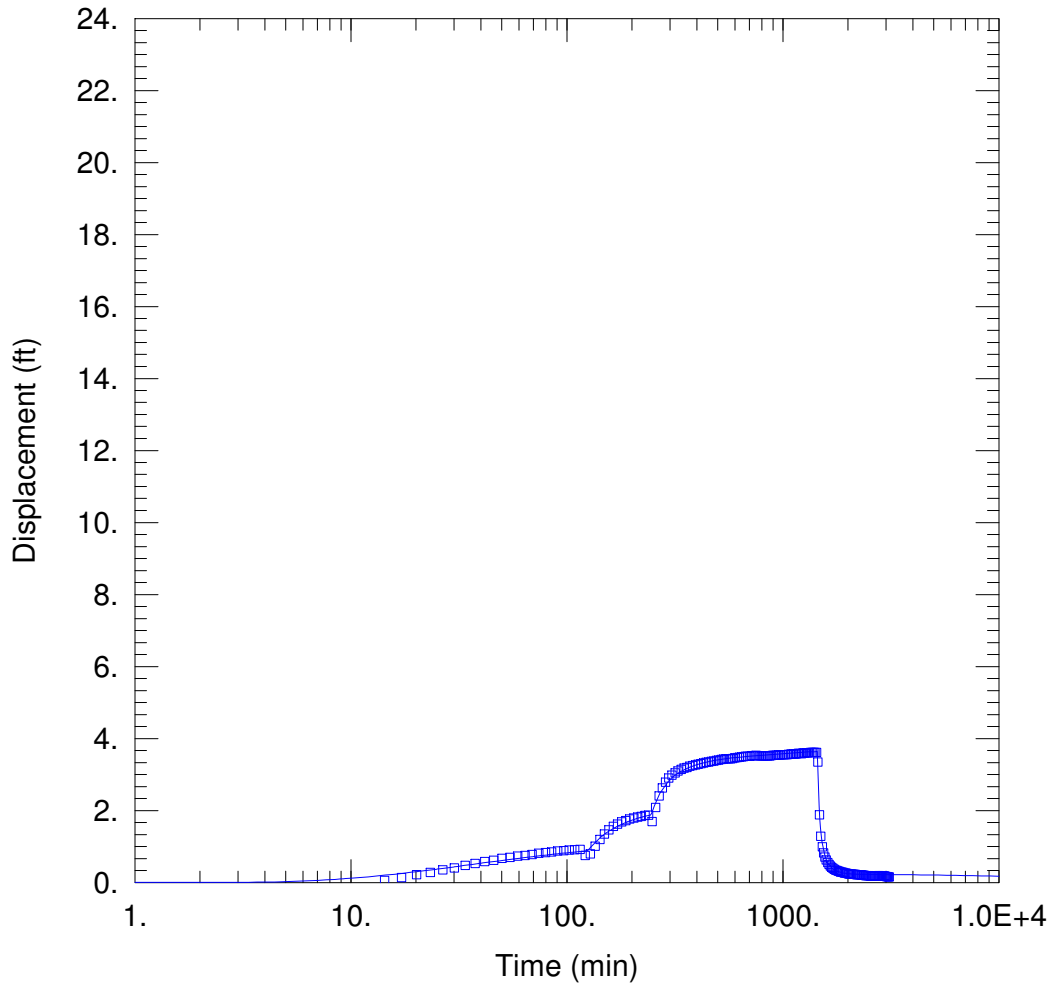
Saturated Thickness: 115. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-A | 0 | 0 | ○ OWA3d | 0 | 300 |

SOLUTION

| | |
|--------------------------------------|--------------------------------|
| Aquifer Model: <u>Unconfined</u> | Solution Method: <u>Neuman</u> |
| T = <u>2287.9 ft²/day</u> | S = <u>0.0166</u> |
| Sy = <u>0.02589</u> | Kz/Kr = <u>0.05415</u> |



WELL TEST ANALYSIS

Data Set: M:\2018033.00 TTL Twin Pines\Aquifer Tests\PWA\unconf\1well\PWA_OWA1S.aqt
 Date: 03/28/19 Time: 15:47:33

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-A

AQUIFER DATA

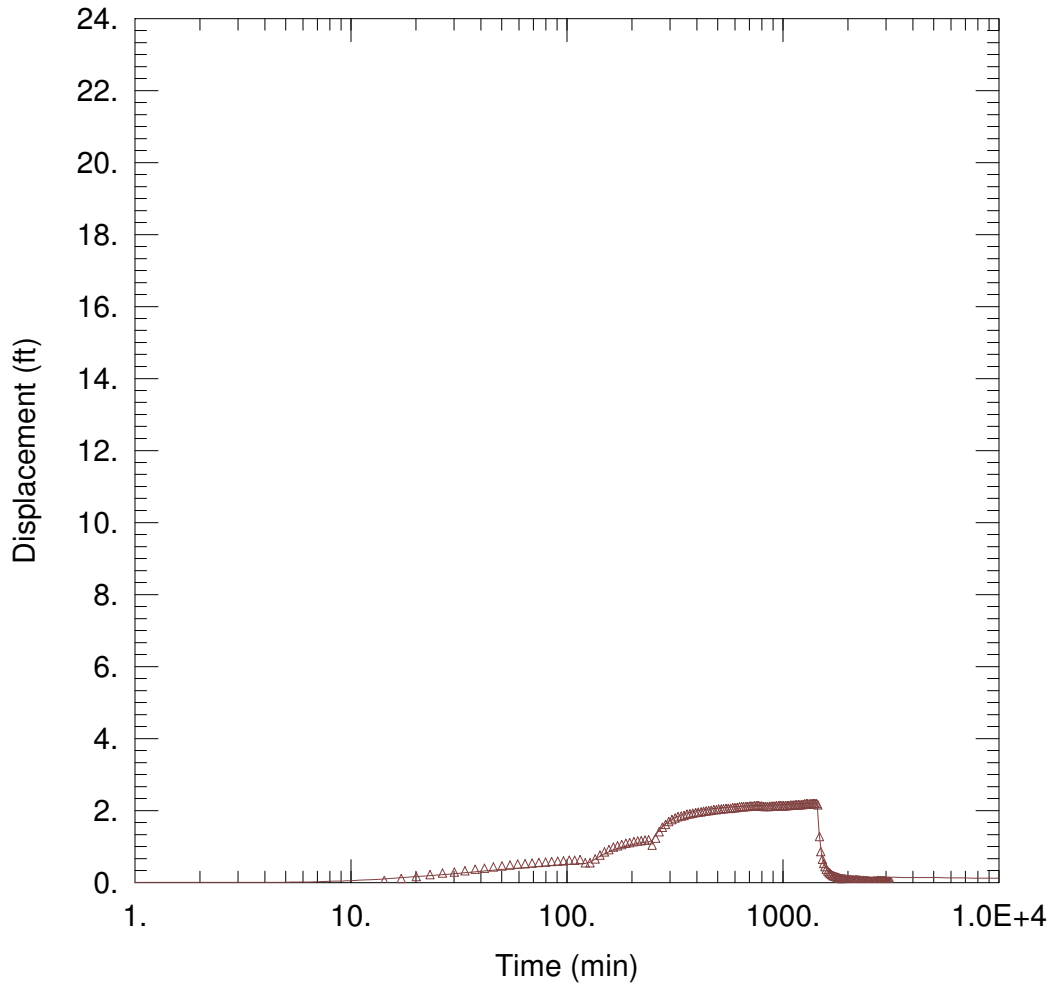
Saturated Thickness: 115. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-A | 0 | 0 | □ OWA1s | 0 | 50 |

SOLUTION

| | |
|--------------------------------------|--------------------------------|
| Aquifer Model: <u>Unconfined</u> | Solution Method: <u>Neuman</u> |
| T = <u>1351.2 ft²/day</u> | S = <u>0.004255</u> |
| Sy = <u>0.5</u> | Kz/Kr = <u>0.1486</u> |



WELL TEST ANALYSIS

Data Set: M:\2018033.00 TTL Twin Pines\Aquifer Tests\PWA\unconf\1well\PWA_OWA2S.aqt
 Date: 03/28/19 Time: 15:48:11

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-A

AQUIFER DATA

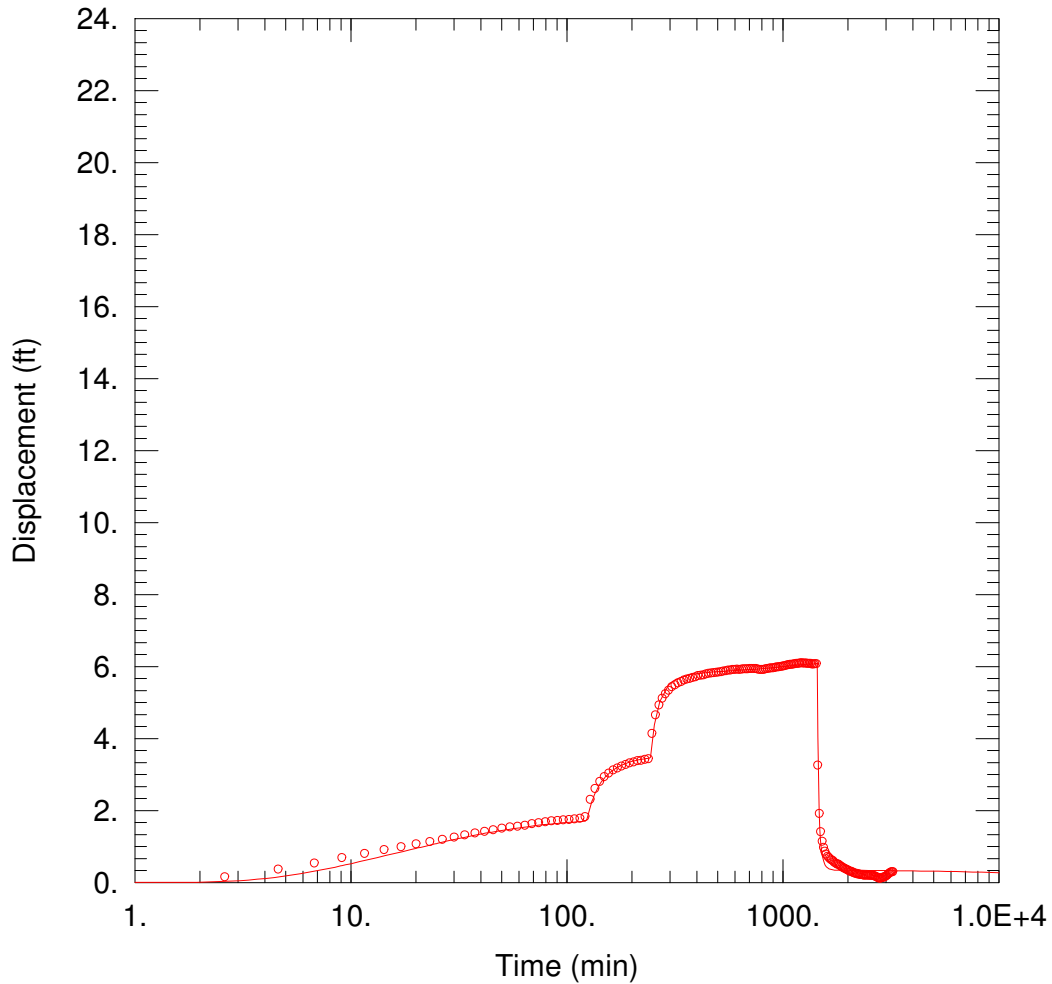
Saturated Thickness: 115. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-A | 0 | 0 | △ OWA2s | 0 | 100 |

SOLUTION

| | |
|--------------------------------------|--------------------------------|
| Aquifer Model: <u>Unconfined</u> | Solution Method: <u>Neuman</u> |
| T = <u>1820.3 ft²/day</u> | S = <u>0.00341</u> |
| Sy = <u>0.5</u> | Kz/Kr = <u>0.1034</u> |



WELL TEST ANALYSIS

Data Set: M:\2018033.00 TTL Twin Pines\Aquifer Tests\PWA\unconf\1well\PWA_OWA3S.aqt
 Date: 03/28/19 Time: 15:49:00

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-A

AQUIFER DATA

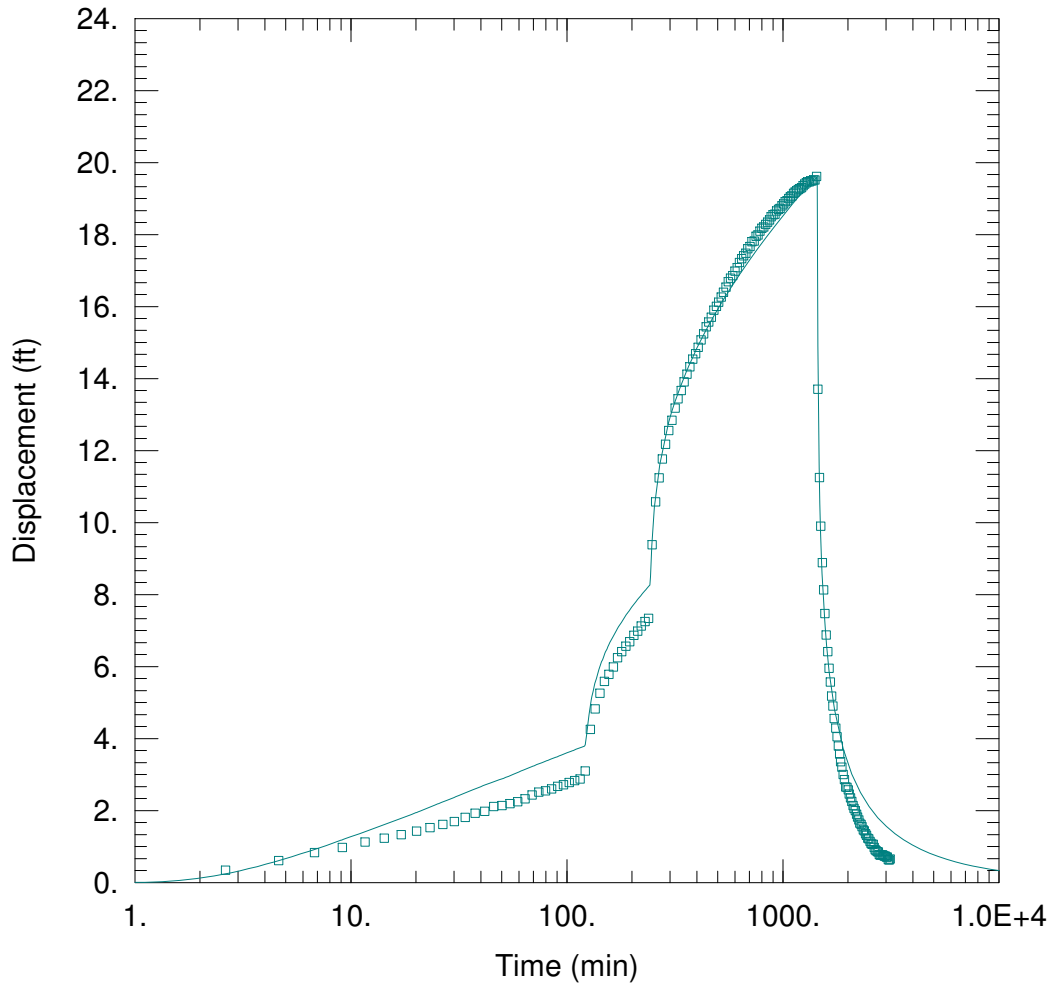
Saturated Thickness: 115. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-A | 0 | 0 | ○ OWA3s | 0 | 300 |

SOLUTION

| | |
|-------------------------------------|--------------------------------|
| Aquifer Model: <u>Unconfined</u> | Solution Method: <u>Neuman</u> |
| T = <u>679.7 ft²/day</u> | S = <u>5.47E-5</u> |
| Sy = <u>0.0216</u> | Kz/Kr = <u>0.01</u> |



WELL TEST ANALYSIS

Data Set: M:\2018033.00 TTL Twin Pines\Aquifer Tests\PWA\leaky\PWAob1d_NW.aqt
 Date: 03/28/19 Time: 15:49:56

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-A

AQUIFER DATA

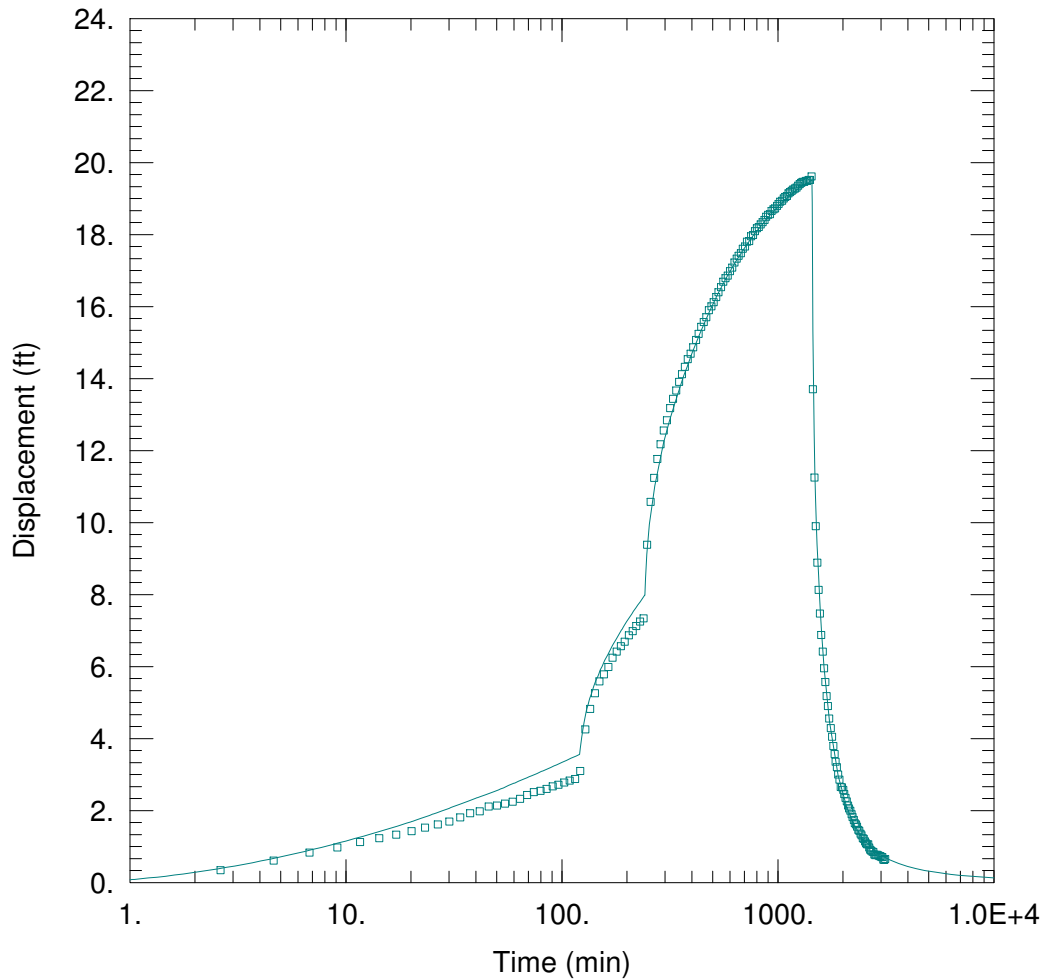
Saturated Thickness: 100. ft Anisotropy Ratio (Kz/Kr): 0.1
 Aquitard Thickness (b'): 10. ft Aquitard Thickness (b''): 1. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-A | 0 | 0 | □ OWA1d | 0 | 50 |

SOLUTION

Aquifer Model: Leaky Solution Method: Neuman-Witherspoon
 $T = 913.9 \text{ ft}^2/\text{day}$ $S = 0.002234$
 $1/B = 2.0E-5 \text{ ft}^{-1}$ $\beta/r = 0.0006577 \text{ ft}^{-1}$
 $T2 = 1.44E+8 \text{ ft}^2/\text{day}$ $S2 = 1.0E-10$



WELL TEST ANALYSIS

Data Set: H:\2018033.00 TTL Twin Pines\Aquifer Tests\PWA\leaky\PWAob1d_NW_SJS.aqt
 Date: 04/03/19 Time: 14:29:27

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-A

AQUIFER DATA

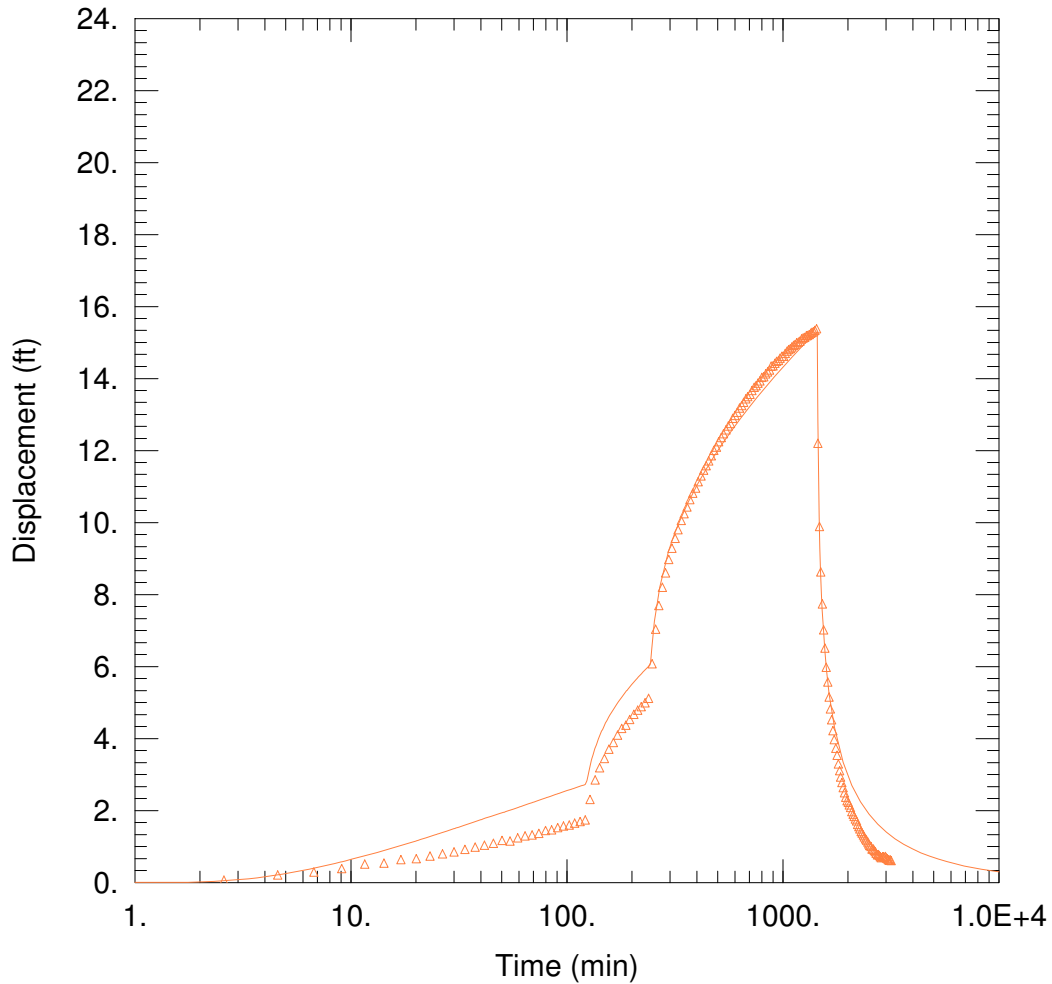
Saturated Thickness: 100. ft Anisotropy Ratio (Kz/Kr): 0.1
 Aquitard Thickness (b'): 10. ft Aquitard Thickness (b''): 1. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-A | 0 | 0 | □ OWA1d | 0 | 50 |

SOLUTION

Aquifer Model: Leaky Solution Method: Neuman-Witherspoon
 $T = 335.6 \text{ ft}^2/\text{day}$ $S = 7.303\text{E-}5$
 $1/B = 0.01145 \text{ ft}^{-1}$ $\beta/r = 0.05652 \text{ ft}^{-1}$
 $T2 = 4169.6 \text{ ft}^2/\text{day}$ $S2 = 0.01494$



WELL TEST ANALYSIS

Data Set: M:\2018033.00 TTL Twin Pines\Aquifer Tests\PWA\leaky\PWAob2d_NW.aqt
 Date: 03/29/19 Time: 10:30:08

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-A

AQUIFER DATA

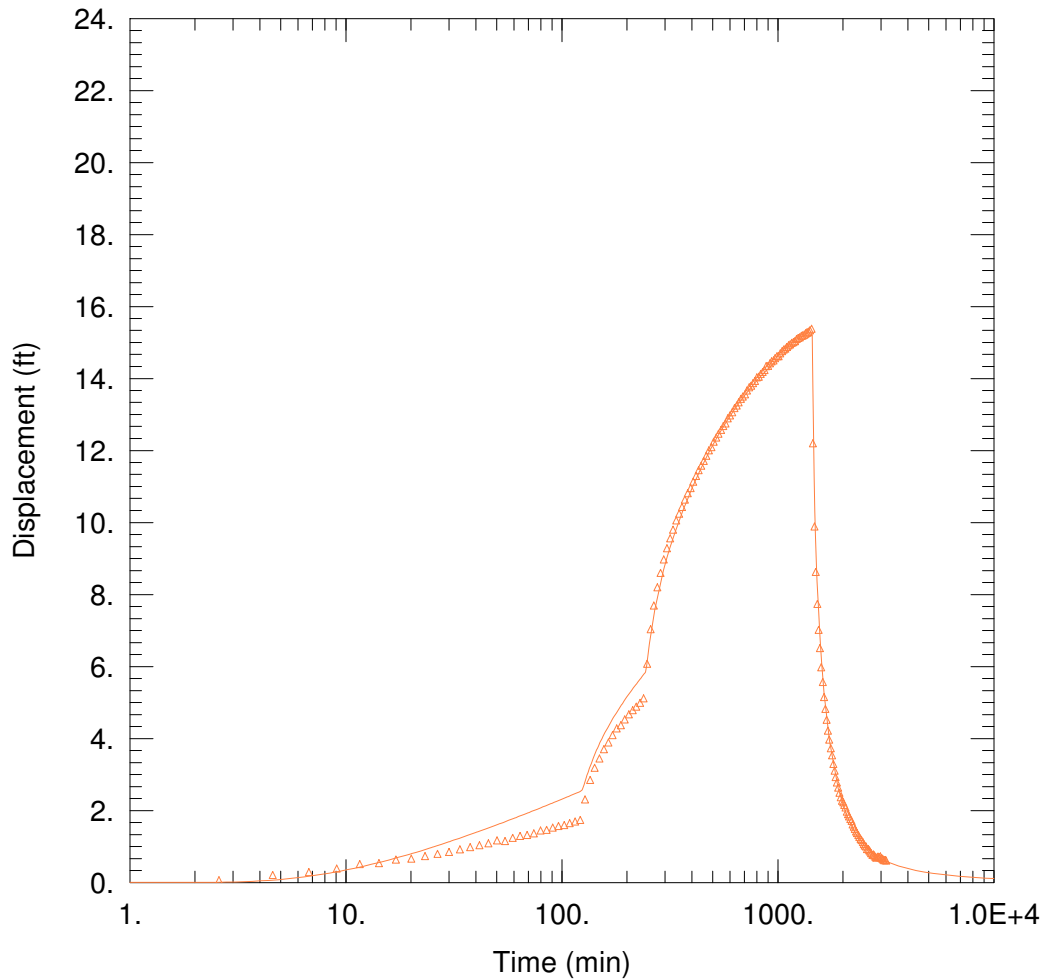
Saturated Thickness: 100. ft Anisotropy Ratio (Kz/Kr): 0.1
 Aquitard Thickness (b'): 10. ft Aquitard Thickness (b''): 1. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-A | 0 | 0 | △ OWA2d | 0 | 100 |

SOLUTION

Aquifer Model: Leaky Solution Method: Neuman-Witherspoon
 $T = 1016.8 \text{ ft}^2/\text{day}$ $S = 0.001197$
 $1/B = 2.0E-5 \text{ ft}^{-1}$ $\beta/r = 0.0004419 \text{ ft}^{-1}$
 $T2 = 1.44E+8 \text{ ft}^2/\text{day}$ $S2 = 1.0E-10$



WELL TEST ANALYSIS

Data Set: H:\2018033.00 TTL Twin Pines\Aquifer Tests\PWA\leaky\PWAob2d_NW_SJS.aqt
 Date: 04/03/19 Time: 14:30:03

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-A

AQUIFER DATA

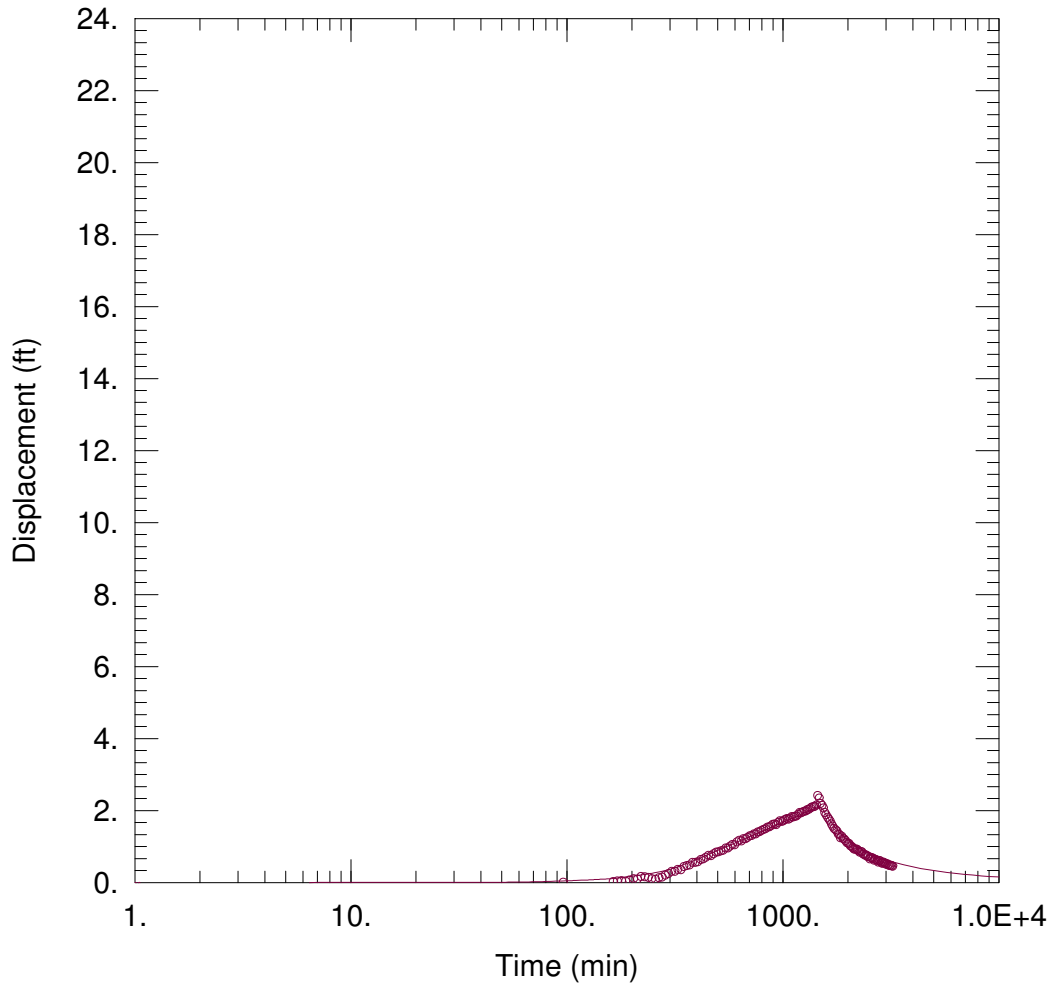
Saturated Thickness: 100. ft Anisotropy Ratio (Kz/Kr): 0.1
 Aquitard Thickness (b'): 10. ft Aquitard Thickness (b''): 1. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-A | 0 | 0 | △ OWA2d | 0 | 100 |

SOLUTION

Aquifer Model: Leaky Solution Method: Neuman-Witherspoon
 $T = 421.8 \text{ ft}^2/\text{day}$ $S = 0.0008812$
 $1/B = 0.006006 \text{ ft}^{-1}$ $\beta/r = 0.004494 \text{ ft}^{-1}$
 $T2 = 4850.3 \text{ ft}^2/\text{day}$ $S2 = 1.014\text{E-}10$



WELL TEST ANALYSIS

Data Set: M:\2018033.00 TTL Twin Pines\Aquifer Tests\PWA\leaky\PWAob3d_NW.aqt
 Date: 03/28/19 Time: 15:54:54

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-A

AQUIFER DATA

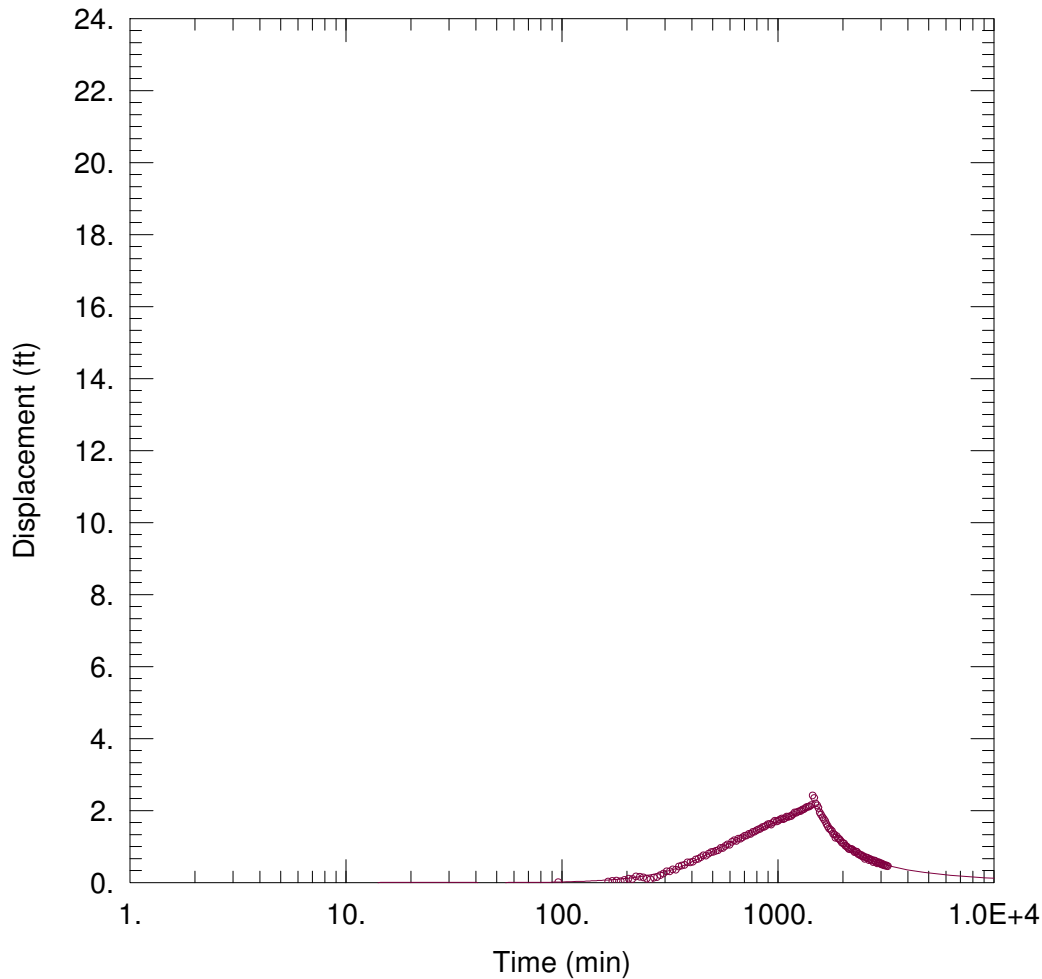
Saturated Thickness: 100. ft Anisotropy Ratio (Kz/Kr): 0.1
 Aquitard Thickness (b''): 10. ft Aquitard Thickness (b''): 1. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-A | 0 | 0 | ○ OWA3d | 0 | 300 |

SOLUTION

Aquifer Model: Leaky Solution Method: Neuman-Witherspoon
 $T = 1700. \text{ ft}^2/\text{day}$ $S = 0.006985$
 $1/B = 2.0\text{E-}5 \text{ ft}^{-1}$ $\beta/r = 0.0009901 \text{ ft}^{-1}$
 $T2 = 1.44\text{E+}8 \text{ ft}^2/\text{day}$ $S2 = 2.666\text{E-}5$



WELL TEST ANALYSIS

Data Set: H:\2018033.00 TTL Twin Pines\Aquifer Tests\PWA\leaky\PWAob3d_NW_SJS.aqt
 Date: 04/03/19 Time: 14:31:00

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-A

AQUIFER DATA

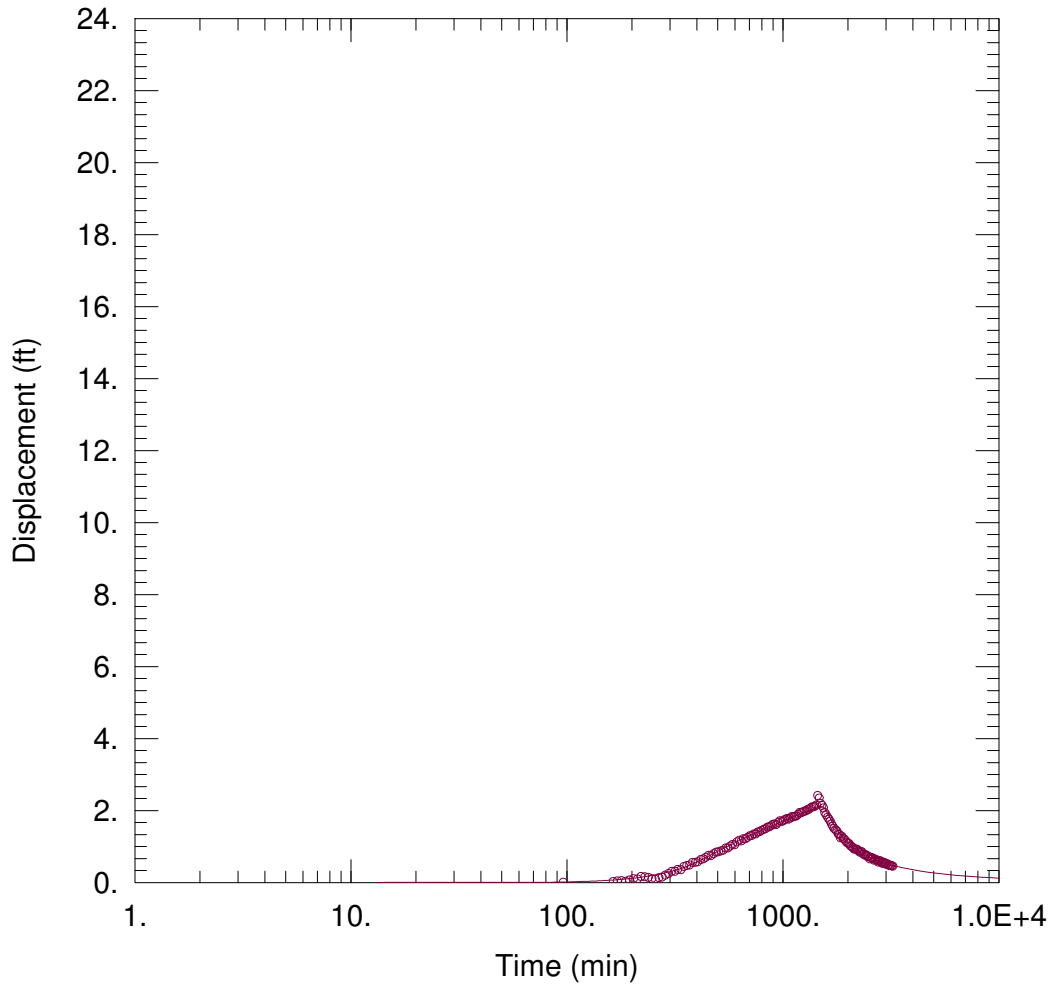
Saturated Thickness: 100. ft Anisotropy Ratio (Kz/Kr): 0.1
 Aquitard Thickness (b'): 10. ft Aquitard Thickness (b''): 1. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-A | 0 | 0 | ◦ OWA3d | 0 | 300 |

SOLUTION

Aquifer Model: Leaky Solution Method: Neuman-Witherspoon
 $T = 331.1 \text{ ft}^2/\text{day}$ $S = 0.003357$
 $1/B = 0.01076 \text{ ft}^{-1}$ $B/r = 0.001353 \text{ ft}^{-1}$
 $T2 = 4271.6 \text{ ft}^2/\text{day}$ $S2 = 0.009912$



WELL TEST ANALYSIS

Data Set: M:\2018033.00 TTL Twin Pines\Aquifer Tests\PWA\leaky\PWAob3d_NW2.aqt
 Date: 03/29/19 Time: 09:28:41

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-A

AQUIFER DATA

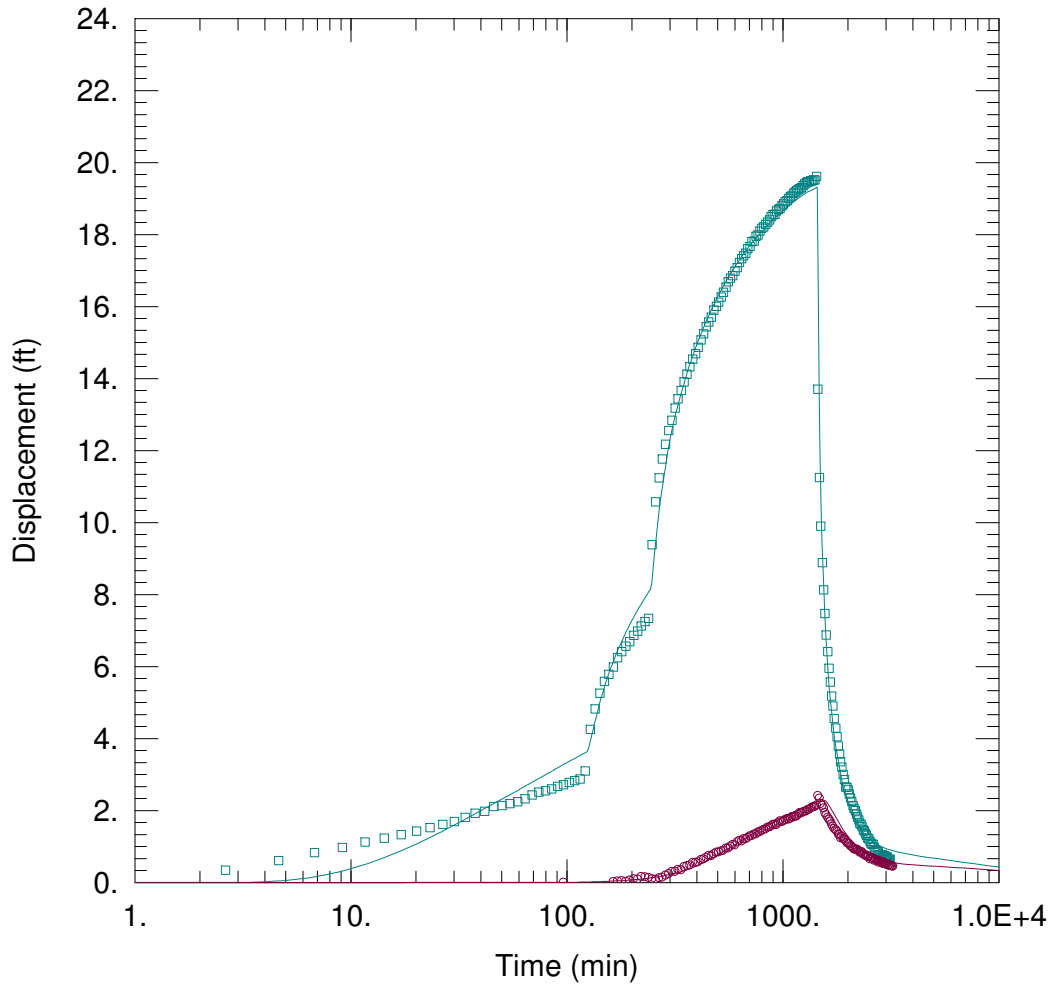
Saturated Thickness: 100. ft Anisotropy Ratio (Kz/Kr): 0.1
 Aquitard Thickness (b''): 10. ft Aquitard Thickness (b''): 1. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-A | 0 | 0 | ○ OWA3d | 0 | 300 |

SOLUTION

Aquifer Model: Leaky Solution Method: Neuman-Witherspoon
 $T = 1.257 \text{ ft}^2/\text{day}$ $S = 0.0001038$
 $1/B = 0.1775 \text{ ft}^{-1}$ $\beta/r = 0.2512 \text{ ft}^{-1}$
 $T2 = 4520.2 \text{ ft}^2/\text{day}$ $S2 = 0.004708$



WELL TEST ANALYSIS

Data Set: M:\2018033.00 TTL Twin Pines\Aquifer Tests\PWA\unconf\2wells\PWA_OWA1D_3D.aqt
 Date: 03/29/19 Time: 09:29:52

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-A

AQUIFER DATA

Saturated Thickness: 115. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-A | 0 | 0 | □ OWA1d | 0 | 50 |
| | | | ○ OWA3d | 0 | 300 |

SOLUTION

Aquifer Model: Unconfined

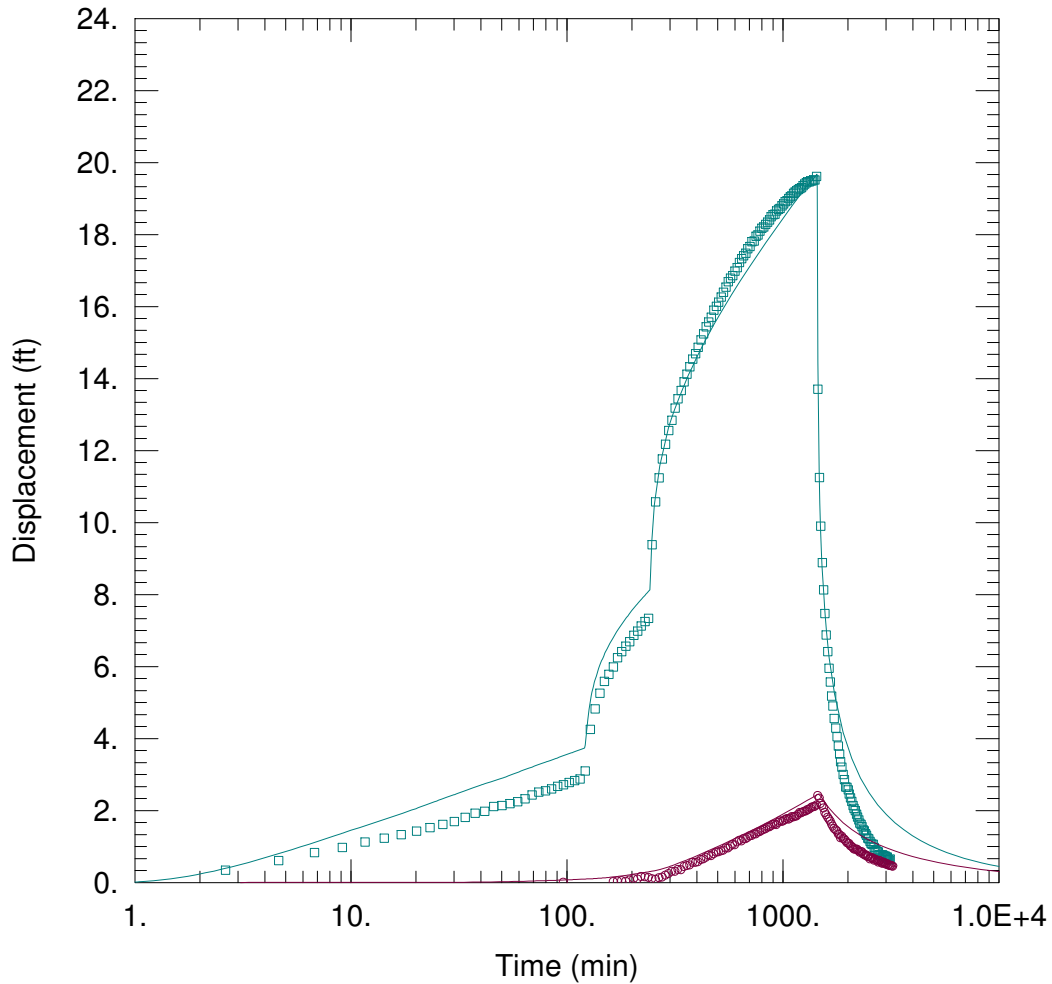
Solution Method: Neuman

T = 946.2 ft²/day

S = 0.01174

Sy = 0.05878

Kz/Kr = 0.1548



WELL TEST ANALYSIS

Data Set: M:\2018033.00 TTL Twin Pines\Aquifer Tests\PWA\leaky\PWAob1d_3d_NW.aqt
 Date: 03/28/19 Time: 16:20:31

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-A

AQUIFER DATA

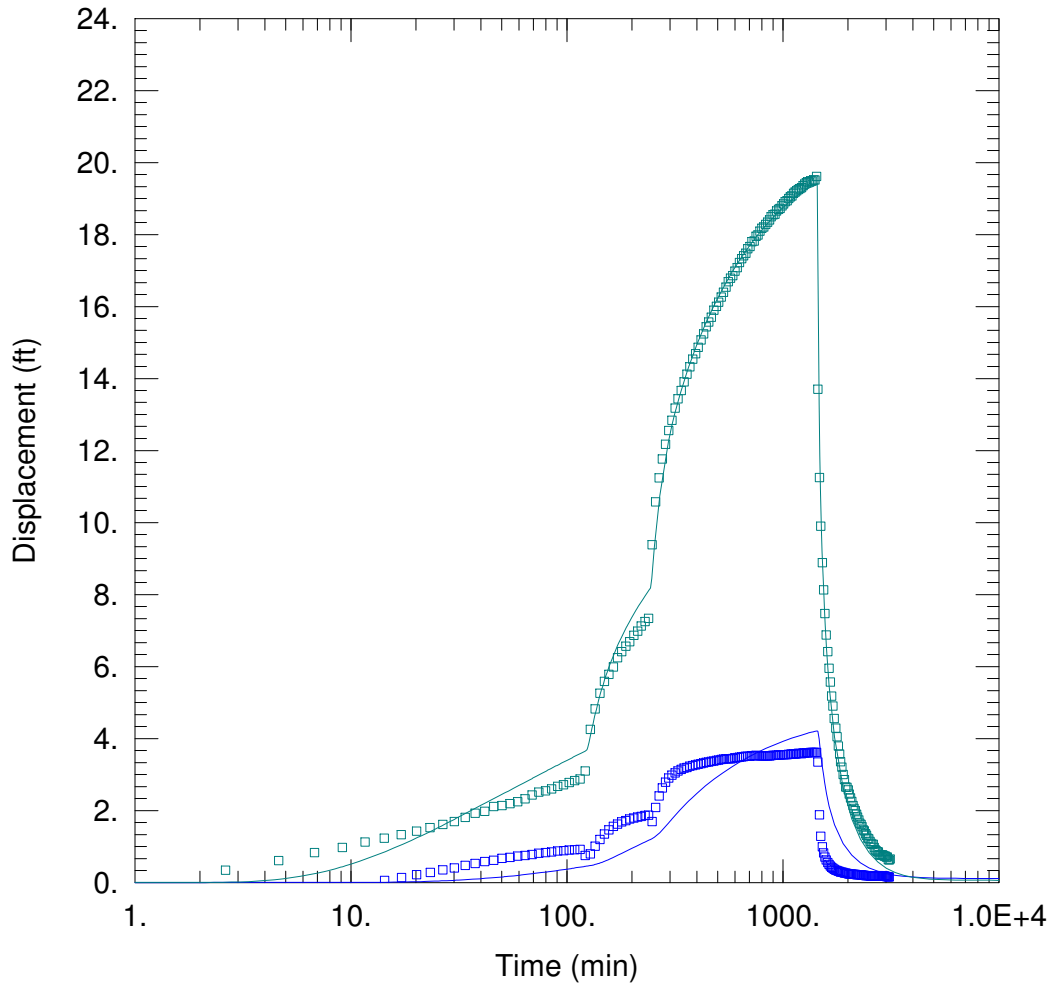
Saturated Thickness: 100. ft Anisotropy Ratio (Kz/Kr): 0.1
 Aquitard Thickness (b'): 10. ft Aquitard Thickness (b''): 1. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-A | 0 | 0 | □ OWA1d | 0 | 50 |
| | | | ○ OWA3d | 0 | 300 |

SOLUTION

Aquifer Model: Leaky Solution Method: Neuman-Witherspoon
 $T = 595.9 \text{ ft}^2/\text{day}$ $S = 0.0009761$
 $1/B = 2.0E-5 \text{ ft}^{-1}$ $\beta/r = 0.005853 \text{ ft}^{-1}$
 $T2 = 1.44E+8 \text{ ft}^2/\text{day}$ $S2 = 1.0E-10$



WELL TEST ANALYSIS

Data Set: M:\2018033.00 TTL Twin Pines\Aquifer Tests\PWA\unconf\2wells\PWA_OWA1.aqt
 Date: 03/29/19 Time: 09:31:03

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-A

AQUIFER DATA

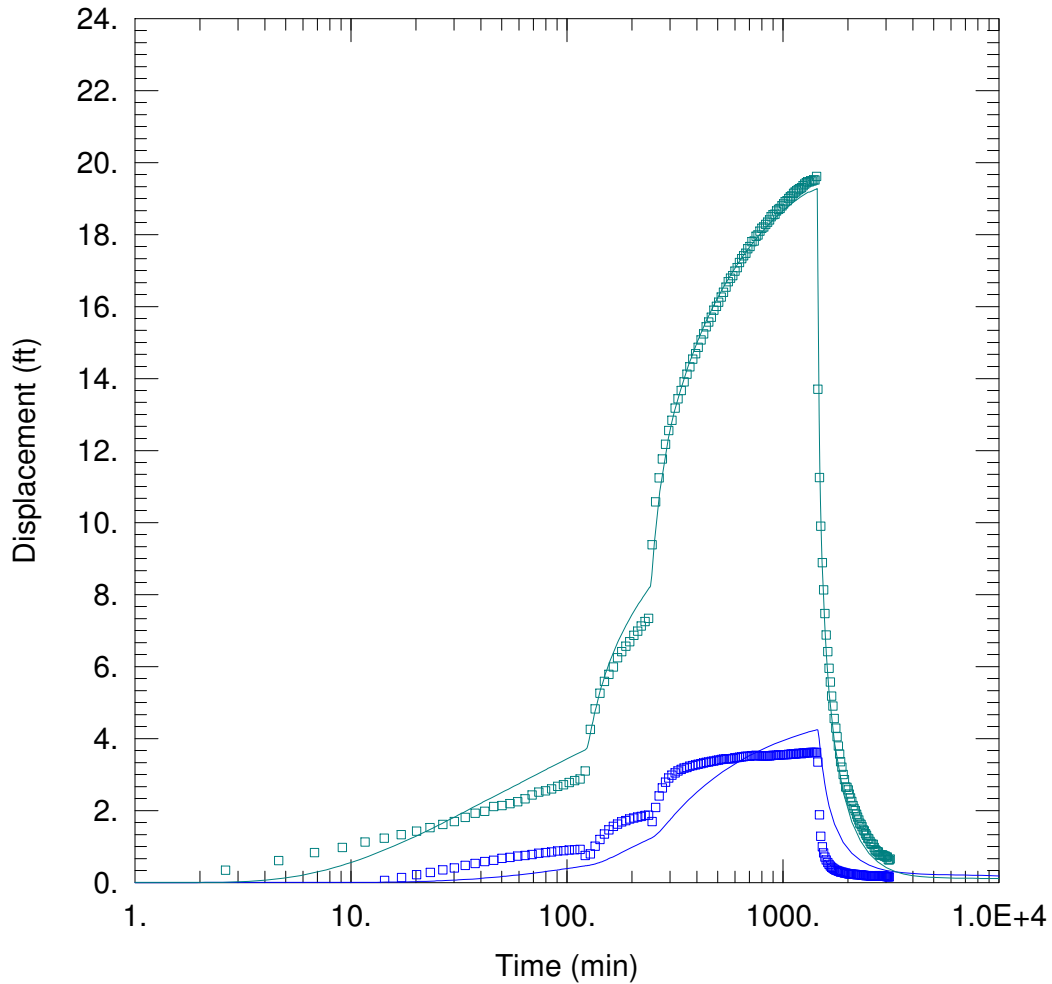
Saturated Thickness: 115. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-A | 0 | 0 | □ OWA1s | 0 | 50 |
| | | | □ OWA1d | 0 | 50 |

SOLUTION

| | |
|--------------------------------------|--------------------------------|
| Aquifer Model: <u>Unconfined</u> | Solution Method: <u>Neuman</u> |
| T = <u>1136.1 ft²/day</u> | S = <u>0.01072</u> |
| Sy = <u>0.5</u> | Kz/Kr = <u>0.07644</u> |



WELL TEST ANALYSIS

Data Set: M:\2018033.00 TTL Twin Pines\Aquifer Tests\PWA\unconf\2wells\PWA_OWA1_2.aqt
 Date: 03/28/19 Time: 16:22:24

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-A

AQUIFER DATA

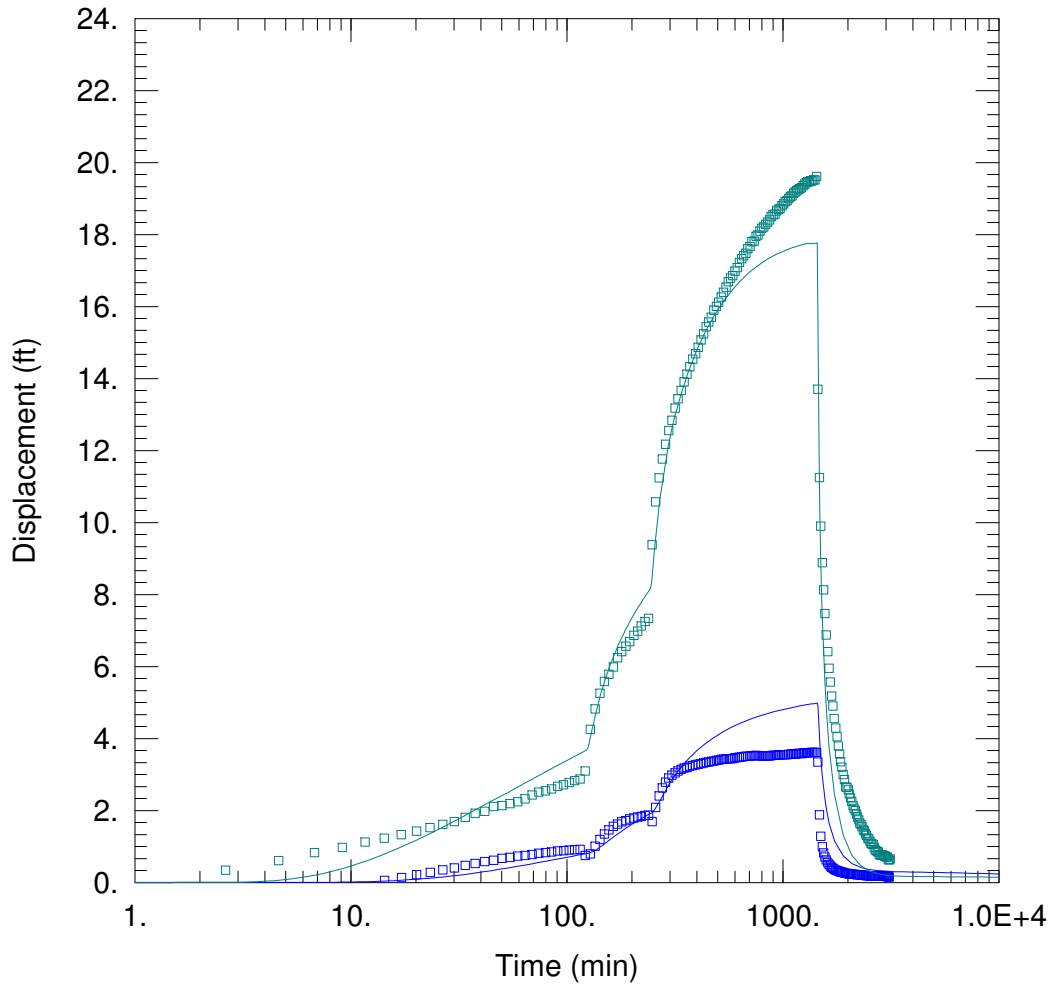
Saturated Thickness: 115. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-A | 0 | 0 | □ OWA1s | 0 | 50 |
| | | | □ OWA1d | 0 | 50 |

SOLUTION

Aquifer Model: Unconfined Solution Method: Neuman
 T = 1153.6 ft²/day S = 0.01019
 Sy = 0.25 Kz/Kr = 0.07527



WELL TEST ANALYSIS

Data Set: M:\2018033.00 TTL Twin Pines\Aquifer Tests\PWA\unconf\2wells\PWA_OWA1_et.aqt
 Date: 03/28/19 Time: 16:23:49

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-A

AQUIFER DATA

Saturated Thickness: 115. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-A | 0 | 0 | □ OWA1s | 0 | 50 |
| | | | □ OWA1d | 0 | 50 |

SOLUTION

Aquifer Model: Unconfined

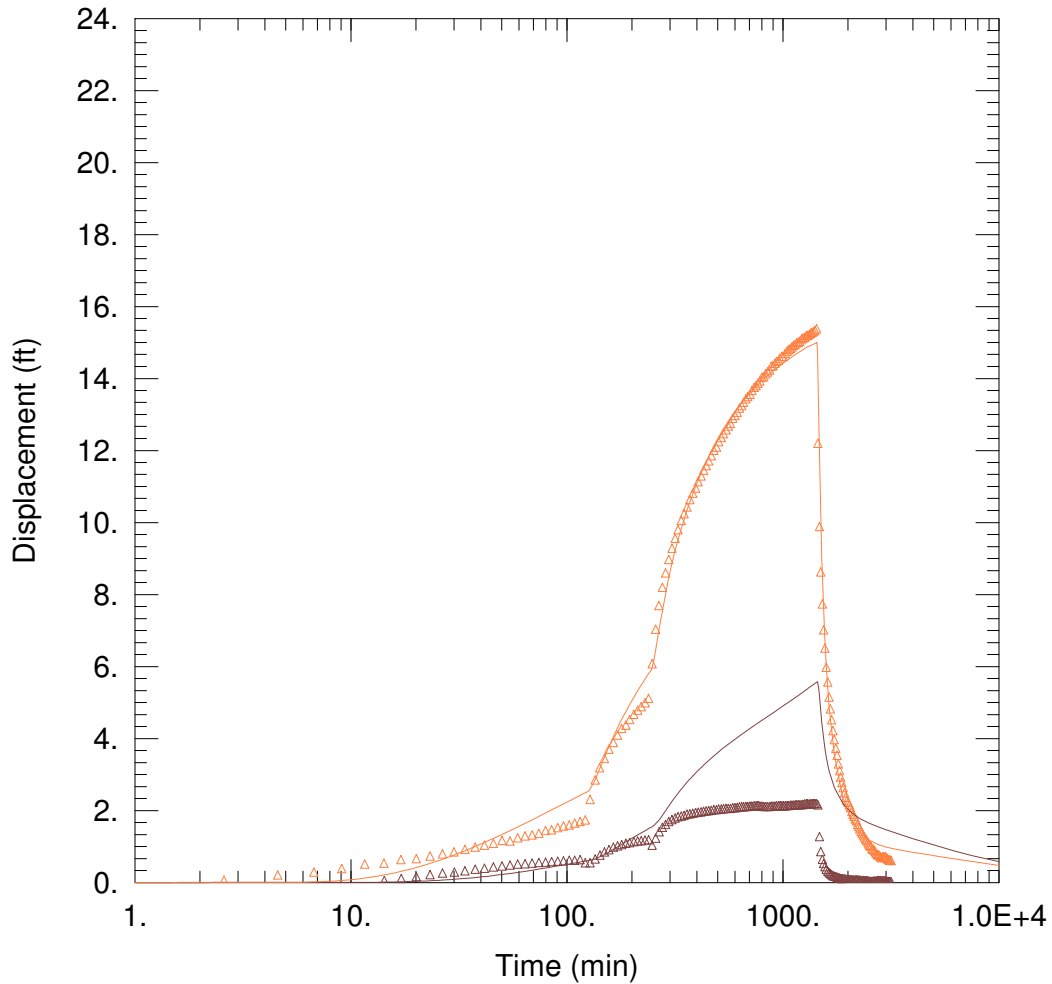
Solution Method: Neuman

T = 925.9 ft²/day

S = 0.01046

Sy = 0.5

Kz/Kr = 0.2029



WELL TEST ANALYSIS

Data Set: M:\2018033.00 TTL Twin Pines\Aquifer Tests\PWA\unconf\2wells\PWA_OWA2.aqt
 Date: 03/29/19 Time: 09:54:11

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-A

AQUIFER DATA

Saturated Thickness: 115. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-A | 0 | 0 | △ OWA2s | 0 | 100 |
| | | | △ OWA2d | 0 | 100 |

SOLUTION

Aquifer Model: Unconfined

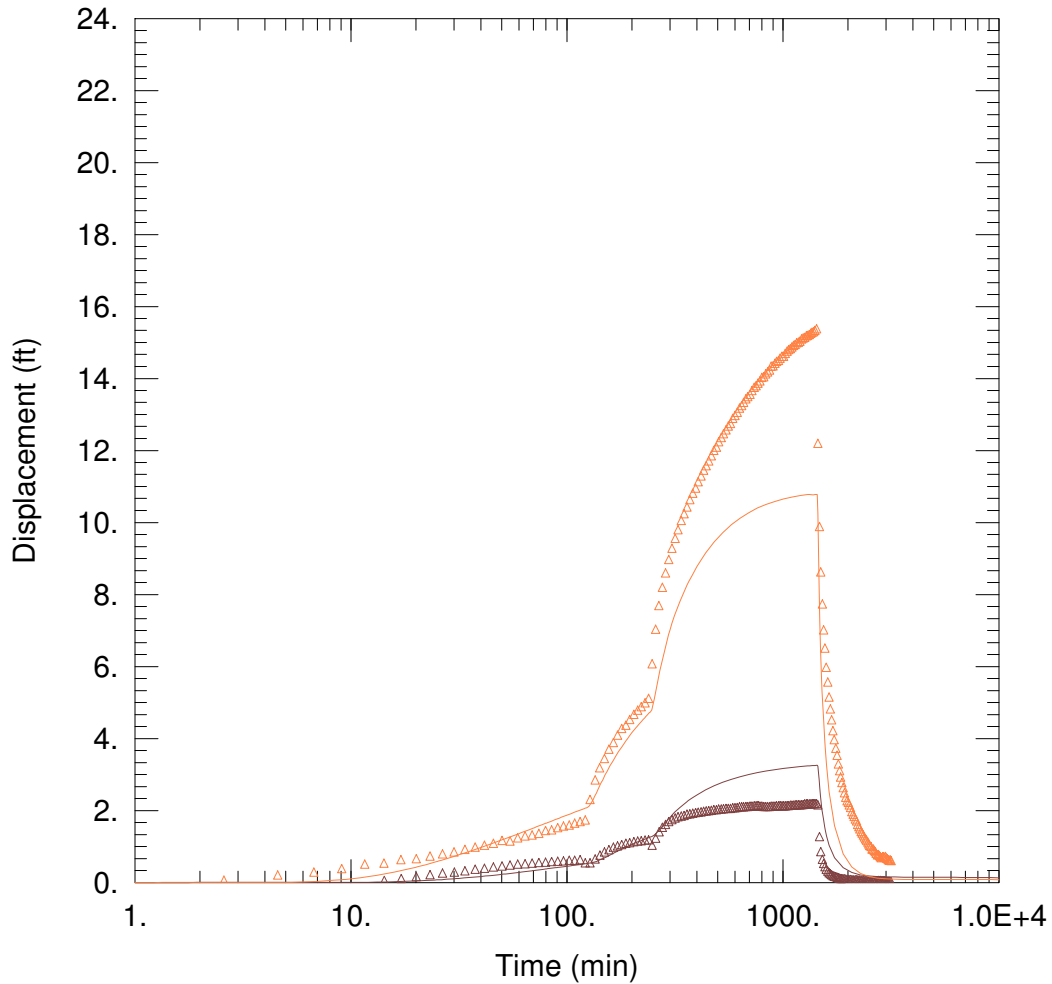
Solution Method: Neuman

T = 865.7 ft²/day

S = 0.005311

Sy = 0.03262

Kz/Kr = 0.1



WELL TEST ANALYSIS

Data Set: M:\2018033.00 TTL Twin Pines\Aquifer Tests\PWA\unconf\2wells\PWA_OWA2_et.aqt
 Date: 03/28/19 Time: 16:26:45

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-A

AQUIFER DATA

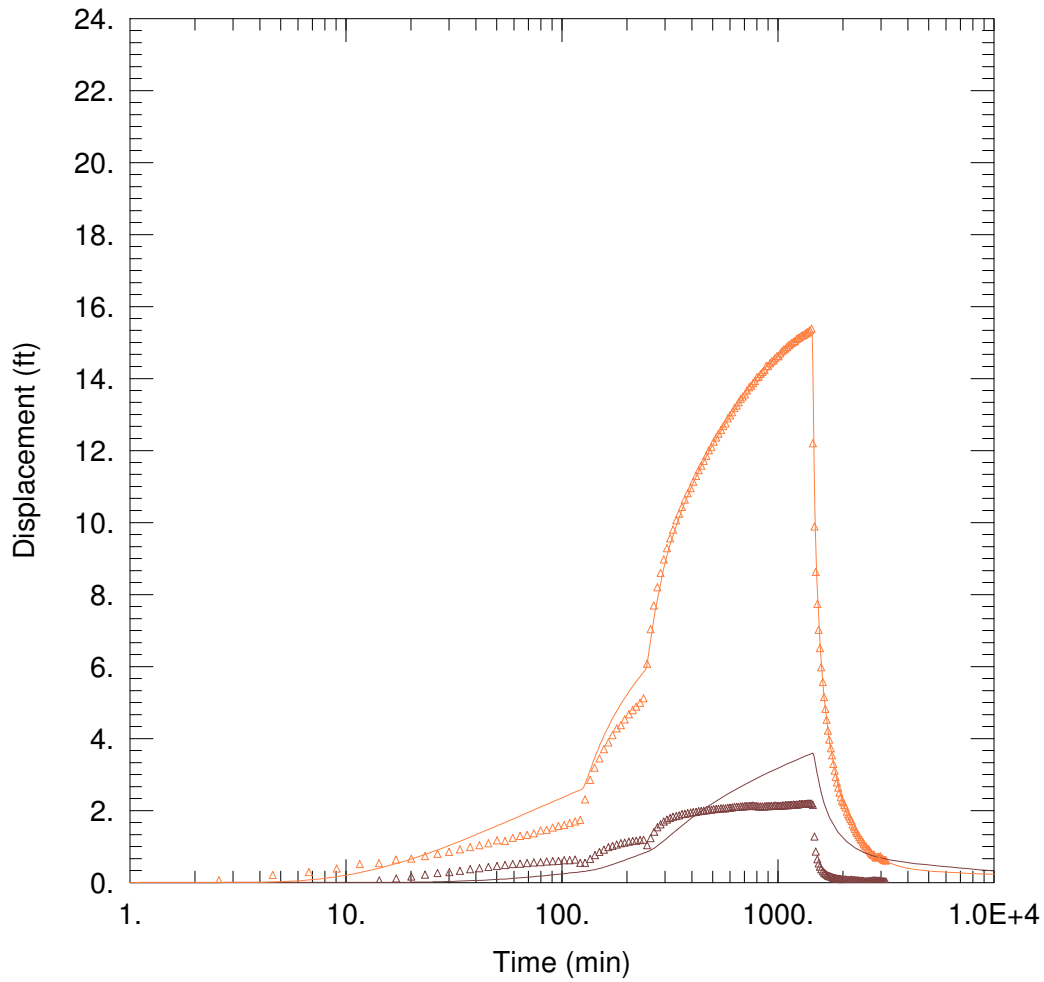
Saturated Thickness: 115. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-A | 0 | 0 | △ OWA2s | 0 | 100 |
| | | | △ OWA2d | 0 | 100 |

SOLUTION

| | |
|--------------------------------------|--------------------------------|
| Aquifer Model: <u>Unconfined</u> | Solution Method: <u>Neuman</u> |
| T = <u>1141.4 ft²/day</u> | S = <u>0.005758</u> |
| Sy = <u>0.5</u> | Kz/Kr = <u>0.1057</u> |



WELL TEST ANALYSIS

Data Set: H:\2018033.00 TTL Twin Pines\Aquifer Tests\PWA\unconf\2wells\PWA_OWA2_SJS.aqt
 Date: 04/03/19 Time: 14:32:11

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-A

AQUIFER DATA

Saturated Thickness: 115. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-A | 0 | 0 | △ OWA2s | 0 | 100 |
| | | | △ OWA2d | 0 | 100 |

SOLUTION

Aquifer Model: Unconfined

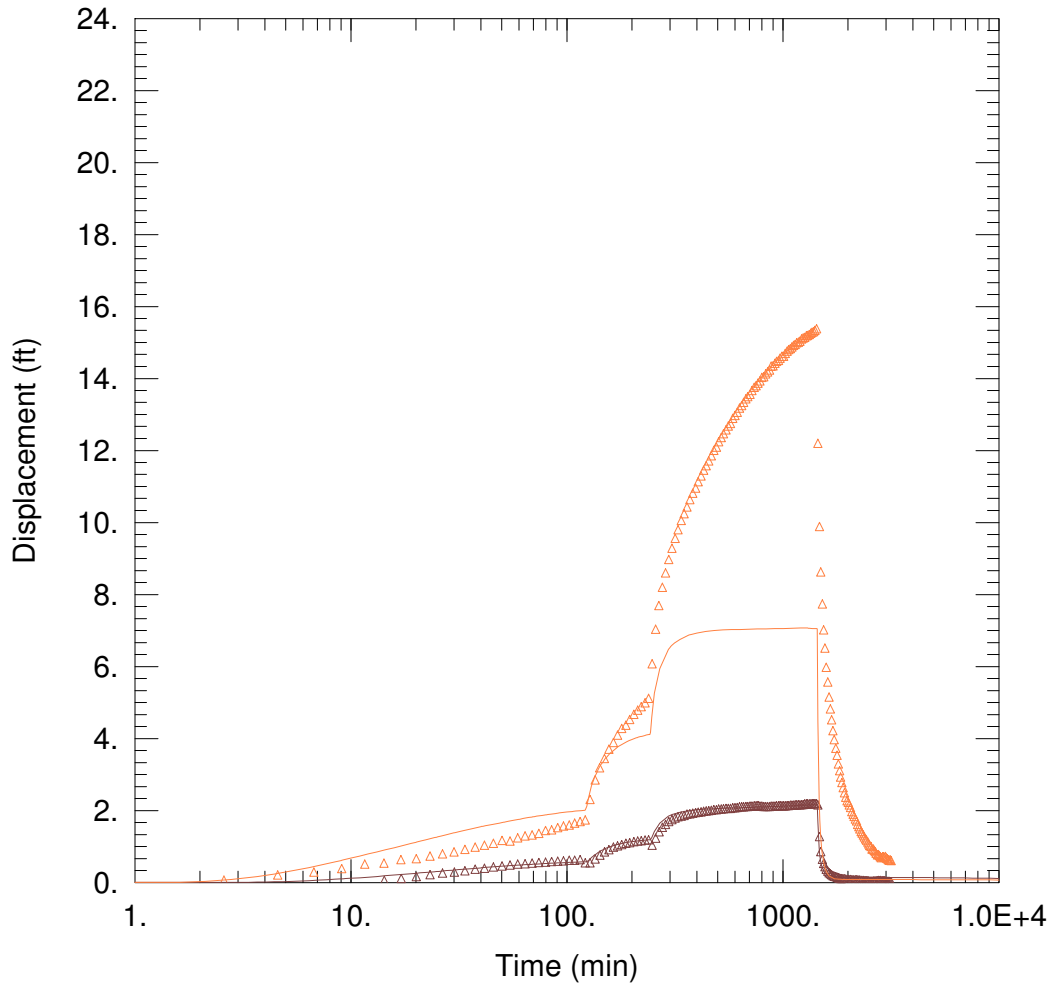
Solution Method: Neuman

T = 1319.1 ft²/day

S = 0.004789

Sy = 0.02875

Kz/Kr = 0.02568



WELL TEST ANALYSIS

Data Set: M:\2018033.00 TTL Twin Pines\Aquifer Tests\PWA\unconf\2wells\PWA_OWA2S.aqt
 Date: 03/29/19 Time: 10:00:14

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-A

AQUIFER DATA

Saturated Thickness: 115. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-A | 0 | 0 | △ OWA2s | 0 | 100 |
| | | | △ OWA2d | 0 | 100 |

SOLUTION

Aquifer Model: Unconfined

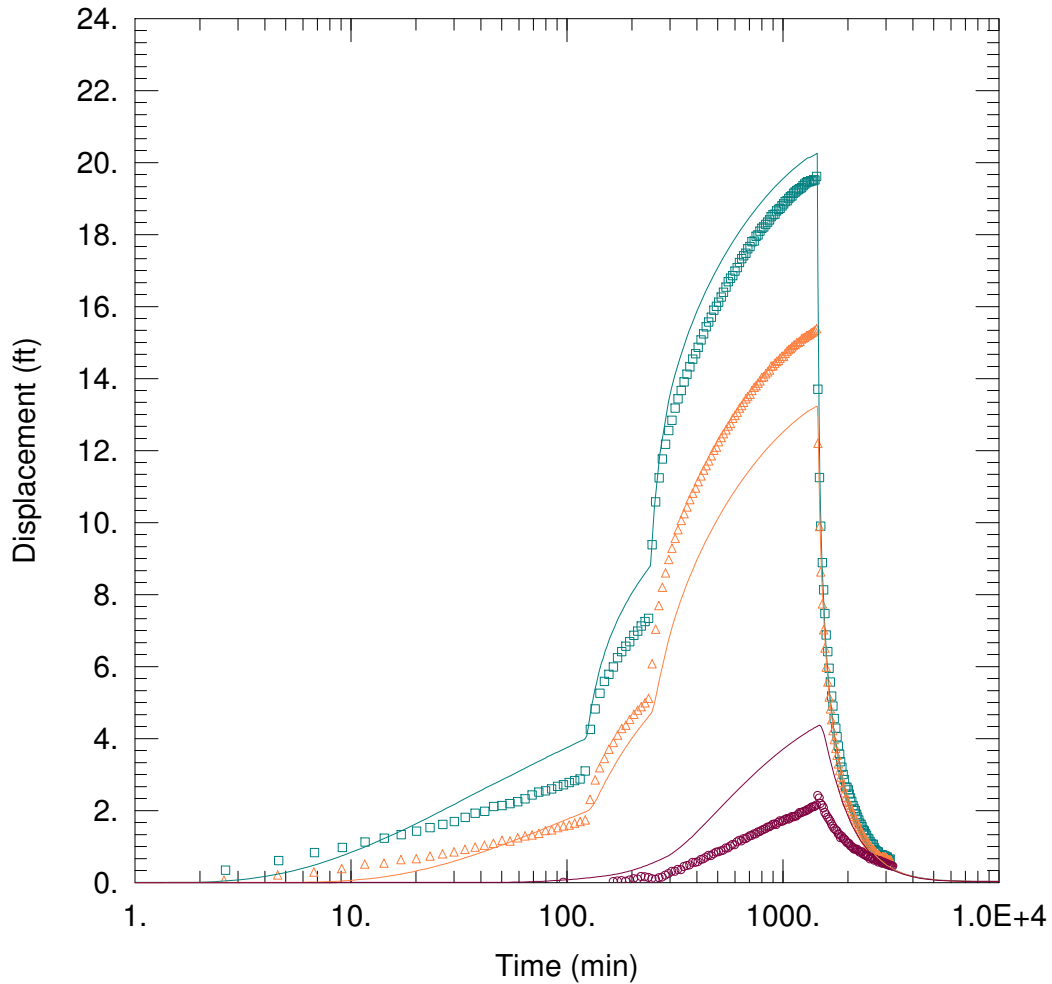
Solution Method: Neuman

T = 1800. ft²/day

S = 0.002

Sy = 0.5

Kz/Kr = 0.1



WELL TEST ANALYSIS

Data Set: M:\2018033.00 TTL Twin Pines\Aquifer Tests\PWA\unconf\2wells\PWA_OWA1D_2D_3D.aqt
 Date: 03/29/19 Time: 10:39:00

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-A

AQUIFER DATA

Saturated Thickness: 115. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-A | 0 | 0 | □ OWA1d | 0 | 50 |
| | | | △ OWA2d | 0 | 100 |
| | | | ○ OWA3d | 0 | 300 |

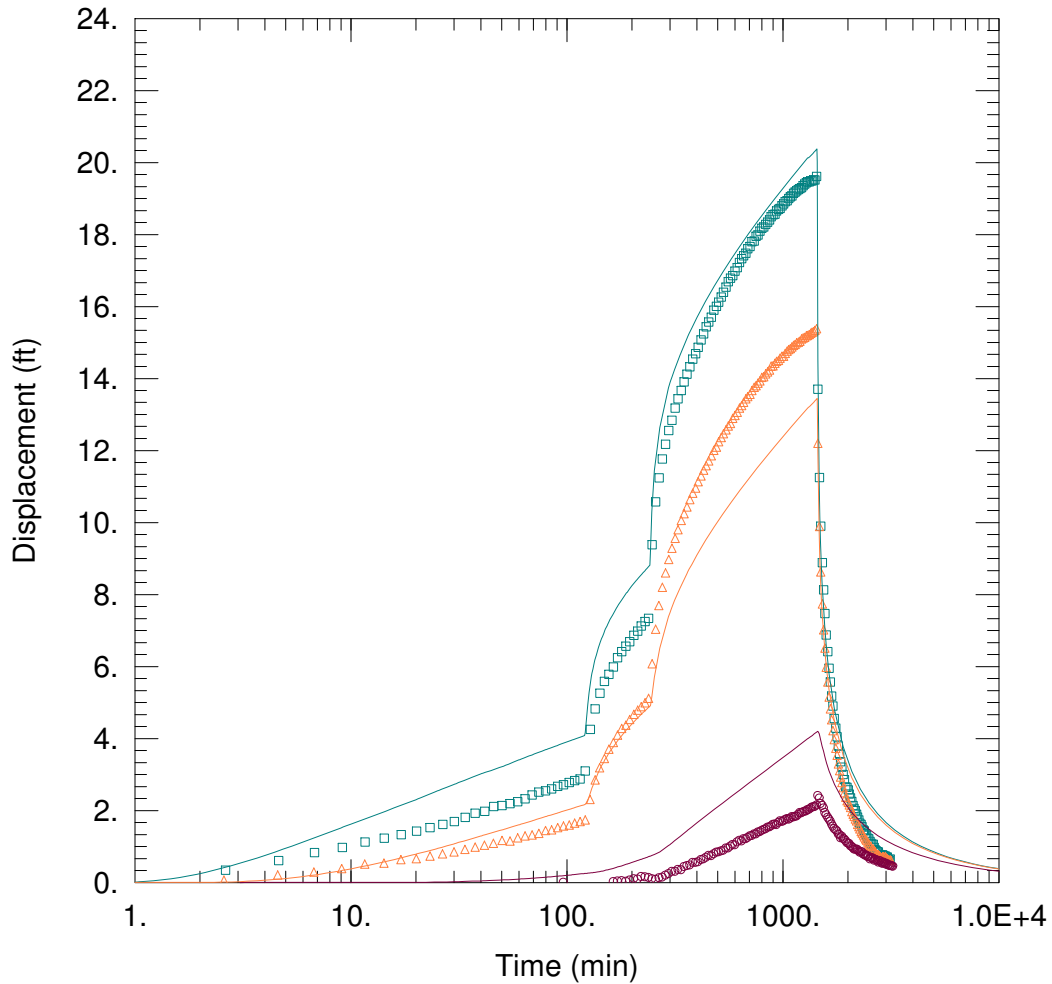
SOLUTION

Aquifer Model: Unconfined

Solution Method: Neuman

T = 1307. ft²/day
 Sy = 0.5

S = 0.007685
 Kz/Kr = 0.03771



WELL TEST ANALYSIS

Data Set: M:\2018033.00 TTL Twin Pines\Aquifer Tests\PWA\leaky\PWAob1d_2d_3d_NW.aqt
 Date: 03/29/19 Time: 10:43:56

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-A

AQUIFER DATA

Saturated Thickness: 100. ft Anisotropy Ratio (Kz/Kr): 0.1
 Aquitard Thickness (b'): 10. ft Aquitard Thickness (b''): 1. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-A | 0 | 0 | □ OWA1d | 0 | 50 |
| | | | △ OWA2d | 0 | 100 |
| | | | ○ OWA3d | 0 | 300 |

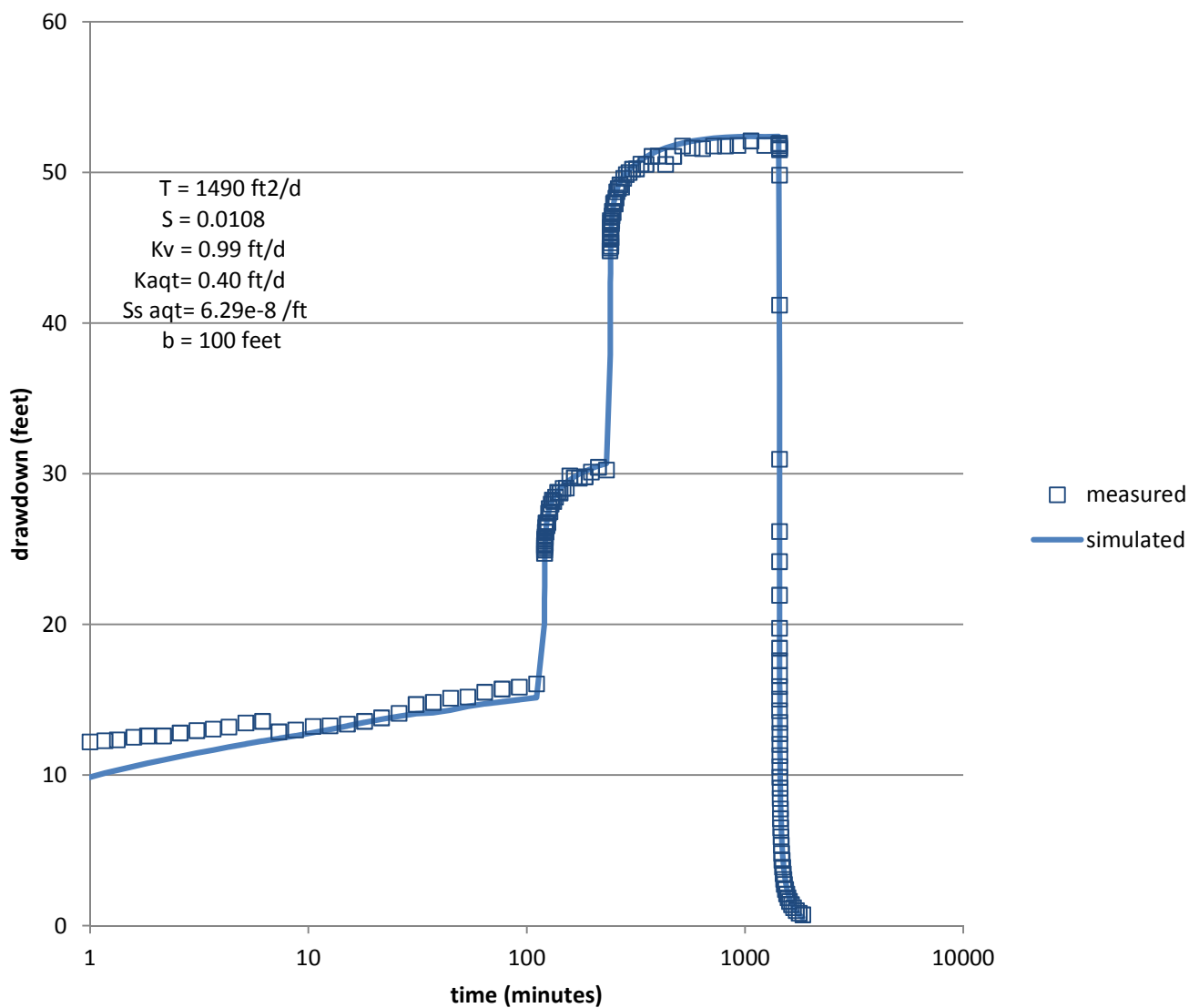
SOLUTION

Aquifer Model: Leaky Solution Method: Neuman-Witherspoon
 $T = 717.9 \text{ ft}^2/\text{day}$ $S = 0.001261$
 $1/B = 2.0E-5 \text{ ft}^{-1}$ $\beta/r = 0.002419 \text{ ft}^{-1}$
 $T2 = 1.44E+8 \text{ ft}^2/\text{day}$ $S2 = 1.0E-10$

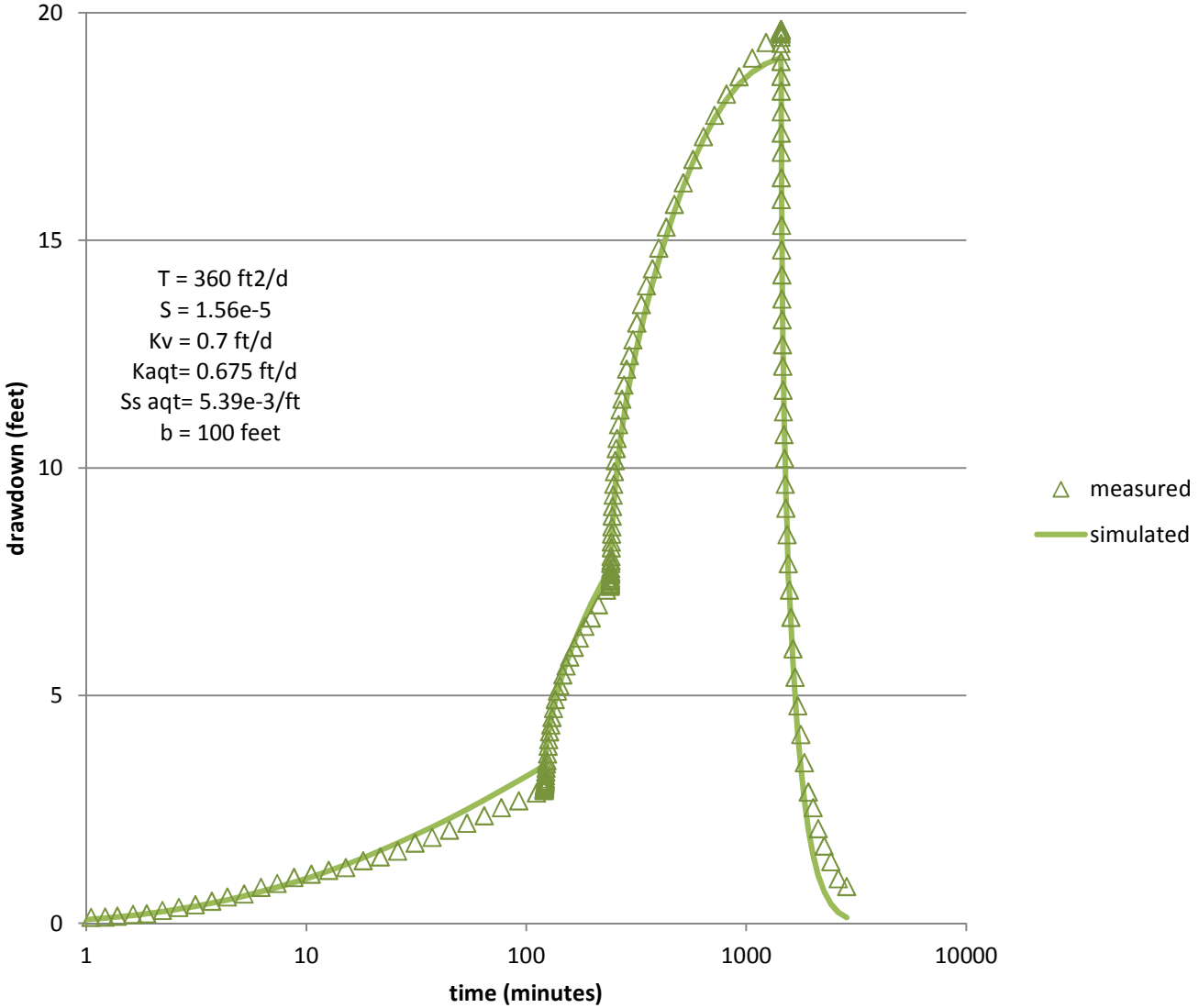
APPENDIX C

WHIP PWA TEST PLOTS

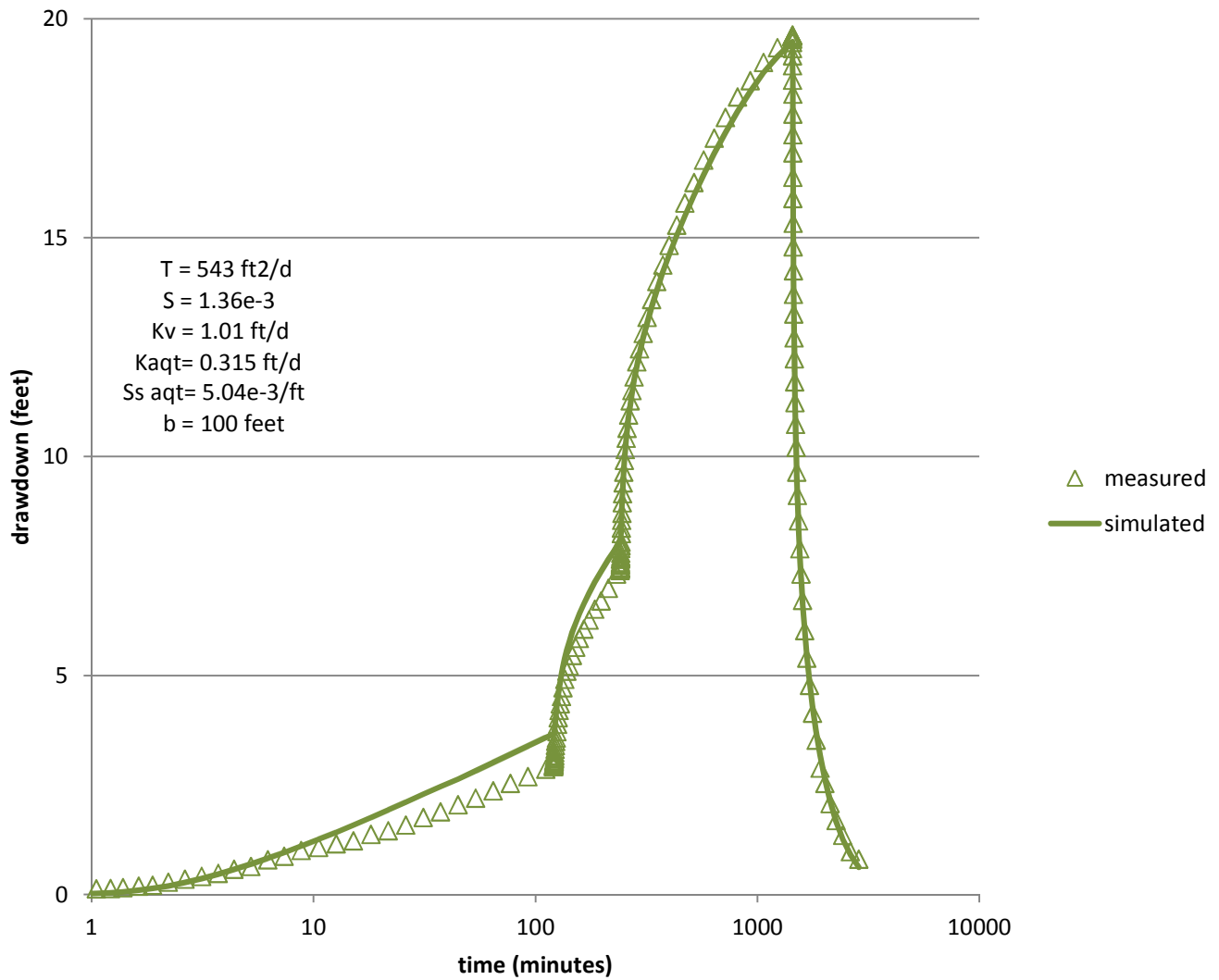
Measured and Simulated Drawdowns at PWA During Pumping of PWA at Approximately 75, 150 and 250 gpm Using Vertically Anisotropic Leaky Aquifer Solution in WHIP



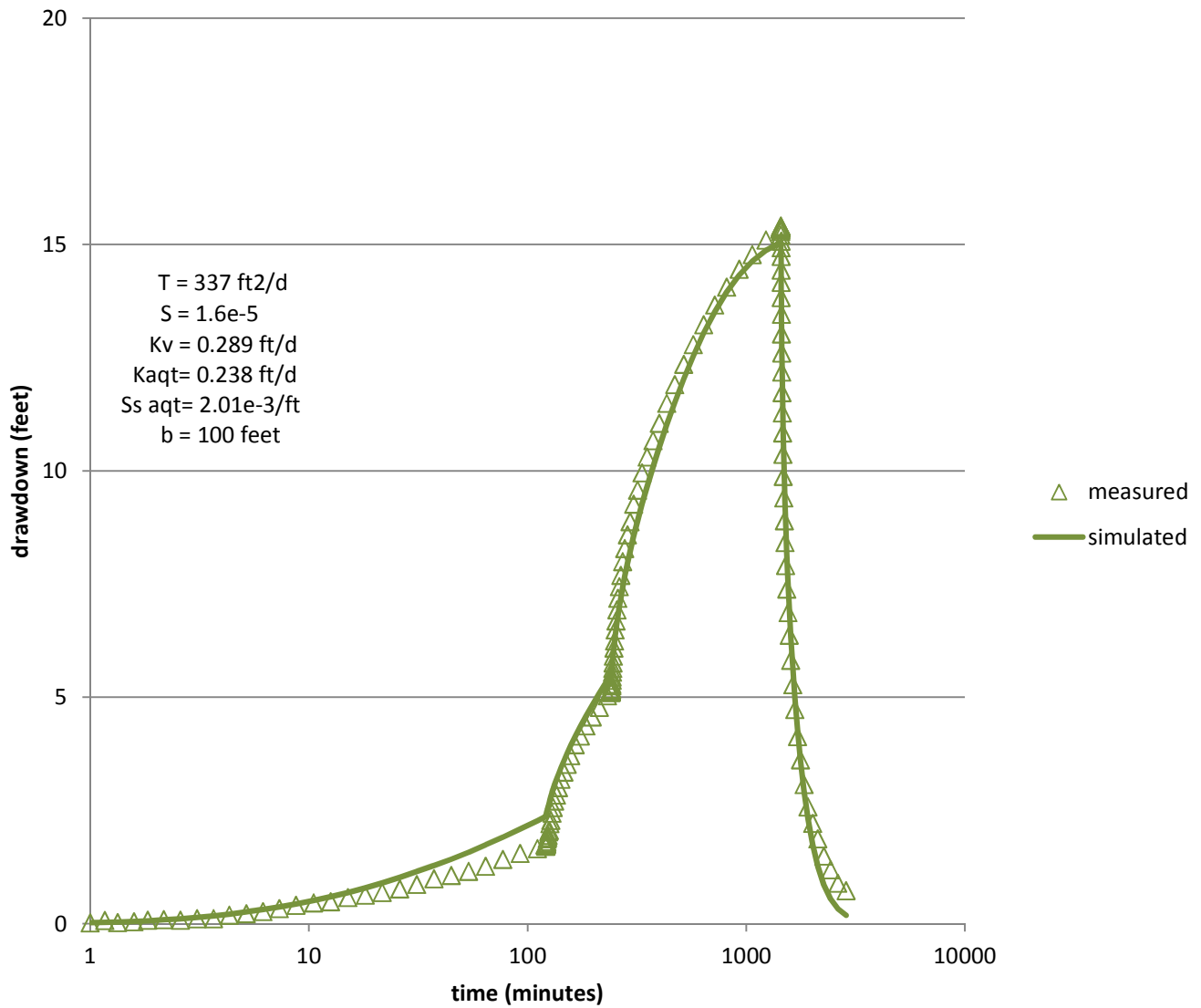
**Measured and Simulated Drawdowns at OWA1D
During Pumping of PWA at Approximately 75, 150 and 250 gpm
Using Vertically Anisotropic Leaky Aquifer Solution in WHIP**



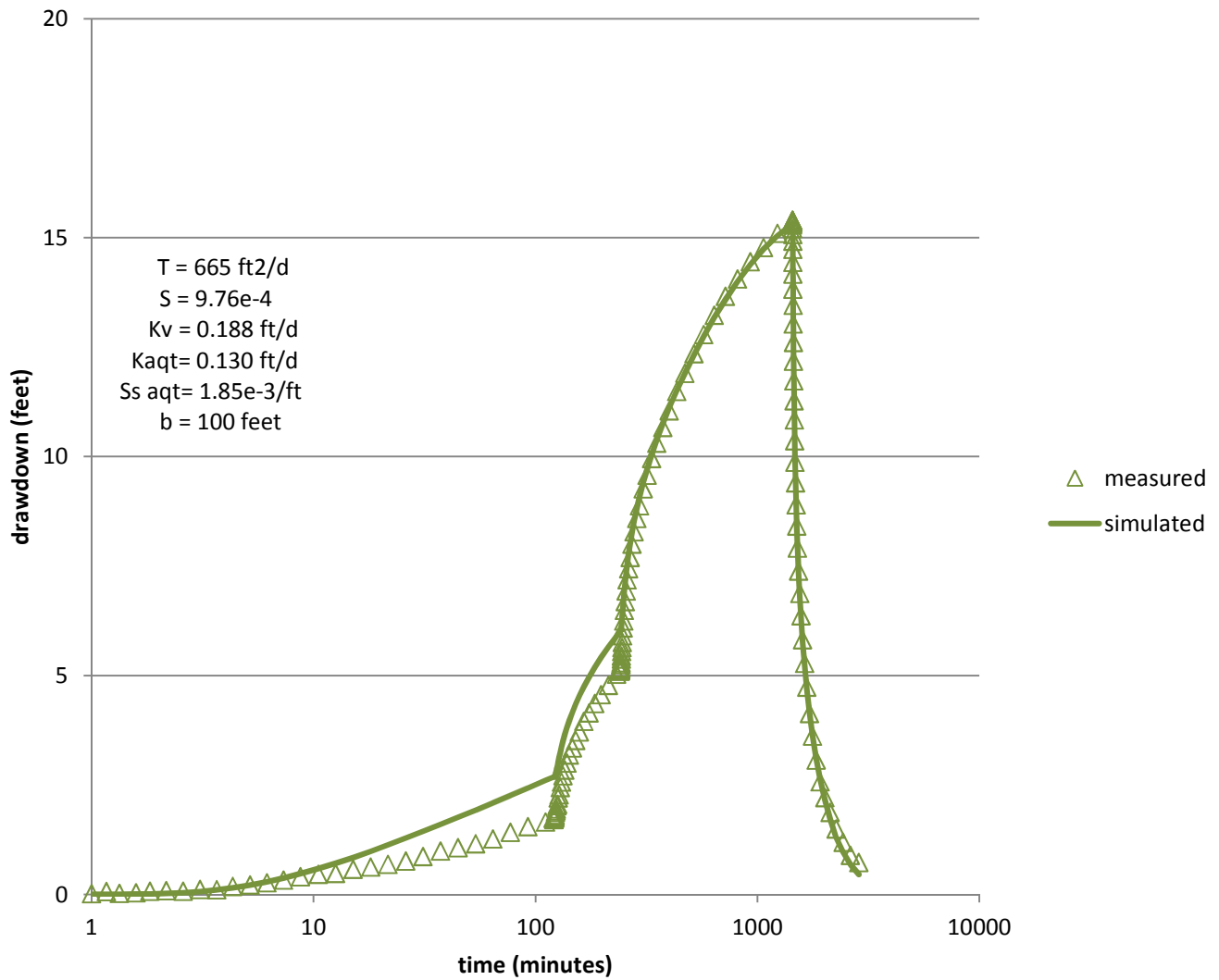
**Measured and Simulated Drawdowns at OWA1D
During Pumping of PWA at Approximately 75, 150 and 250 gpm
Using Vertically Anisotropic Leaky Aquifer Solution in WHIP
(fitting recovery data)**



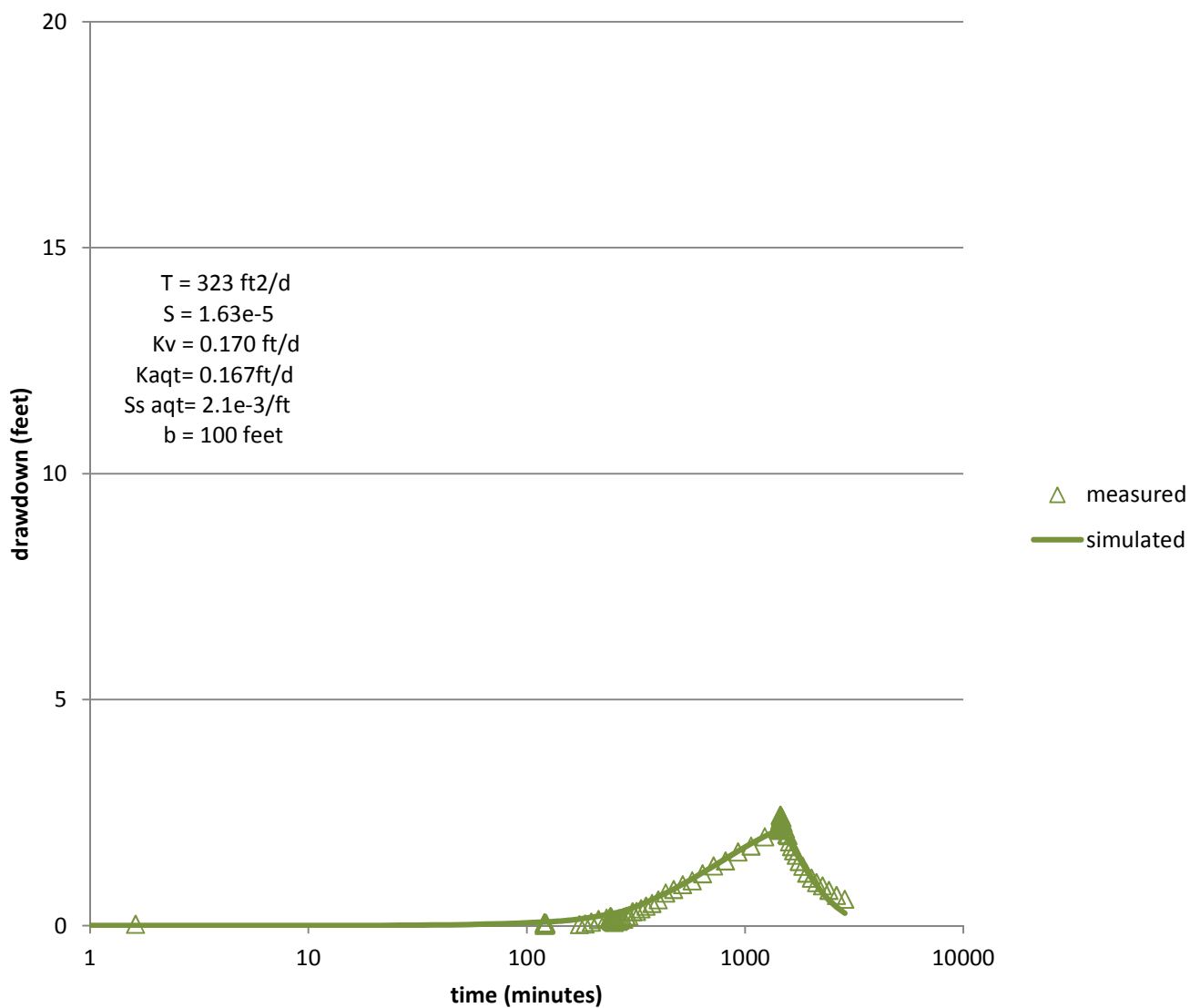
Measured and Simulated Drawdowns at OWA2D During Pumping of PWA at Approximately 75, 150 and 250 gpm Using Vertically Anisotropic Leaky Aquifer Solution in WHIP



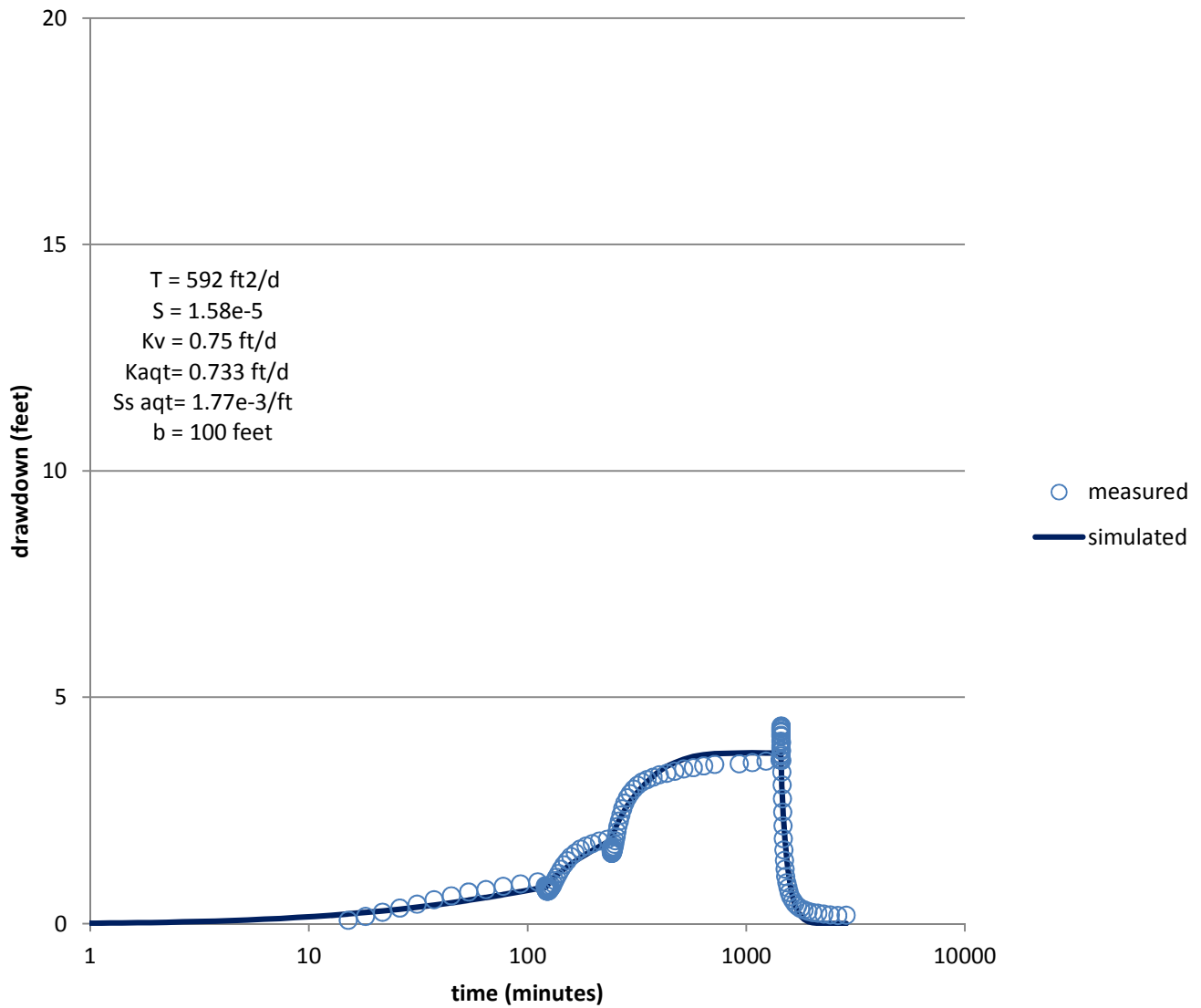
**Measured and Simulated Drawdowns at OWA2D
During Pumping of PWA at Approximately 75, 150 and 250 gpm
Using Vertically Anisotropic Leaky Aquifer Solution in WHIP
(fitting recovery data)**



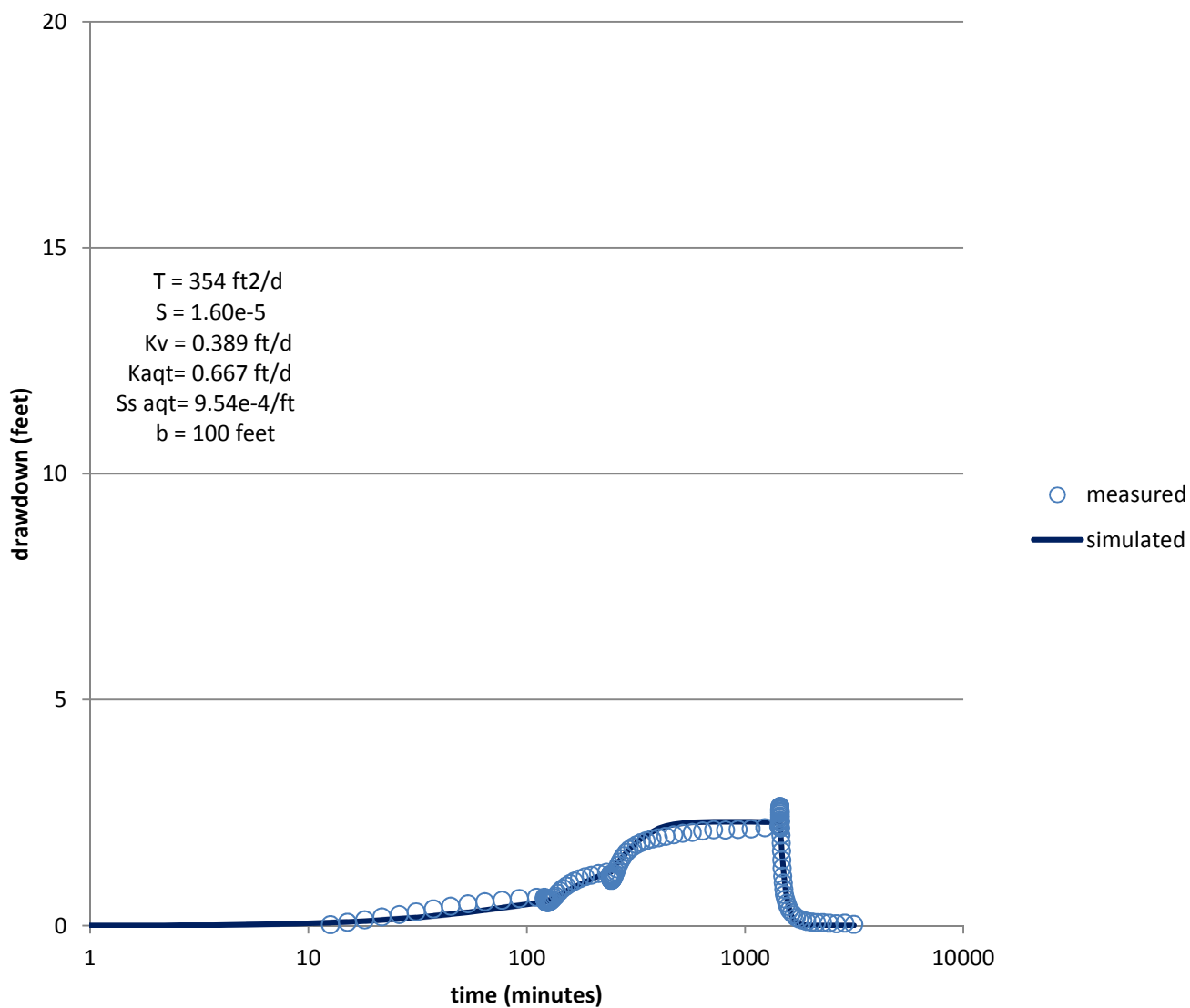
Measured and Simulated Drawdowns at OWA3D During Pumping of PWA at Approximately 75, 150 and 250 gpm Using Vertically Anisotropic Leaky Aquifer Solution in WHIP



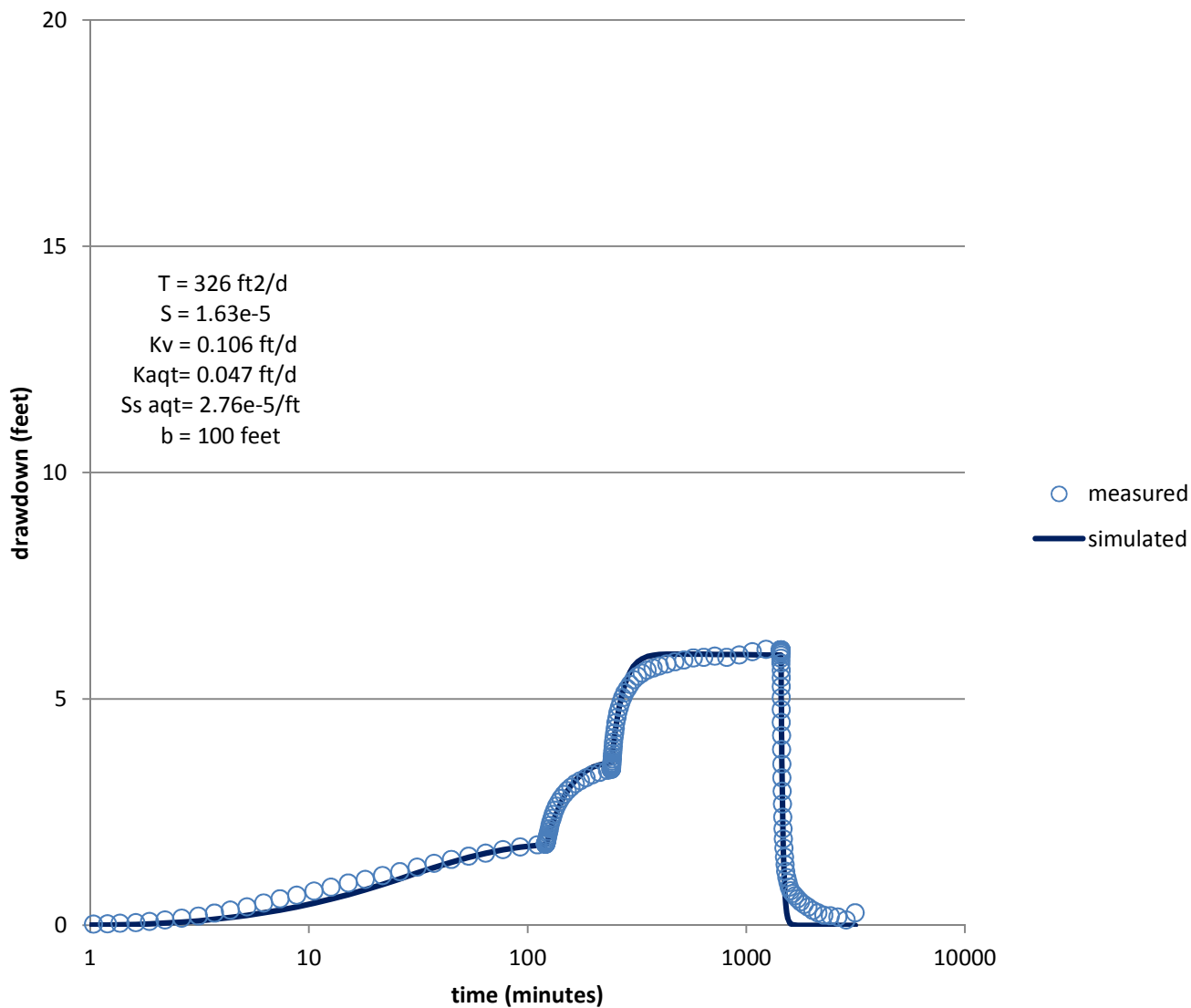
**Measured and Simulated Drawdowns at OWA1S
During Pumping of PWA at Approximately 75, 150 and 250 gpm
Using Vertically Anisotropic Leaky Aquifer Solution in WHIP**



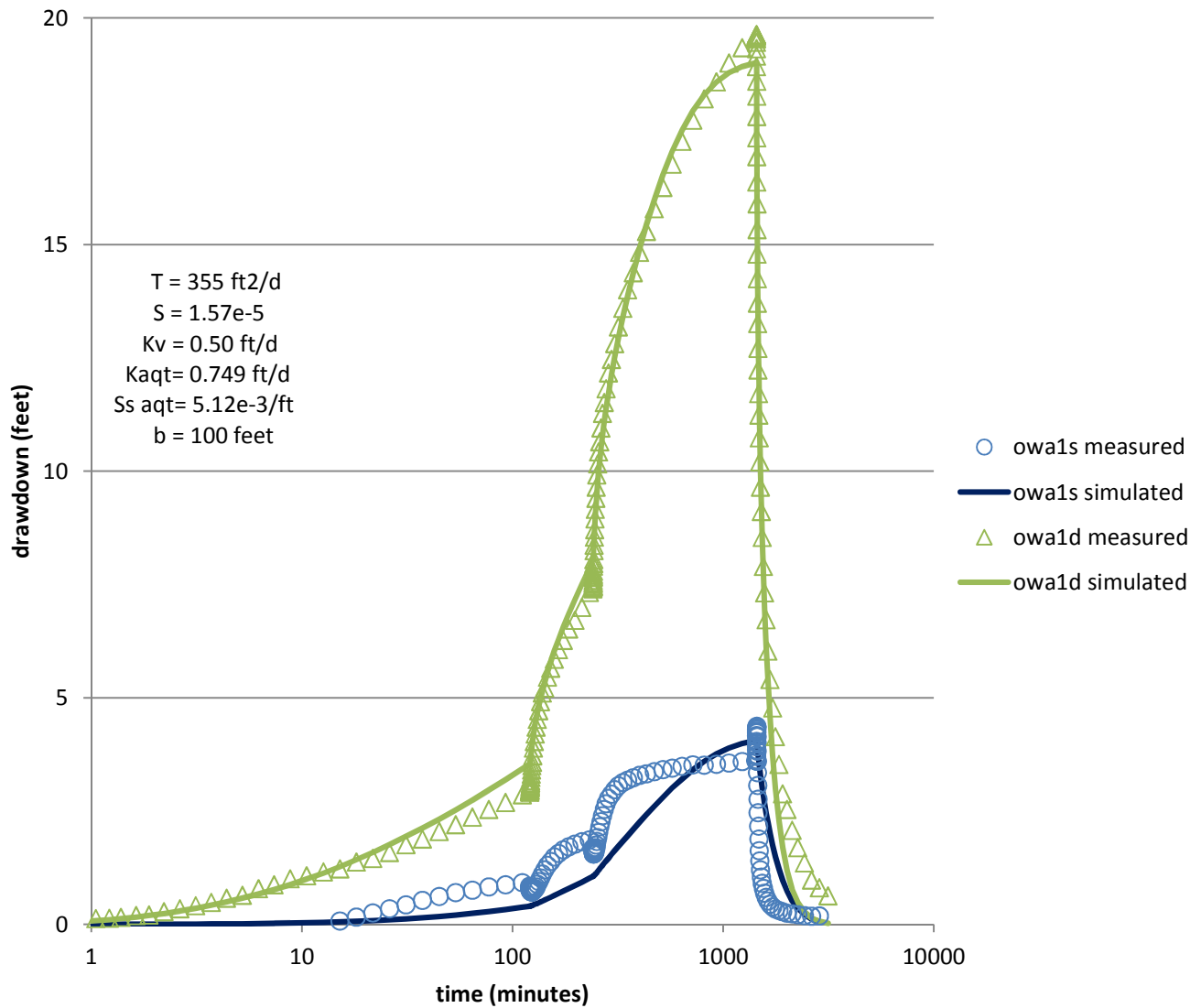
Measured and Simulated Drawdowns at OWA2S During Pumping of PWA at Approximately 75, 150 and 250 gpm Using Vertically Anisotropic Leaky Aquifer Solution in WHIP



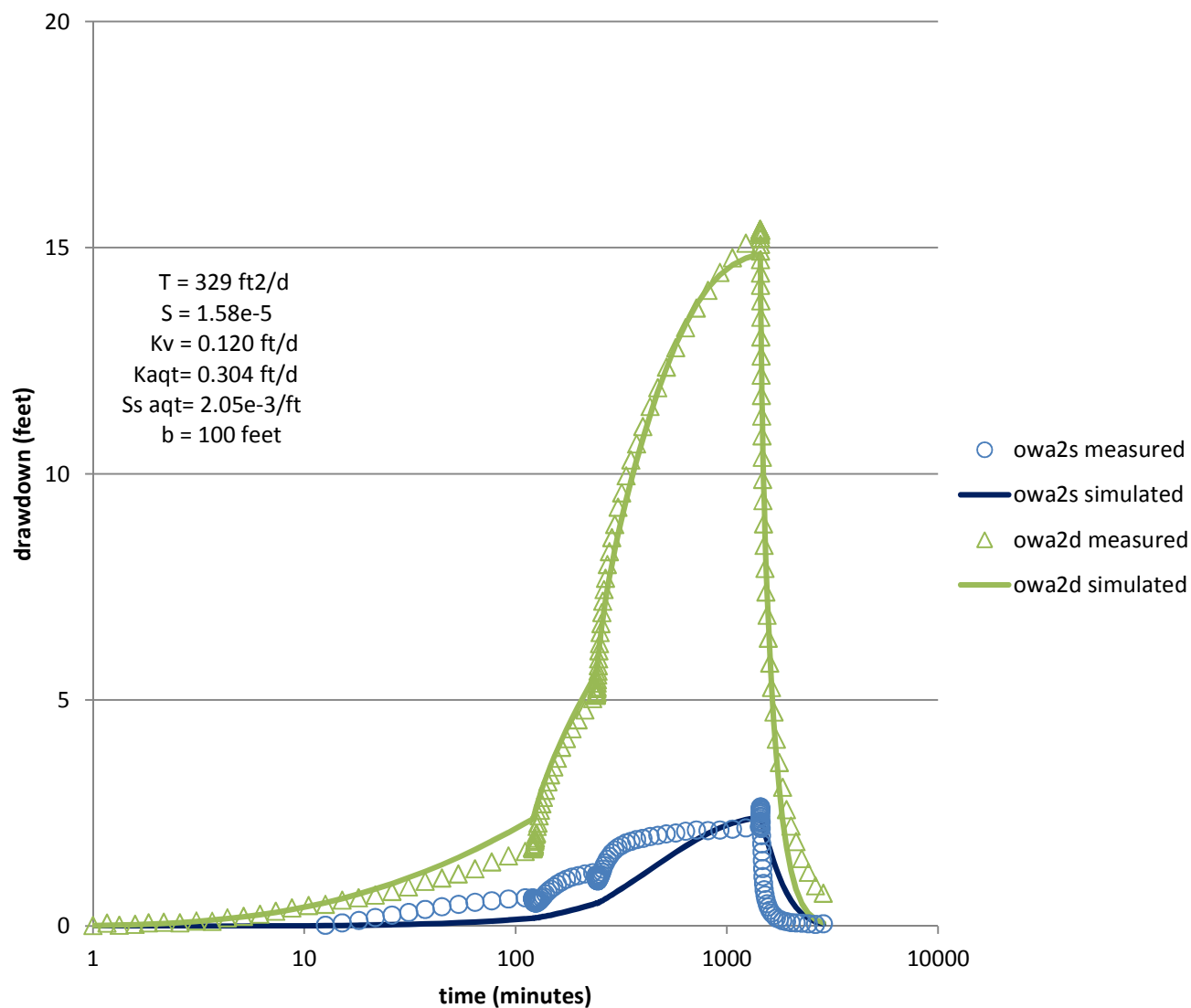
Measured and Simulated Drawdowns at OWA3S During Pumping of PWA at Approximately 75, 150 and 250 gpm Using Vertically Anisotropic Leaky Aquifer Solution in WHIP



**Measured and Simulated Drawdowns at OWA1D and OWA1S
During Pumping of PWA at Approximately 75, 150 and 250 gpm
Using Vertically Anisotropic Leaky Aquifer Solution in WHIP**

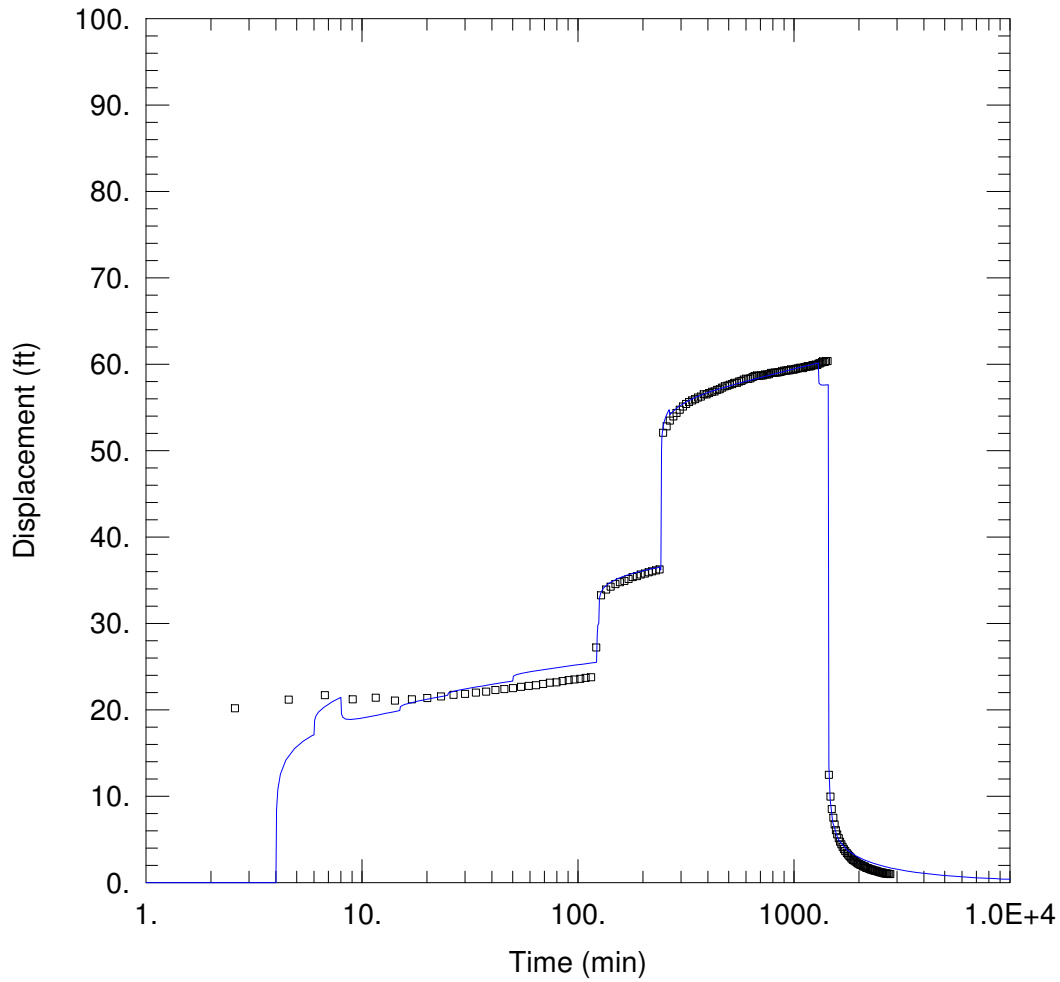


Measured and Simulated Drawdowns at OWA2D and OWA2S During Pumping of PWA at Approximately 75, 150 and 250 gpm Using Vertically Anisotropic Leaky Aquifer Solution in WHIP



APPENDIX D

AQTESOLV PWB TEST PLOTS



WELL TEST ANALYSIS

Data Set: H:\2018033.00 TTL Twin Pines\Aquifer Tests\PWB\unconf\PWB.aqt
 Date: 03/27/19 Time: 14:20:03

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-B

AQUIFER DATA

Saturated Thickness: 115. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-B | 0 | 0 | □ PW-B | 0 | 0 |

SOLUTION

Aquifer Model: Unconfined

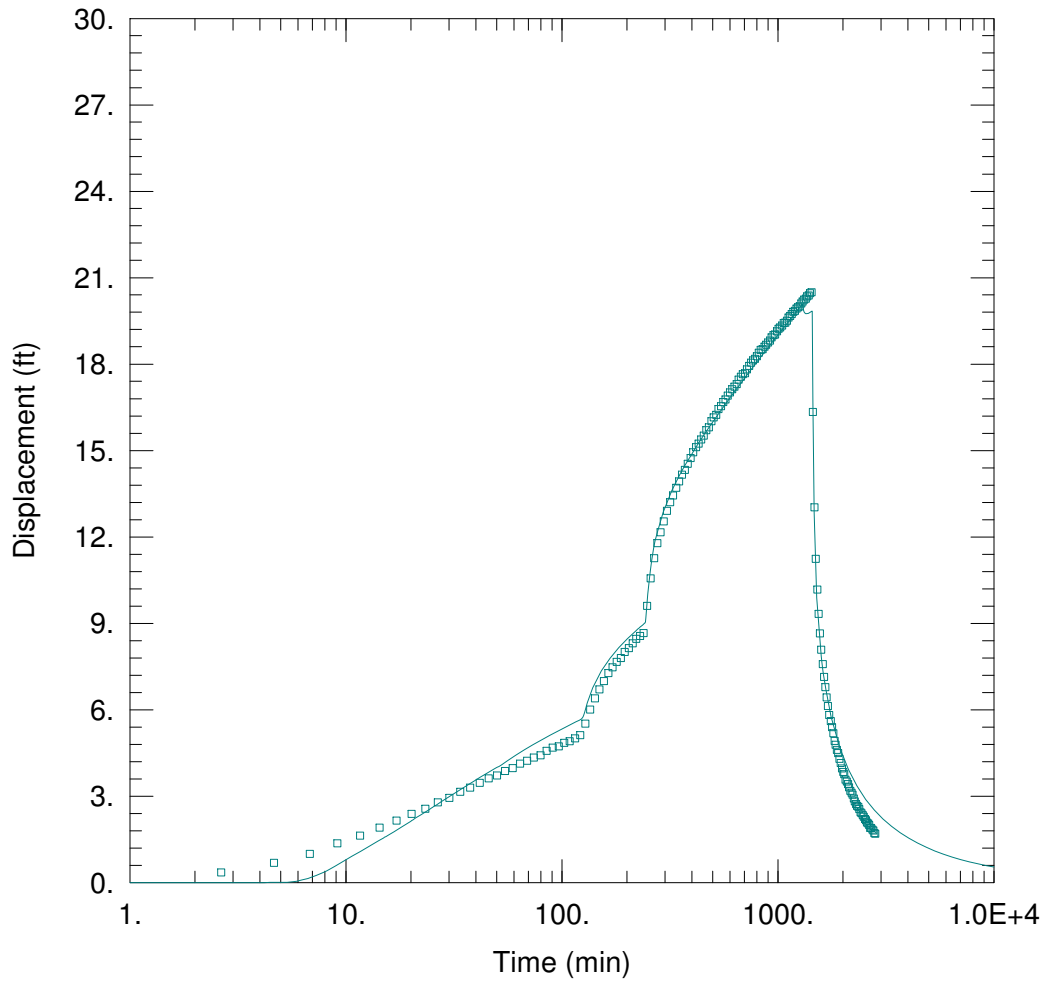
Solution Method: Neuman

T = 697. ft²/day

S = 0.002418

Sy = 0.001

β = 1.89E-6



WELL TEST ANALYSIS

Data Set: H:\2018033.00 TTL Twin Pines\Aquifer Tests\PWB\unconf\1well\PWBob1d.aqt
 Date: 04/15/19 Time: 13:58:44

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-B

AQUIFER DATA

Saturated Thickness: 115. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-B | 0 | 0 | □ <u>OWB1d</u> | 0 | 50 |

SOLUTION

Aquifer Model: Unconfined

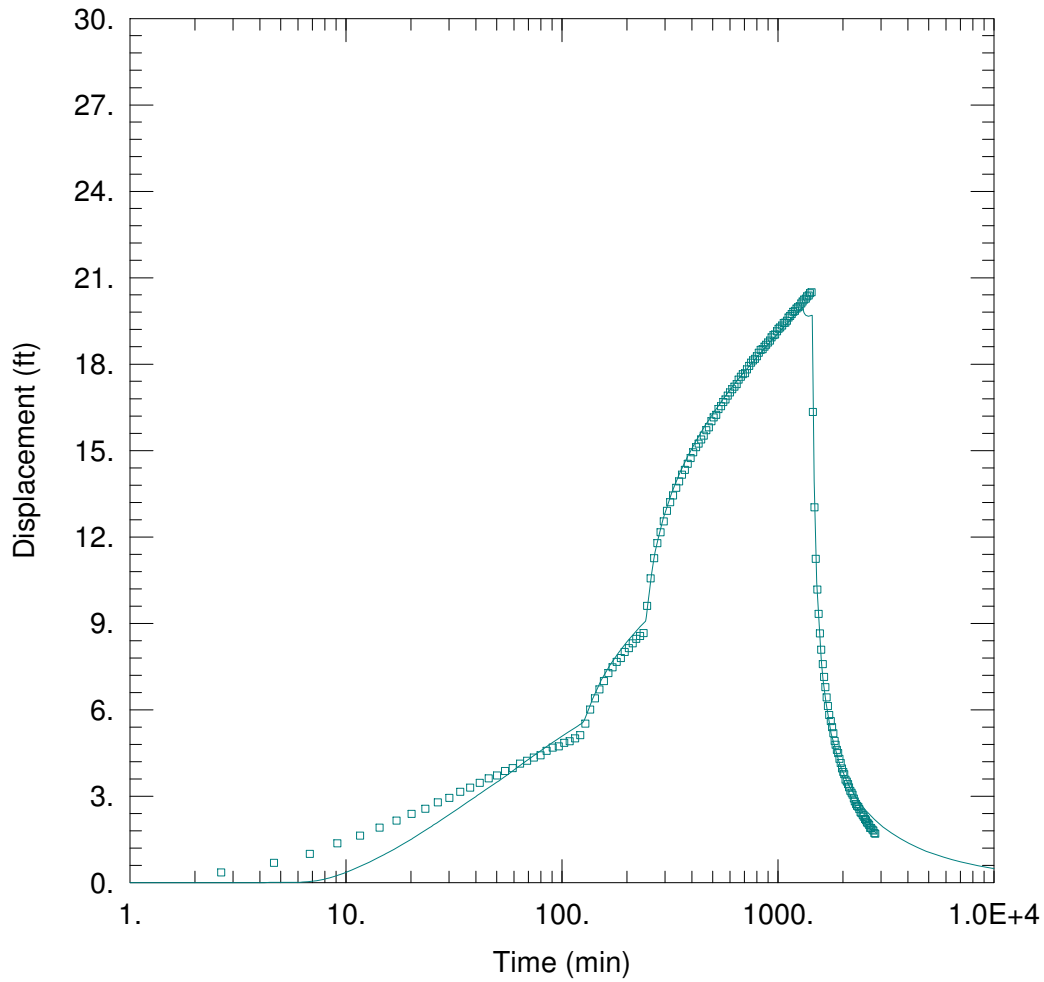
Solution Method: Neuman

T = 478.1 ft²/day

S = 0.002919

Sy = 0.001

Kz/Kr = 0.3432



WELL TEST ANALYSIS

Data Set: H:\2018033.00 TTL Twin Pines\Aquifer Tests\PWB\unconf\1well\PWBob1d2.aqt
 Date: 04/15/19 Time: 14:00:13

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-B

AQUIFER DATA

Saturated Thickness: 115. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-B | 0 | 0 | □ <u>OWB1d</u> | 0 | 50 |

SOLUTION

Aquifer Model: Unconfined

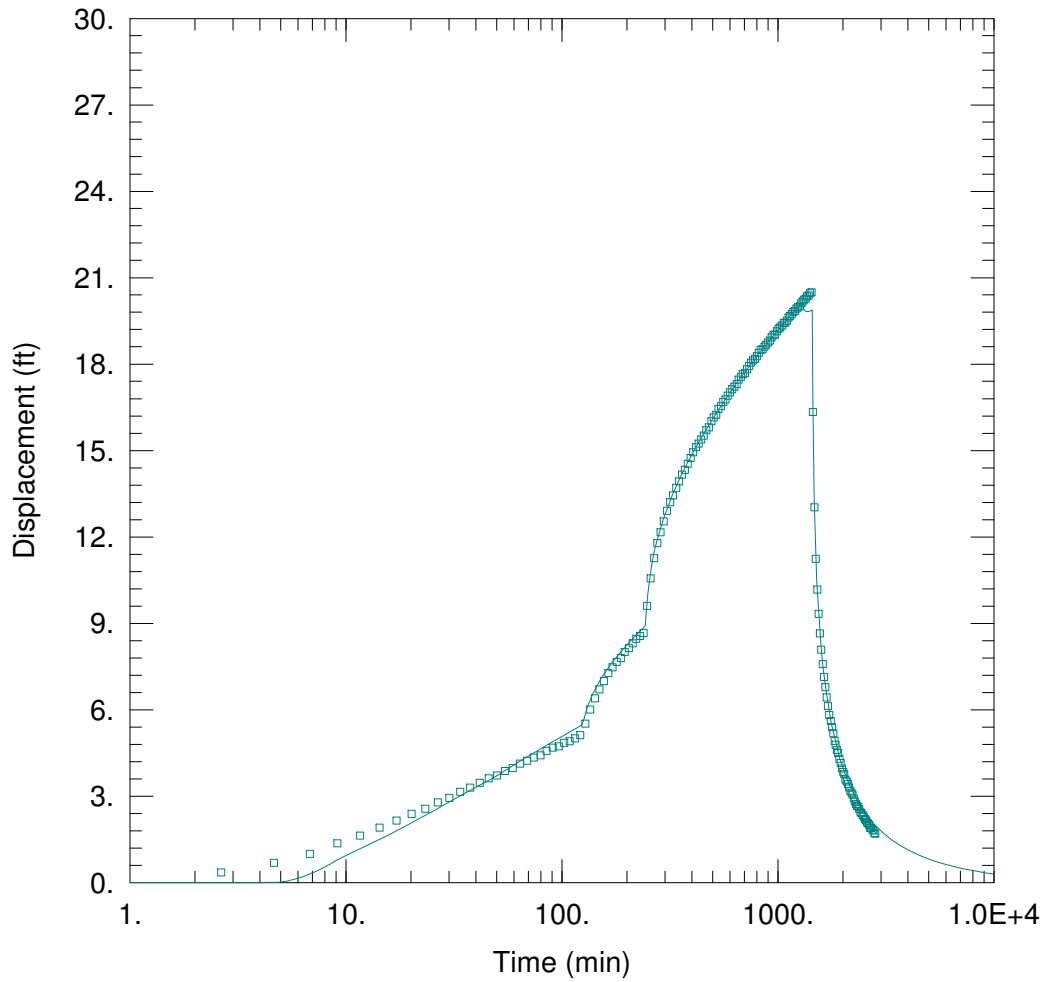
Solution Method: Neuman

T = 529. ft²/day

S = 0.004956

Sy = 0.001

Kz/Kr = 0.101



WELL TEST ANALYSIS

Data Set: H:\2018033.00 TTL Twin Pines\Aquifer Tests\PWB\unconf\1well\PWBob1d3.aqt
 Date: 04/15/19 Time: 14:01:07

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-B

AQUIFER DATA

Saturated Thickness: 115. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-B | 0 | 0 | □ <u>OWB1d</u> | 0 | 50 |

SOLUTION

Aquifer Model: Unconfined

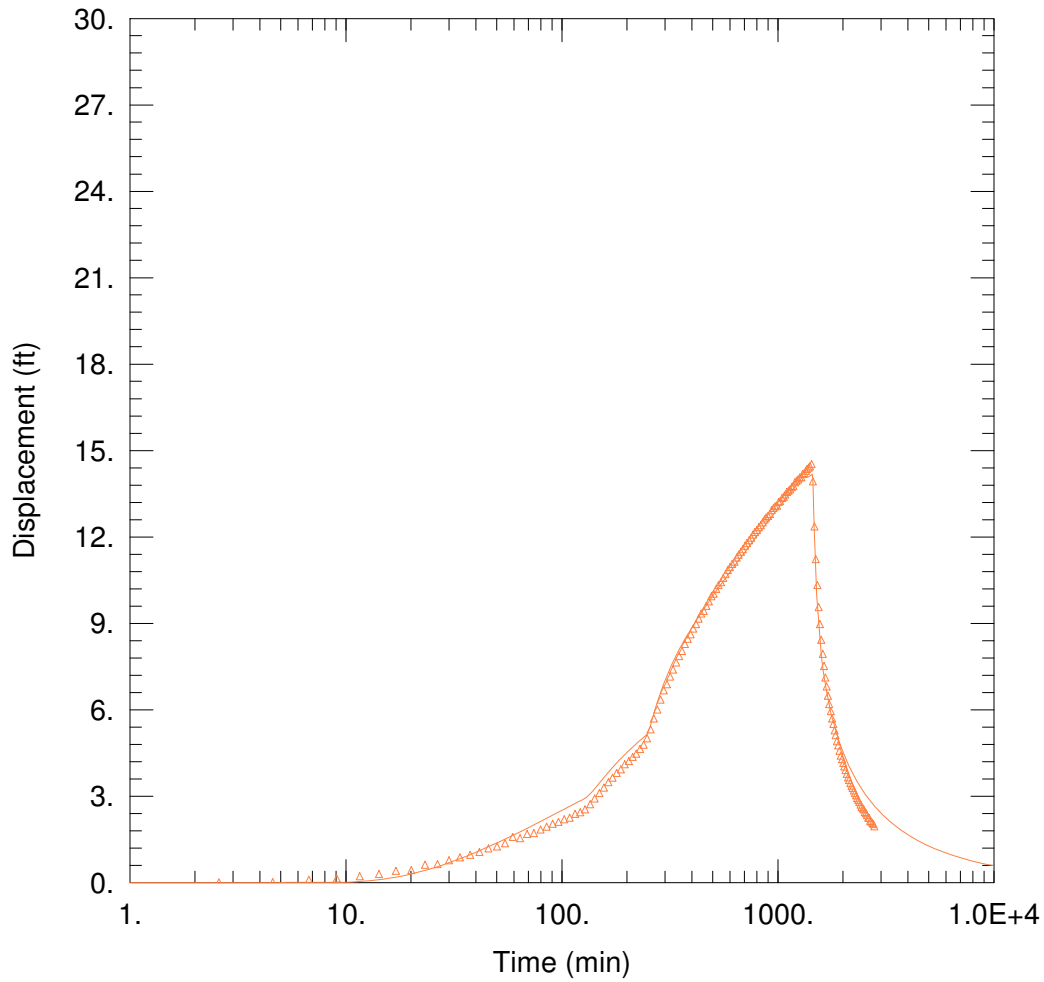
Solution Method: Neuman

T = 900.8 ft²/day

S = 0.003201

Sy = 0.25

Kz/Kr = 0.001186



WELL TEST ANALYSIS

Data Set: H:\2018033.00 TTL Twin Pines\Aquifer Tests\PWB\unconf\1well\PWBob2d.aqt
 Date: 04/15/19 Time: 14:08:26

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-B

AQUIFER DATA

Saturated Thickness: 115. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-B | 0 | 0 | △ <u>OWB2d</u> | 0 | 100 |

SOLUTION

Aquifer Model: Unconfined

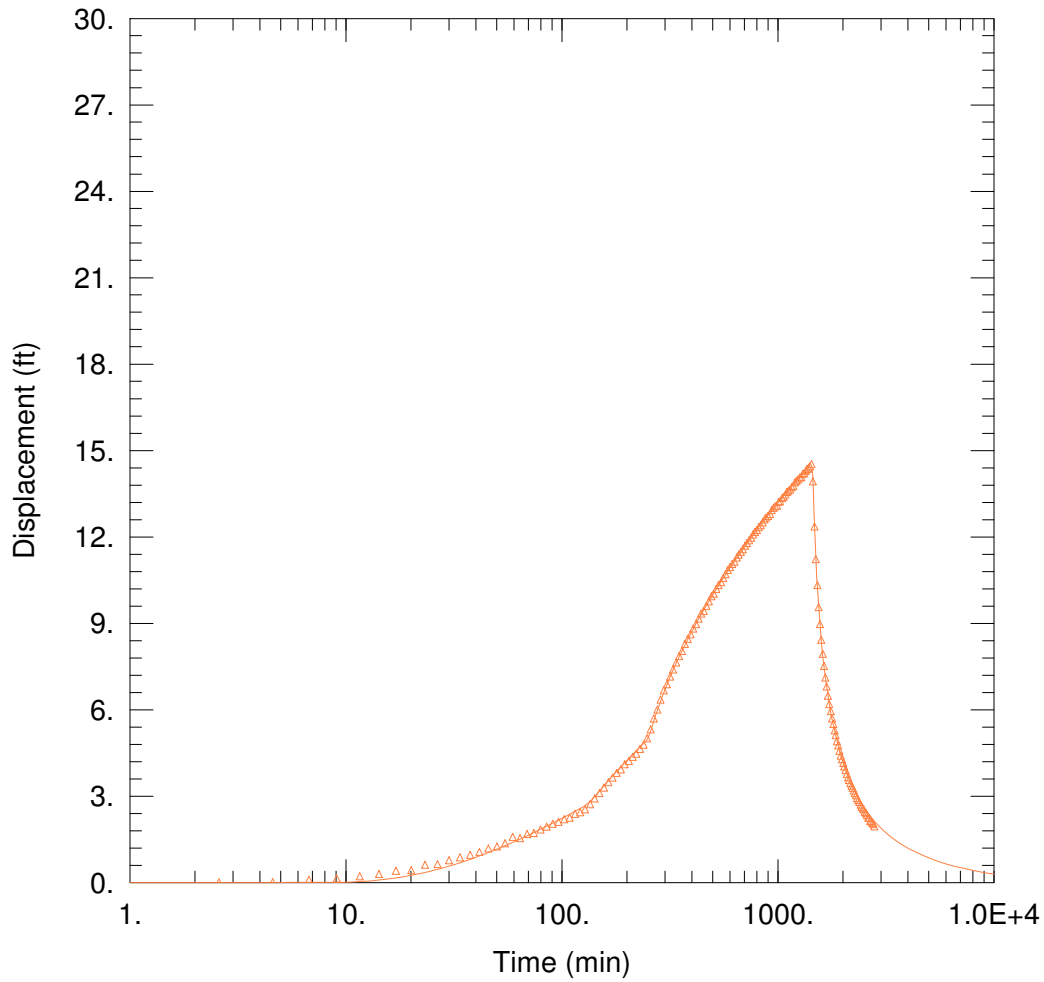
Solution Method: Neuman

T = 442.3 ft²/day

S = 0.002953

Sy = 0.001

Kz/Kr = 0.2292



WELL TEST ANALYSIS

Data Set: H:\2018033.00 TTL Twin Pines\Aquifer Tests\PWB\unconf\1well\PWBob2d2.aqt
 Date: 04/15/19 Time: 14:07:55

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-B

AQUIFER DATA

Saturated Thickness: 115. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-B | 0 | 0 | △ <u>OWB2d</u> | 0 | 100 |

SOLUTION

Aquifer Model: Unconfined

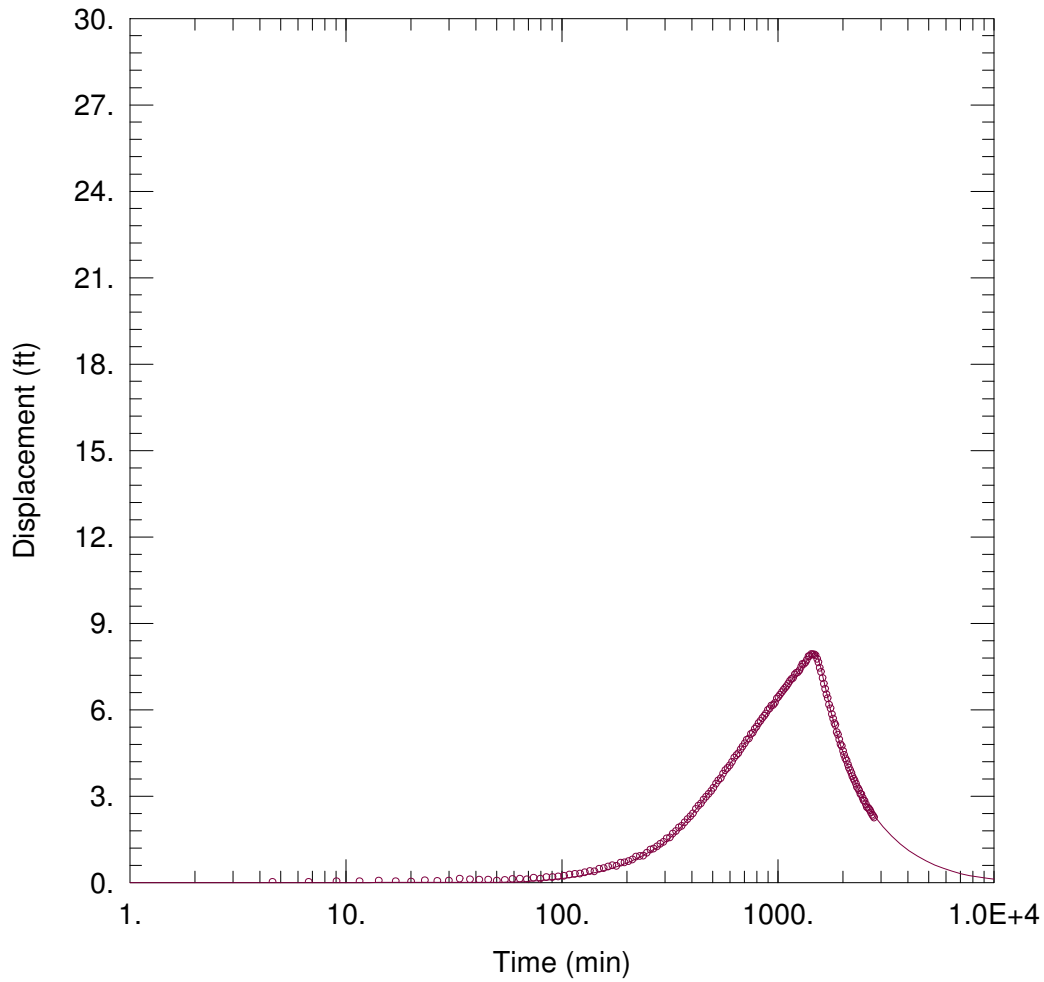
Solution Method: Neuman

T = 808.2 ft²/day

S = 0.004784

Sy = 0.25

Kz/Kr = 0.002553



WELL TEST ANALYSIS

Data Set: H:\2018033.00 TTL Twin Pines\Aquifer Tests\PWB\unconf\1well\PWBob3d.aqt
 Date: 04/15/19 Time: 14:10:37

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-B

AQUIFER DATA

Saturated Thickness: 115. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-B | 0 | 0 | ◦ <u>OWB3d</u> | 0 | 300 |

SOLUTION

Aquifer Model: Unconfined

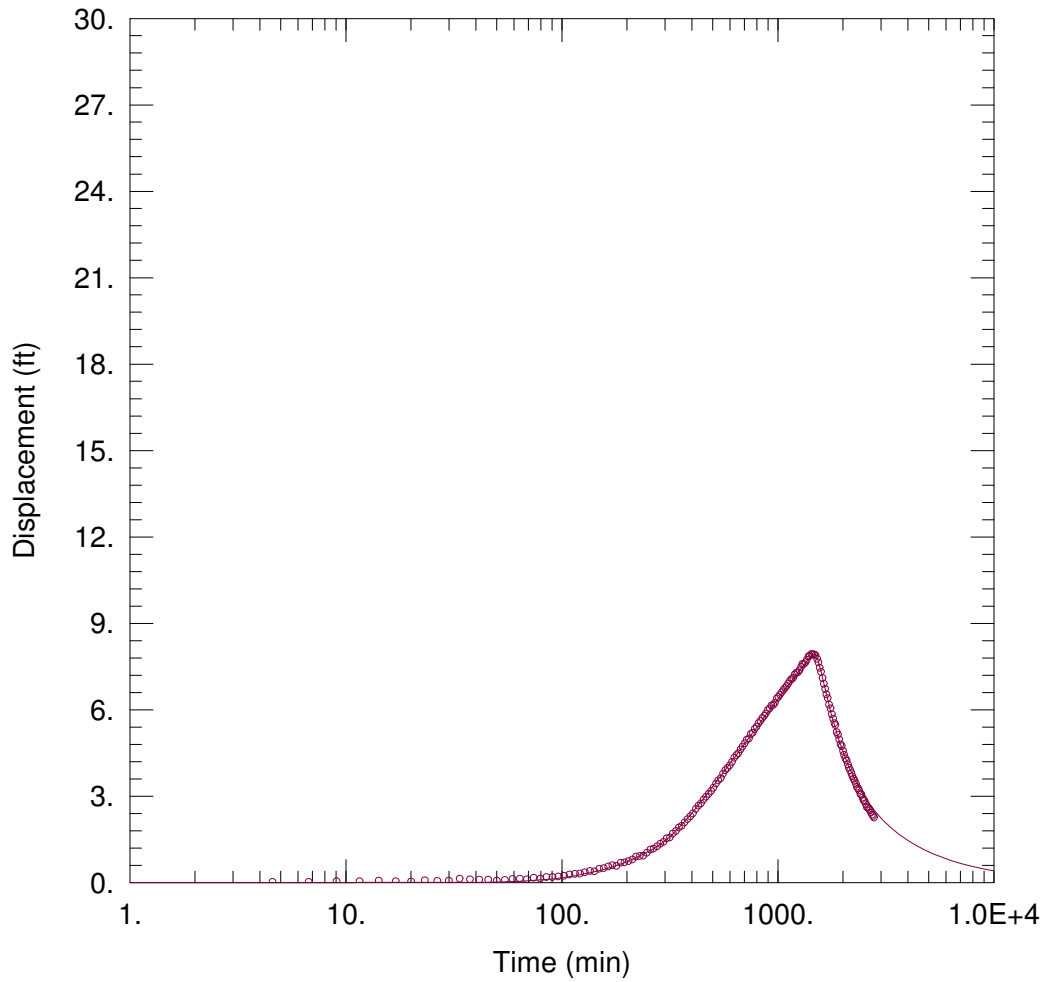
Solution Method: Neuman

T = 474.5 ft²/day

S = 0.002944

Sy = 0.25

Kz/Kr = 0.01052



WELL TEST ANALYSIS

Data Set: H:\2018033.00 TTL Twin Pines\Aquifer Tests\PWB\unconf\1well\PWBob3d2.aqt
 Date: 04/15/19 Time: 14:11:12

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-B

AQUIFER DATA

Saturated Thickness: 115. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-B | 0 | 0 | ◦ <u>OWB3d</u> | 0 | 300 |

SOLUTION

Aquifer Model: Unconfined

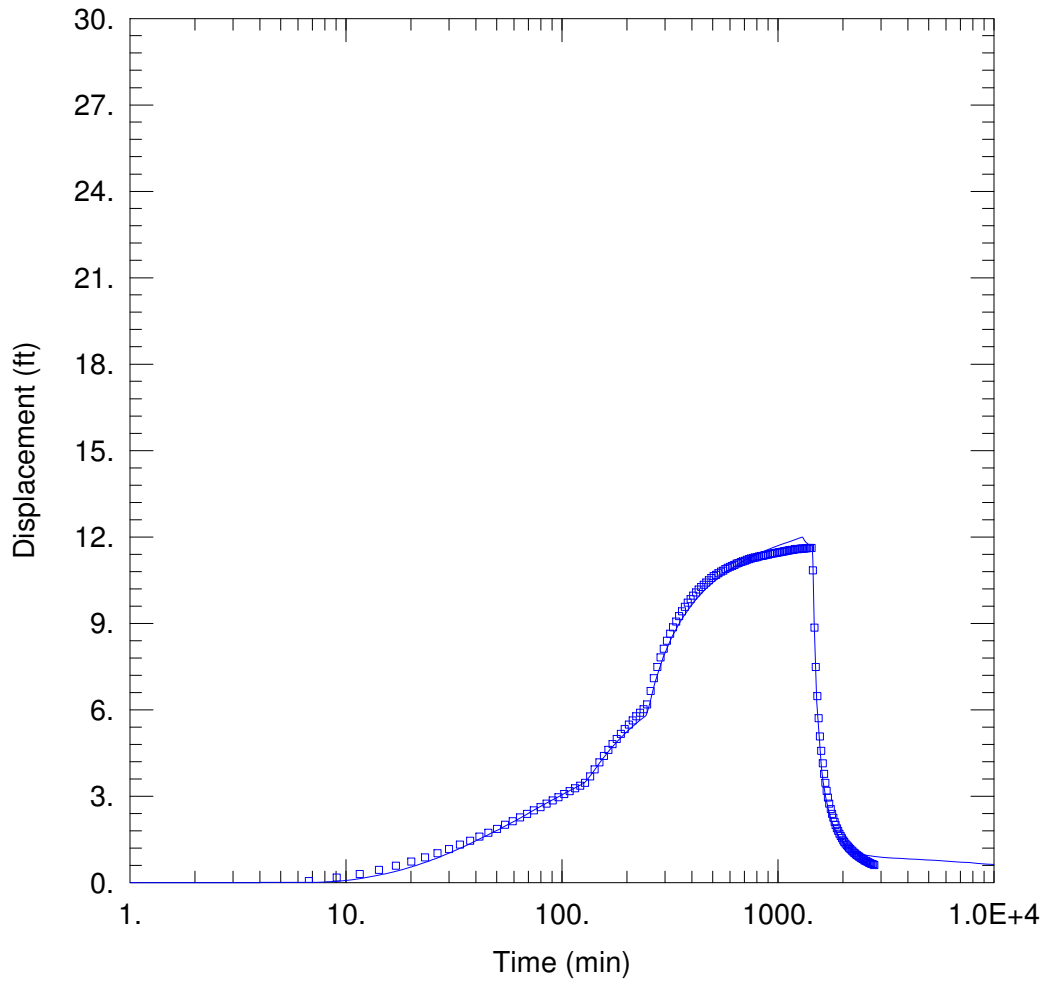
Solution Method: Neuman

T = 674.2 ft²/day

S = 0.003427

Sy = 0.25

Kz/Kr = 0.001574



WELL TEST ANALYSIS

Data Set: H:\2018033.00 TTL Twin Pines\Aquifer Tests\PWB\unconf\1well\PWBob1s.aqt
 Date: 04/15/19 Time: 14:01:44

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-B

AQUIFER DATA

Saturated Thickness: 115. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-B | 0 | 0 | □ <u>OWB1s</u> | 0 | 50 |

SOLUTION

Aquifer Model: Unconfined

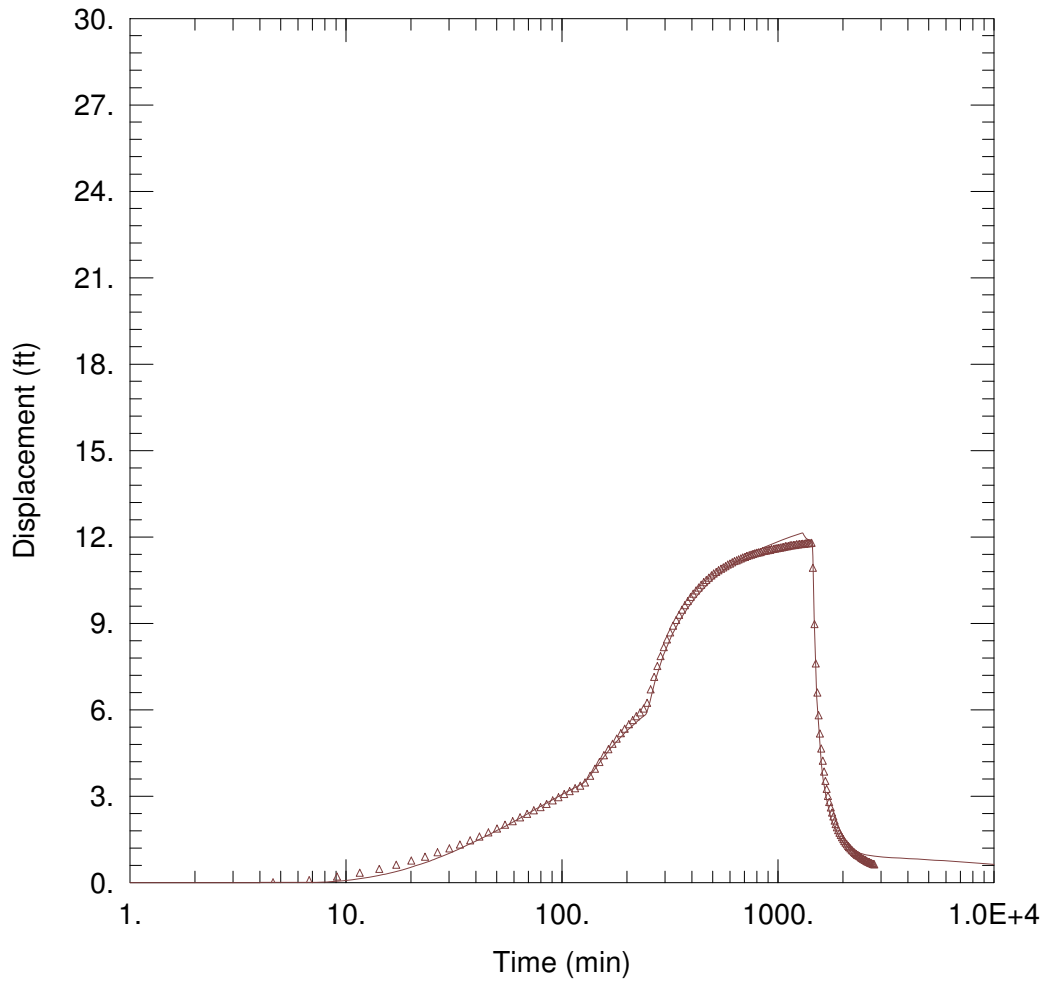
Solution Method: Neuman

T = 223.6 ft²/day

S = 0.0001192

Sy = 0.004584

Kz/Kr = 0.01089



WELL TEST ANALYSIS

Data Set: H:\2018033.00 TTL Twin Pines\Aquifer Tests\PWB\unconf\1well\PWBob2s.aqt
 Date: 04/15/19 Time: 14:09:09

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-B

AQUIFER DATA

Saturated Thickness: 115. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-B | 0 | 0 | △ <u>OWB2s</u> | 0 | 100 |

SOLUTION

Aquifer Model: Unconfined

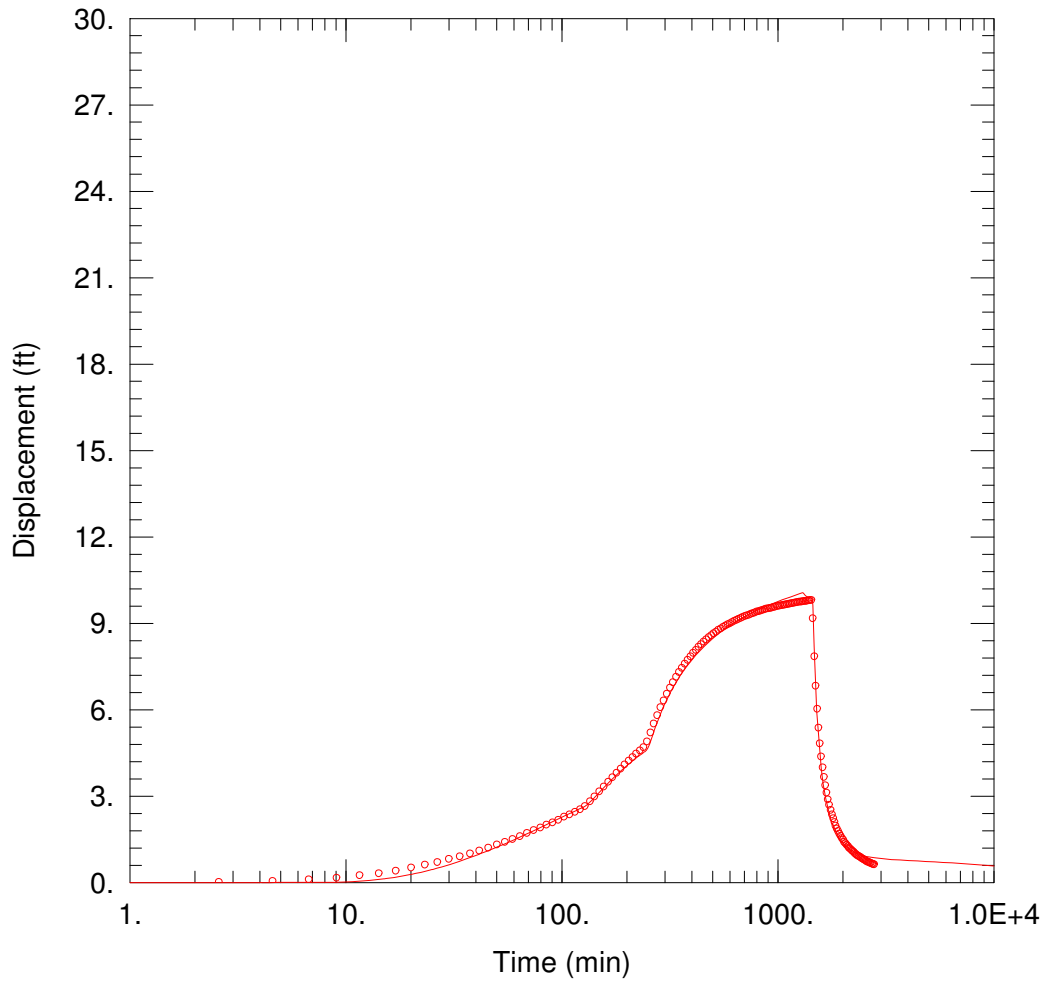
Solution Method: Neuman

T = 220.6 ft²/day

S = 2.96E-5

Sy = 0.001125

Kz/Kr = 0.002689



WELL TEST ANALYSIS

Data Set: H:\2018033.00 TTL Twin Pines\Aquifer Tests\PWB\unconf\1well\PWBob3s.aqt
 Date: 04/15/19 Time: 14:12:06

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-B

AQUIFER DATA

Saturated Thickness: 115. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-B | 0 | 0 | ◦ OWB3s | 0 | 300 |

SOLUTION

Aquifer Model: Unconfined

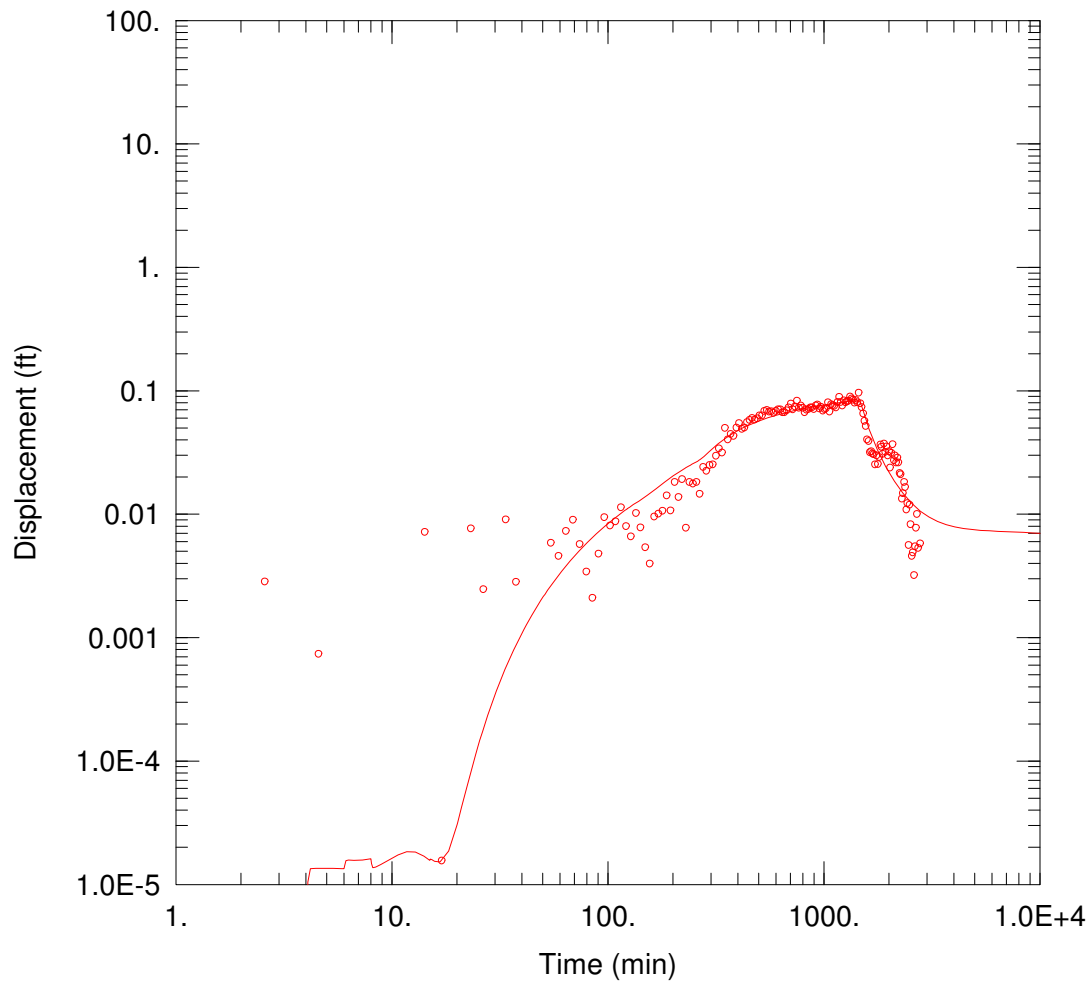
Solution Method: Neuman

T = 246.8 ft²/day

S = 3.089E-5

Sy = 0.001

Kz/Kr = 0.002275



WELL TEST ANALYSIS

Data Set: H:\2018033.00 TTL Twin Pines\Aquifer Tests\PWB\unconf\1well\PWBob2bs.aqt
 Date: 04/15/19 Time: 14:04:58

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-B

AQUIFER DATA

Saturated Thickness: 115. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-B | 0 | 0 | ◦ OWB2Bs | 0 | 100 |

SOLUTION

Aquifer Model: Unconfined

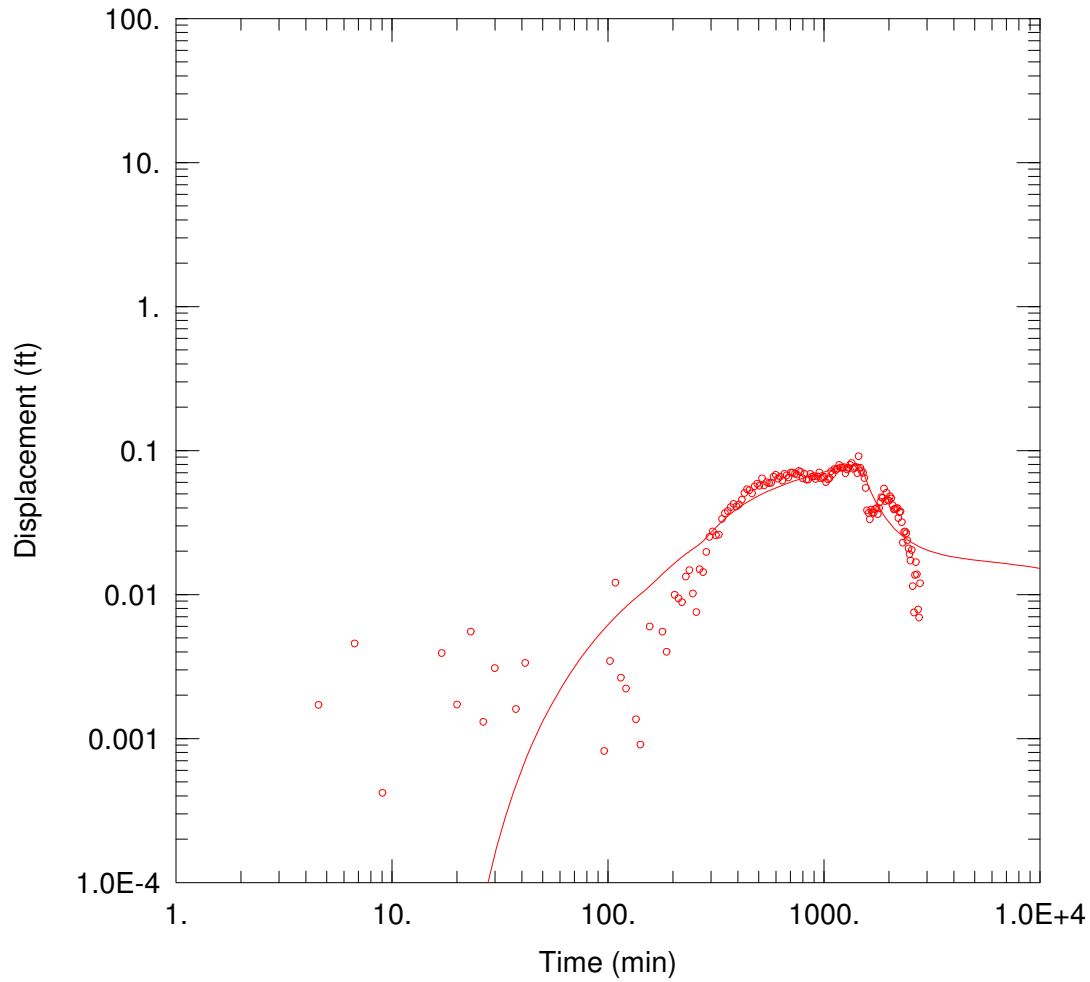
Solution Method: Neuman

T = 5455. ft²/day

S = 0.000137

Sy = 0.0178

Kz/Kr = 0.000216



WELL TEST ANALYSIS

Data Set: H:\2018033.00 TTL Twin Pines\Aquifer Tests\PWB\unconf\1well\PWBob3bs.aqt
 Date: 04/15/19 Time: 14:09:55

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-B

AQUIFER DATA

Saturated Thickness: 115. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-B | 0 | 0 | ◦ OWB3Bs | 0 | 50 |

SOLUTION

Aquifer Model: Unconfined

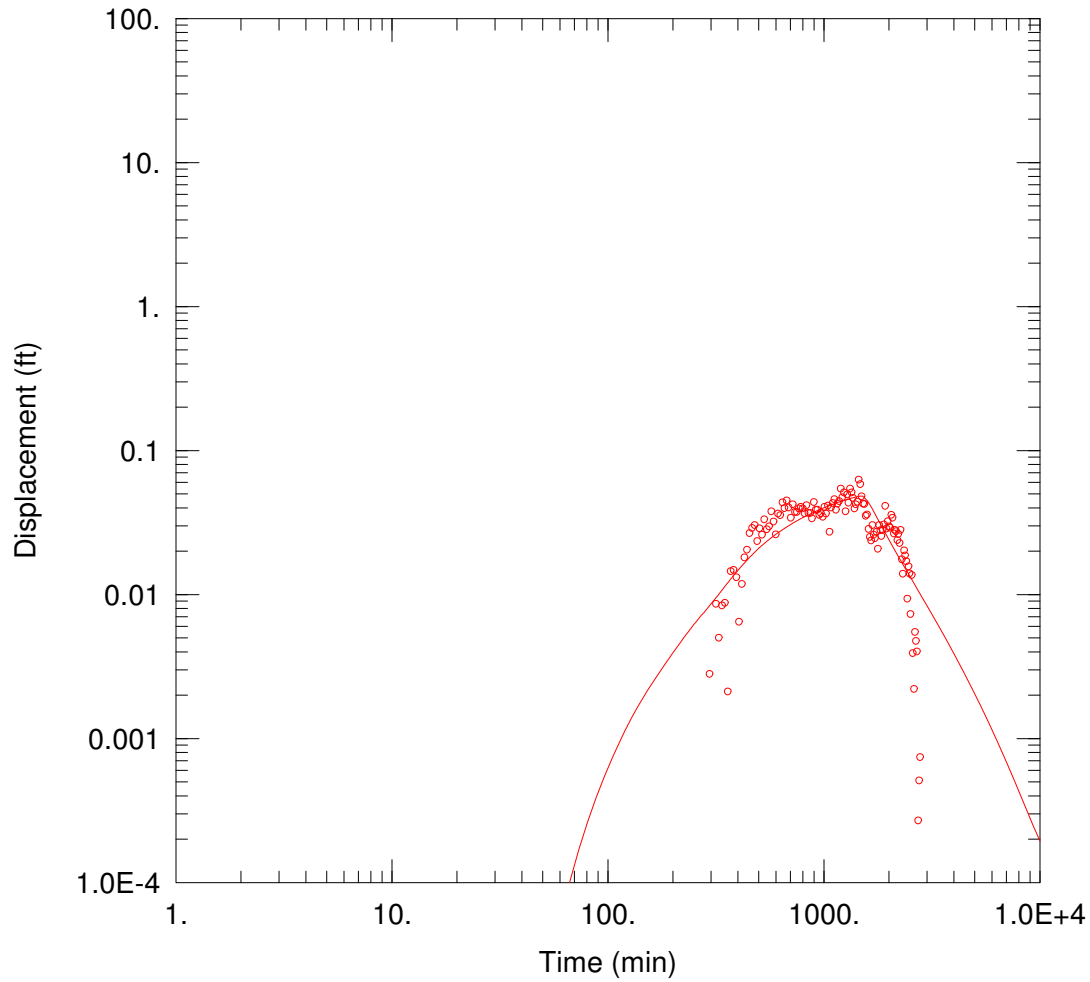
Solution Method: Neuman

T = 6147.9 ft²/day

S = 5.01E-5

Sy = 0.002013

Kz/Kr = 6.13E-5



WELL TEST ANALYSIS

Data Set: H:\2018033.00 TTL Twin Pines\Aquifer Tests\PWB\unconf\1well\PWBob4bs.aqt
 Date: 04/15/19 Time: 14:13:00

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-B

AQUIFER DATA

Saturated Thickness: 115. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-B | 0 | 0 | ◦ OWB4Bs | 0 | 50 |

SOLUTION

Aquifer Model: Unconfined

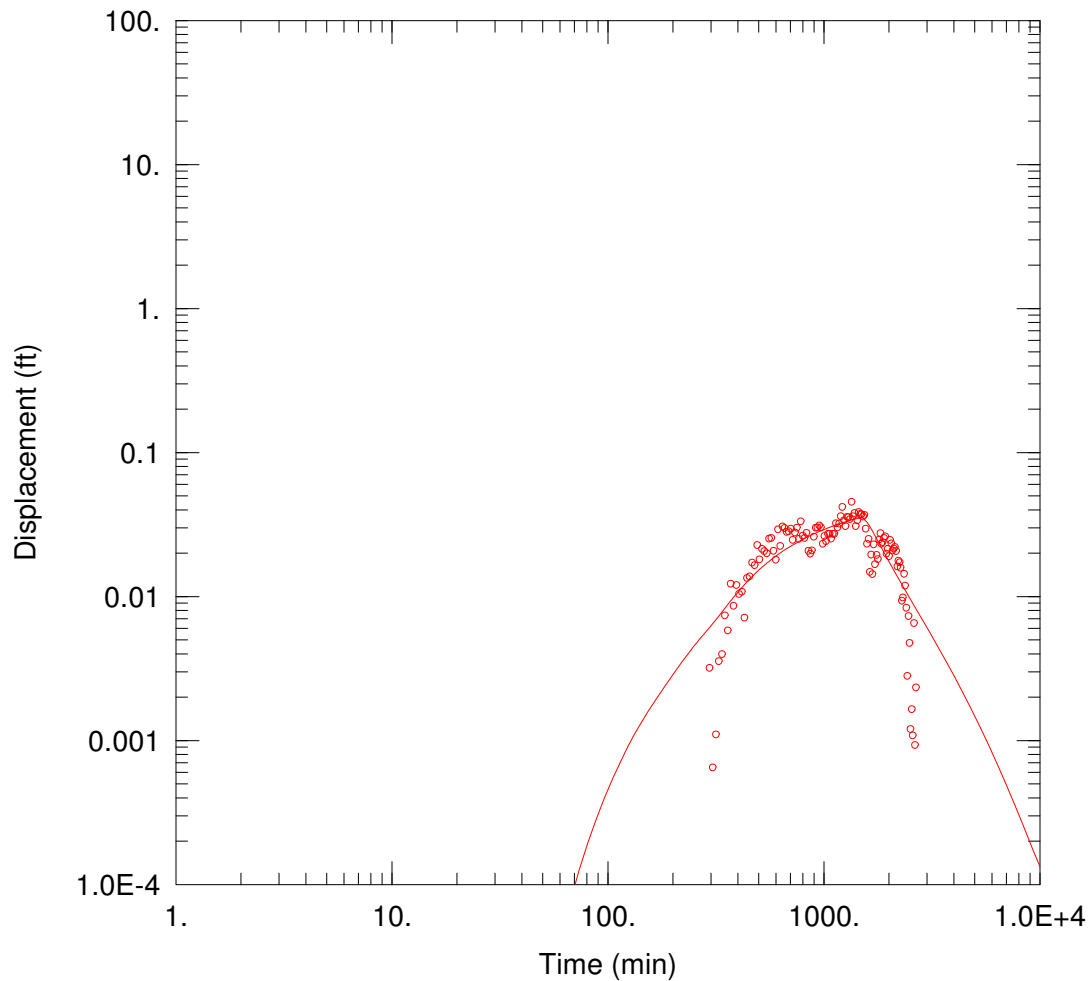
Solution Method: Neuman

T = 6918.1 ft²/day

S = 4.843E-5

Sy = 0.25

Kz/Kr = 2.053E-5



WELL TEST ANALYSIS

Data Set: H:\2018033.00 TTL Twin Pines\Aquifer Tests\PWB\unconf\1well\PWBob5bs.aqt
 Date: 04/15/19 Time: 14:13:44

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-B

AQUIFER DATA

Saturated Thickness: 115. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-B | 0 | 0 | ◦ OWB5Bs | 0 | 100 |

SOLUTION

Aquifer Model: Unconfined

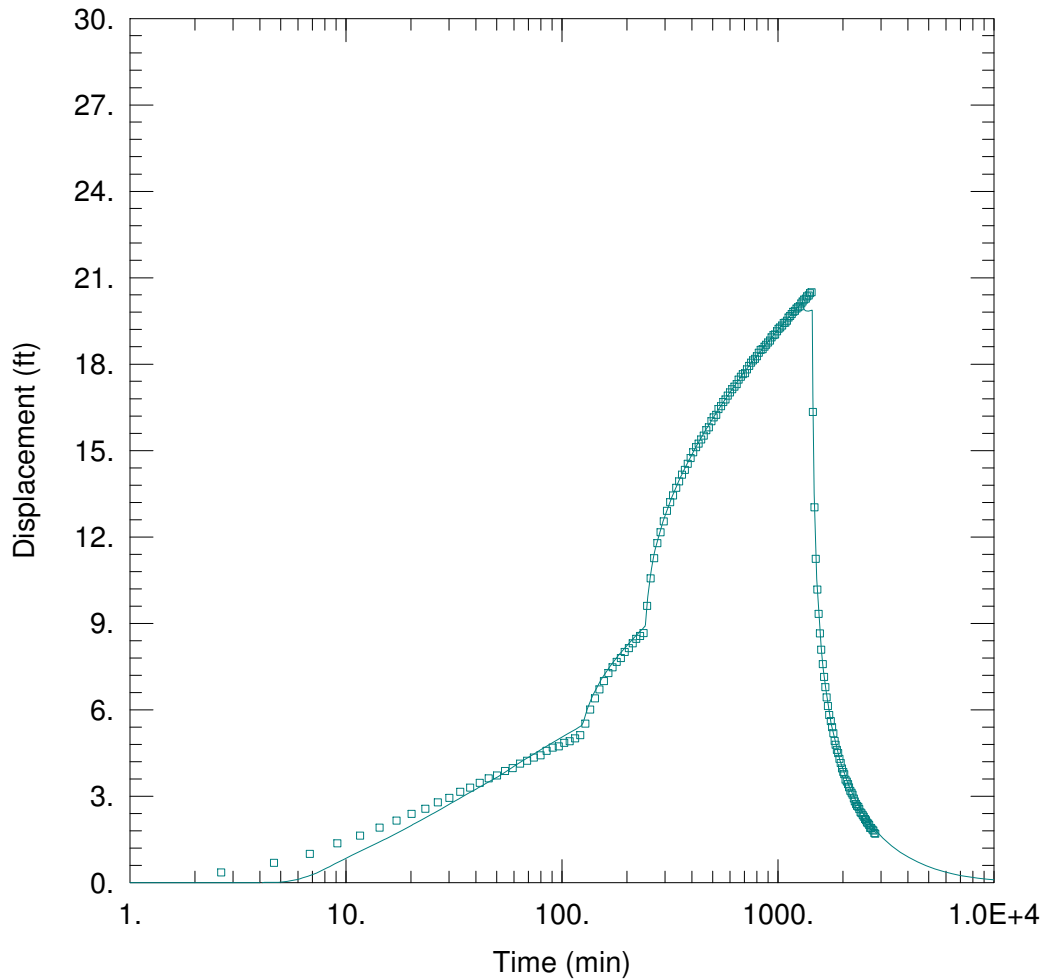
Solution Method: Neuman

T = 9498.6 ft²/day

S = 3.748E-5

Sy = 0.25

Kz/Kr = 1.158E-5



WELL TEST ANALYSIS

Data Set: H:\2018033.00 TTL Twin Pines\Aquifer Tests\PWB\leaky\1well\PWBob1d_NW.aqt
 Date: 03/27/19 Time: 16:09:19

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-B

AQUIFER DATA

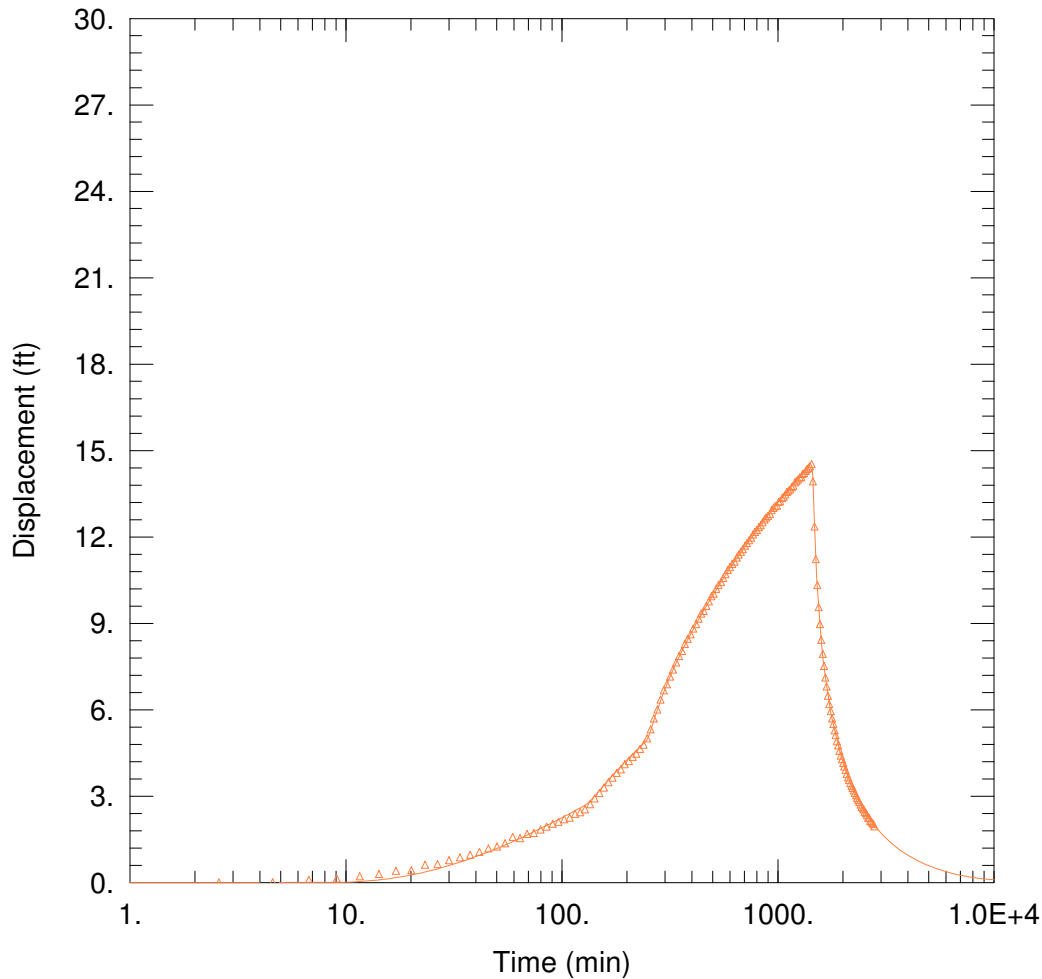
Saturated Thickness: 100. ft Anisotropy Ratio (Kz/Kr): 0.1804
 Aquitard Thickness (b'): 10. ft Aquitard Thickness (b''): 1. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-A | 0 | 0 | □ OWB1d | 0 | 50 |

SOLUTION

Aquifer Model: Leaky Solution Method: Neuman-Witherspoon
 $T = 444.7 \text{ ft}^2/\text{day}$ $S = 0.001795$
 $1/B = 0.001103 \text{ ft}^{-1}$ $\beta/r = 8.785E-5 \text{ ft}^{-1}$
 $T2 = 1.44E+8 \text{ ft}^2/\text{day}$ $S2 = 1.$



WELL TEST ANALYSIS

Data Set: H:\2018033.00 TTL Twin Pines\Aquifer Tests\PWB\leaky\1well\PWBob2d_NW.aqt
 Date: 03/27/19 Time: 16:10:34

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-B

AQUIFER DATA

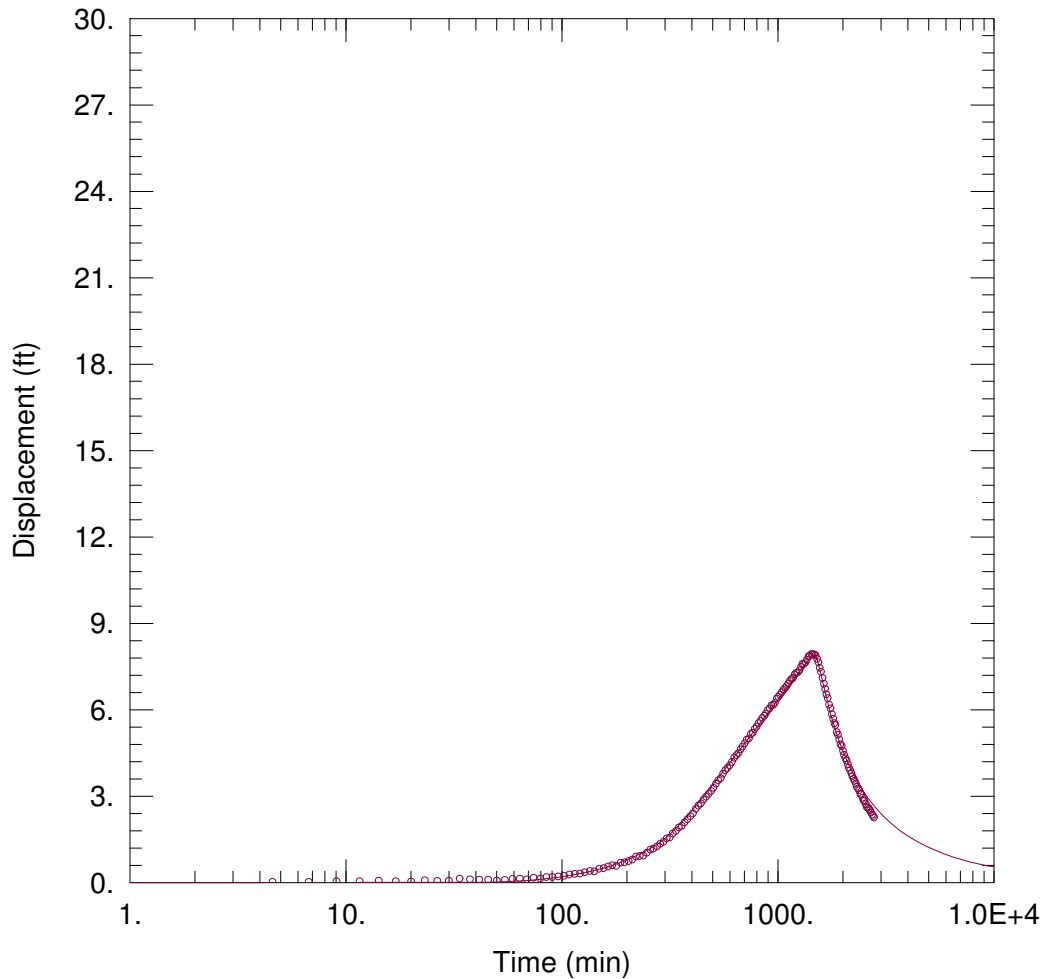
Saturated Thickness: 100. ft Anisotropy Ratio (Kz/Kr): 0.1804
 Aquitard Thickness (b'): 10. ft Aquitard Thickness (b''): 1. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-A | 0 | 0 | △ <u>OWB2d</u> | 0 | 100 |

SOLUTION

Aquifer Model: Leaky Solution Method: Neuman-Witherspoon
 $T = 404.8 \text{ ft}^2/\text{day}$ $S = 0.002342$
 $1/B = 0.001379 \text{ ft}^{-1}$ $\beta/r = 0.0001726 \text{ ft}^{-1}$
 $T2 = 1.44\text{E}+8 \text{ ft}^2/\text{day}$ $S2 = 1.$



WELL TEST ANALYSIS

Data Set: H:\2018033.00 TTL Twin Pines\Aquifer Tests\PWB\leaky\1well\PWBob3d_NW.aqt
 Date: 03/27/19 Time: 16:12:09

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-B

AQUIFER DATA

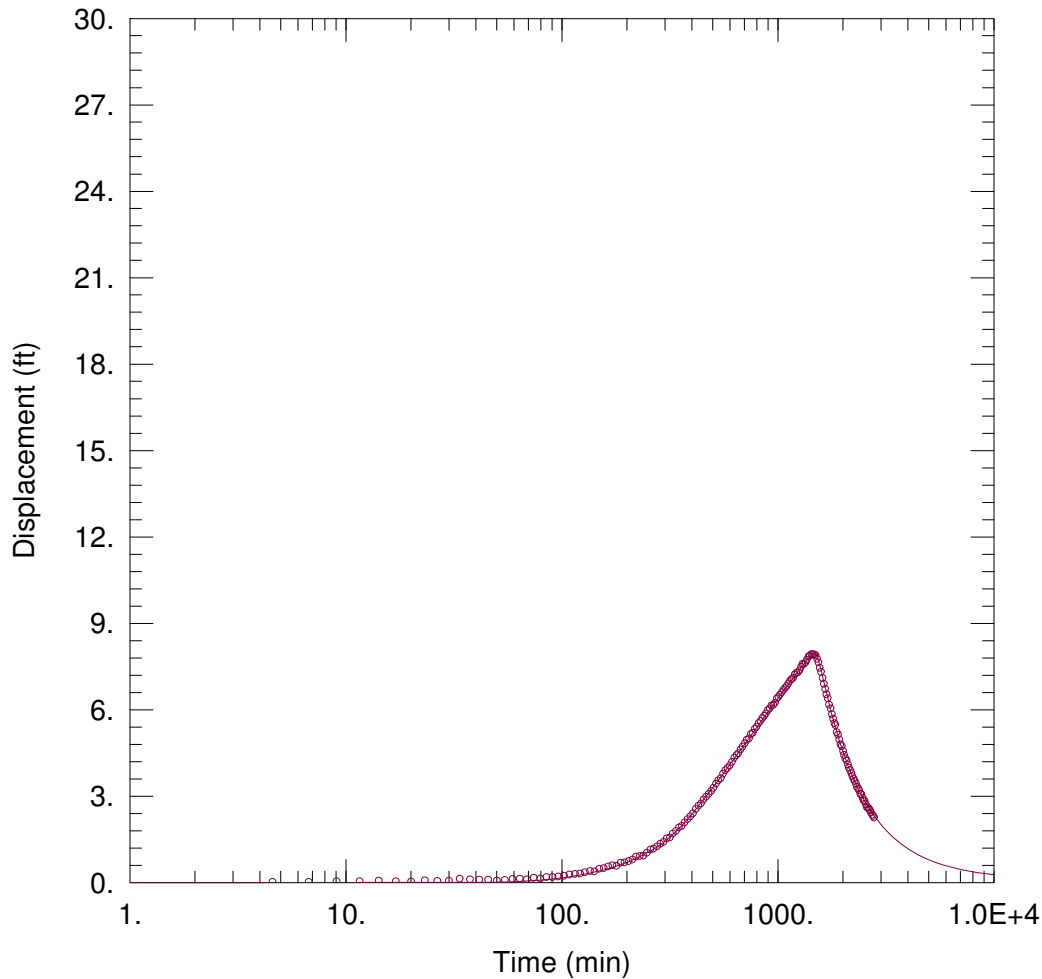
Saturated Thickness: 100. ft Anisotropy Ratio (Kz/Kr): 0.1804
 Aquitard Thickness (b'): 10. ft Aquitard Thickness (b''): 1. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-B | 0 | 0 | ◦ OWB3d | 0 | 300 |

SOLUTION

Aquifer Model: Leaky Solution Method: Neuman-Witherspoon
 $T = 285.4 \text{ ft}^2/\text{day}$ $S = 0.001322$
 $1/B = 2.0E-5 \text{ ft}^{-1}$ $\beta/r = 0.0004048 \text{ ft}^{-1}$
 $T2 = 1.44E+8 \text{ ft}^2/\text{day}$ $S2 = 6.029E-9$



WELL TEST ANALYSIS

Data Set: H:\2018033.00 TTL Twin Pines\Aquifer Tests\PWB\leaky\1well\PWBob3d_NW2.aqt
 Date: 03/27/19 Time: 16:12:44

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-B

AQUIFER DATA

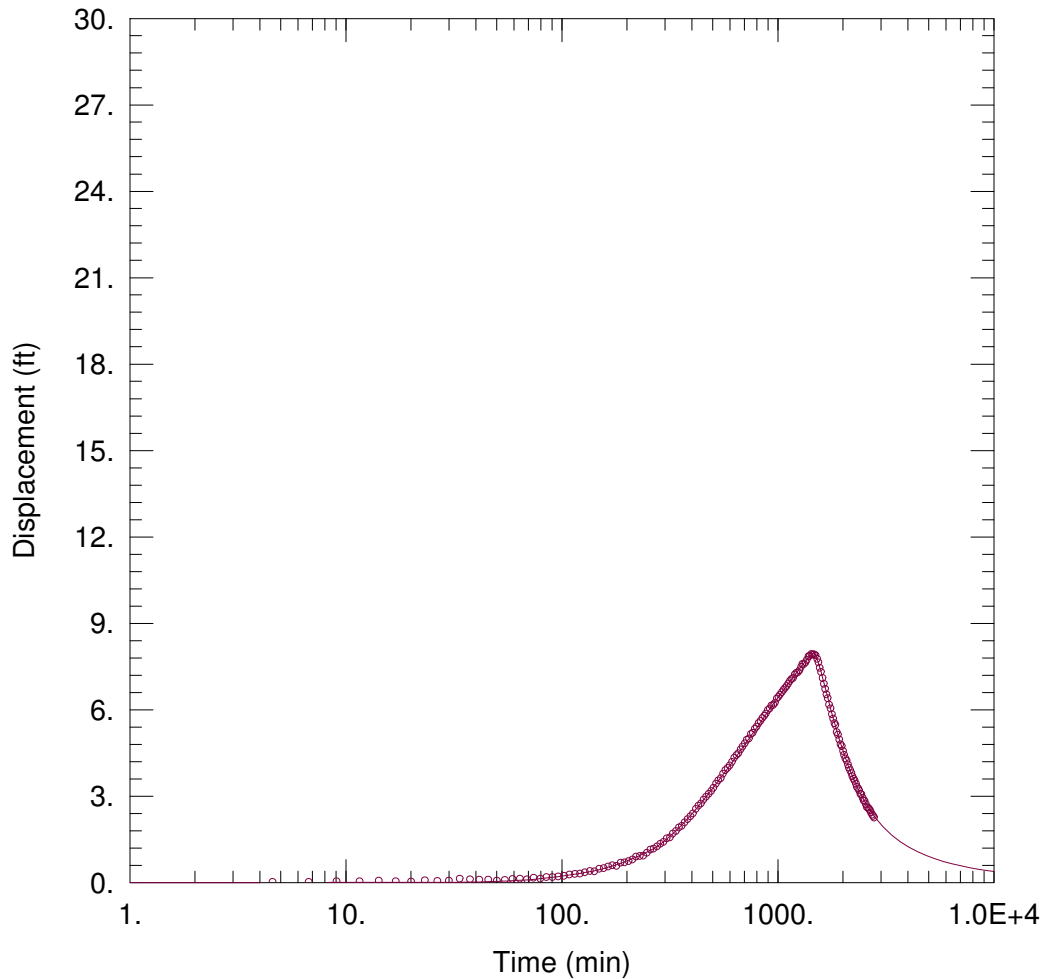
Saturated Thickness: 100. ft Anisotropy Ratio (Kz/Kr): 0.1804
 Aquitard Thickness (b'): 10. ft Aquitard Thickness (b''): 1. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-A | 0 | 0 | ◦ <u>OWB3d</u> | 0 | 300 |

SOLUTION

Aquifer Model: Leaky Solution Method: Neuman-Witherspoon
 $T = 211.1 \text{ ft}^2/\text{day}$ $S = 0.001112$
 $1/B = 0.002594 \text{ ft}^{-1}$ $\beta/r = 0.0007434 \text{ ft}^{-1}$
 $T2 = 1050.4 \text{ ft}^2/\text{day}$ $S2 = 1.0E-10$



WELL TEST ANALYSIS

Data Set: H:\2018033.00 TTL Twin Pines\Aquifer Tests\PWB\leaky\1well\PWBob3d_NW3.aqt
 Date: 03/27/19 Time: 16:13:15

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-B

AQUIFER DATA

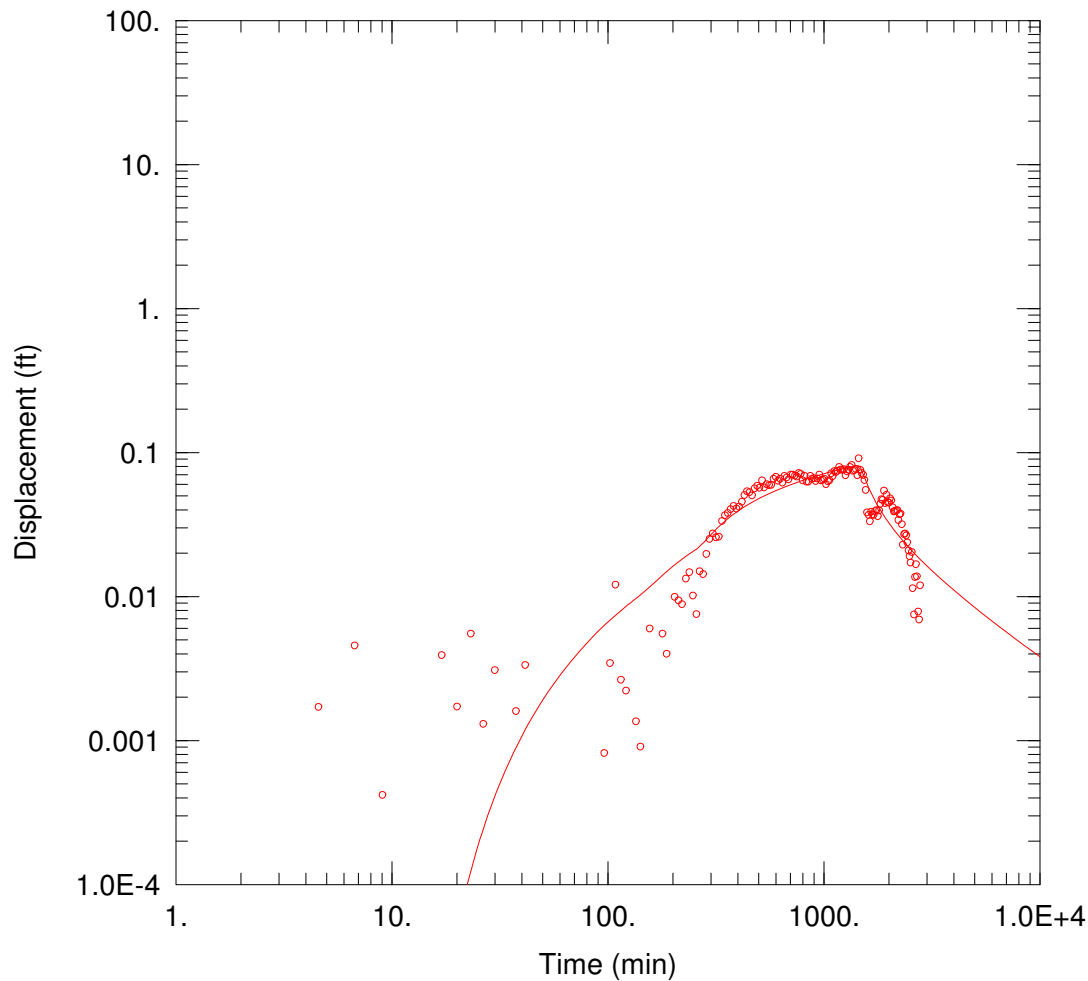
Saturated Thickness: 100. ft Anisotropy Ratio (Kz/Kr): 0.1804
 Aquitard Thickness (b'): 10. ft Aquitard Thickness (b''): 1. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-A | 0 | 0 | ◦ OWB3d | 0 | 300 |

SOLUTION

Aquifer Model: Leaky Solution Method: Neuman-Witherspoon
 $T = 52.87 \text{ ft}^2/\text{day}$ $S = 0.0001383$
 $1/B = 0.007383 \text{ ft}^{-1}$ $\beta/r = 0.006333 \text{ ft}^{-1}$
 $T2 = 671.2 \text{ ft}^2/\text{day}$ $S2 = 0.001389$



WELL TEST ANALYSIS

Data Set: H:\2018033.00 TTL Twin Pines\Aquifer Tests\PWB\leaky\1well\PWBob3bs_NW.aqt
 Date: 03/27/19 Time: 16:11:23

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-B

AQUIFER DATA

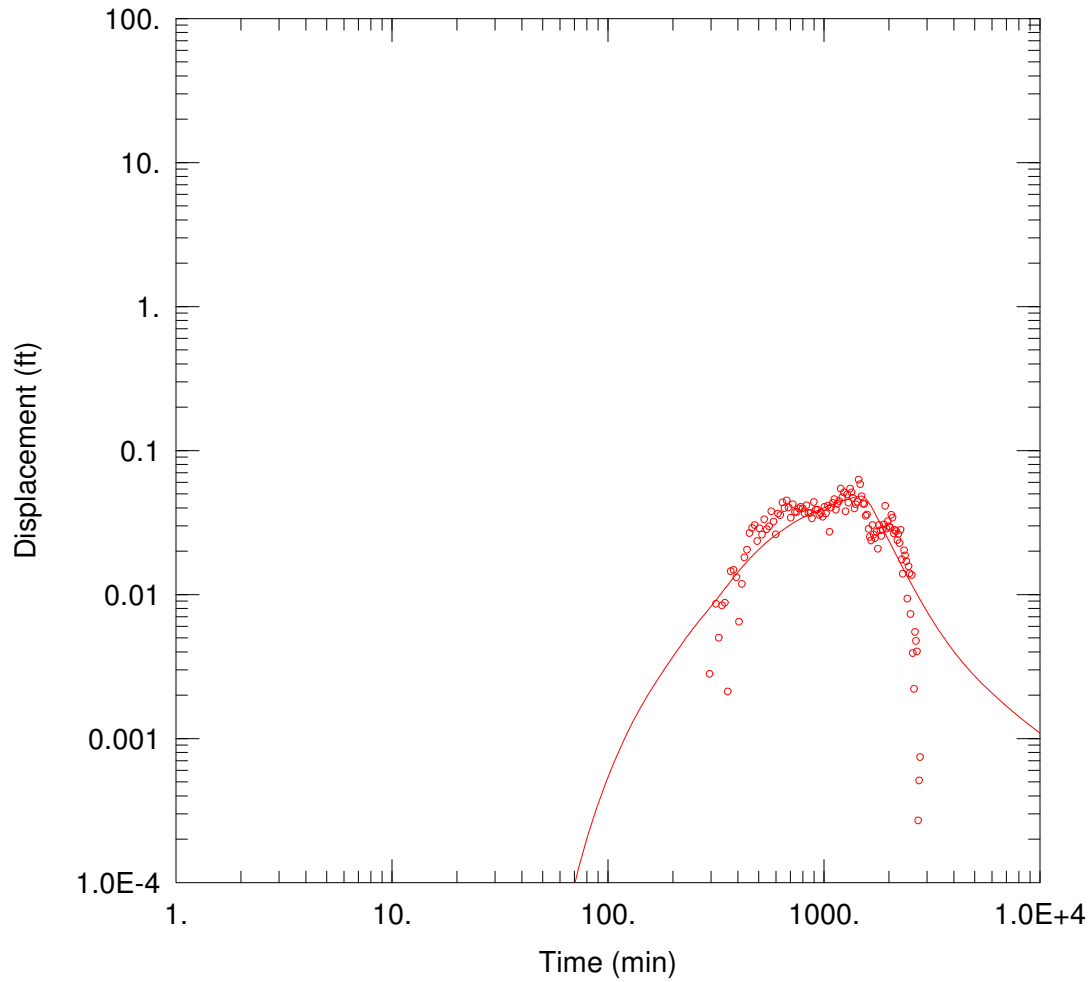
Saturated Thickness: 100. ft Anisotropy Ratio (Kz/Kr): 0.1804
 Aquitard Thickness (b'): 10. ft Aquitard Thickness (b''): 1. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-A | 0 | 0 | ○ OWB3Bs | 0 | 50 |

SOLUTION

Aquifer Model: Leaky Solution Method: Neuman-Witherspoon
 $T = 1.1E+4 \text{ ft}^2/\text{day}$ $S = 0.0004231$
 $1/B = 0.001675 \text{ ft}^{-1}$ $\beta/r = 0.001461 \text{ ft}^{-1}$
 $T2 = 5.713E+4 \text{ ft}^2/\text{day}$ $S2 = 0.01113$



WELL TEST ANALYSIS

Data Set: H:\2018033.00 TTL Twin Pines\Aquifer Tests\PWB\leaky\1well\PWBob4bs_NW.aqt
 Date: 03/27/19 Time: 16:13:40

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-B

AQUIFER DATA

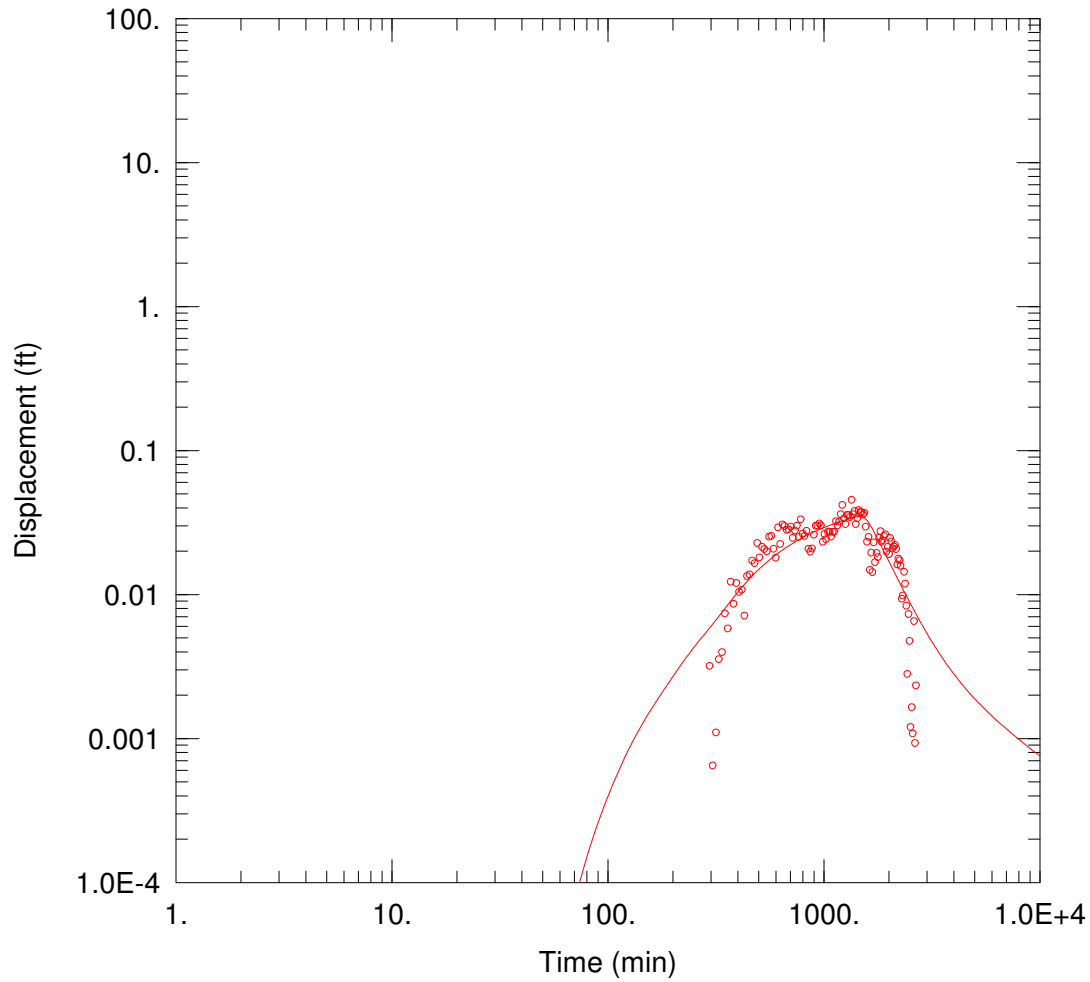
Saturated Thickness: 100. ft Anisotropy Ratio (Kz/Kr): 0.1804
 Aquitard Thickness (b'): 10. ft Aquitard Thickness (b''): 1. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-A | 0 | 0 | ◦ OWB4Bs | 0 | 50 |

SOLUTION

Aquifer Model: Leaky Solution Method: Neuman-Witherspoon
 $T = 203.6 \text{ ft}^2/\text{day}$ $S = 1.155\text{E-}5$
 $1/B = 0.001029 \text{ ft}^{-1}$ $\beta/r = 0.000962 \text{ ft}^{-1}$
 $T2 = 2.555\text{E+}5 \text{ ft}^2/\text{day}$ $S2 = 1.192\text{E-}5$



WELL TEST ANALYSIS

Data Set: H:\2018033.00 TTL Twin Pines\Aquifer Tests\PWB\leaky\1well\PWBob5bs_NW.aqt
 Date: 03/27/19 Time: 16:14:07

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-B

AQUIFER DATA

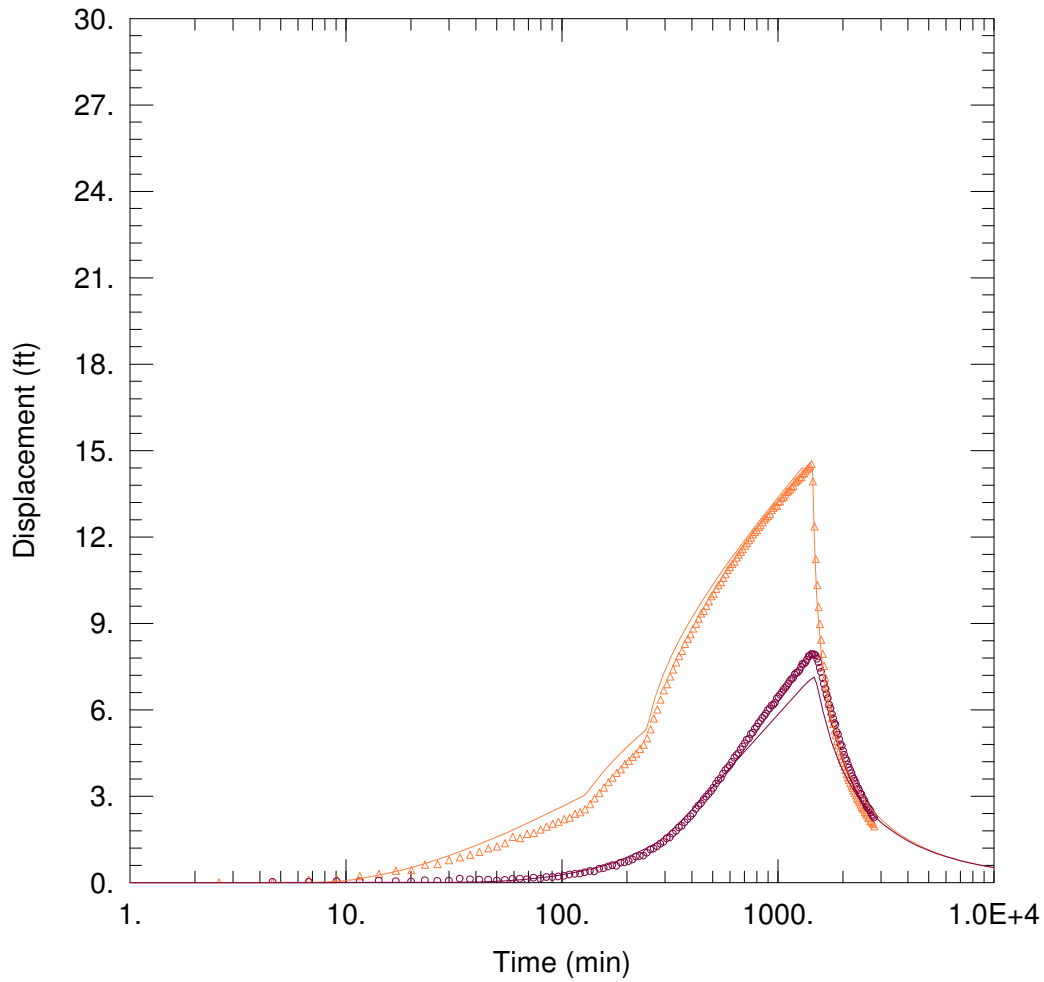
Saturated Thickness: 100. ft Anisotropy Ratio (Kz/Kr): 0.1804
 Aquitard Thickness (b'): 10. ft Aquitard Thickness (b''): 1. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-A | 0 | 0 | ◦ OWB5Bs | 0 | 100 |

SOLUTION

Aquifer Model: Leaky Solution Method: Neuman-Witherspoon
 $T = 206.1 \text{ ft}^2/\text{day}$ $S = 1.155\text{E-}5$
 $1/B = 0.0009783 \text{ ft}^{-1}$ $B/r = 0.0008631 \text{ ft}^{-1}$
 $T2 = 3.673\text{E+}5 \text{ ft}^2/\text{day}$ $S2 = 1.9\text{E-}5$



WELL TEST ANALYSIS

Data Set: H:\2018033.00 TTL Twin Pines\Aquifer Tests\PWB\unconf\2wells\PWBob1d2d.aqt
 Date: 04/15/19 Time: 14:20:37

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-B

AQUIFER DATA

Saturated Thickness: 115. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-B | 0 | 0 | △ OWB2d | 0 | 100 |
| | | | ○ OWB3d | 0 | 300 |

SOLUTION

Aquifer Model: Unconfined

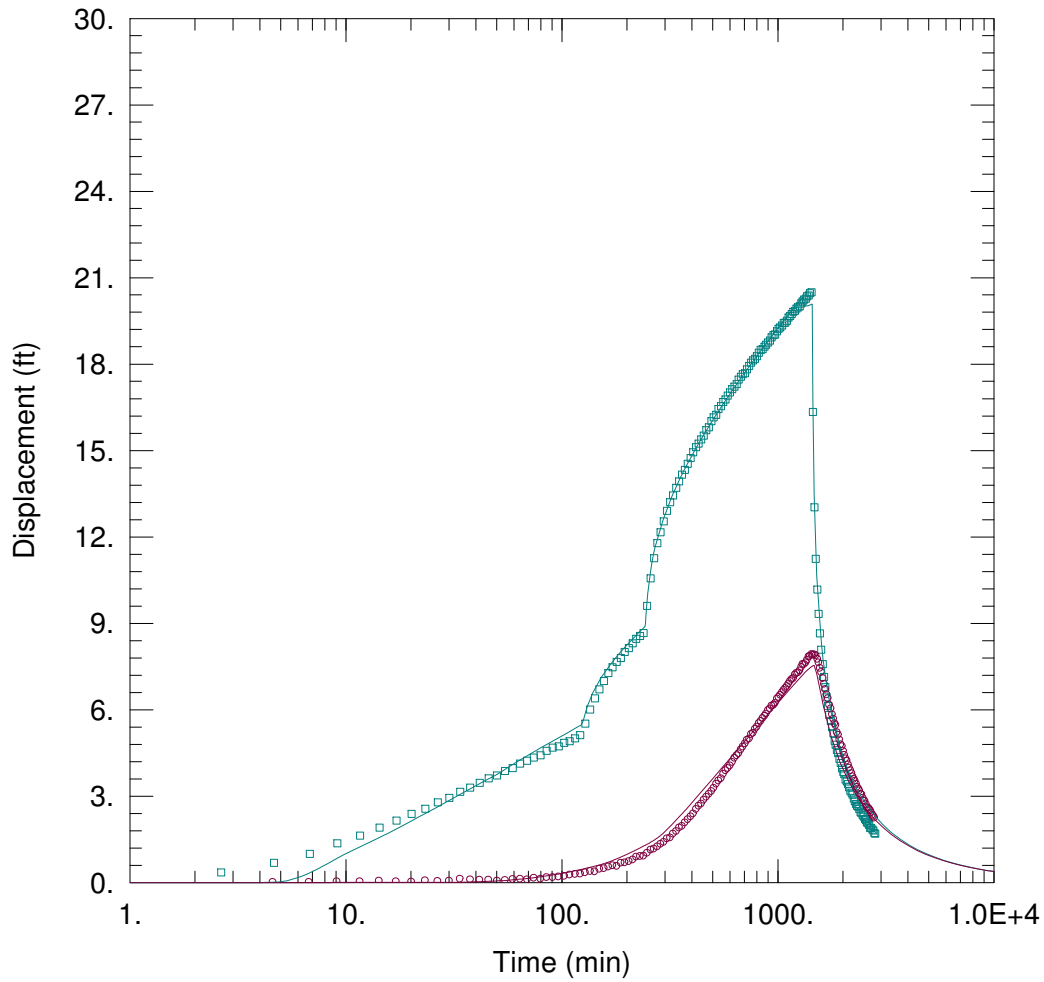
Solution Method: Neuman

T = 960.2 ft²/day

S = 0.003311

Sy = 0.001

Kz/Kr = 1.033E-5



WELL TEST ANALYSIS

Data Set: H:\2018033.00 TTL Twin Pines\Aquifer Tests\PWB\unconf\2wells\PWBob1d3d.aqt
 Date: 04/15/19 Time: 14:22:02

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-B

AQUIFER DATA

Saturated Thickness: 115. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-B | 0 | 0 | □ <u>OWB1d</u> | 0 | 50 |
| | | | ○ <u>OWB3d</u> | 0 | 300 |

SOLUTION

Aquifer Model: Unconfined

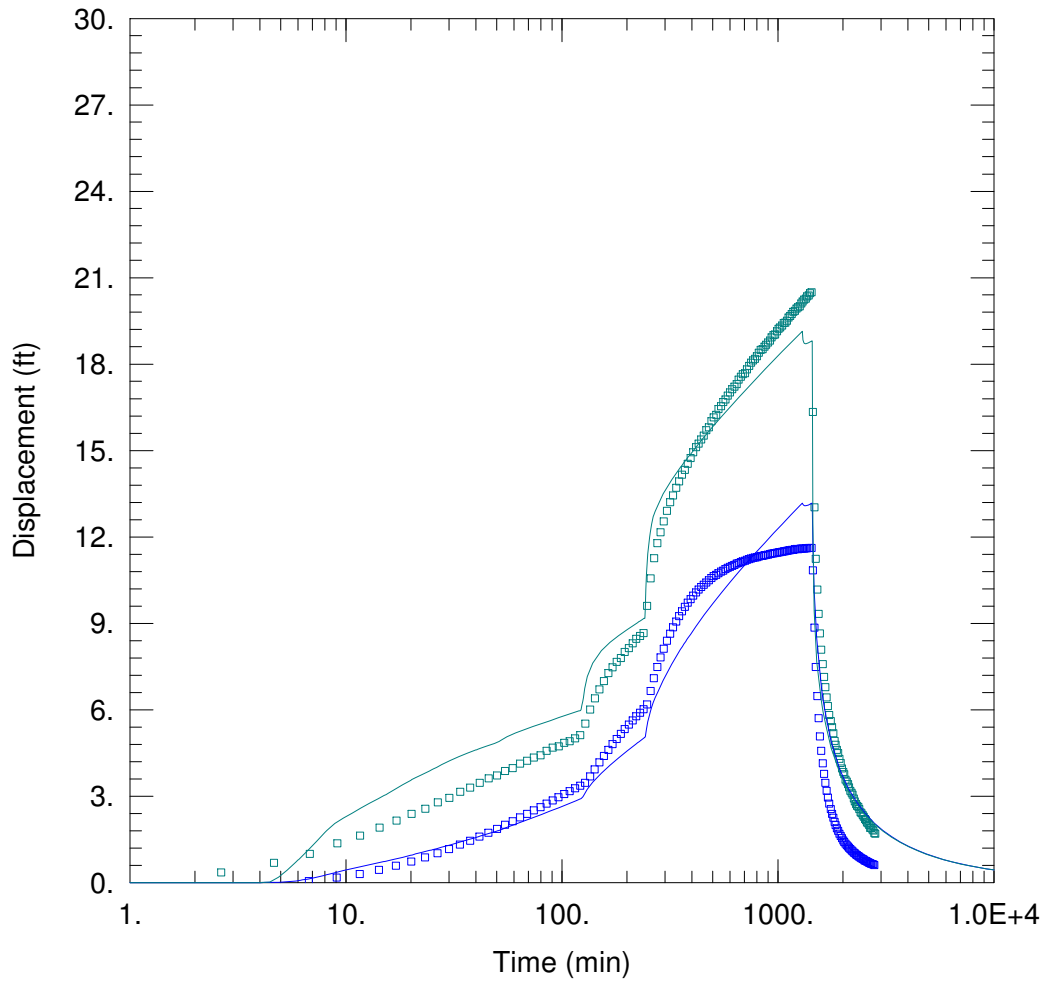
Solution Method: Neuman

T = 924.1 ft²/day

S = 0.003009

Sy = 0.25

Kz/Kr = 0.0003728



WELL TEST ANALYSIS

Data Set: H:\2018033.00 TTL Twin Pines\Aquifer Tests\PWB\unconf\2wells\PWBob1.aqt
 Date: 04/15/19 Time: 14:14:54

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-B

AQUIFER DATA

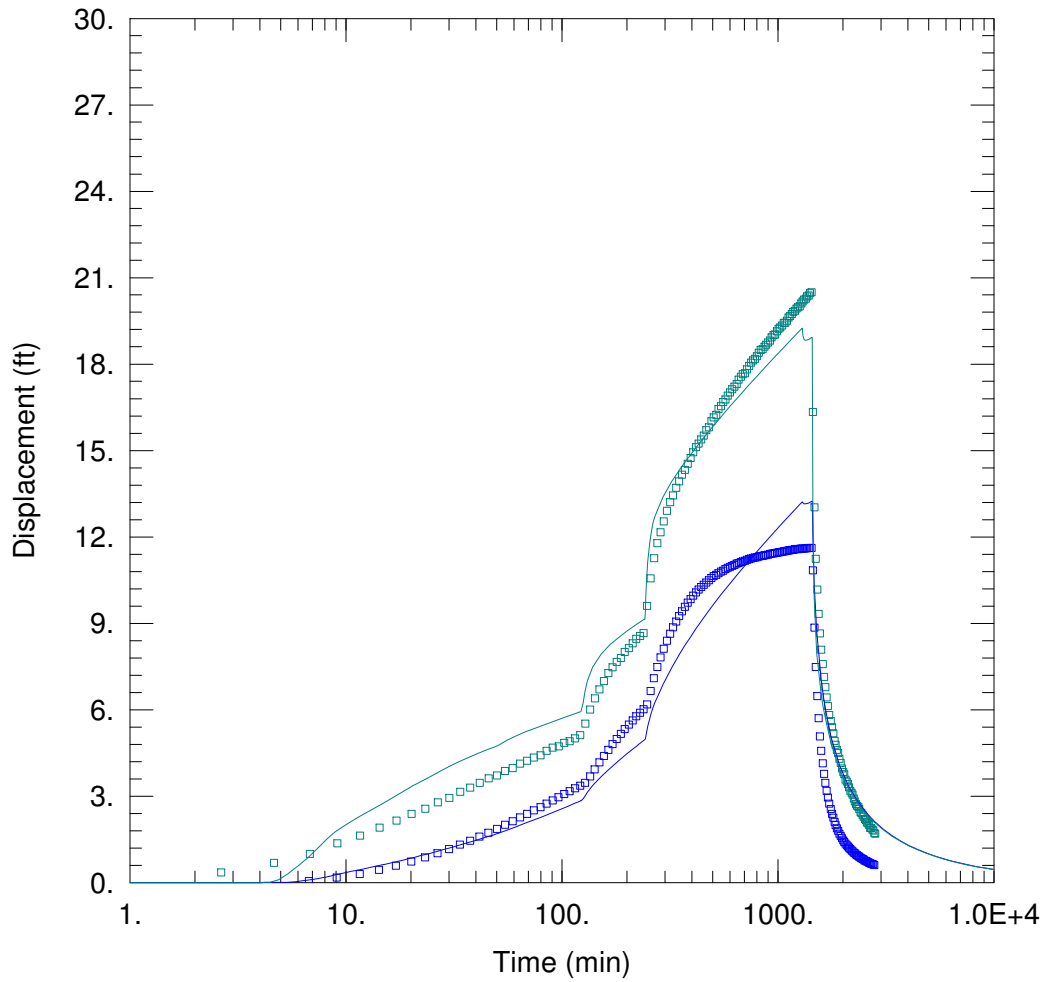
Saturated Thickness: 115. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-B | 0 | 0 | ▣ <u>OWB1s</u> | 0 | 50 |
| | | | ▣ <u>OWB1d</u> | 0 | 50 |

SOLUTION

Aquifer Model: Unconfined Solution Method: Neuman
 T = 593.1 ft²/day S = 0.001002
 Sy = 0.001 Kz/Kr = 0.2921



WELL TEST ANALYSIS

Data Set: H:\2018033.00 TTL Twin Pines\Aquifer Tests\PWB\unconf\2wells\PWBob1alt.aqt
 Date: 04/15/19 Time: 14:17:49

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-B

AQUIFER DATA

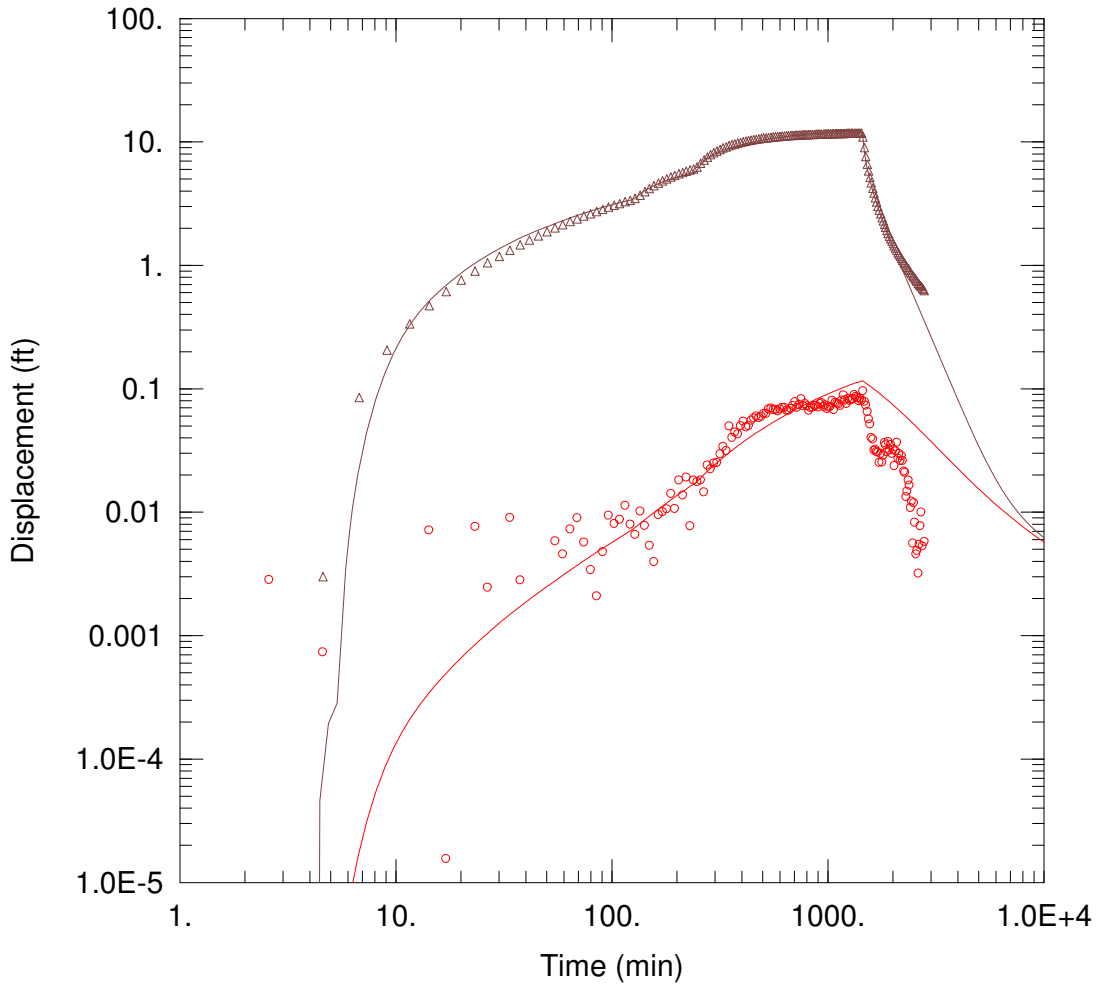
Saturated Thickness: 115. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-B | 0 | 0 | ▣ OWB1s | 0 | 50 |
| | | | ▣ OWB1d | 0 | 50 |

SOLUTION

| | |
|-------------------------------------|--------------------------------|
| Aquifer Model: <u>Unconfined</u> | Solution Method: <u>Neuman</u> |
| T = <u>575.2 ft²/day</u> | S = <u>0.001228</u> |
| Sy = <u>0.001</u> | Kz/Kr = <u>0.3018</u> |



WELL TEST ANALYSIS

Data Set: M:\2018033.00 TTL Twin Pines\Aquifer Tests\PWB\leaky\2wells\PWBob2bs_NW.aqt
 Date: 03/28/19 Time: 13:39:04

PROJECT INFORMATION

Company: HGC
 Client: TTL
 Test Well: PW-B

AQUIFER DATA

Saturated Thickness: 100. ft Anisotropy Ratio (Kz/Kr): 0.1804
 Aquitard Thickness (b'): 10. ft Aquitard Thickness (b''): 1. ft

WELL DATA

| Pumping Wells | | | Observation Wells | | |
|---------------|--------|--------|-------------------|--------|--------|
| Well Name | X (ft) | Y (ft) | Well Name | X (ft) | Y (ft) |
| PW-A | 0 | 0 | △ OWB2s | 0 | 100 |
| | | | ○ OWB2Bs | 0 | 100 |

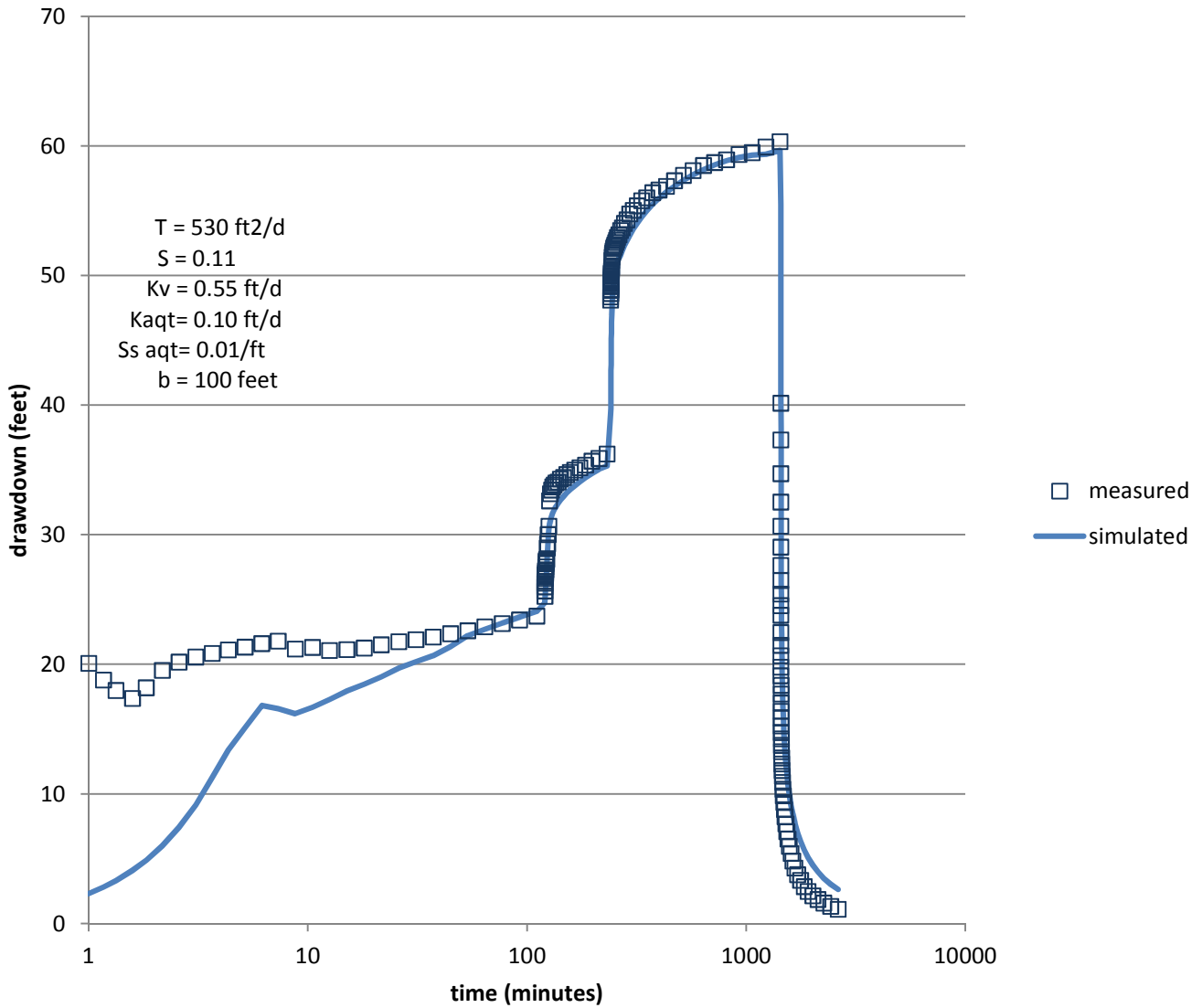
SOLUTION

Aquifer Model: Leaky Solution Method: Neuman-Witherspoon
 $T = 516.8 \text{ ft}^2/\text{day}$ $S = 0.001132$
 $1/B = 0.001867 \text{ ft}^{-1}$ $\beta/r = 5.261\text{E-}5 \text{ ft}^{-1}$
 $T2 = 5.028\text{E+}4 \text{ ft}^2/\text{day}$ $S2 = 0.002588$

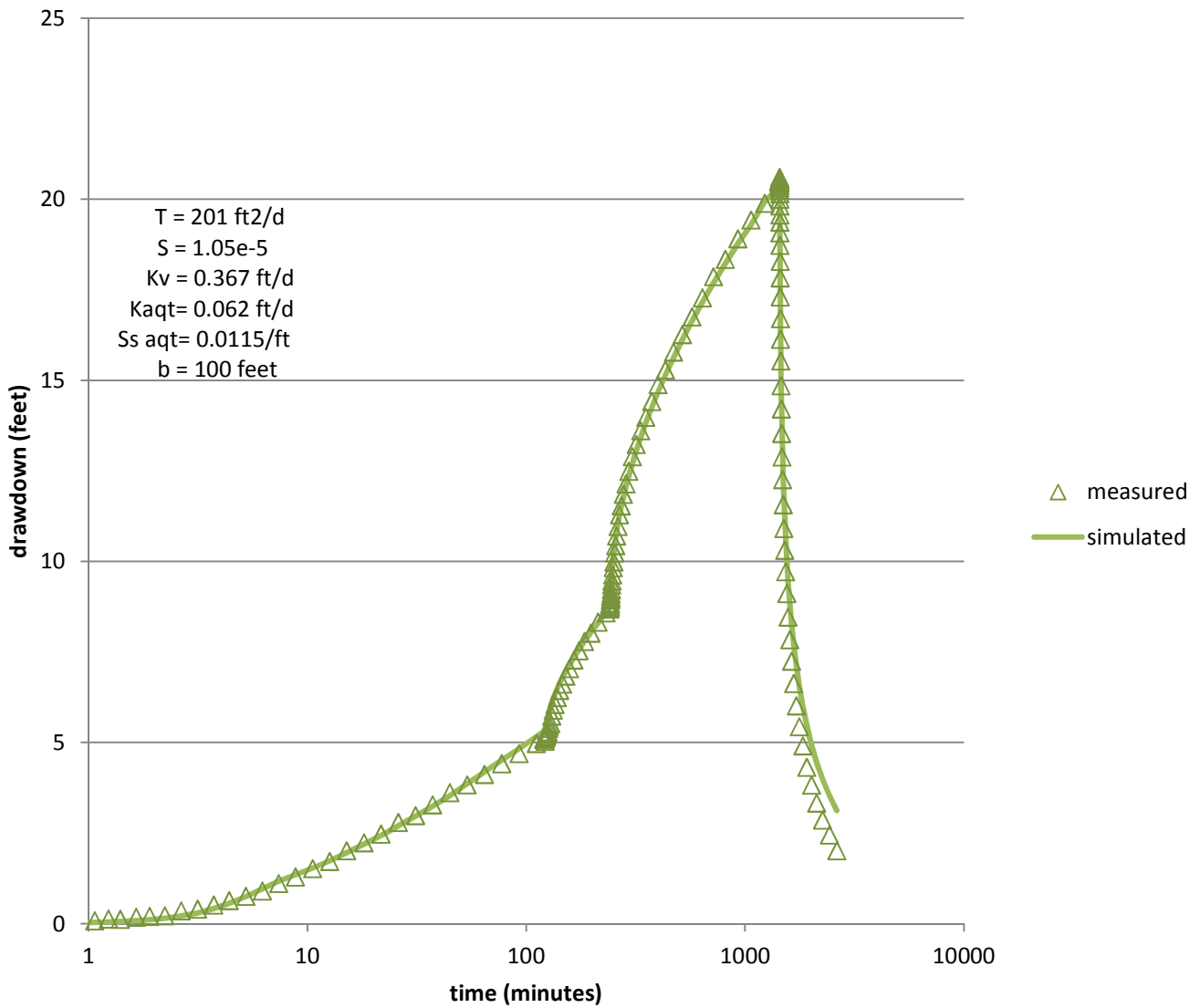
APPENDIX E

WHIP PWB TEST PLOTS

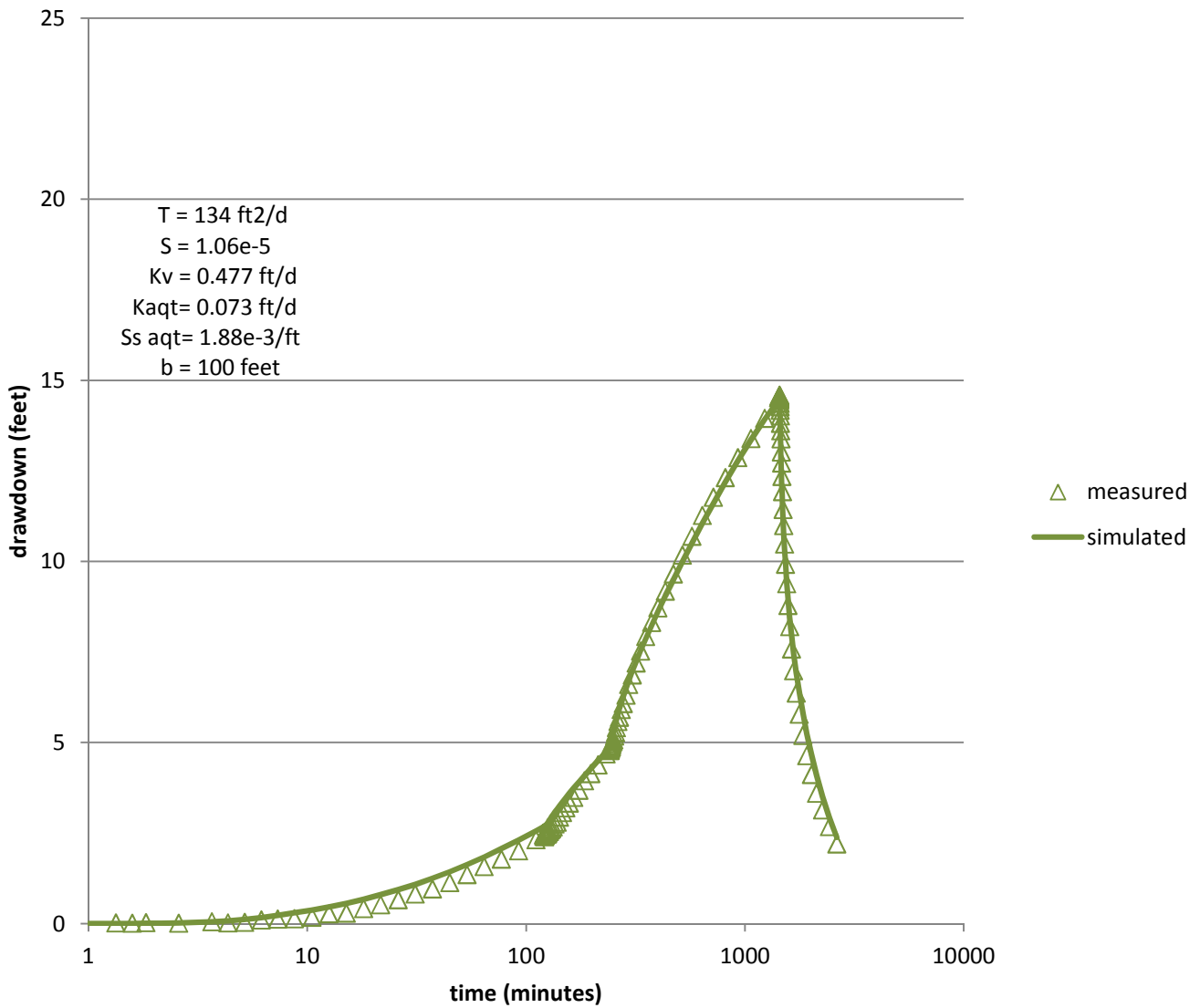
**Measured and Simulated Drawdowns at PWB
During Pumping of PWA at Approximately 55, 75 and 115 gpm
Using Vertically Anisotropic Leaky Aquifer Solution in WHIP**



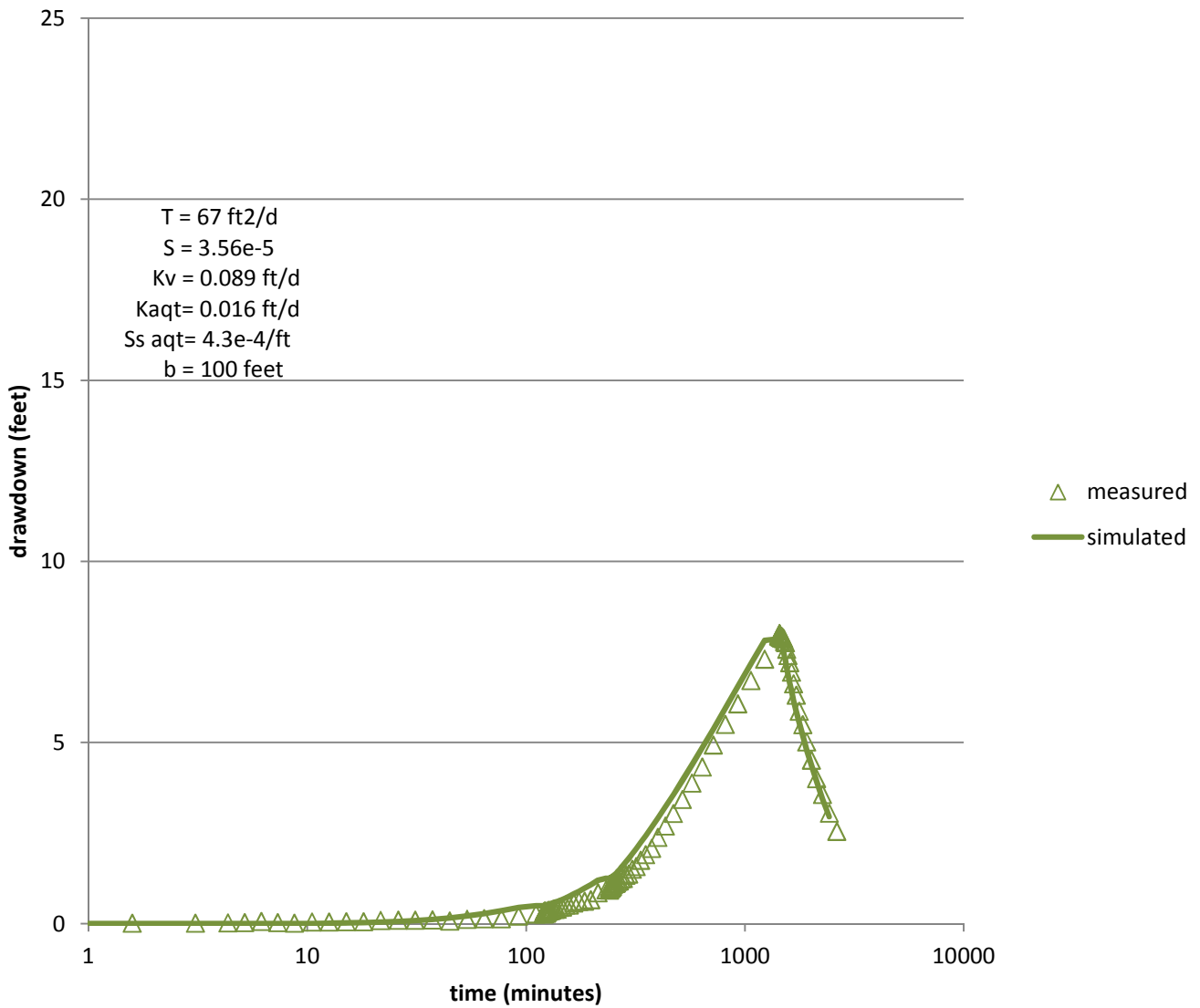
**Measured and Simulated Drawdowns at OWB1D
During Pumping of PWA at Approximately 55, 75 and 115 gpm
Using Vertically Anisotropic Leaky Aquifer Solution in WHIP**



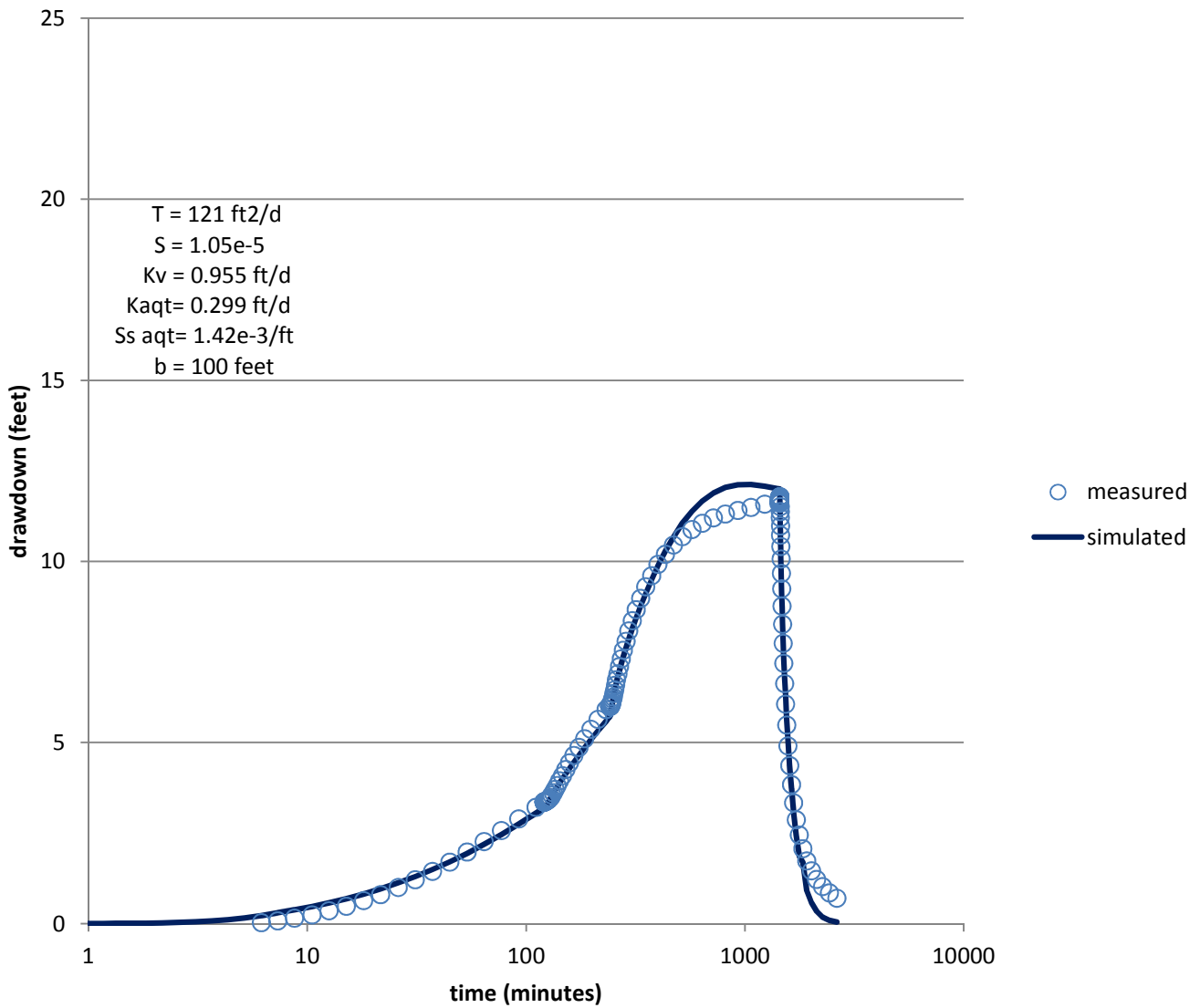
**Measured and Simulated Drawdowns at OWB2D
During Pumping of PWA at Approximately 55, 75 and 115 gpm
Using Vertically Anisotropic Leaky Aquifer Solution in WHIP**



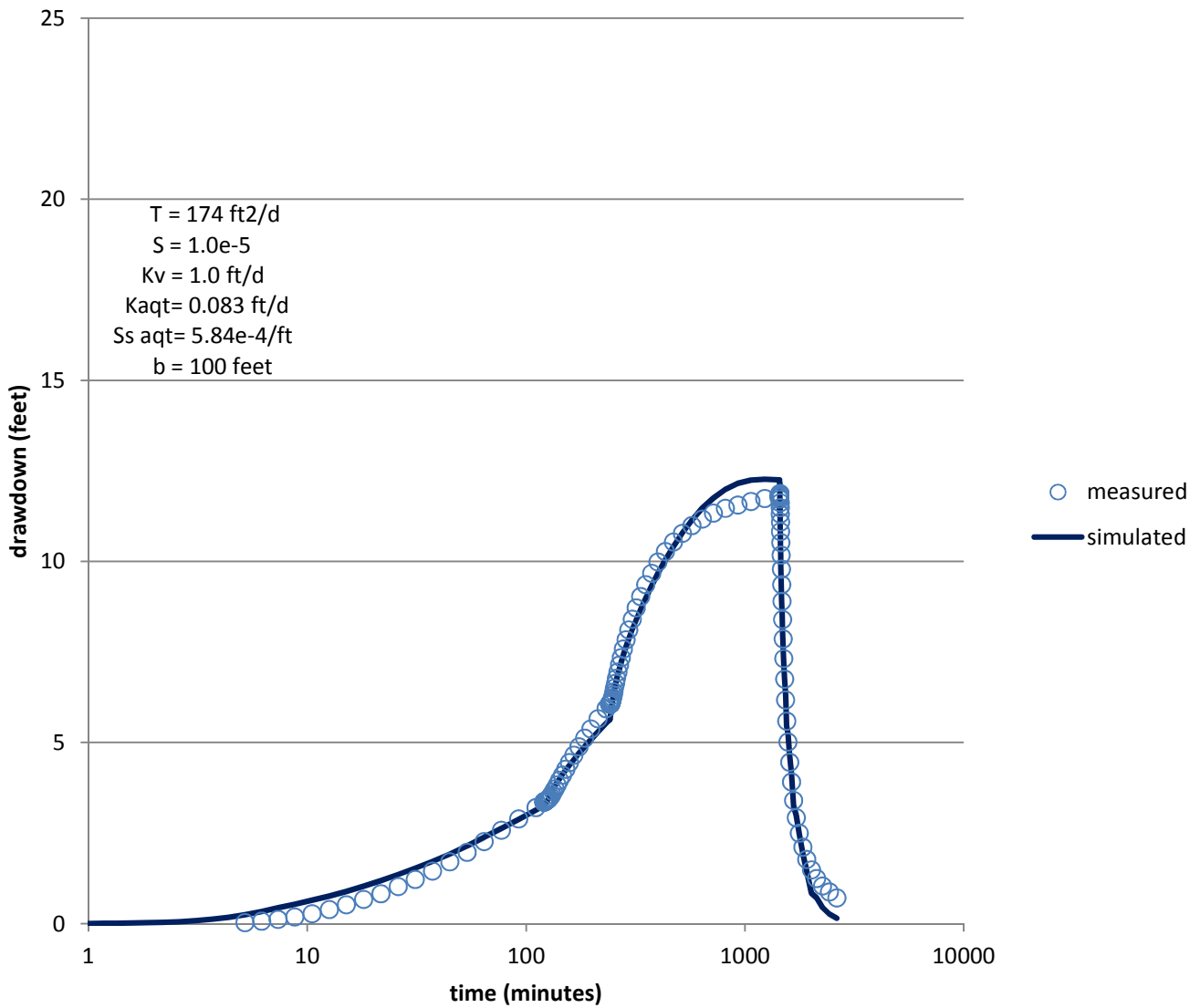
**Measured and Simulated Drawdowns at OWB3D
During Pumping of PWA at Approximately 55, 75 and 115 gpm
Using Vertically Anisotropic Leaky Aquifer Solution in WHIP**



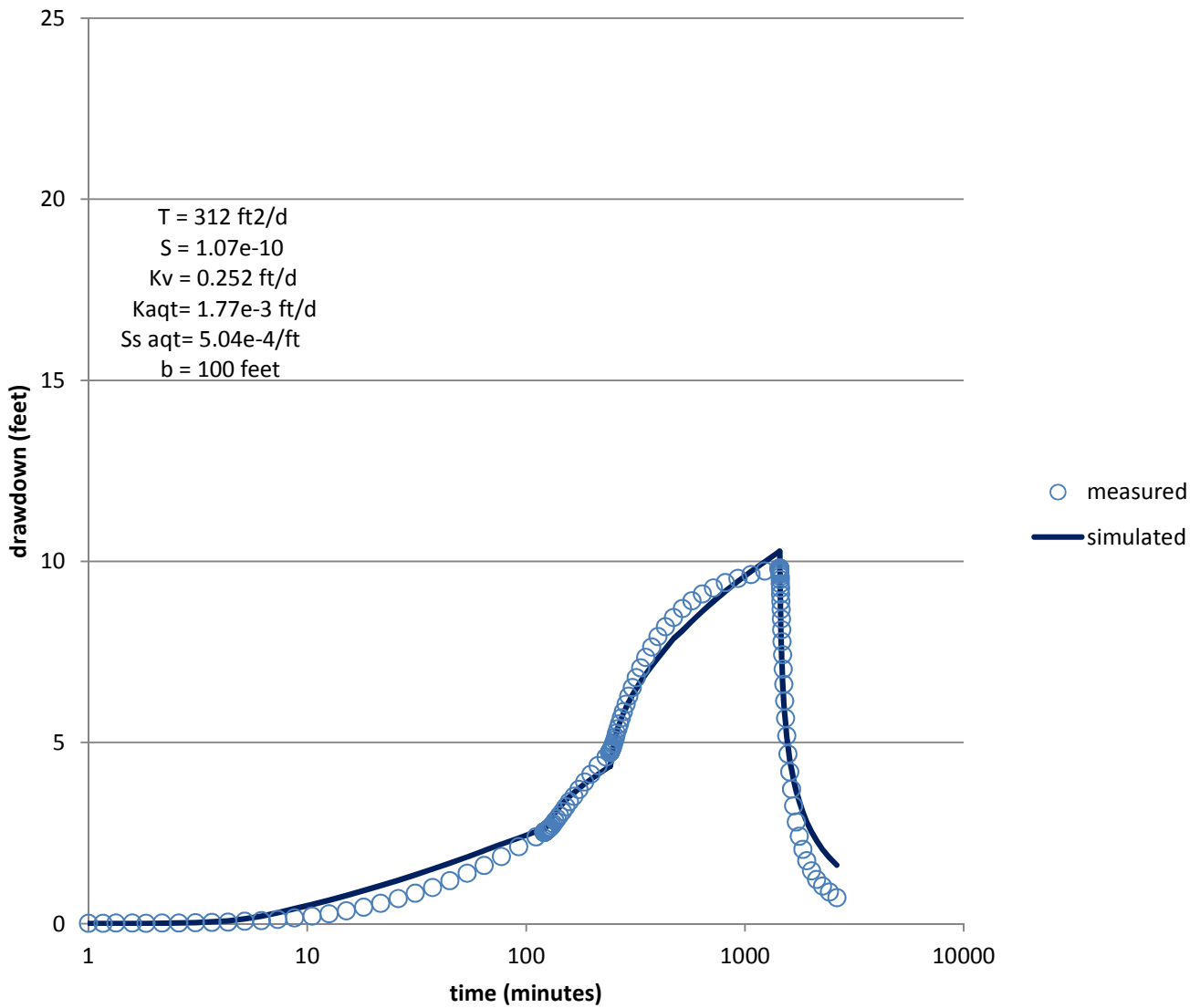
**Measured and Simulated Drawdowns at OWB1S
During Pumping of PWA at Approximately 55, 75 and 115 gpm
Using Vertically Anisotropic Leaky Aquifer Solution in WHIP**



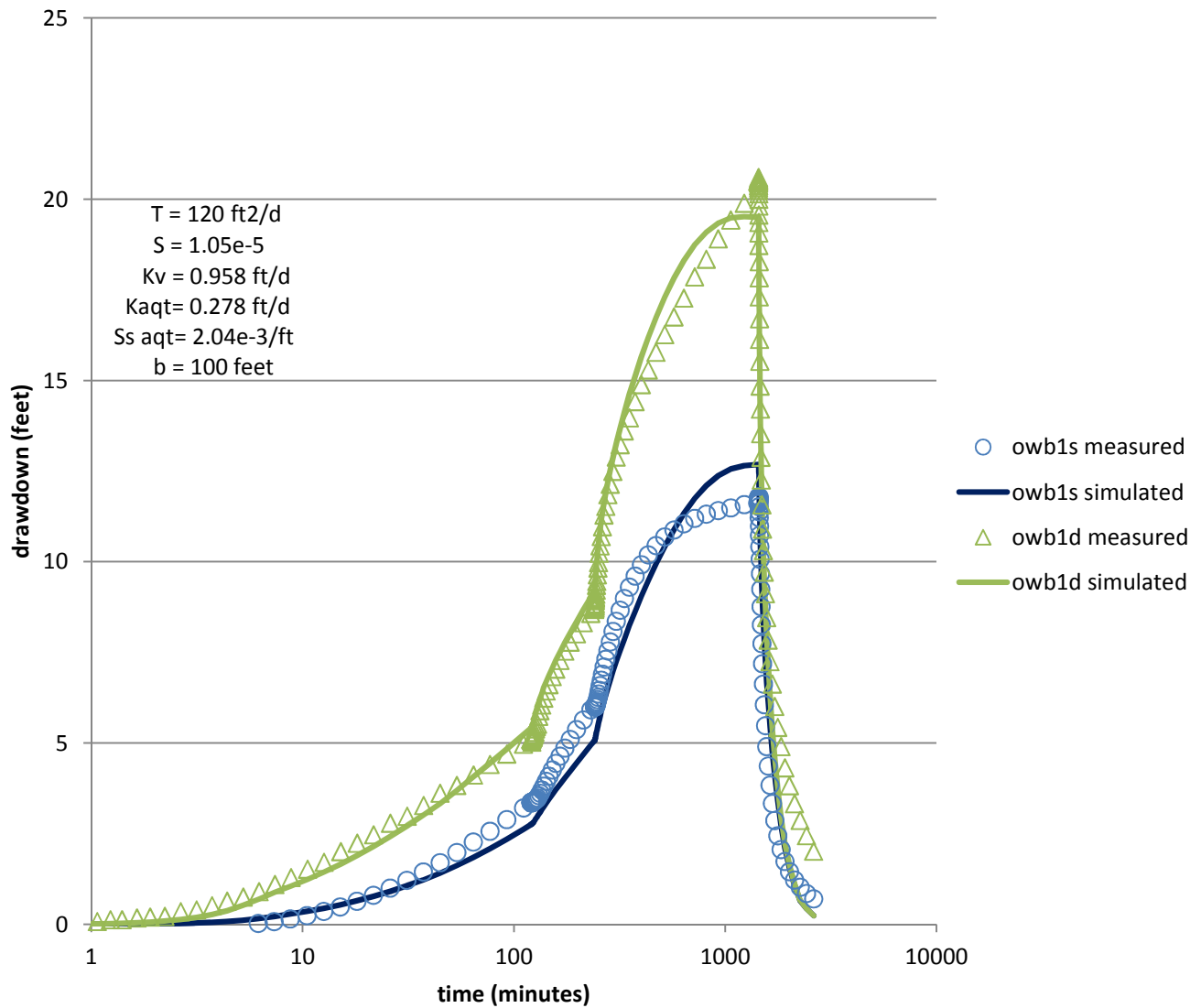
**Measured and Simulated Drawdowns at OWB2S
During Pumping of PWA at Approximately 55, 75 and 115 gpm
Using Vertically Anisotropic Leaky Aquifer Solution in WHIP**



**Measured and Simulated Drawdowns at OWB3S
During Pumping of PWA at Approximately 55, 75 and 115 gpm
Using Vertically Anisotropic Leaky Aquifer Solution in WHIP**



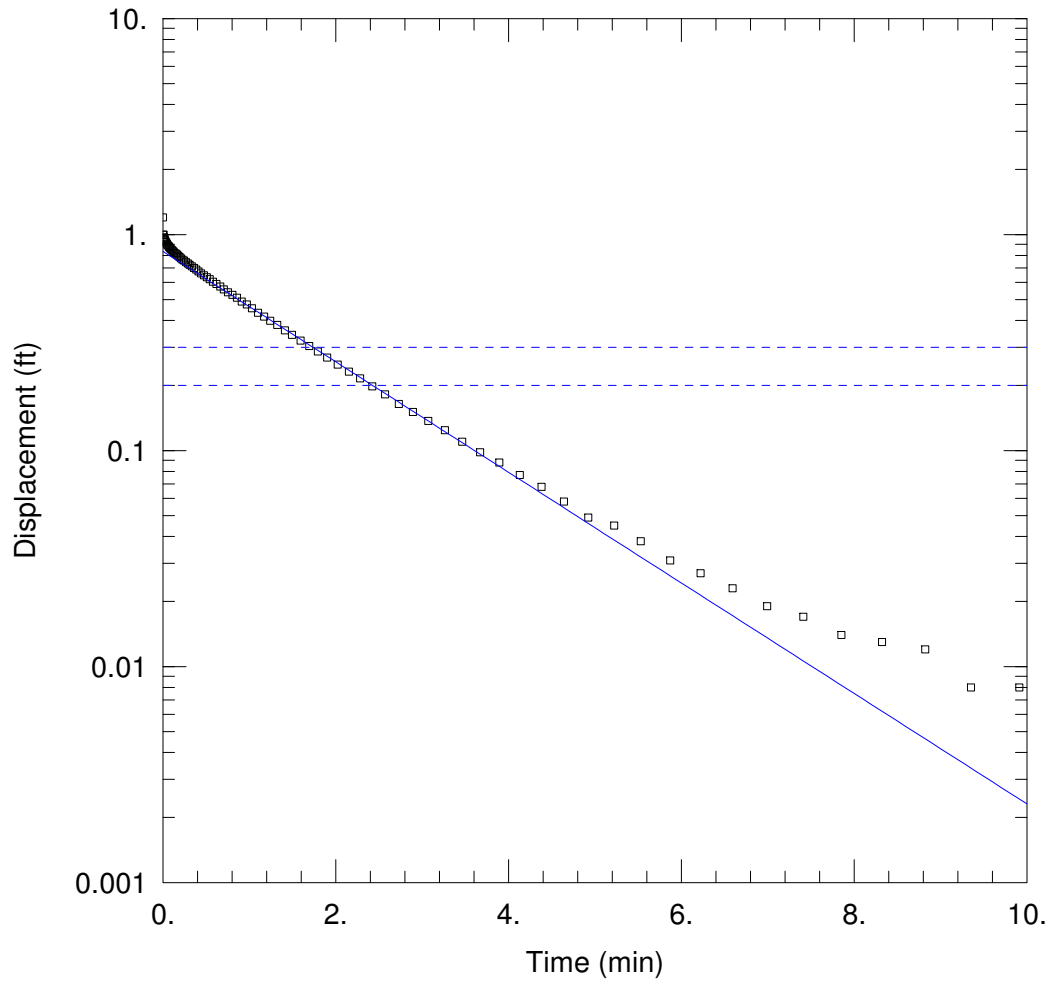
**Measured and Simulated Drawdowns at OWB1D and OWB1S
During Pumping of PWA at Approximately 55, 75 and 115 gpm
Using Vertically Anisotropic Leaky Aquifer Solution in WHIP**



APPENDIX C

Attached Documents:
Slug and Bail Test Interpretations

SLUG AND BAIL TEST INTERPRETATIONS



WELL TEST ANALYSIS

Data Set: H:\...\PZ01 BAIL_SJS_BR_rev.aqt
 Date: 07/10/19

Time: 12:56:15

PROJECT INFORMATION

Company: TTL, INC.
 Client: TWIN PINES
 Test Well: PZ01 BAIL
 Test Date: 10-10-18

AQUIFER DATA

Saturated Thickness: 77. ft

Anisotropy Ratio (K_z/K_r): 0.1

WELL DATA (PZ01 BAIL)

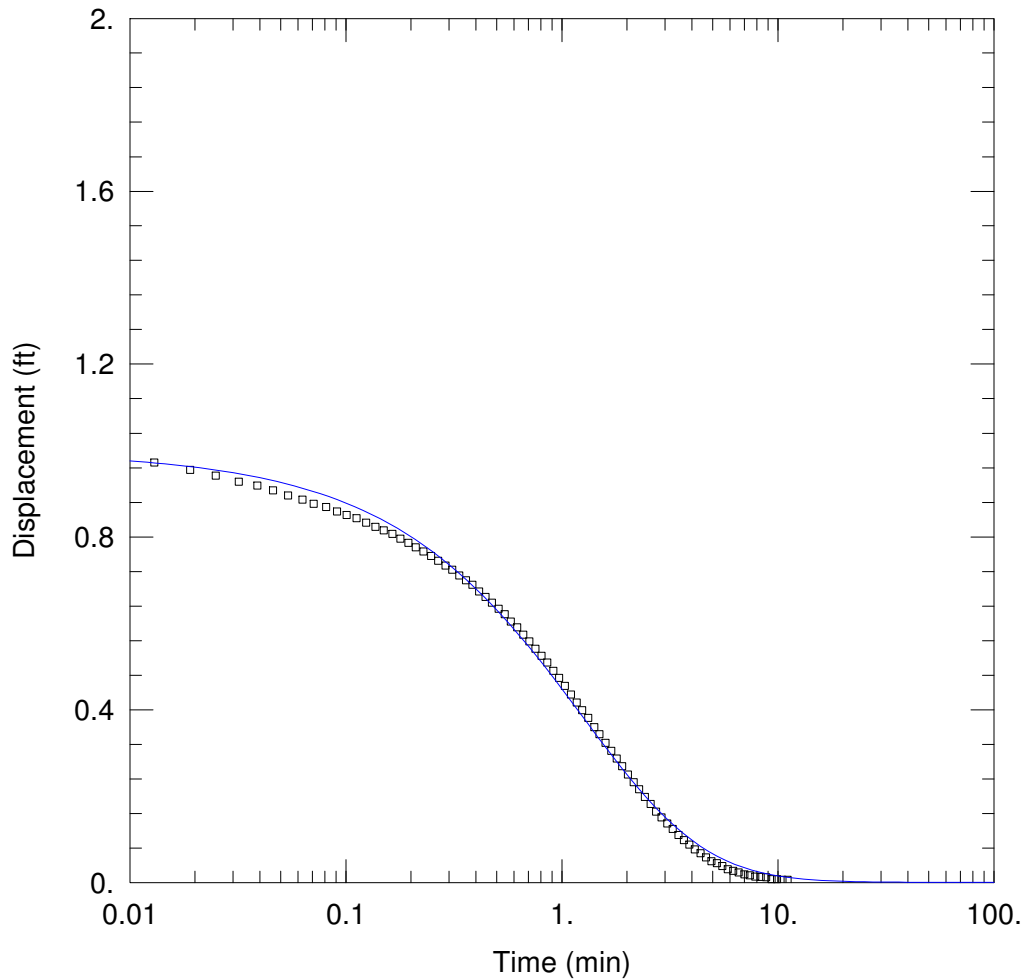
Initial Displacement: 1. ft
 Total Well Penetration Depth: 12.18 ft
 Casing Radius: 0.083 ft

Static Water Column Height: 12.18 ft
 Screen Length: 10. ft
 Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Unconfined
 $K = 0.9818$ ft/day

Solution Method: Bouwer-Rice
 $y_0 = 0.8352$ ft



WELL TEST ANALYSIS

Data Set: H:\...\PZ01 BAIL_SJS_KGS_rev.aqt

Date: 07/10/19

Time: 12:57:07

PROJECT INFORMATION

Company: TTL, INC.

Client: TWIN PINES

Test Well: PZ01 BAIL

Test Date: 10-10-18

AQUIFER DATA

Saturated Thickness: 77. ft

WELL DATA (PZ01 BAIL)

Initial Displacement: 1. ft

Total Well Penetration Depth: 12.18 ft

Casing Radius: 0.083 ft

Static Water Column Height: 12.18 ft

Screen Length: 10. ft

Well Radius: 0.25 ft

SOLUTION

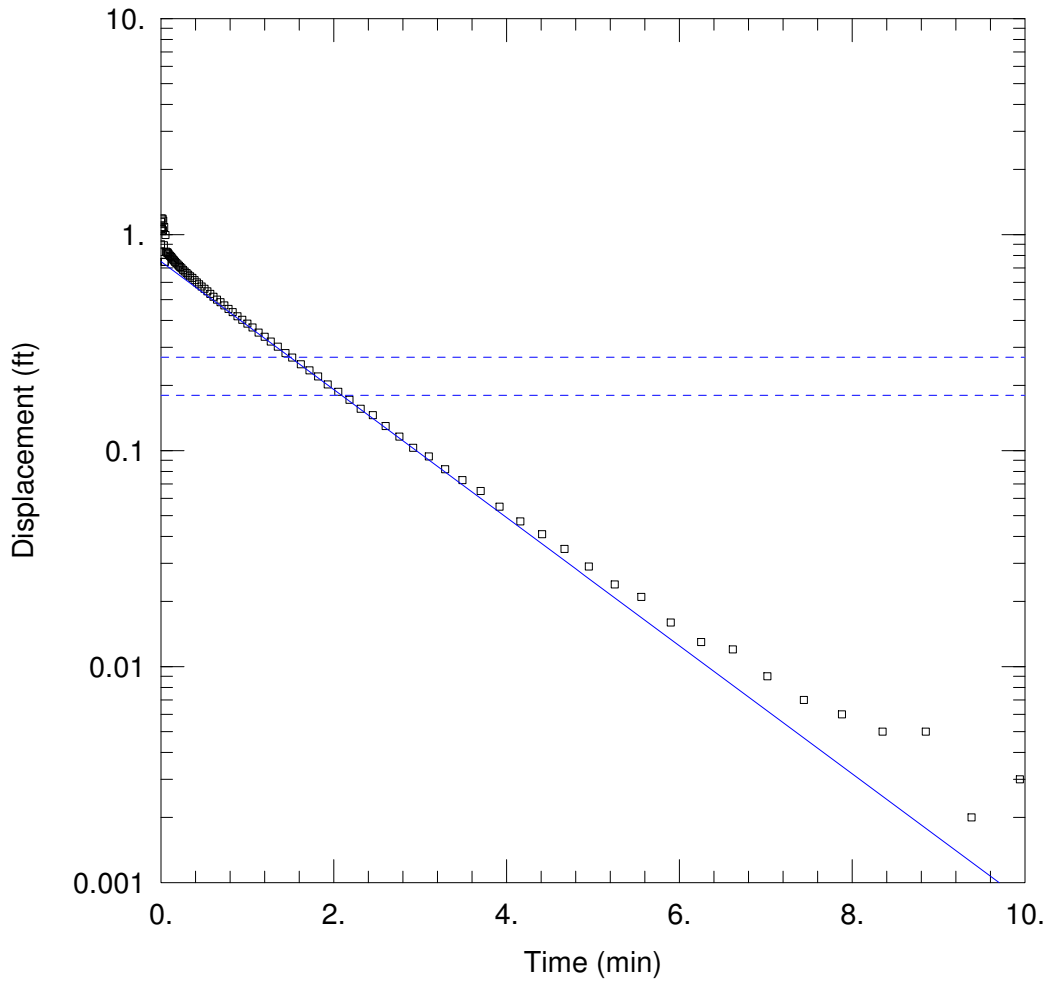
Aquifer Model: Unconfined

Kr = 1.236 ft/day

Kz/Kr = 0.1

Solution Method: KGS Model

Ss = 3.278E-5 ft⁻¹



WELL TEST ANALYSIS

Data Set: H:\...\PZ01 SLUG_SJS_BR_rev.aqt
 Date: 07/10/19

Time: 12:57:27

PROJECT INFORMATION

Company: TTL, INC.
 Client: TWIN PINES
 Test Well: PZ01 SLUG
 Test Date: 10-10-18

AQUIFER DATA

Saturated Thickness: 77. ft

Anisotropy Ratio (K_z/K_r): 0.1

WELL DATA (PZ01 SLUG)

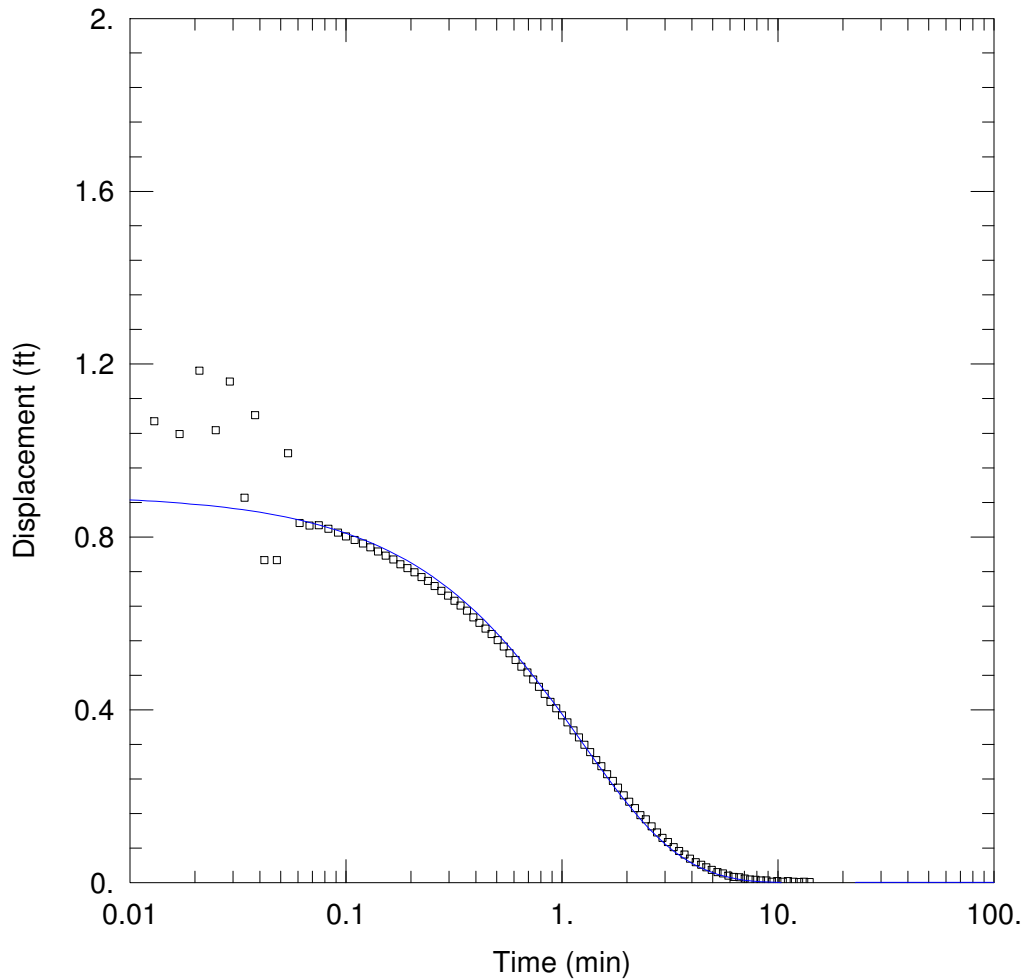
Initial Displacement: 0.9 ft
 Total Well Penetration Depth: 12.18 ft
 Casing Radius: 0.083 ft

Static Water Column Height: 12.18 ft
 Screen Length: 10. ft
 Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Unconfined
 $K = 1.138$ ft/day

Solution Method: Bouwer-Rice
 $y_0 = 0.7508$ ft



WELL TEST ANALYSIS

Data Set: H:\...\PZ01 SLUG_SJS_KGS_rev.aqt

Date: 07/10/19

Time: 12:57:45

PROJECT INFORMATION

Company: TTL, INC.

Client: TWIN PINES

Test Well: PZ01 SLUG

Test Date: 10-10-18

AQUIFER DATA

Saturated Thickness: 77. ft

WELL DATA (PZ01 SLUG)

Initial Displacement: 0.9 ft

Total Well Penetration Depth: 12.18 ft

Casing Radius: 0.083 ft

Static Water Column Height: 12.18 ft

Screen Length: 10. ft

Well Radius: 0.25 ft

SOLUTION

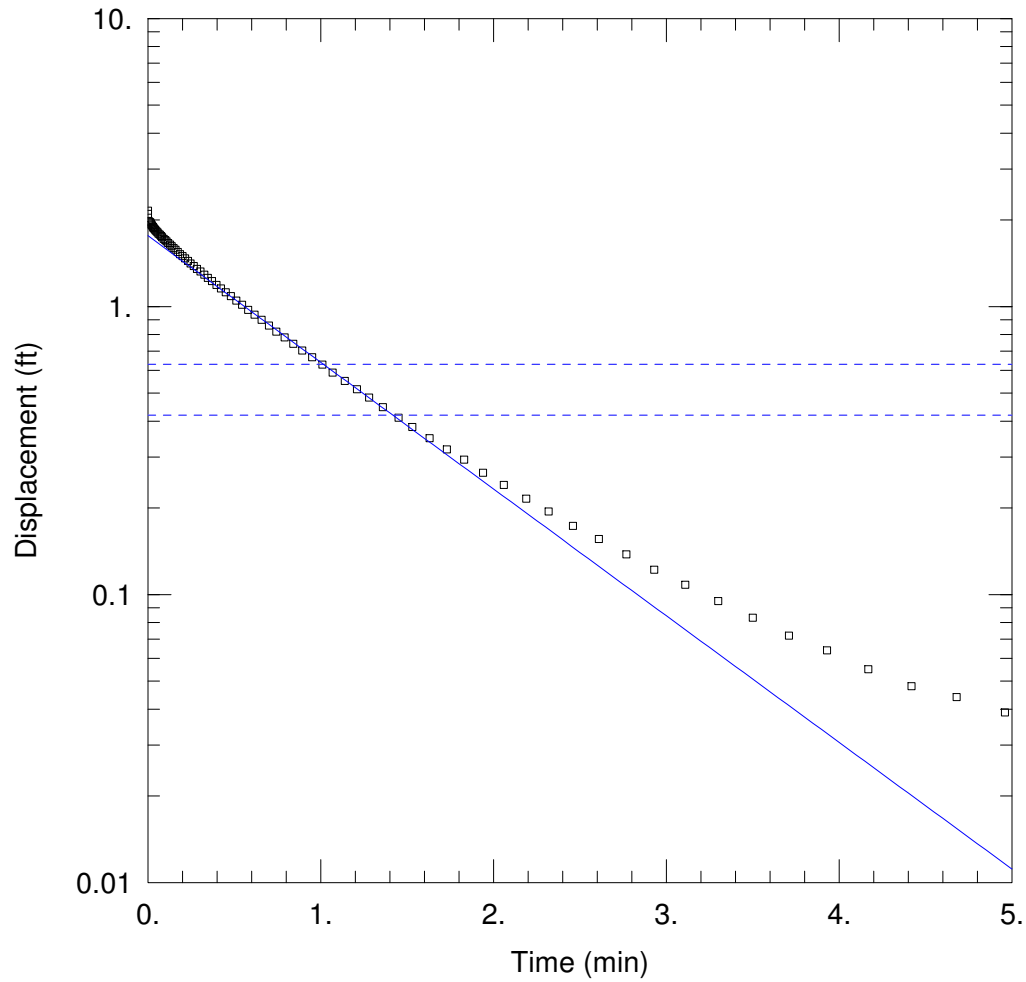
Aquifer Model: Unconfined

Kr = 1.645 ft/day

Kz/Kr = 0.1

Solution Method: KGS Model

Ss = 2.606E-6 ft⁻¹



WELL TEST ANALYSIS

Data Set: H:\...\PZ04 BAIL_SJS_BR_rev.aqt
 Date: 07/10/19

Time: 12:58:02

PROJECT INFORMATION

Company: TTL, INC.
 Client: TWIN PINES
 Test Well: PZ04 BAIL
 Test Date: 10-10-18

AQUIFER DATA

Saturated Thickness: 60. ft

Anisotropy Ratio (K_z/K_r): 0.1

WELL DATA (PZ04 BAIL)

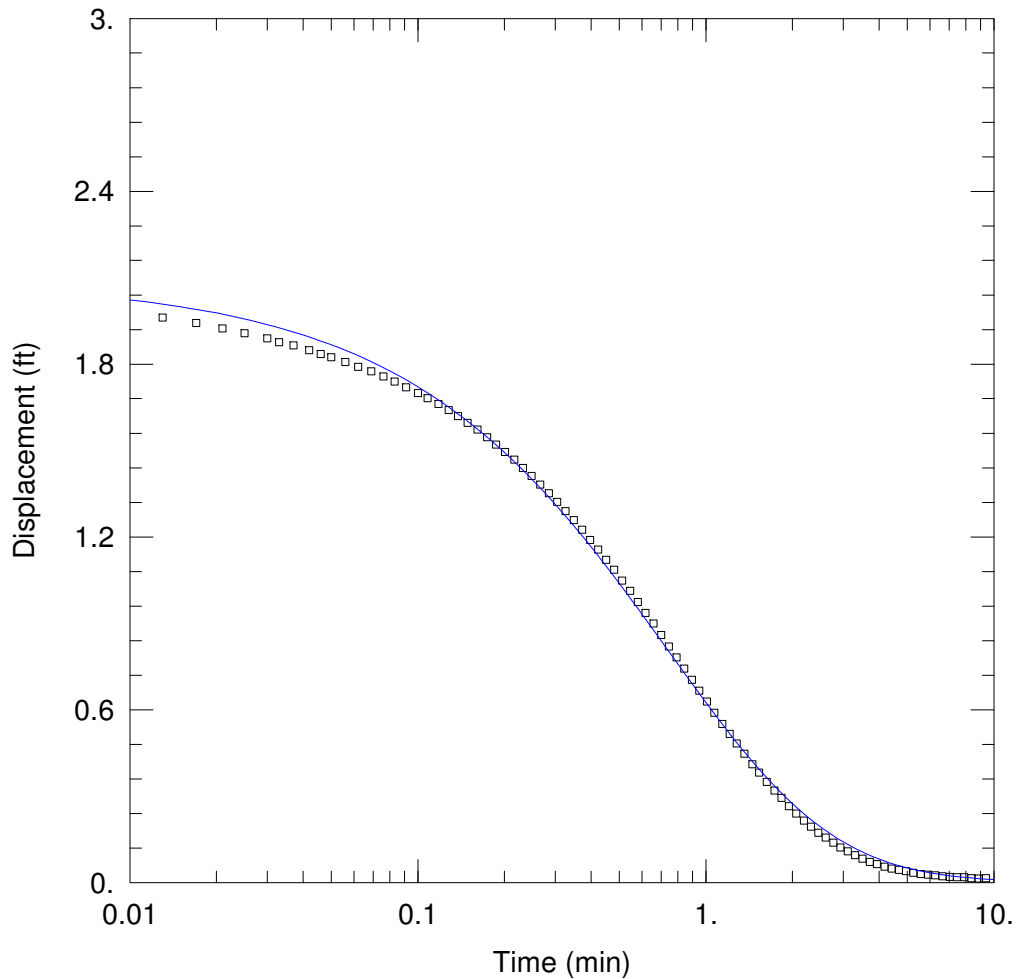
Initial Displacement: 2.1 ft
 Total Well Penetration Depth: 10.88 ft
 Casing Radius: 0.083 ft

Static Water Column Height: 10.88 ft
 Screen Length: 10. ft
 Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Unconfined
 $K = 1.66$ ft/day

Solution Method: Bouwer-Rice
 $y_0 = 1.76$ ft



WELL TEST ANALYSIS

Data Set: H:\...\PZ04 BAIL_SJS_KGS_rev.aqt

Date: 07/10/19

Time: 12:58:17

PROJECT INFORMATION

Company: TTL, INC.

Client: TWIN PINES

Test Well: PZ04 BAIL

Test Date: 10-10-18

AQUIFER DATA

Saturated Thickness: 60. ft

WELL DATA (PZ04 BAIL)

Initial Displacement: 2.1 ft

Total Well Penetration Depth: 10.88 ft

Casing Radius: 0.083 ft

Static Water Column Height: 10.88 ft

Screen Length: 10. ft

Well Radius: 0.25 ft

SOLUTION

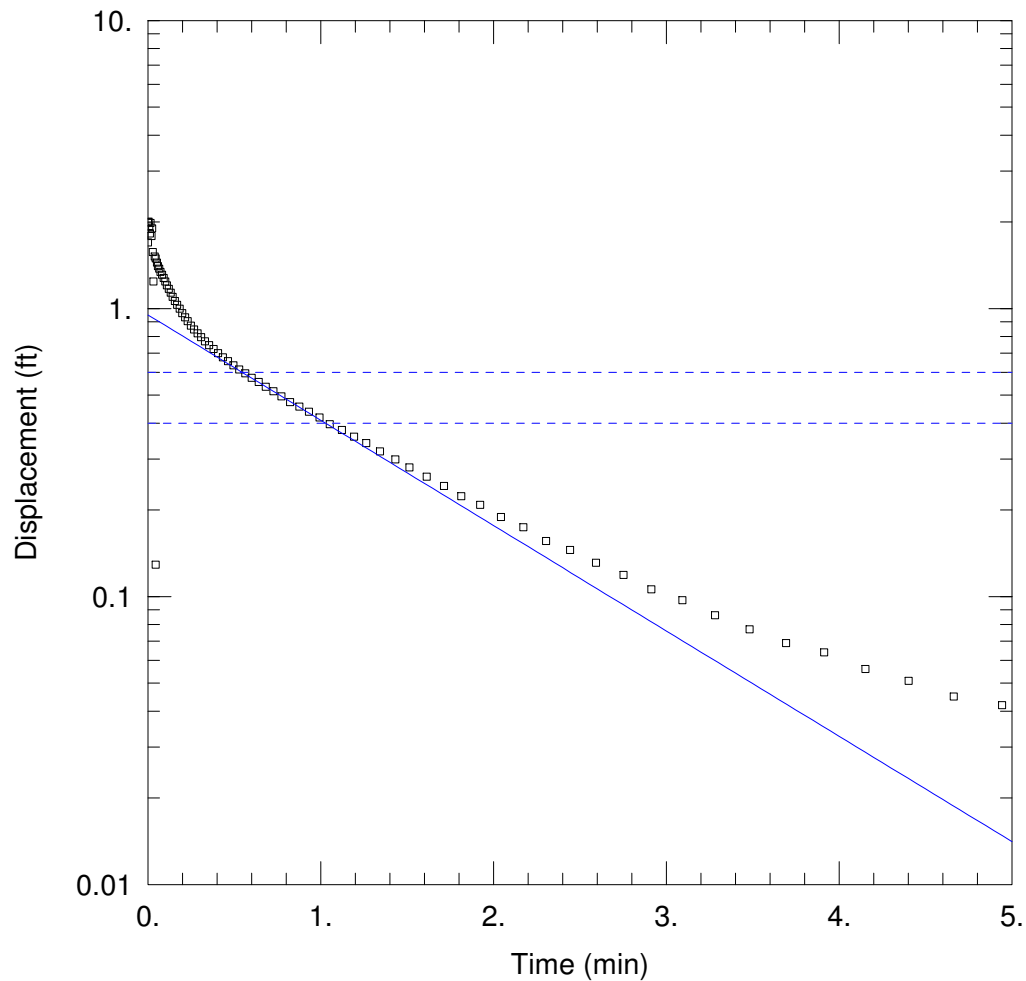
Aquifer Model: Unconfined

Kr = 1.996 ft/day

Kz/Kr = 0.1

Solution Method: KGS Model

Ss = 4.415E-5 ft⁻¹



WELL TEST ANALYSIS

Data Set: H:\...\PZ04 SLUG_SJS_BR_rev.aqt

Date: 07/10/19

Time: 12:58:38

PROJECT INFORMATION

Company: TTL, INC.

Client: TWIN PINES

Test Well: PZ04SLUG

Test Date: 10-10-18

AQUIFER DATA

Saturated Thickness: 60. ft

Anisotropy Ratio (K_z/K_r): 0.1

WELL DATA (PZ04 SLUG)

Initial Displacement: 2. ft

Static Water Column Height: 10.88 ft

Total Well Penetration Depth: 10.88 ft

Screen Length: 10. ft

Casing Radius: 0.083 ft

Well Radius: 0.25 ft

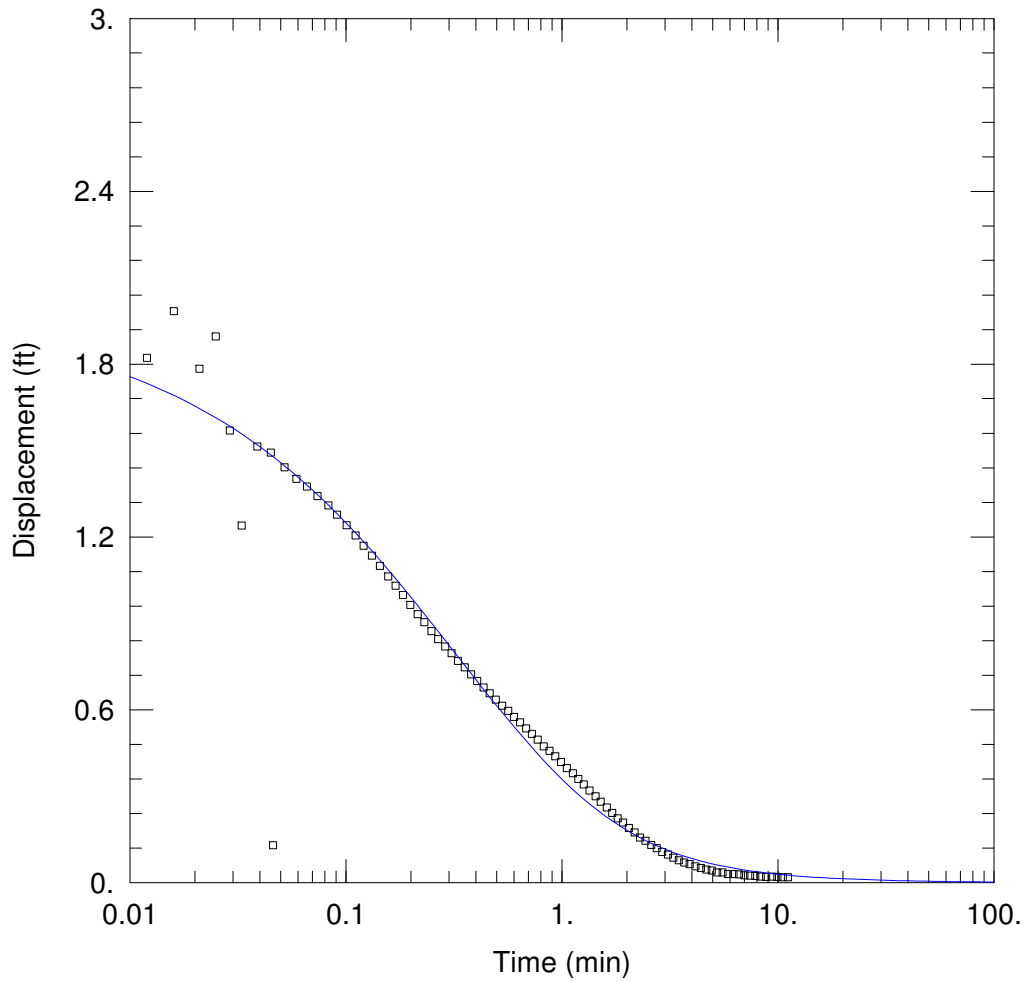
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

$K = 1.381$ ft/day

$y_0 = 0.95$ ft



WELL TEST ANALYSIS

Data Set: H:\...\PZ04 SLUG_SJS_KGS_rev.aqt

Date: 07/10/19

Time: 12:59:00

PROJECT INFORMATION

Company: TTL, INC.

Client: TWIN PINES

Test Well: PZ04SLUG

Test Date: 10-10-18

AQUIFER DATA

Saturated Thickness: 60. ft

WELL DATA (PZ04 SLUG)

Initial Displacement: 2. ft

Total Well Penetration Depth: 10.88 ft

Casing Radius: 0.083 ft

Static Water Column Height: 10.88 ft

Screen Length: 10. ft

Well Radius: 0.25 ft

SOLUTION

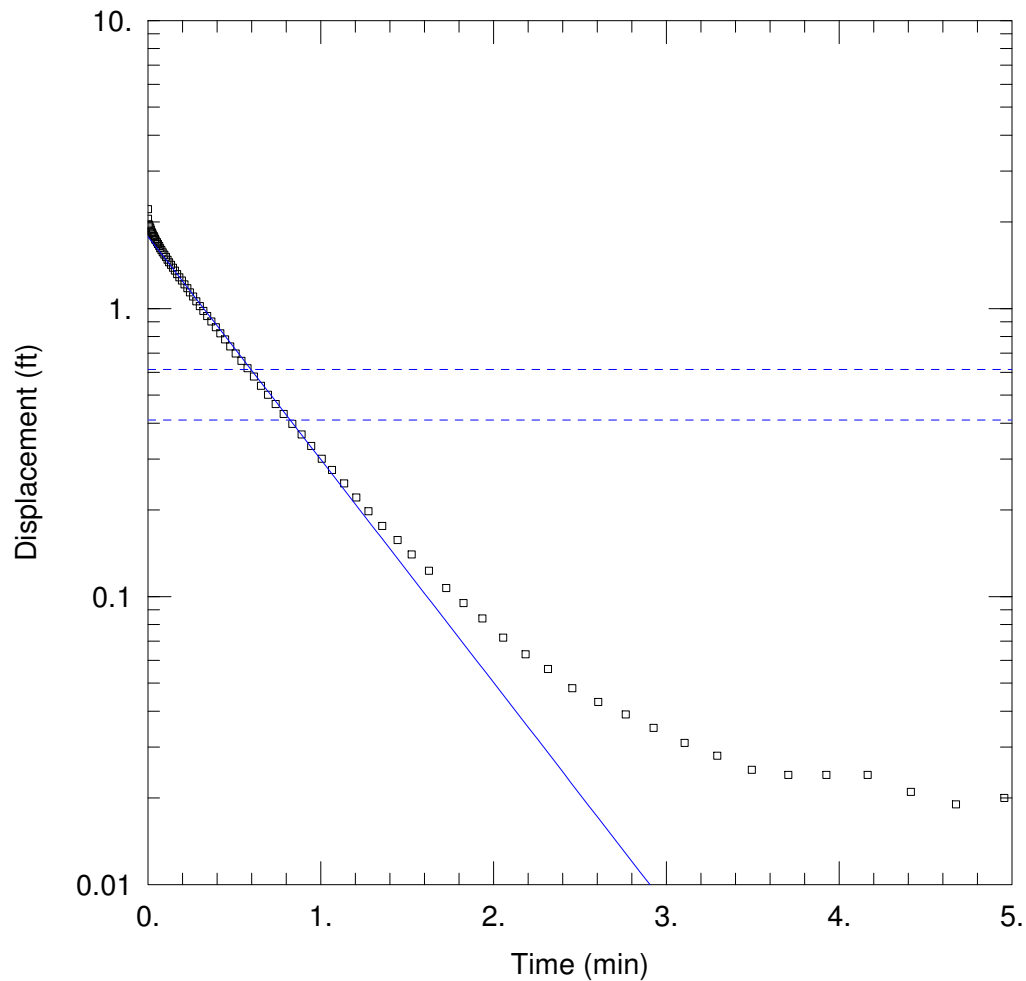
Aquifer Model: Unconfined

Kr = 1.738 ft/day

Kz/Kr = 0.1

Solution Method: KGS Model

Ss = 0.001667 ft⁻¹



WELL TEST ANALYSIS

Data Set: H:\...\PZ06 BAIL_SJS_BR_rev.aqt

Date: 07/10/19

Time: 12:59:17

PROJECT INFORMATION

Company: TTL, INC.

Client: TWIN PINES

Test Well: PZ06 BAIL

Test Date: 10-10-18

AQUIFER DATA

Saturated Thickness: 60. ft

Anisotropy Ratio (K_z/K_r): 0.1

WELL DATA (PZ06 BAIL)

Initial Displacement: 2.05 ft

Static Water Column Height: 11.46 ft

Total Well Penetration Depth: 11.46 ft

Screen Length: 10. ft

Casing Radius: 0.083 ft

Well Radius: 0.25 ft

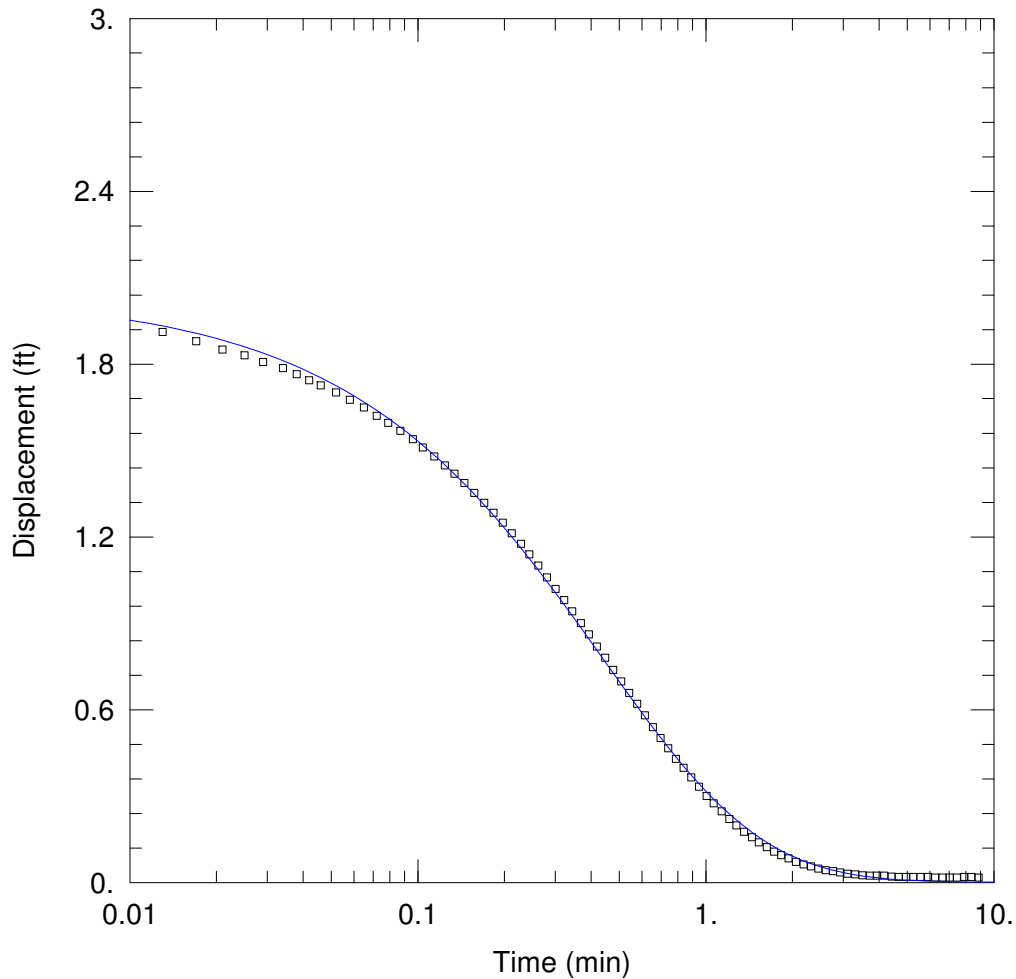
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

$K = 2.946$ ft/day

$y_0 = 1.778$ ft



WELL TEST ANALYSIS

Data Set: H:\...\PZ06 BAIL_SJS_KGS_rev.aqt

Date: 07/10/19

Time: 12:59:35

PROJECT INFORMATION

Company: TTL, INC.

Client: TWIN PINES

Test Well: PZ06 BAIL

Test Date: 10-10-18

AQUIFER DATA

Saturated Thickness: 60. ft

WELL DATA (PZ06 BAIL)

Initial Displacement: 2.05 ft

Total Well Penetration Depth: 11.46 ft

Casing Radius: 0.083 ft

Static Water Column Height: 11.46 ft

Screen Length: 10. ft

Well Radius: 0.25 ft

SOLUTION

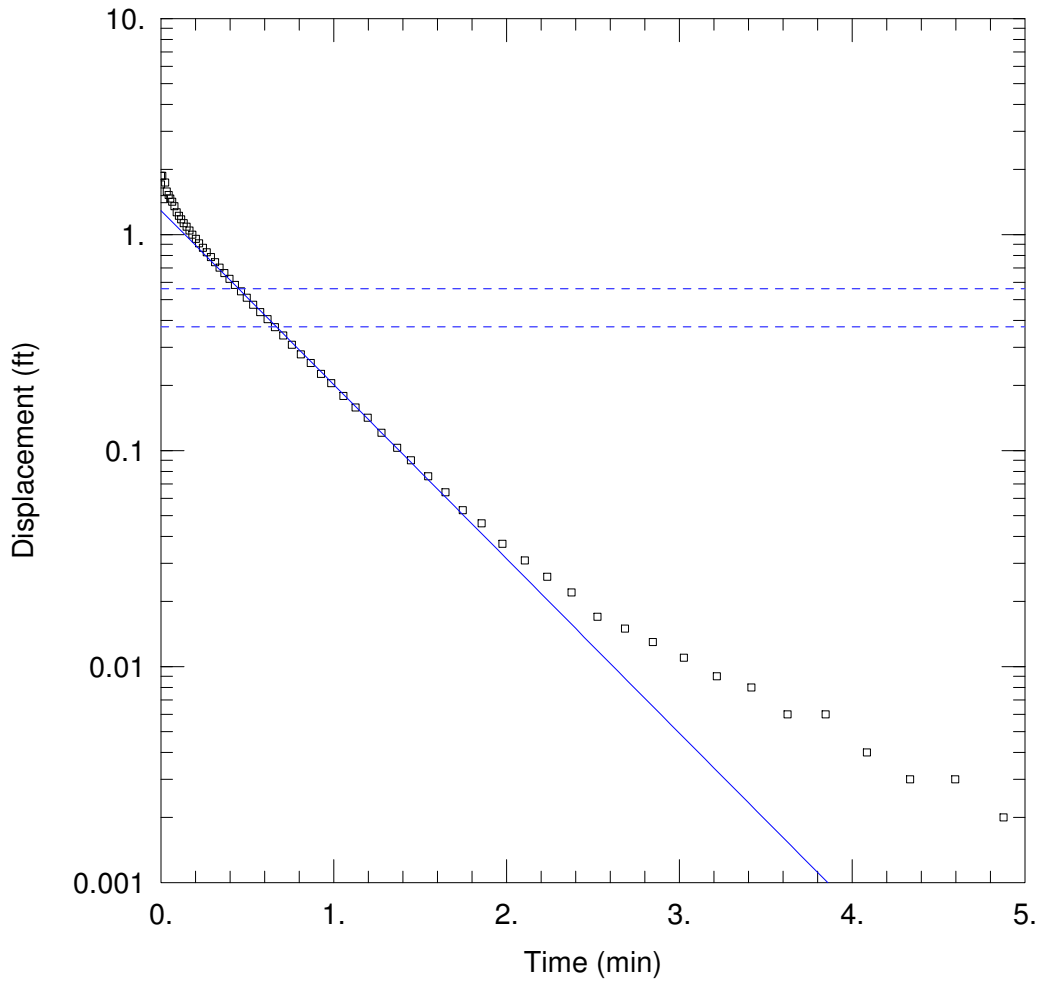
Aquifer Model: Unconfined

Kr = 3.709 ft/day

Kz/Kr = 0.1

Solution Method: KGS Model

Ss = 2.407E-5 ft⁻¹



WELL TEST ANALYSIS

Data Set: H:\...\PZ06 SLUG_SJS_BR_rev.aqt
 Date: 07/10/19

Time: 12:59:52

PROJECT INFORMATION

Company: TTL, INC.
 Client: TWIN PINES
 Test Well: PZ06 SLUG
 Test Date: 10-10-18

AQUIFER DATA

Saturated Thickness: 60. ft

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (PZ06 SLUG)

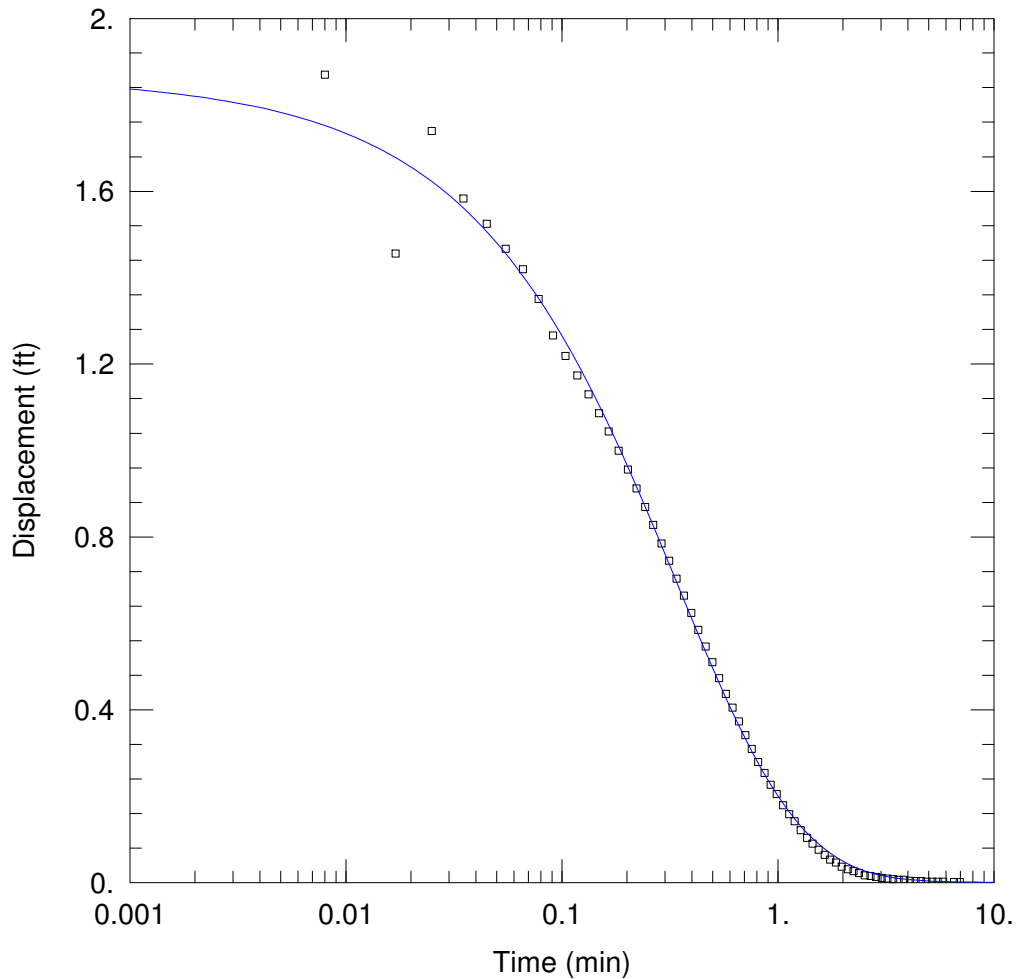
Initial Displacement: 1.87 ft
 Total Well Penetration Depth: 11.46 ft
 Casing Radius: 0.083 ft

Static Water Column Height: 11.46 ft
 Screen Length: 10. ft
 Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Unconfined
 K = 2.215 ft/day

Solution Method: Bouwer-Rice
 y0 = 1.291 ft



WELL TEST ANALYSIS

Data Set: H:\...\PZ06 SLUG_SJS_KGS_rev.aqt

Date: 07/10/19

Time: 13:00:07

PROJECT INFORMATION

Company: TTL, INC.

Client: TWIN PINES

Test Well: PZ06 SLUG

Test Date: 10-10-18

AQUIFER DATA

Saturated Thickness: 60. ft

WELL DATA (PZ06 SLUG)

Initial Displacement: 1.87 ft

Total Well Penetration Depth: 11.46 ft

Casing Radius: 0.083 ft

Static Water Column Height: 11.46 ft

Screen Length: 10. ft

Well Radius: 0.25 ft

SOLUTION

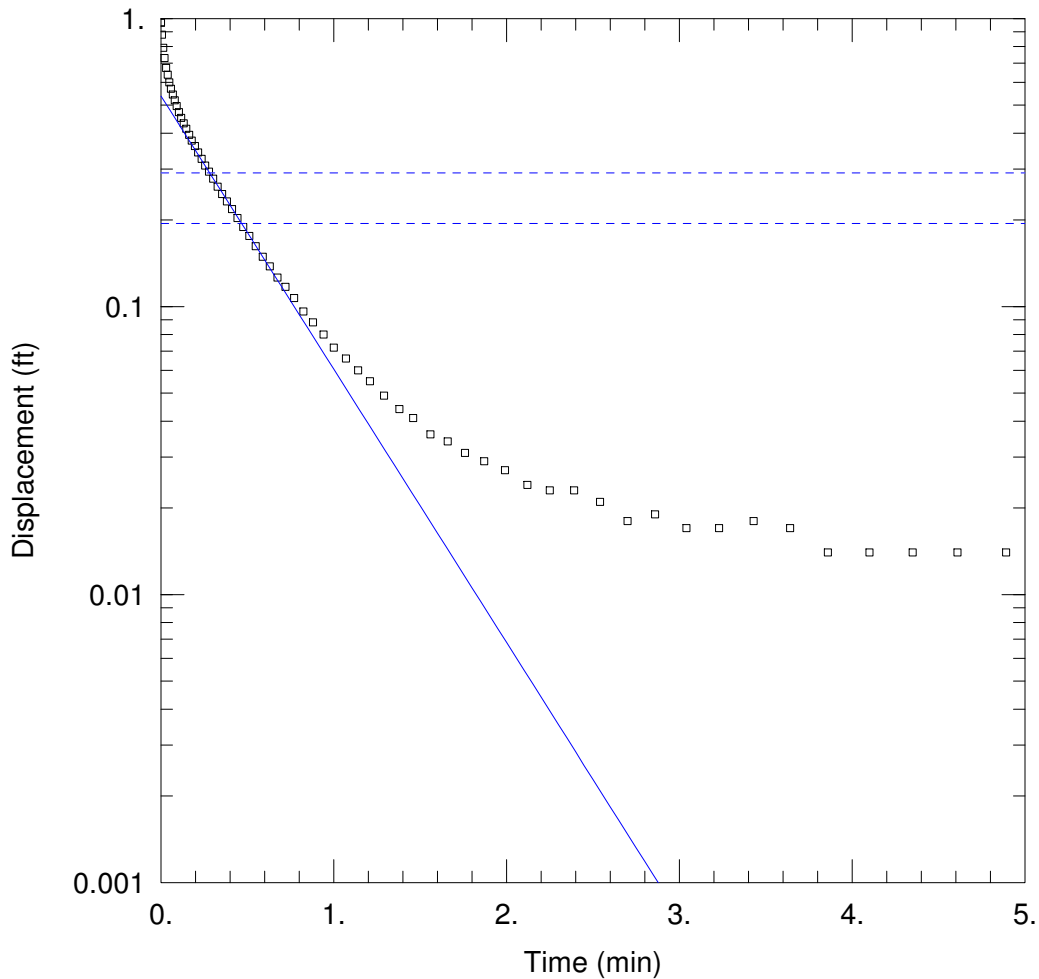
Aquifer Model: Unconfined

Kr = 3.511 ft/day

Kz/Kr = 1.

Solution Method: KGS Model

Ss = 0.0001258 ft⁻¹



WELL TEST ANALYSIS

Data Set: H:\...\PZ10 BAIL_SJS_BR_rev.aqt

Date: 07/10/19

Time: 13:00:24

PROJECT INFORMATION

Company: TTL, INC.

Client: TWIN PINES

Test Well: PZ10 BAIL

Test Date: 10-10-18

AQUIFER DATA

Saturated Thickness: 90. ft

Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (PZ10 BAIL)

Initial Displacement: 0.97 ft

Static Water Column Height: 22.58 ft

Total Well Penetration Depth: 20.58 ft

Screen Length: 10. ft

Casing Radius: 0.083 ft

Well Radius: 0.25 ft

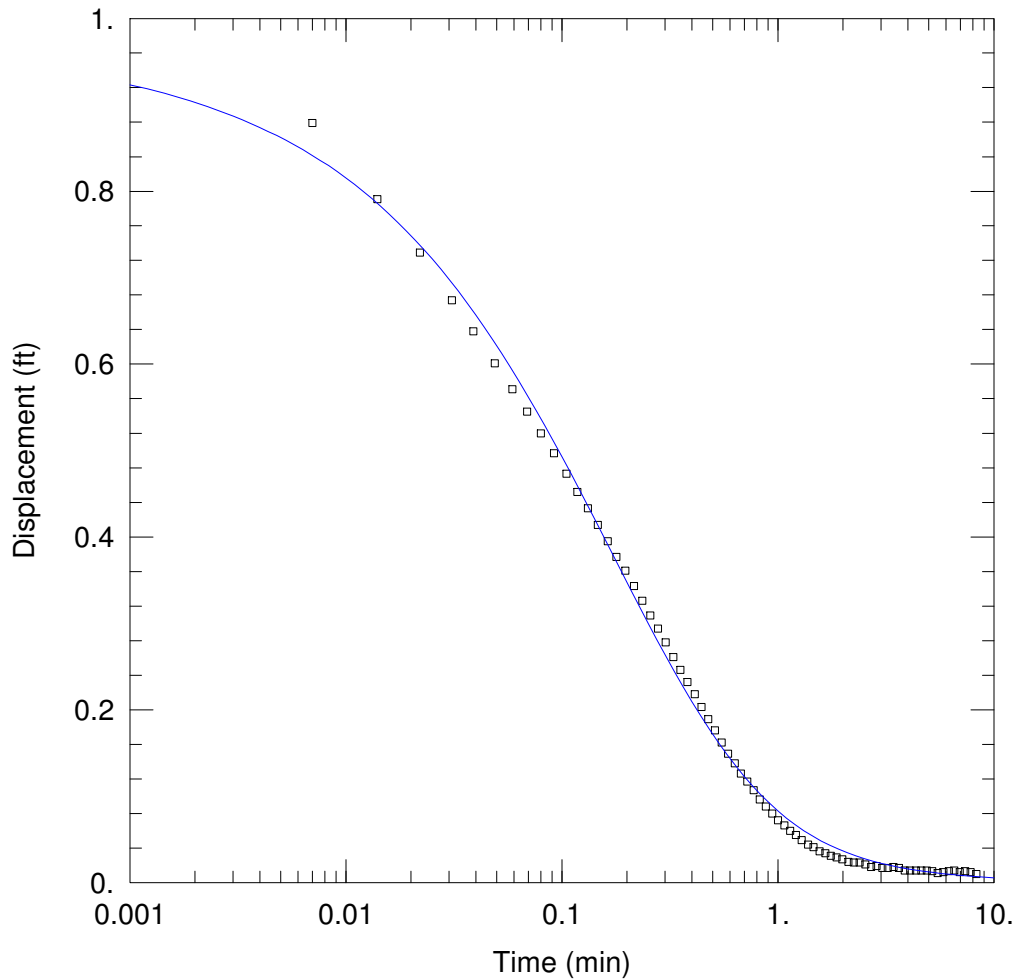
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 3.914 ft/day

y0 = 0.5383 ft



WELL TEST ANALYSIS

Data Set: H:\...\PZ10 BAIL_SJS_KGS_rev.aqt

Date: 07/10/19

Time: 13:00:38

PROJECT INFORMATION

Company: TTL, INC.

Client: TWIN PINES

Test Well: PZ10 BAIL

Test Date: 10-10-18

AQUIFER DATA

Saturated Thickness: 90. ft

WELL DATA (PZ10 BAIL)

Initial Displacement: 0.97 ft

Total Well Penetration Depth: 20.58 ft

Casing Radius: 0.083 ft

Static Water Column Height: 22.58 ft

Screen Length: 10. ft

Well Radius: 0.25 ft

SOLUTION

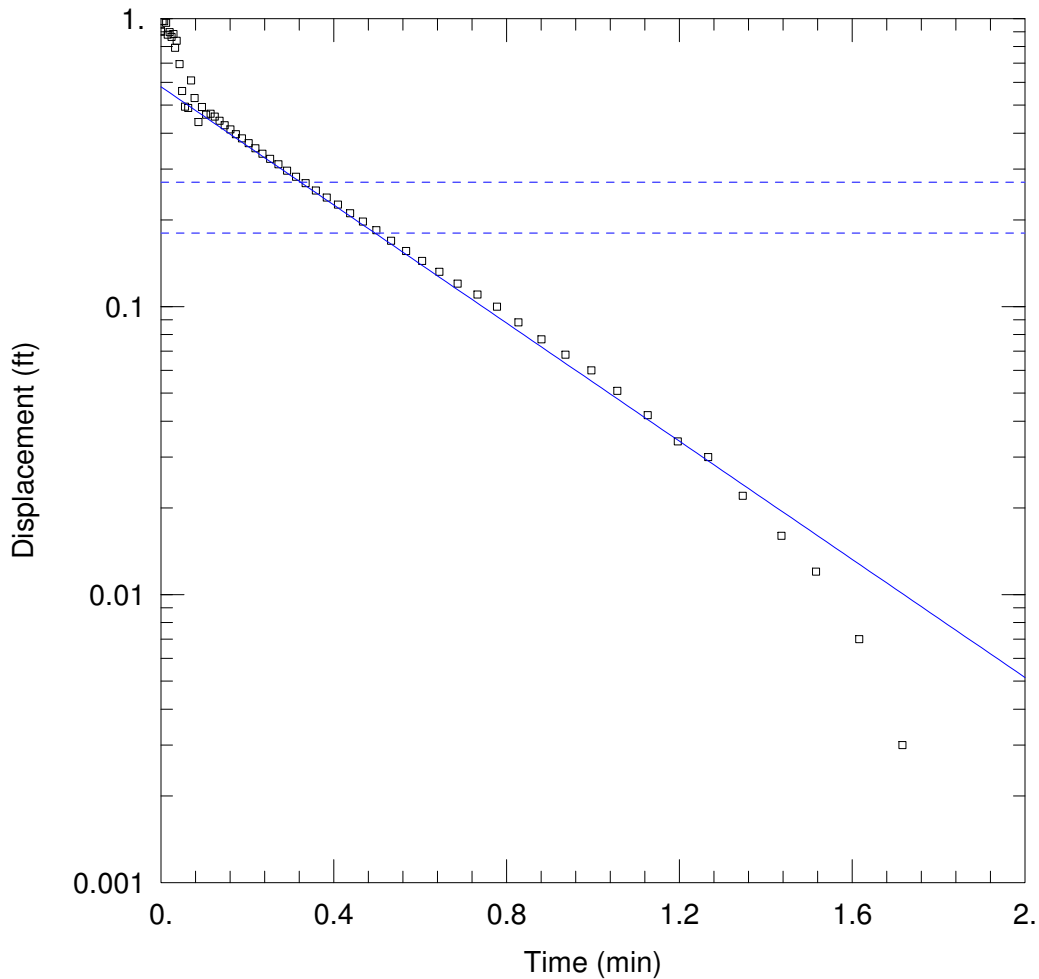
Aquifer Model: Unconfined

Kr = 3.914 ft/day

Kz/Kr = 0.1

Solution Method: KGS Model

Ss = 0.001111 ft⁻¹



WELL TEST ANALYSIS

Data Set: H:\...\PZ10 SLUG_SJS_BR_rev.aqt

Date: 07/10/19

Time: 13:00:56

PROJECT INFORMATION

Company: TTL, INC.

Client: TWIN PINES

Test Well: PZ10 SLUG

Test Date: 10-10-18

AQUIFER DATA

Saturated Thickness: 90. ft

Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (PZ10 SLUG)

Initial Displacement: 0.9 ft

Static Water Column Height: 22.6 ft

Total Well Penetration Depth: 20.26 ft

Screen Length: 10. ft

Casing Radius: 0.083 ft

Well Radius: 0.25 ft

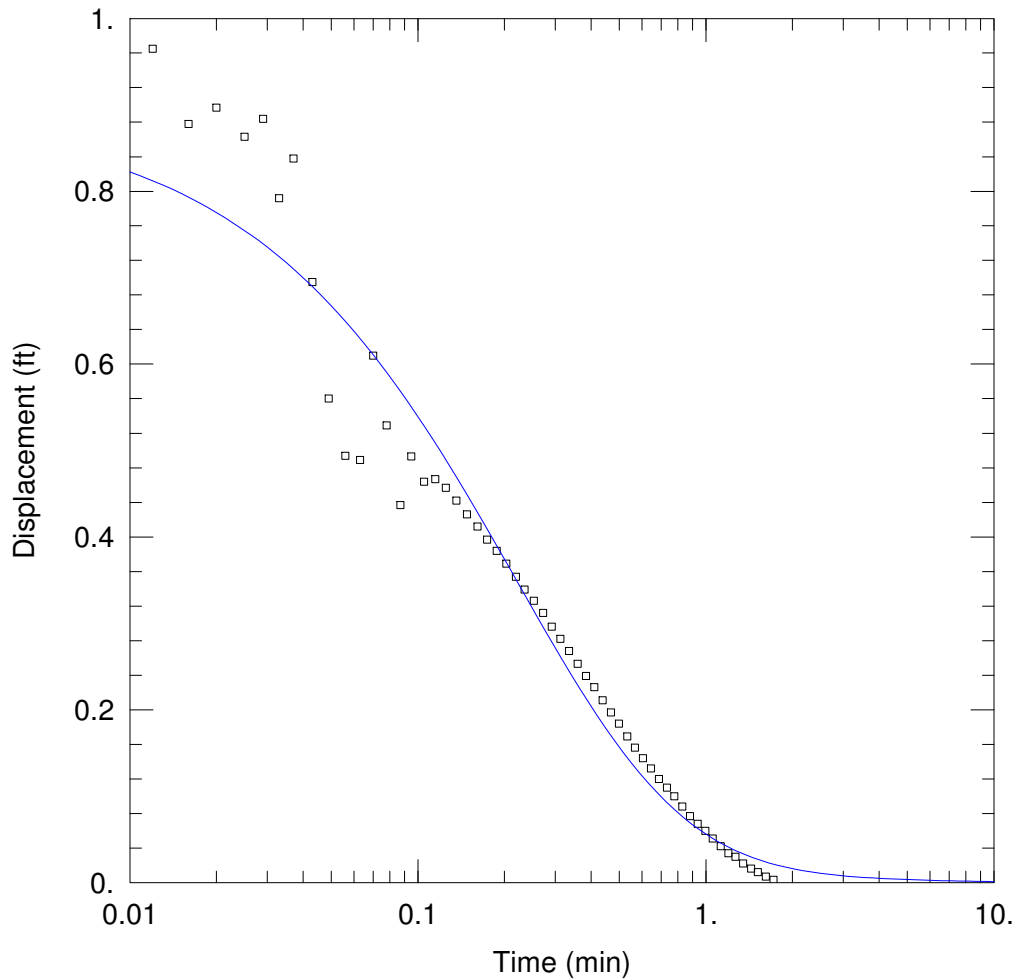
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 4.222 ft/day

y0 = 0.5791 ft



WELL TEST ANALYSIS

Data Set: H:\...\PZ10 SLUG_SJS_KGS_rev.aqt

Date: 07/10/19

Time: 13:01:13

PROJECT INFORMATION

Company: TTL, INC.

Client: TWIN PINES

Test Well: PZ10 SLUG

Test Date: 10-10-18

AQUIFER DATA

Saturated Thickness: 90. ft

WELL DATA (PZ10 SLUG)

Initial Displacement: 0.9 ft

Total Well Penetration Depth: 20.26 ft

Casing Radius: 0.083 ft

Static Water Column Height: 22.6 ft

Screen Length: 10. ft

Well Radius: 0.25 ft

SOLUTION

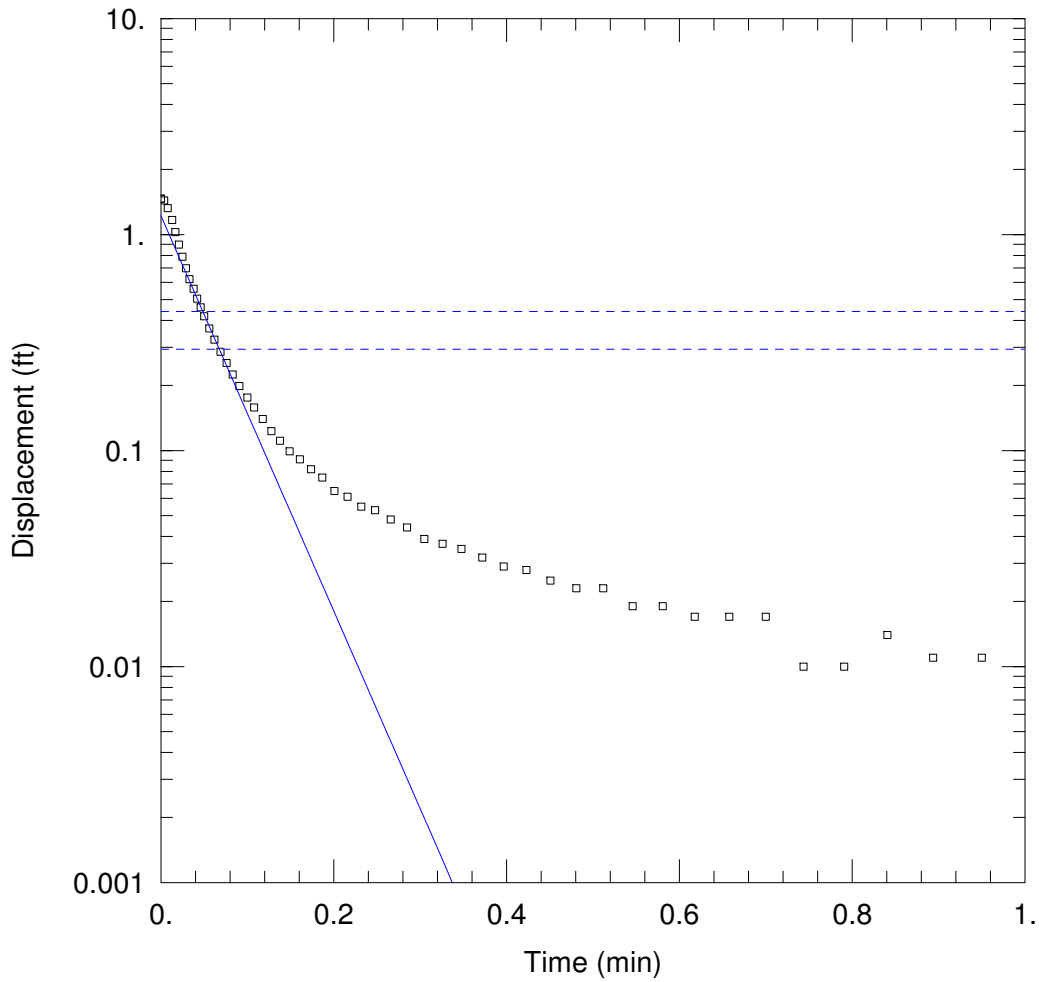
Aquifer Model: Unconfined

Kr = 6.39 ft/day

Kz/Kr = 0.1

Solution Method: KGS Model

Ss = 5.488E-5 ft⁻¹



WELL TEST ANALYSIS

Data Set: H:\...\PZ13 BAIL_SJS_BR_rev.aqt
 Date: 07/10/19

Time: 13:01:29

PROJECT INFORMATION

Company: TTL, INC.
 Client: TWIN PINES
 Test Well: PZ13 BAIL
 Test Date: 10-10-18

AQUIFER DATA

Saturated Thickness: 62. ft

Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (PZ13 BAIL)

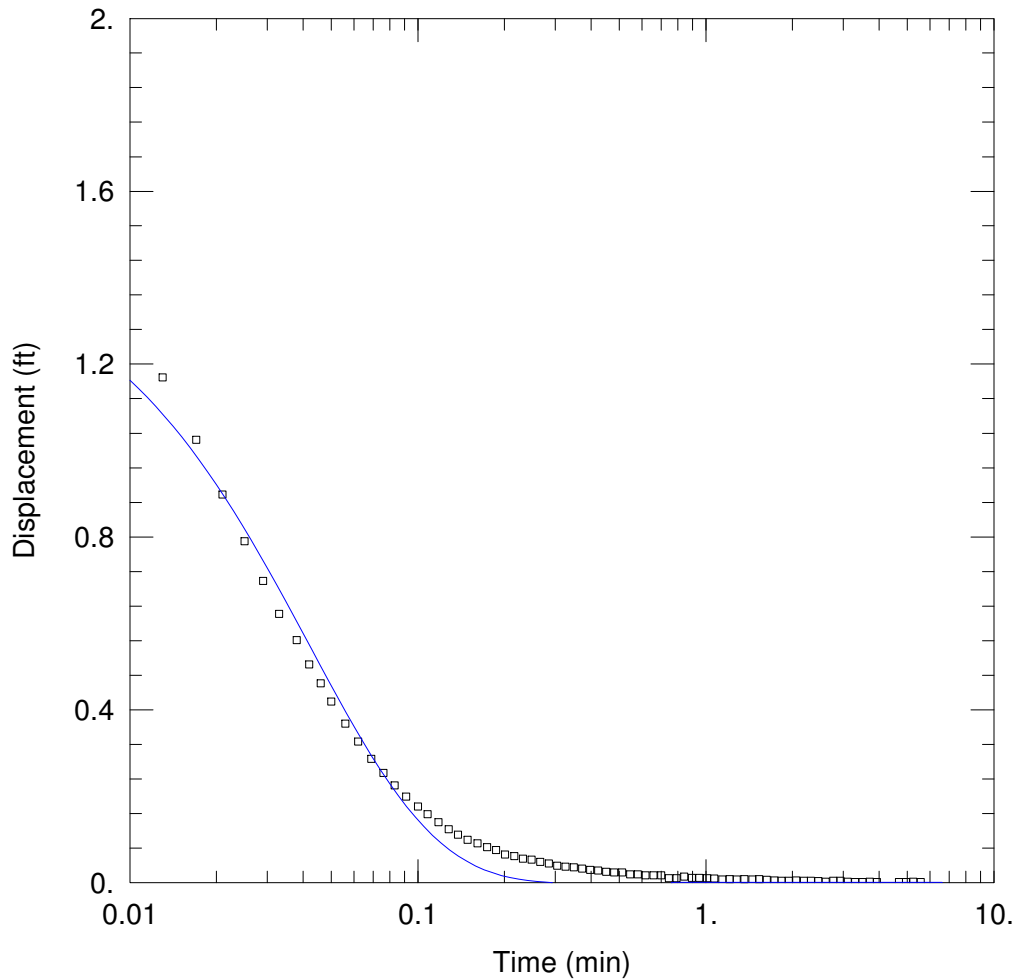
Initial Displacement: 1.47 ft
 Total Well Penetration Depth: 27.39 ft
 Casing Radius: 0.083 ft

Static Water Column Height: 27.39 ft
 Screen Length: 10. ft
 Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Unconfined
 K = 39.11 ft/day

Solution Method: Bouwer-Rice
 y0 = 1.22 ft



WELL TEST ANALYSIS

Data Set: H:\...\PZ13 BAIL_SJS_KGS_rev.aqt

Date: 07/10/19

Time: 13:01:45

PROJECT INFORMATION

Company: TTL, INC.

Client: TWIN PINES

Test Well: PZ13 BAIL

Test Date: 10-10-18

AQUIFER DATA

Saturated Thickness: 62. ft

WELL DATA (PZ13 BAIL)

Initial Displacement: 1.47 ft

Total Well Penetration Depth: 27.39 ft

Casing Radius: 0.083 ft

Static Water Column Height: 27.39 ft

Screen Length: 10. ft

Well Radius: 0.25 ft

SOLUTION

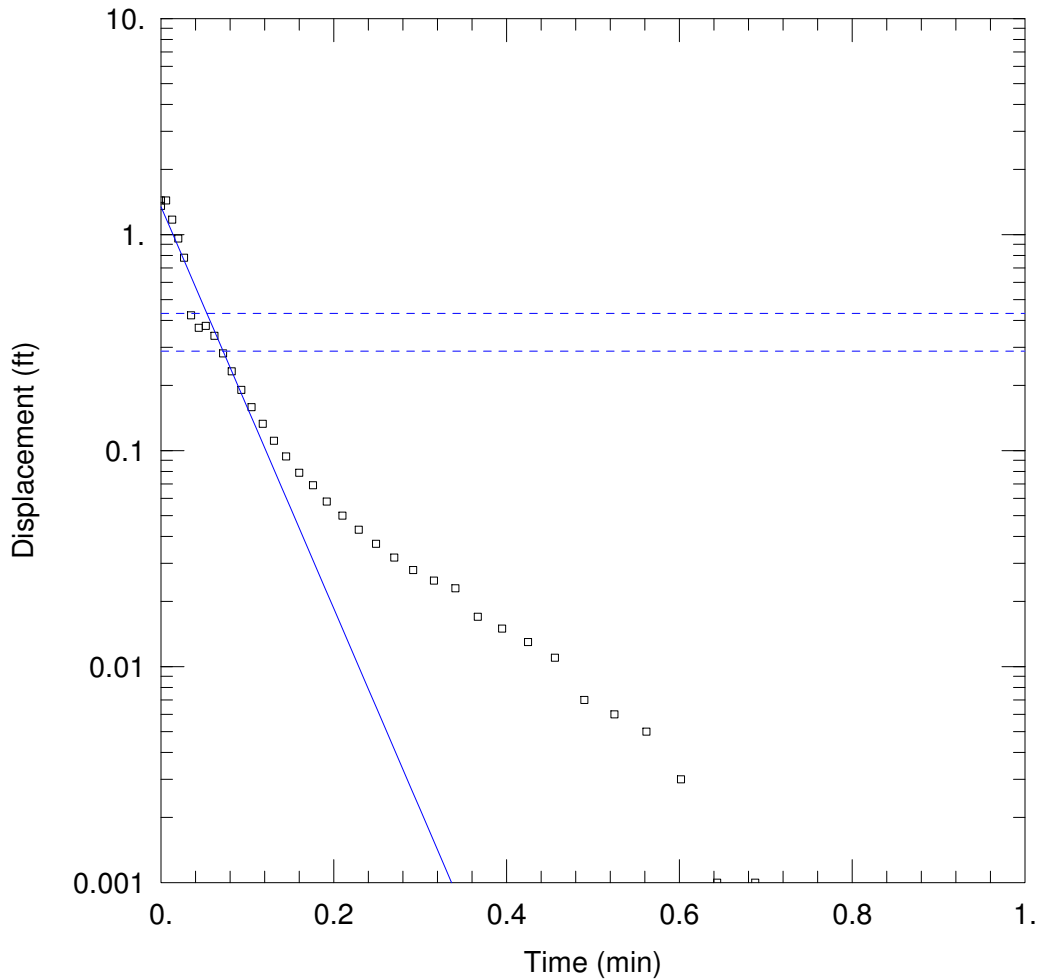
Aquifer Model: Unconfined

Kr = 51.55 ft/day

Kz/Kr = 0.1

Solution Method: KGS Model

Ss = 1.613E-12 ft⁻¹



WELL TEST ANALYSIS

Data Set: H:\...\PZ13 SLUG_SJS_BR_rev.aqt
 Date: 07/10/19

Time: 13:02:02

PROJECT INFORMATION

Company: TTL, INC.
 Client: TWIN PINES
 Test Well: PZ13 SLUG
 Test Date: 10-10-18

AQUIFER DATA

Saturated Thickness: 62. ft

Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (PZ13 SLUG)

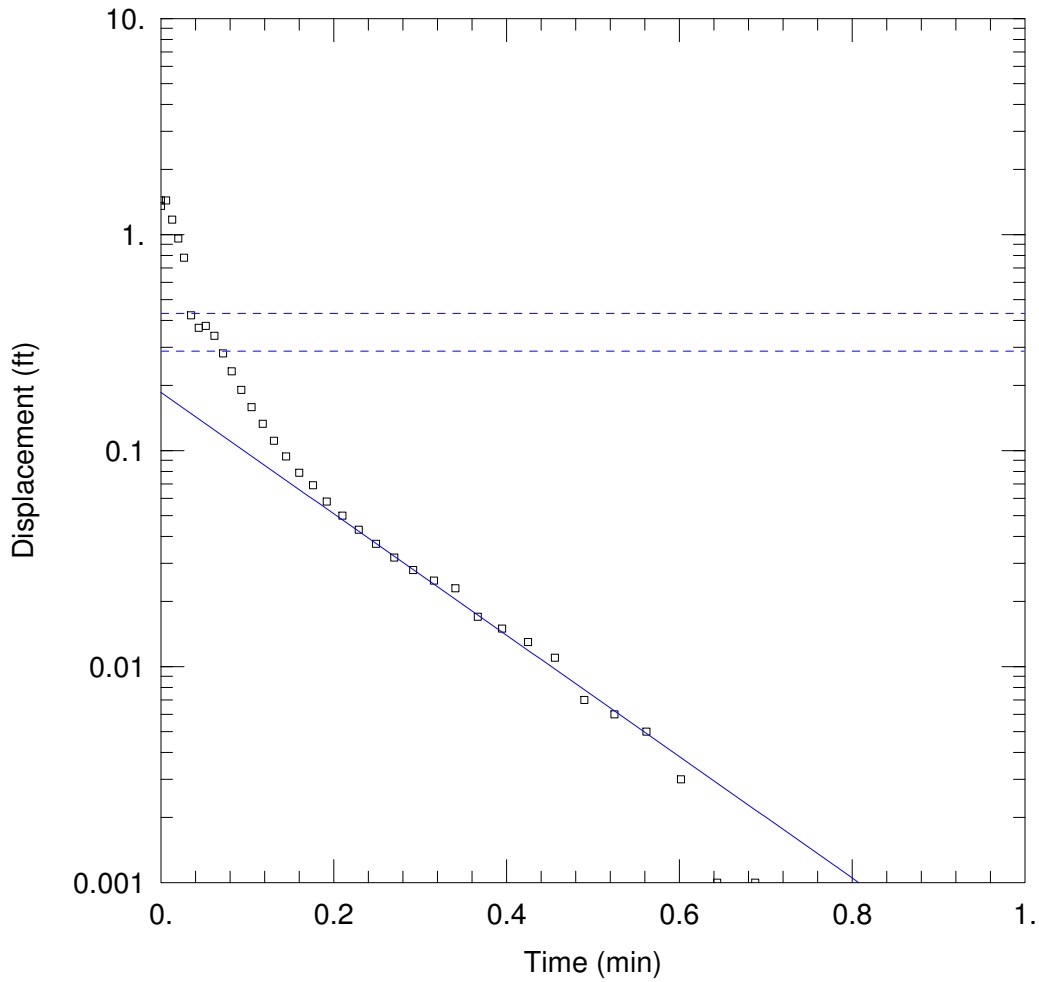
Initial Displacement: 1.44 ft
 Total Well Penetration Depth: 27.4 ft
 Casing Radius: 0.083 ft

Static Water Column Height: 27.4 ft
 Screen Length: 10. ft
 Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Unconfined
 K = 39.77 ft/day

Solution Method: Bouwer-Rice
 y0 = 1.345 ft



WELL TEST ANALYSIS

Data Set: H:\...\PZ13 SLUG_SJS_BRIt_rev.aqt
 Date: 07/10/19

Time: 13:02:22

PROJECT INFORMATION

Company: TTL, INC.
 Client: TWIN PINES
 Test Well: PZ13 SLUG
 Test Date: 10-10-18

AQUIFER DATA

Saturated Thickness: 62. ft

Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (PZ13 SLUG)

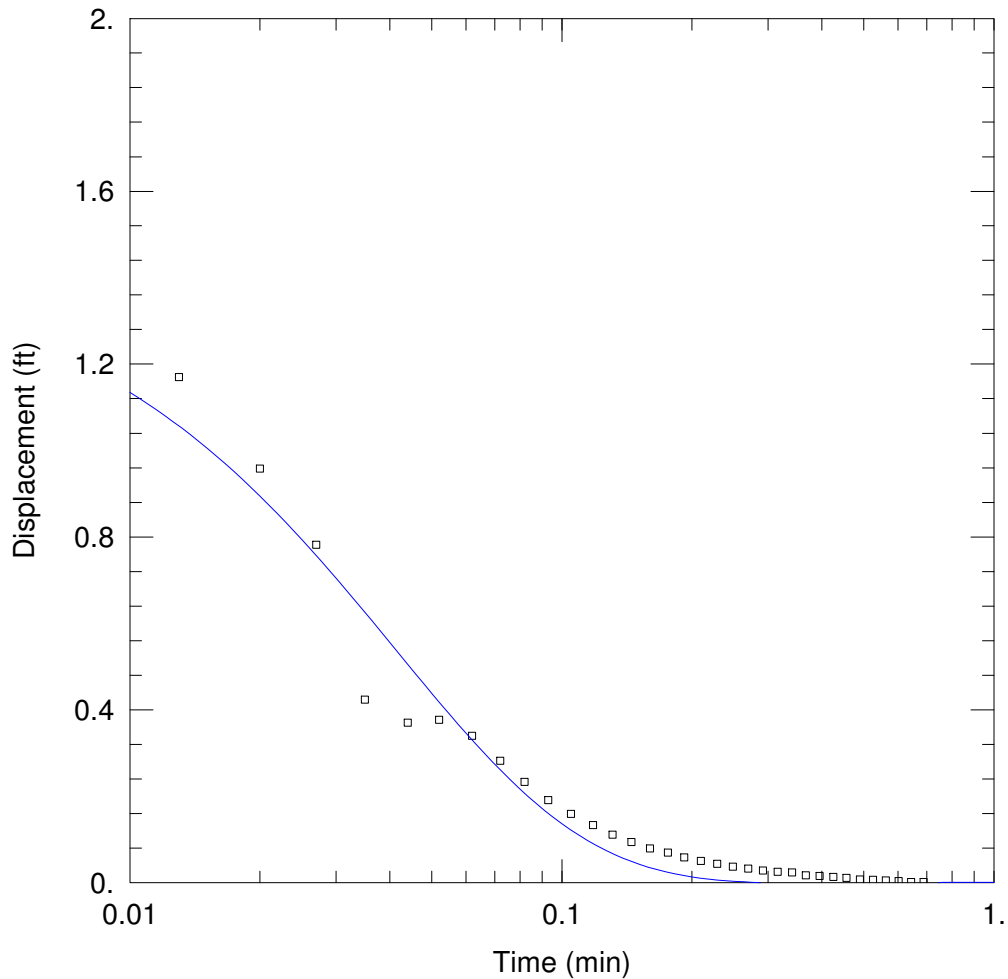
Initial Displacement: 1.44 ft
 Total Well Penetration Depth: 27.4 ft
 Casing Radius: 0.083 ft

Static Water Column Height: 27.4 ft
 Screen Length: 10. ft
 Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Unconfined
 K = 12.01 ft/day

Solution Method: Bouwer-Rice
 y0 = 0.1856 ft



WELL TEST ANALYSIS

Data Set: H:\...\PZ13 SLUG_SJS_KGS_rev.aqt

Date: 07/10/19

Time: 13:02:39

PROJECT INFORMATION

Company: TTL, INC.

Client: TWIN PINES

Test Well: PZ13 SLUG

Test Date: 10-10-18

AQUIFER DATA

Saturated Thickness: 62. ft

WELL DATA (PZ13 SLUG)

Initial Displacement: 1.44 ft

Total Well Penetration Depth: 27.4 ft

Casing Radius: 0.083 ft

Static Water Column Height: 27.4 ft

Screen Length: 10. ft

Well Radius: 0.25 ft

SOLUTION

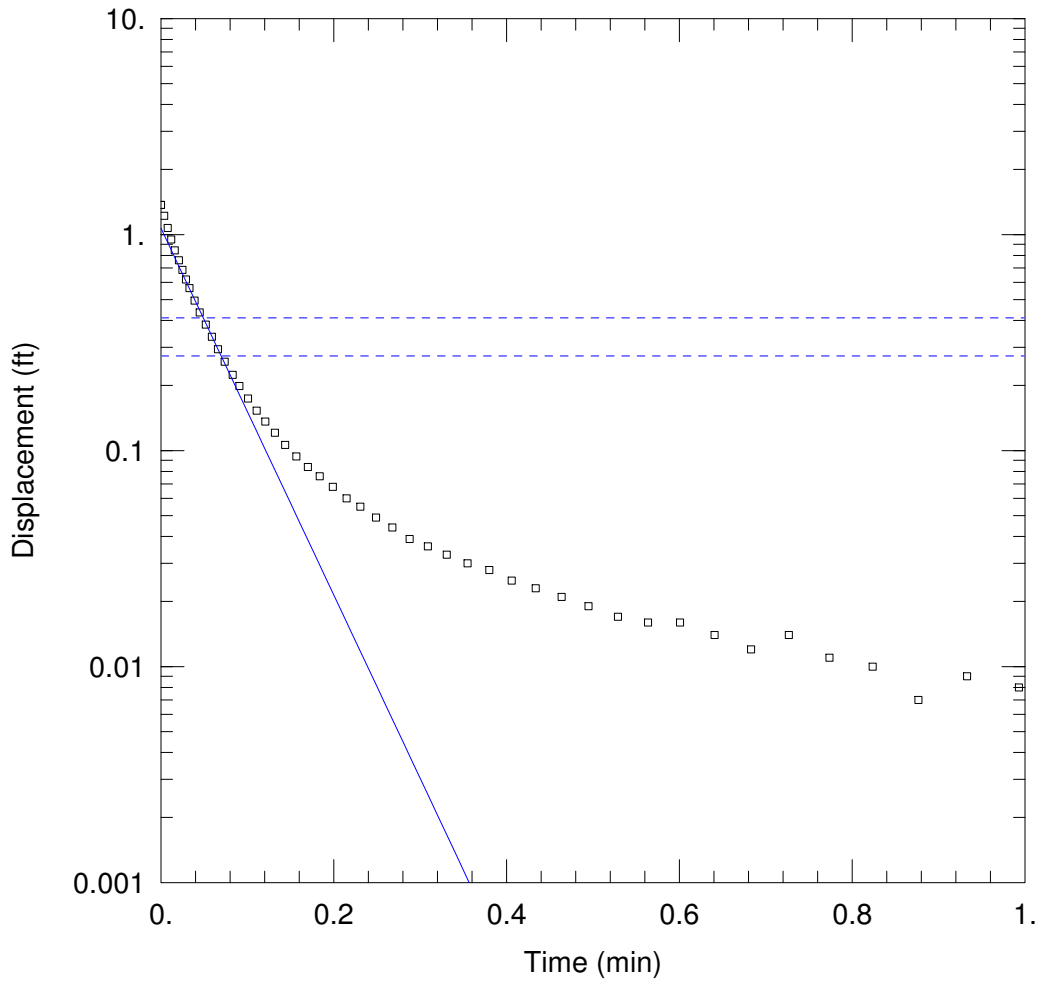
Aquifer Model: Unconfined

Kr = 52.42 ft/day

Kz/Kr = 0.1

Solution Method: KGS Model

Ss = 1.613E-12 ft⁻¹



WELL TEST ANALYSIS

Data Set: H:\...\PZ16S BAIL_SJS_BR_rev.aqt
 Date: 07/10/19

Time: 13:02:57

PROJECT INFORMATION

Company: TTL, INC.
 Client: TWIN PINES
 Test Well: PZ16S BAIL
 Test Date: 10-11-18

AQUIFER DATA

Saturated Thickness: 100. ft

Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (PZ16S BAIL)

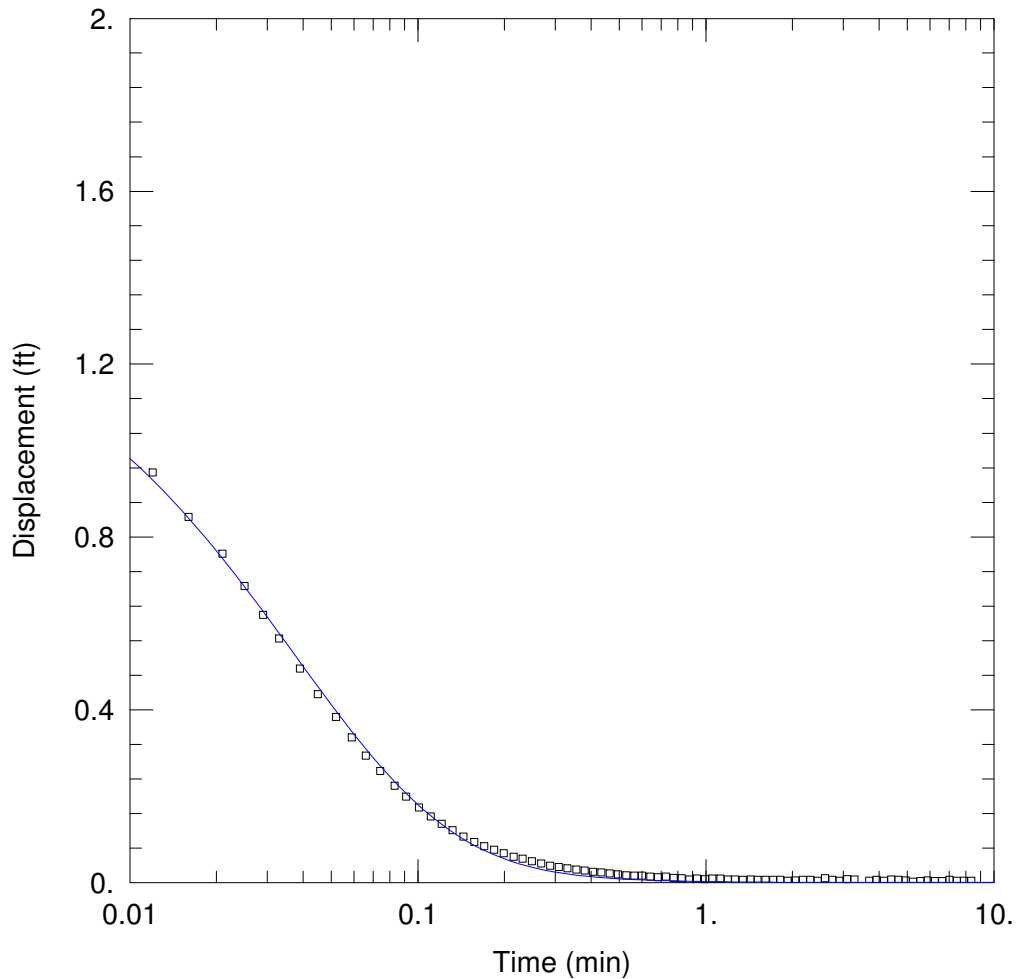
Initial Displacement: 1.37 ft
 Total Well Penetration Depth: 16.91 ft
 Casing Radius: 0.083 ft

Static Water Column Height: 16.91 ft
 Screen Length: 10. ft
 Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Unconfined
 K = 34.13 ft/day

Solution Method: Bouwer-Rice
 y0 = 1.069 ft



WELL TEST ANALYSIS

Data Set: H:\...\PZ16S BAIL_SJS_KGS_rev.aqt

Date: 07/10/19

Time: 13:03:48

PROJECT INFORMATION

Company: TTL, INC.

Client: TWIN PINES

Test Well: PZ16S BAIL

Test Date: 10-11-18

AQUIFER DATA

Saturated Thickness: 100. ft

WELL DATA (PZ16S BAIL)

Initial Displacement: 1.37 ft

Total Well Penetration Depth: 16.91 ft

Casing Radius: 0.083 ft

Static Water Column Height: 16.91 ft

Screen Length: 10. ft

Well Radius: 0.25 ft

SOLUTION

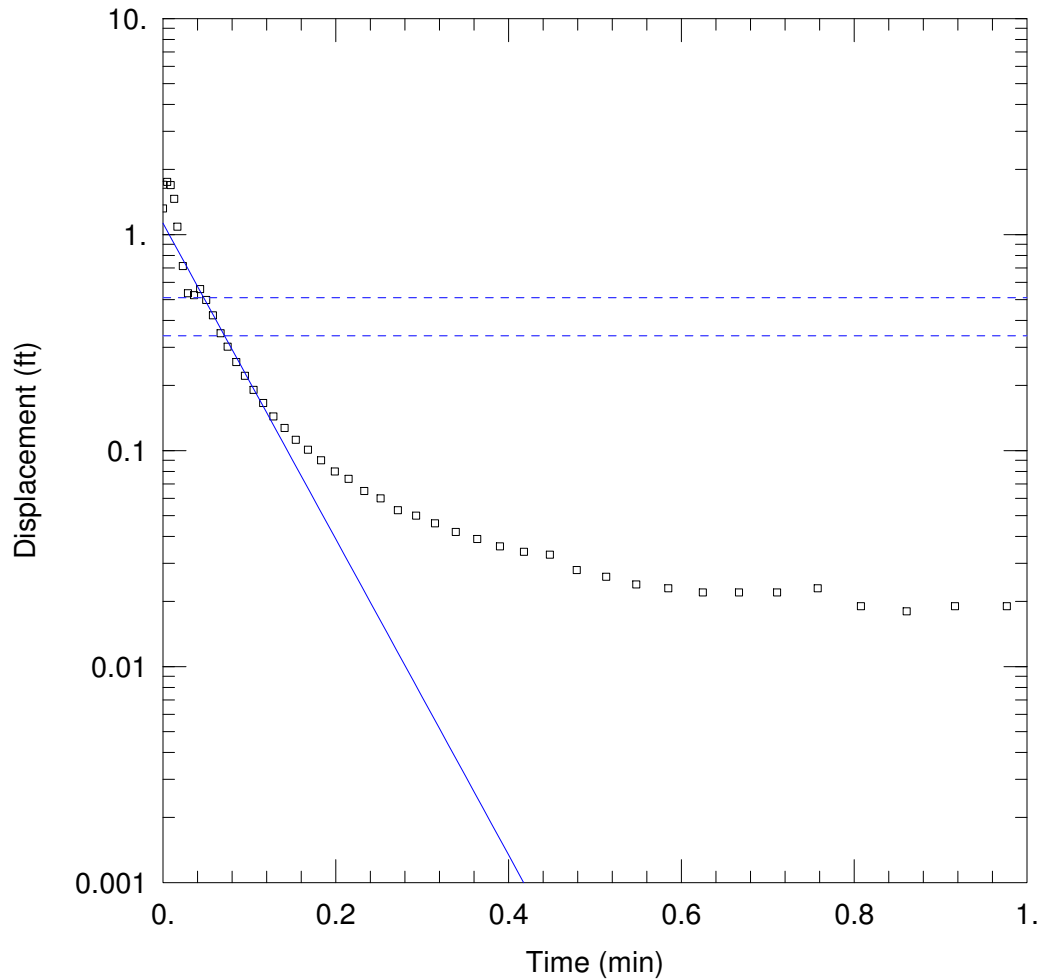
Aquifer Model: Unconfined

Kr = 41.03 ft/day

Kz/Kr = 0.1

Solution Method: KGS Model

Ss = 3.337E-5 ft⁻¹



WELL TEST ANALYSIS

Data Set: H:\...\PZ16S SLUG_SJS_BR_rev.aqt

Date: 07/10/19

Time: 13:04:12

PROJECT INFORMATION

Company: TTL, INC.

Client: TWIN PINES

Test Well: PZ16S SLUG

Test Date: 10-11-18

AQUIFER DATA

Saturated Thickness: 100. ft

Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (PZ16S SLUG)

Initial Displacement: 1.7 ft

Static Water Column Height: 16.9 ft

Total Well Penetration Depth: 16.9 ft

Screen Length: 10. ft

Casing Radius: 0.083 ft

Well Radius: 0.25 ft

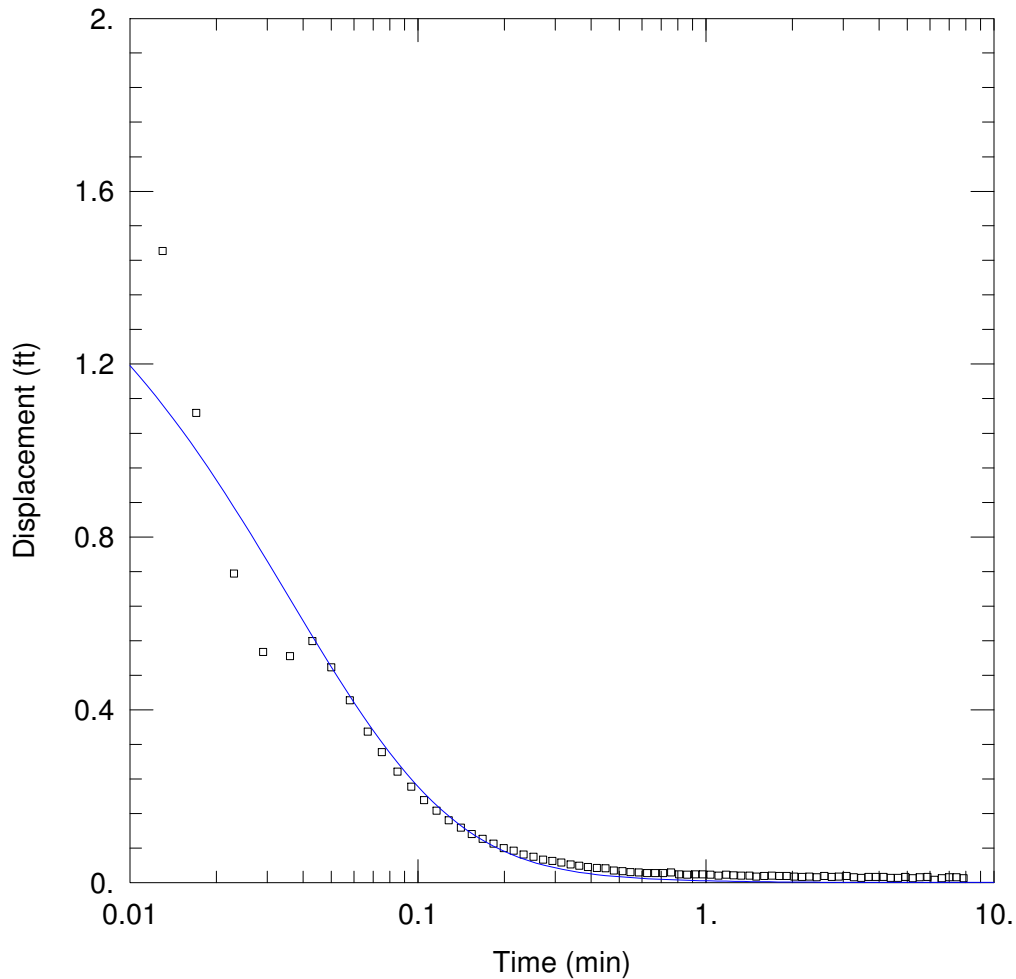
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 29.39 ft/day

y0 = 1.127 ft



WELL TEST ANALYSIS

Data Set: H:\...\PZ16S SLUG_SJS_KGS_rev.aqt

Date: 07/10/19

Time: 13:04:29

PROJECT INFORMATION

Company: TTL, INC.

Client: TWIN PINES

Test Well: PZ16S SLUG

Test Date: 10-11-18

AQUIFER DATA

Saturated Thickness: 100. ft

WELL DATA (PZ16S SLUG)

Initial Displacement: 1.7 ft

Total Well Penetration Depth: 16.9 ft

Casing Radius: 0.083 ft

Static Water Column Height: 16.9 ft

Screen Length: 10. ft

Well Radius: 0.25 ft

SOLUTION

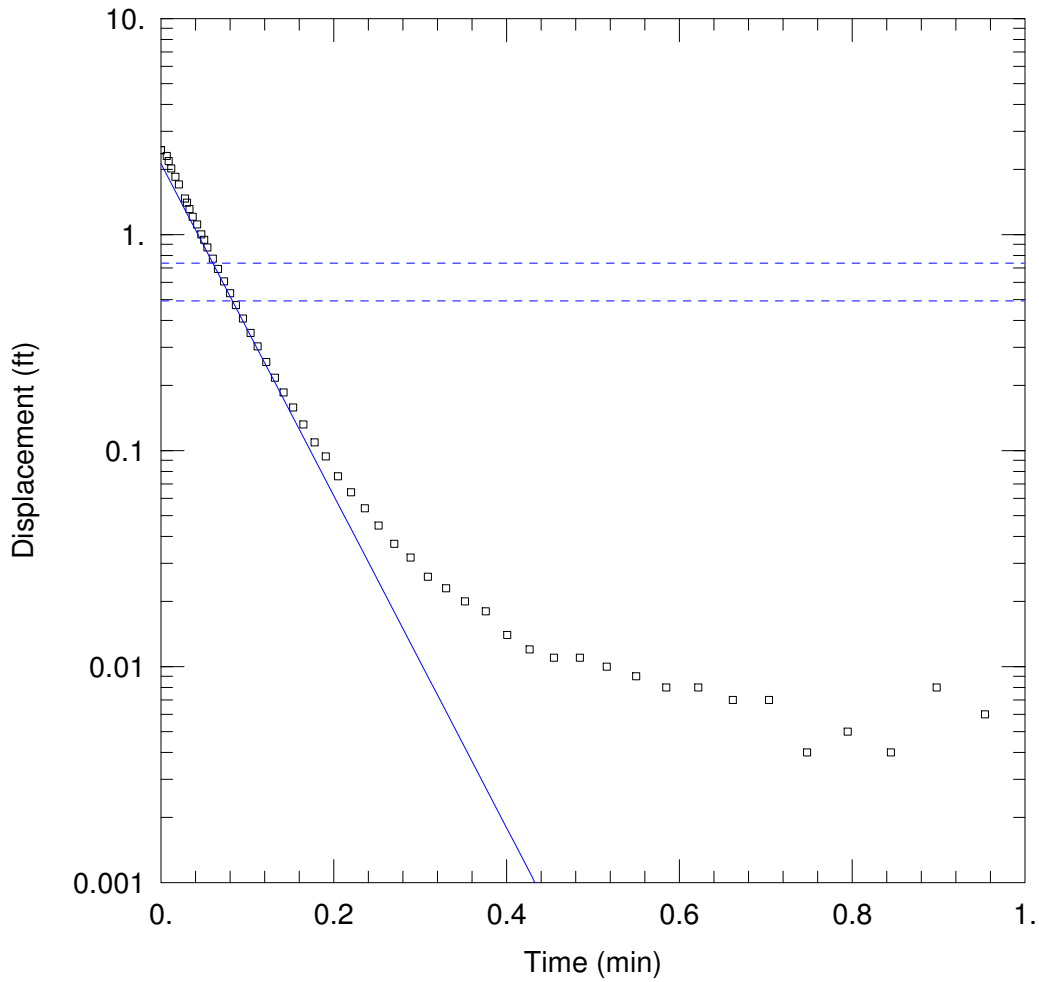
Aquifer Model: Unconfined

Kr = 39.9 ft/day

Kz/Kr = 0.1

Solution Method: KGS Model

Ss = 5.088E-5 ft⁻¹



WELL TEST ANALYSIS

Data Set: H:\...\PZ17D BAIL_SJS_BR_rev.aqt

Date: 07/10/19

Time: 13:04:48

PROJECT INFORMATION

Company: TTL, INC.

Client: TWIN PINES

Test Well: PZ17D BAIL

Test Date: 10-11-18

AQUIFER DATA

Saturated Thickness: 110. ft

Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (PZ17D BAIL)

Initial Displacement: 2.46 ft

Static Water Column Height: 41.07 ft

Total Well Penetration Depth: 41.07 ft

Screen Length: 10. ft

Casing Radius: 0.083 ft

Well Radius: 0.25 ft

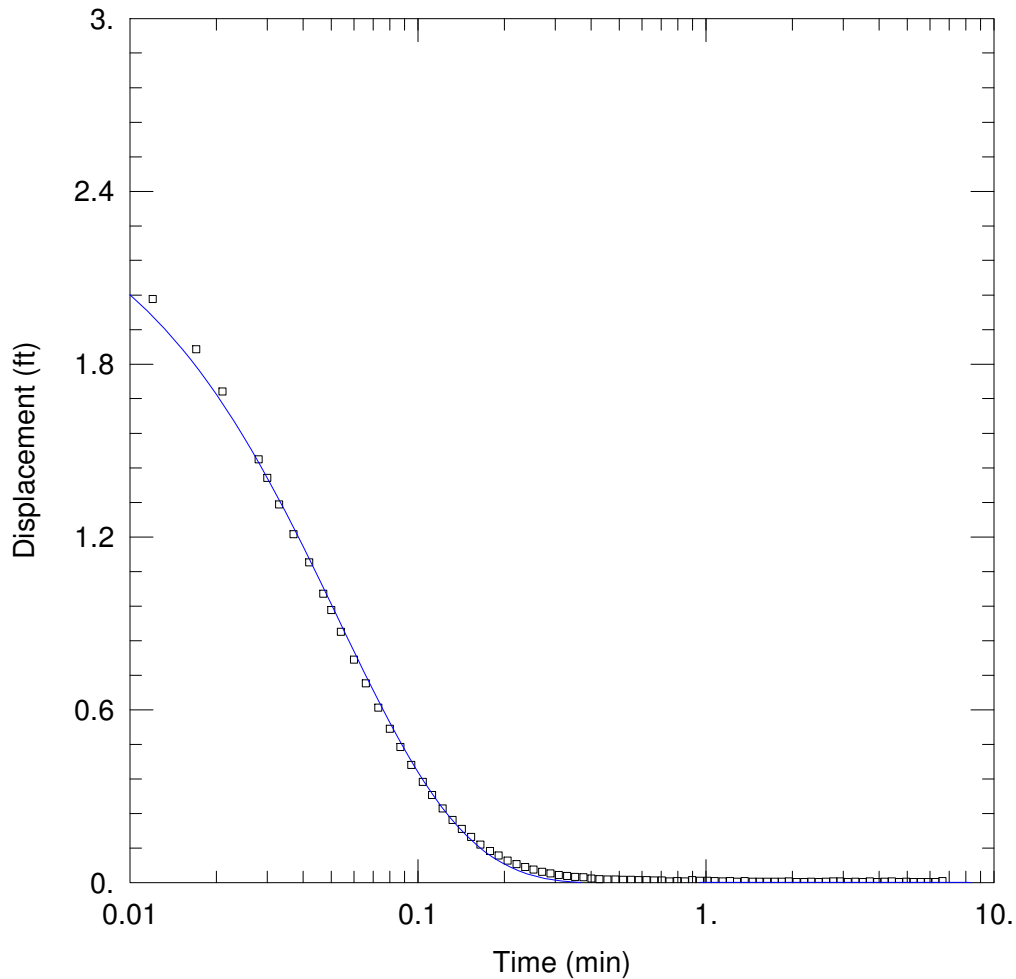
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 34.43 ft/day

y0 = 2.13 ft



WELL TEST ANALYSIS

Data Set: H:\...\PZ17D BAIL_SJS_KGS_rev.aqt

Date: 07/10/19

Time: 13:05:26

PROJECT INFORMATION

Company: TTL, INC.

Client: TWIN PINES

Test Well: PZ17D BAIL

Test Date: 10-11-18

AQUIFER DATA

Saturated Thickness: 110. ft

WELL DATA (PZ17D BAIL)

Initial Displacement: 2.46 ft

Total Well Penetration Depth: 41.07 ft

Casing Radius: 0.083 ft

Static Water Column Height: 41.07 ft

Screen Length: 10. ft

Well Radius: 0.25 ft

SOLUTION

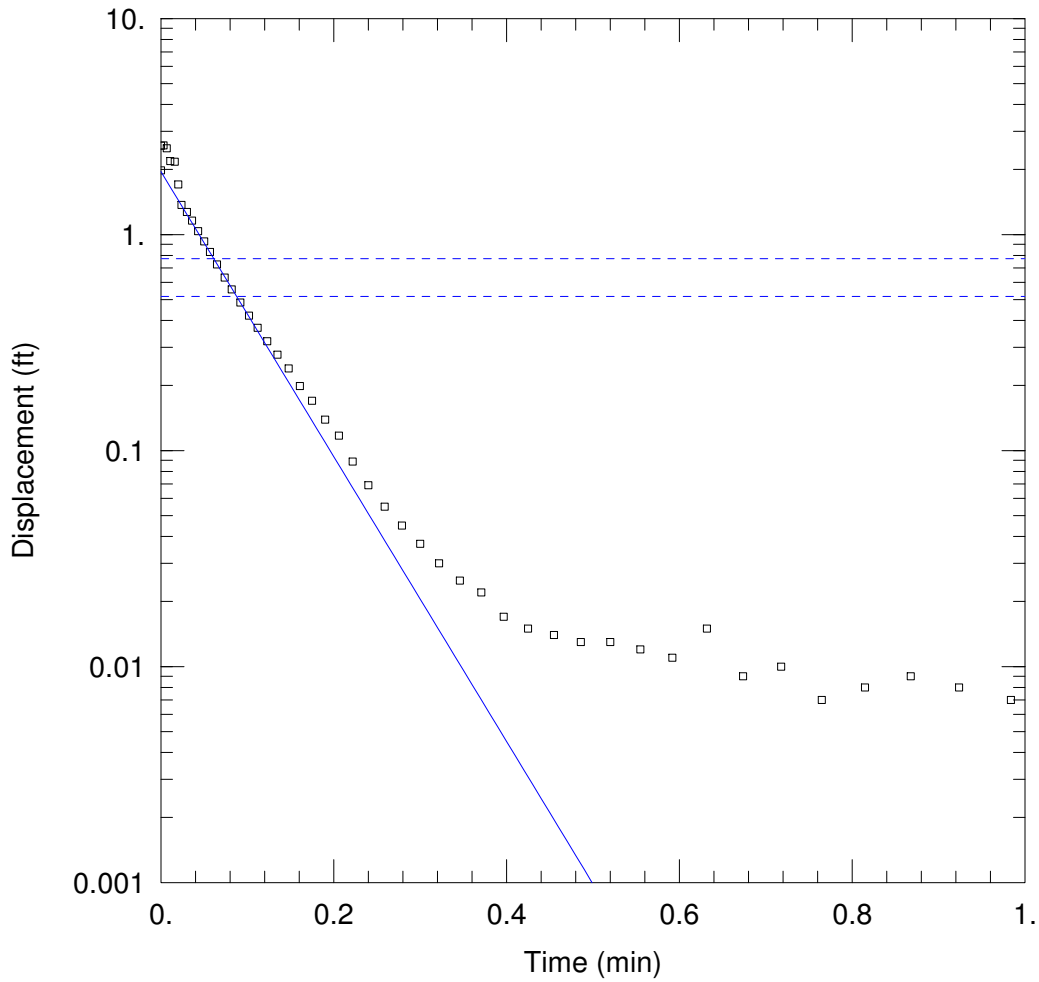
Aquifer Model: Unconfined

Kr = 41.4 ft/day

Kz/Kr = 0.1

Solution Method: KGS Model

Ss = 8.547E-13 ft⁻¹



WELL TEST ANALYSIS

Data Set: H:\...\PZ17D SLUG_SJS_BR_rev.aqt
 Date: 07/10/19

Time: 13:05:43

PROJECT INFORMATION

Company: TTL, INC.
 Client: TWIN PINES
 Test Well: PZ17D SLUG
 Test Date: 10-11-18

AQUIFER DATA

Saturated Thickness: 110. ft

Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (PZ17D SLUG)

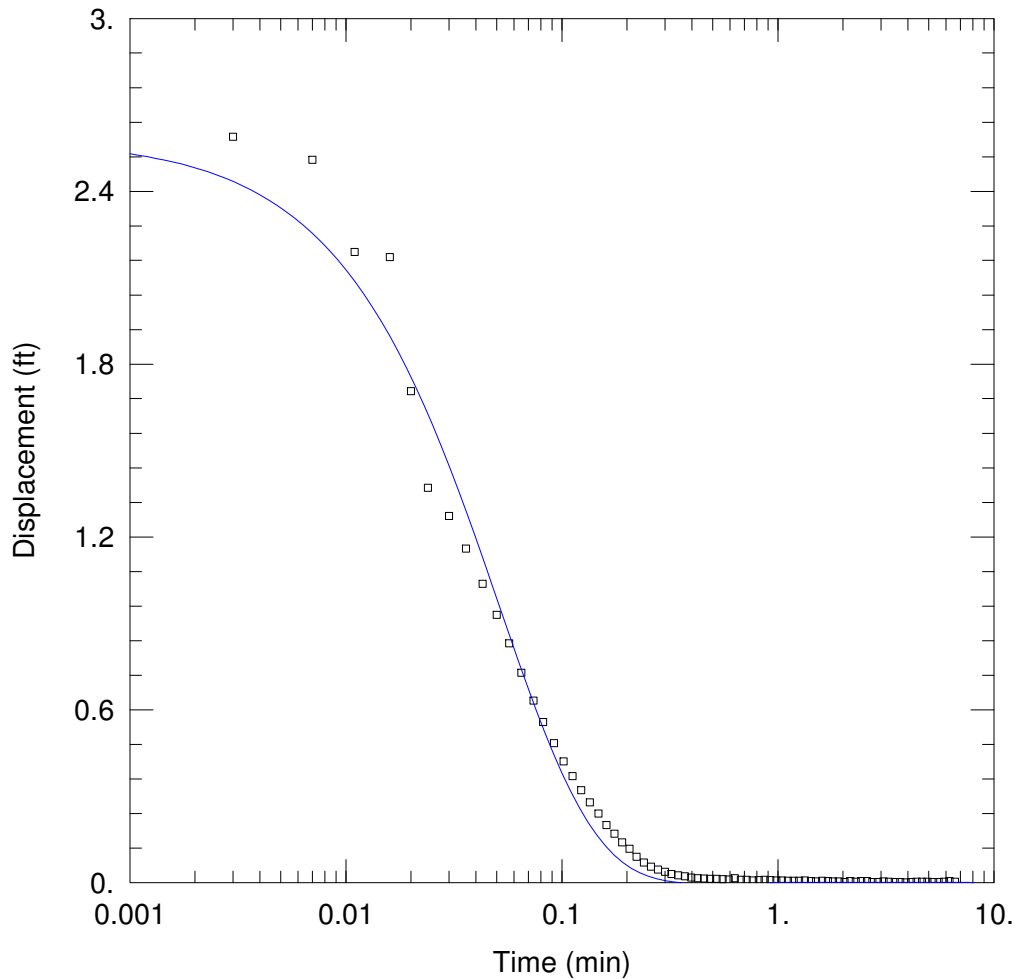
Initial Displacement: 2.58 ft
 Total Well Penetration Depth: 41.06 ft
 Casing Radius: 0.083 ft

Static Water Column Height: 41.06 ft
 Screen Length: 10. ft
 Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Unconfined
 K = 29.53 ft/day

Solution Method: Bouwer-Rice
 y0 = 1.952 ft



WELL TEST ANALYSIS

Data Set: H:\...\PZ17D SLUG_SJS_KGS_rev.aqt

Date: 07/10/19

Time: 13:06:00

PROJECT INFORMATION

Company: TTL, INC.

Client: TWIN PINES

Test Well: PZ17D SLUG

Test Date: 10-11-18

AQUIFER DATA

Saturated Thickness: 110. ft

WELL DATA (PZ17D SLUG)

Initial Displacement: 2.58 ft

Total Well Penetration Depth: 41.06 ft

Casing Radius: 0.083 ft

Static Water Column Height: 41.06 ft

Screen Length: 10. ft

Well Radius: 0.25 ft

SOLUTION

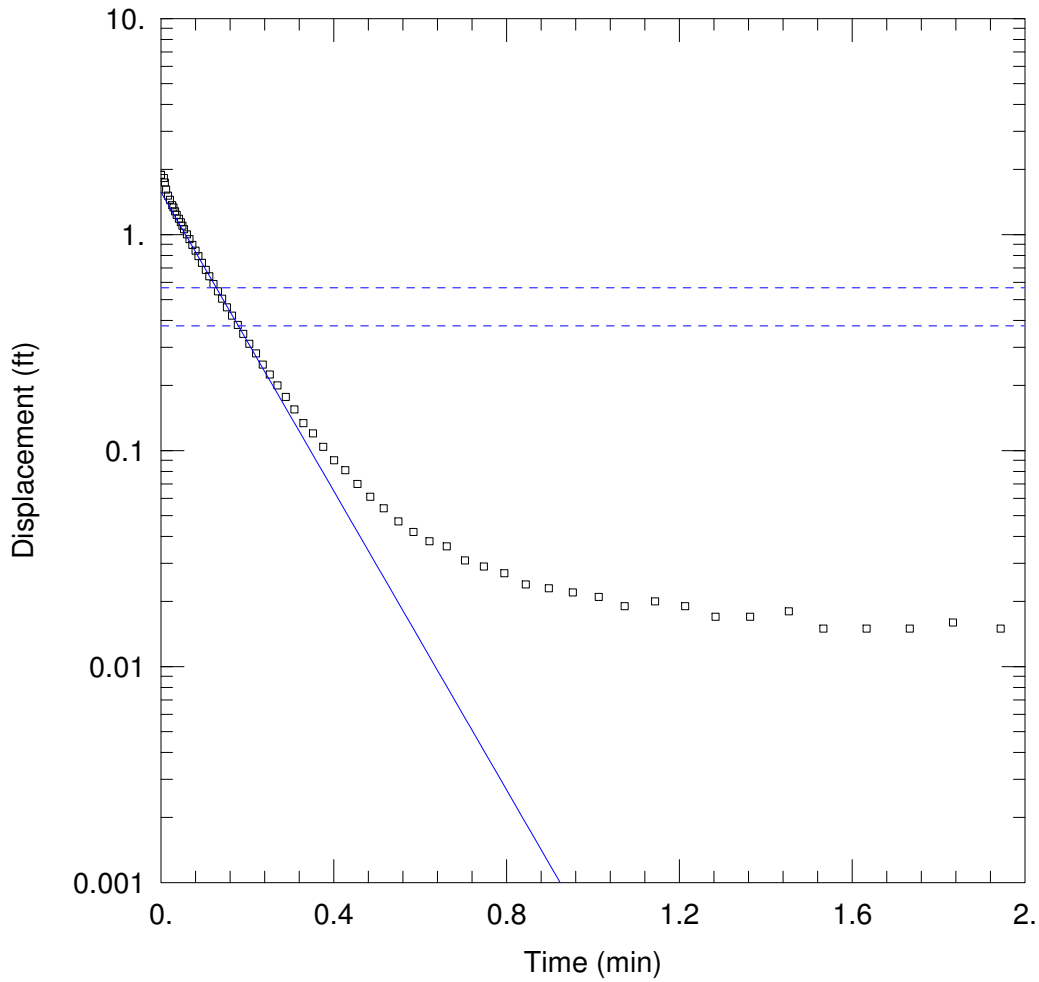
Aquifer Model: Unconfined

Kr = 42.69 ft/day

Kz/Kr = 0.1

Solution Method: KGS Model

Ss = 8.547E-13 ft⁻¹



WELL TEST ANALYSIS

Data Set: H:\...\PZ20D BAIL_SJS_BR_rev.aqt
 Date: 07/10/19

Time: 13:06:17

PROJECT INFORMATION

Company: TTL, INC.
 Client: TWIN PINES
 Test Well: PZ20D BAIL
 Test Date: 10-11-18

AQUIFER DATA

Saturated Thickness: 120. ft

Anisotropy Ratio (K_z/K_r): 0.1

WELL DATA (PZ20D BAIL)

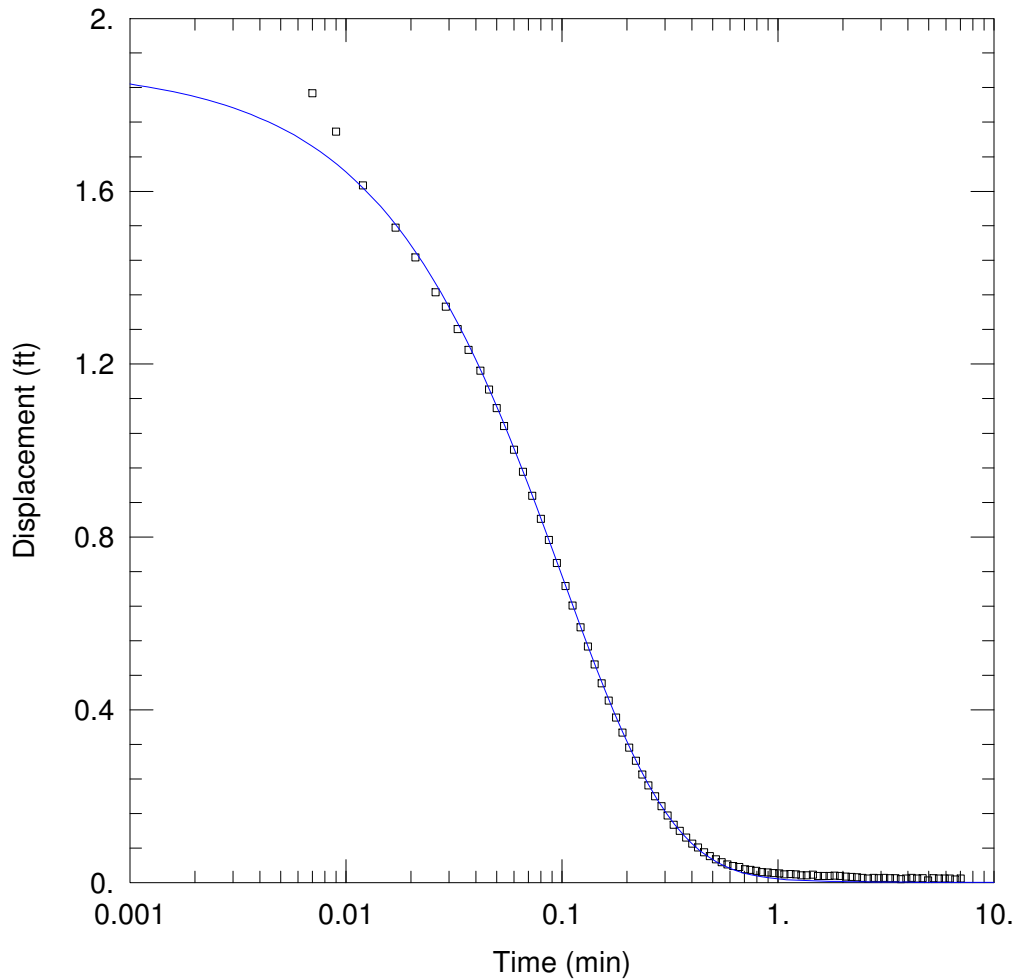
Initial Displacement: 1.89 ft
 Total Well Penetration Depth: 36.78 ft
 Casing Radius: 0.083 ft

Static Water Column Height: 36.78 ft
 Screen Length: 10. ft
 Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Unconfined
 $K = 15.3$ ft/day

Solution Method: Bouwer-Rice
 $y_0 = 1.571$ ft



WELL TEST ANALYSIS

Data Set: H:\...\PZ20D BAIL_SJS_KGS_rev.aqt

Date: 07/10/19

Time: 13:06:37

PROJECT INFORMATION

Company: TTL, INC.

Client: TWIN PINES

Test Well: PZ20D BAIL

Test Date: 10-11-18

AQUIFER DATA

Saturated Thickness: 120. ft

WELL DATA (PZ20D BAIL)

Initial Displacement: 1.89 ft

Total Well Penetration Depth: 36.78 ft

Casing Radius: 0.083 ft

Static Water Column Height: 36.78 ft

Screen Length: 10. ft

Well Radius: 0.25 ft

SOLUTION

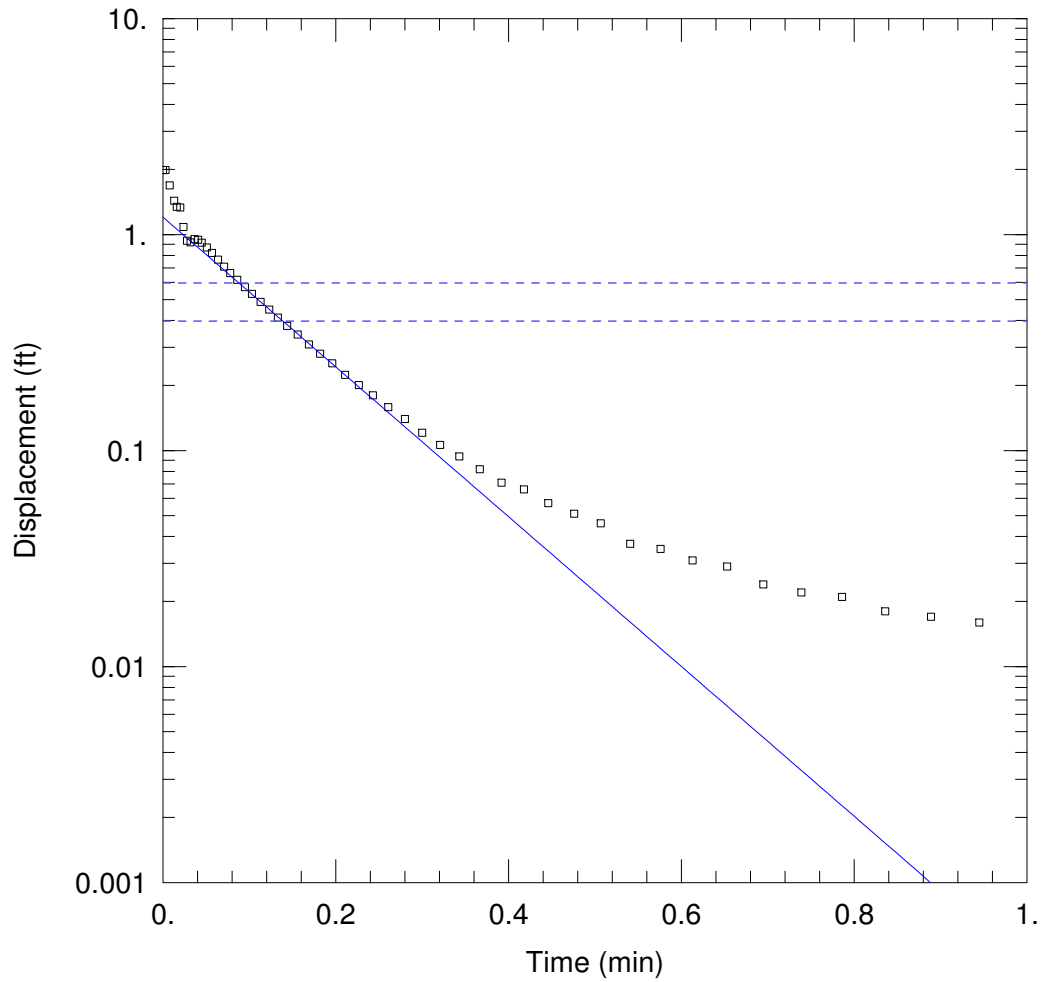
Aquifer Model: Unconfined

Kr = 18.41 ft/day

Kz/Kr = 0.1

Solution Method: KGS Model

Ss = 8.183E-6 ft⁻¹



WELL TEST ANALYSIS

Data Set: H:\...\PZ20D SLUG_SJS_BR_rev.aqt
 Date: 07/10/19

Time: 13:06:54

PROJECT INFORMATION

Company: TTL, INC.
 Client: TWIN PINES
 Test Well: PZ20D SLUG
 Test Date: 10-11-18

AQUIFER DATA

Saturated Thickness: 120. ft

Anisotropy Ratio (K_z/K_r): 0.1

WELL DATA (PZ20D SLUG)

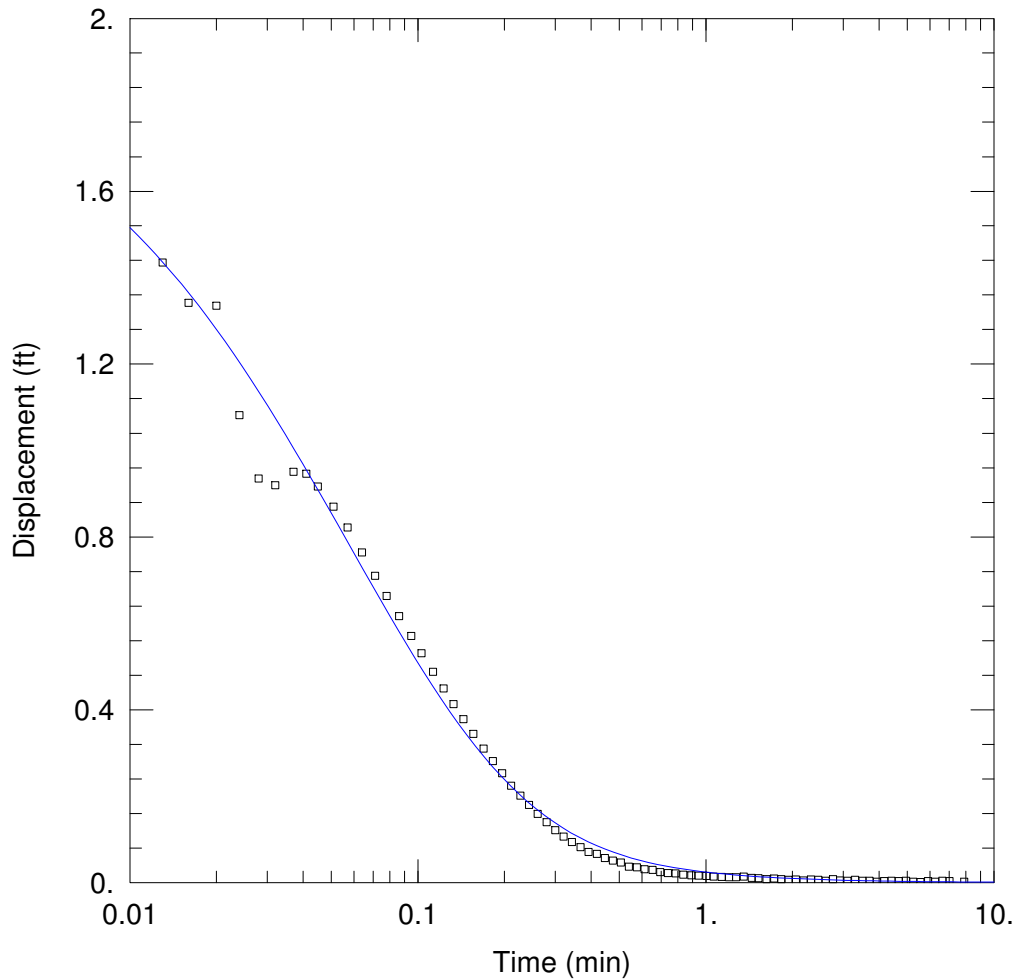
Initial Displacement: 1.99 ft
 Total Well Penetration Depth: 36.78 ft
 Casing Radius: 0.083 ft

Static Water Column Height: 36.78 ft
 Screen Length: 10. ft
 Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Unconfined
 $K = 15.34$ ft/day

Solution Method: Bouwer-Rice
 $y_0 = 1.203$ ft



WELL TEST ANALYSIS

Data Set: H:\...\PZ20D SLUG_SJS_KGS_rev.aqt

Date: 07/10/19

Time: 13:07:11

PROJECT INFORMATION

Company: TTL, INC.

Client: TWIN PINES

Test Well: PZ20D SLUG

Test Date: 10-11-18

AQUIFER DATA

Saturated Thickness: 120. ft

WELL DATA (PZ20D SLUG)

Initial Displacement: 1.99 ft

Total Well Penetration Depth: 36.78 ft

Casing Radius: 0.083 ft

Static Water Column Height: 36.78 ft

Screen Length: 10. ft

Well Radius: 0.25 ft

SOLUTION

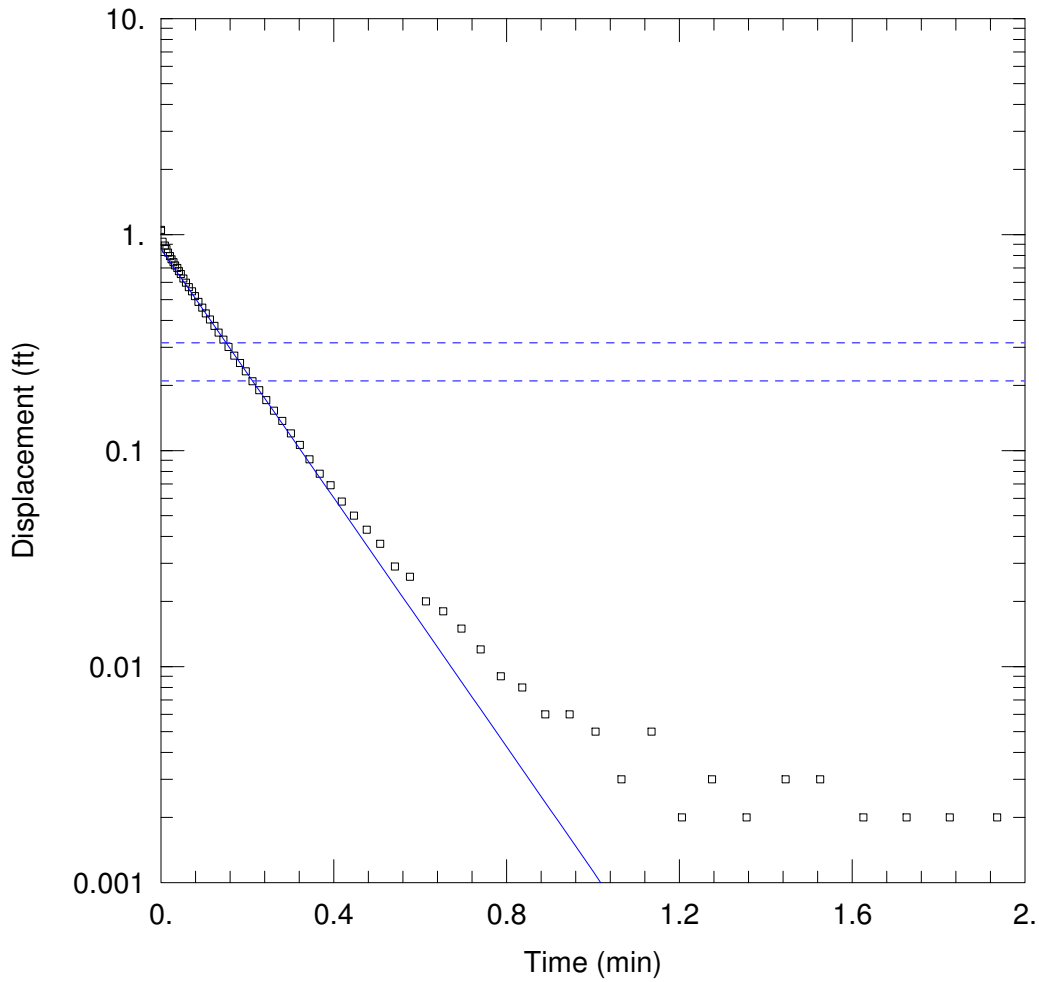
Aquifer Model: Unconfined

Kr = 18.44 ft/day

Kz/Kr = 0.1

Solution Method: KGS Model

Ss = 0.0002171 ft⁻¹



WELL TEST ANALYSIS

Data Set: H:\...\PZ24 BAIL_SJS_BR_rev.aqt
 Date: 07/11/19

Time: 11:17:33

PROJECT INFORMATION

Company: TTL, INC.
 Client: TWIN PINES
 Test Well: PZ24 BAIL
 Test Date: 10-11-18

AQUIFER DATA

Saturated Thickness: 107. ft

Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (PZ24 BAIL)

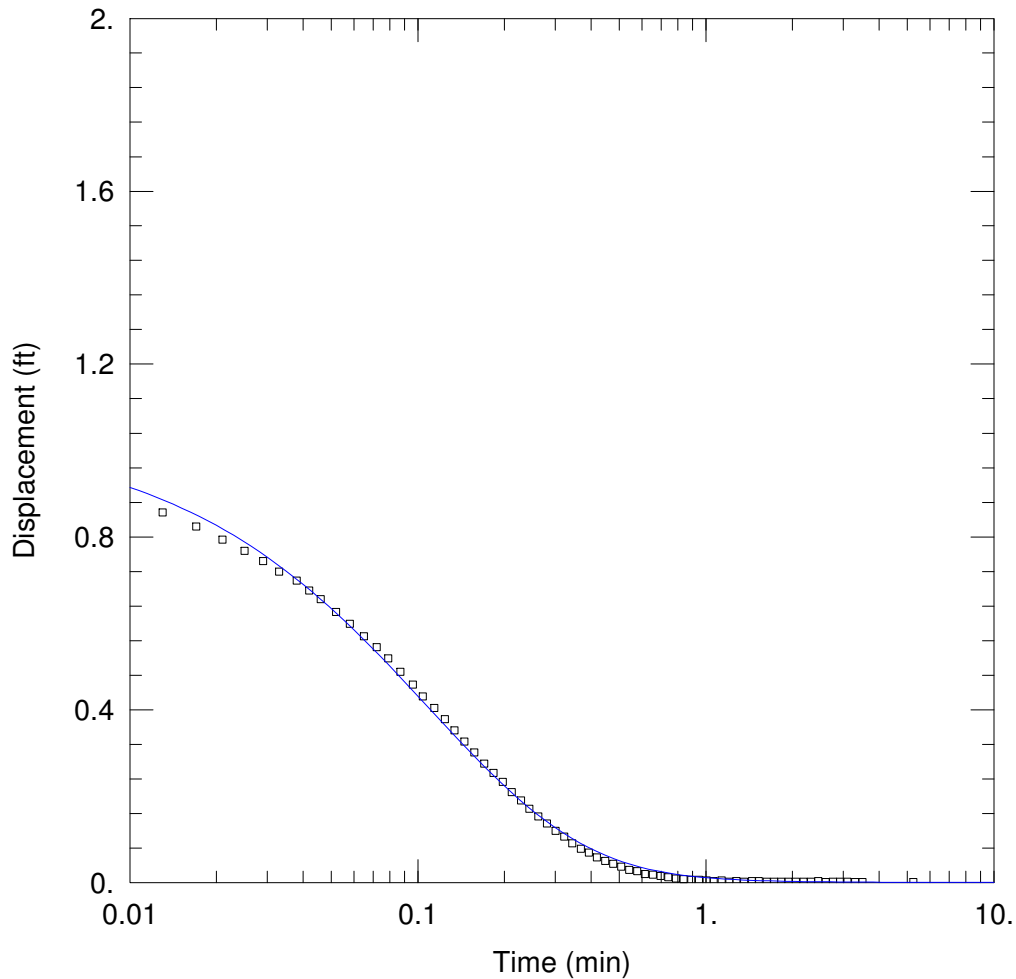
Initial Displacement: 1.05 ft
 Total Well Penetration Depth: 19.08 ft
 Casing Radius: 0.083 ft

Static Water Column Height: 19.08 ft
 Screen Length: 10. ft
 Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Unconfined
 K = 11.77 ft/day

Solution Method: Bouwer-Rice
 y0 = 0.8568 ft



WELL TEST ANALYSIS

Data Set: H:\...\PZ24 BAIL_SJS_KGS_rev.aqt

Date: 07/11/19

Time: 11:18:08

PROJECT INFORMATION

Company: TTL, INC.

Client: TWIN PINES

Test Well: PZ24 BAIL

Test Date: 10-11-18

AQUIFER DATA

Saturated Thickness: 107. ft

WELL DATA (PZ24 BAIL)

Initial Displacement: 1.05 ft

Total Well Penetration Depth: 19.08 ft

Casing Radius: 0.083 ft

Static Water Column Height: 19.08 ft

Screen Length: 10. ft

Well Radius: 0.25 ft

SOLUTION

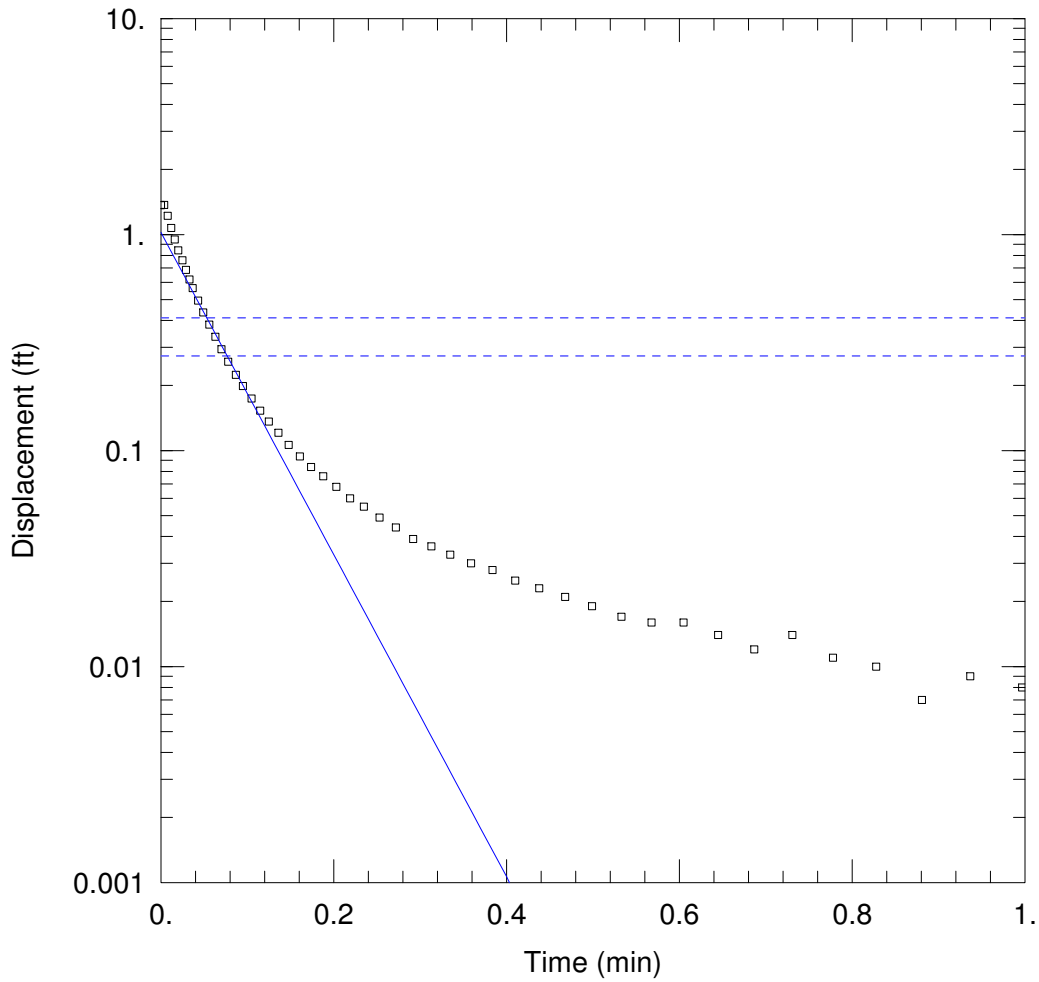
Aquifer Model: Unconfined

Kr = 14.81 ft/day

Kz/Kr = 0.1

Solution Method: KGS Model

Ss = 2.185E-5 ft⁻¹



WELL TEST ANALYSIS

Data Set: H:\...\PZ24 SLUG_SJS_BR_rev.aqt
 Date: 07/11/19

Time: 11:18:33

PROJECT INFORMATION

Company: TTL, INC.
 Client: TWIN PINES
 Test Well: PZ16 BAIL
 Test Date: 10-11-18

AQUIFER DATA

Saturated Thickness: 107. ft

Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (PZ24 SLUG)

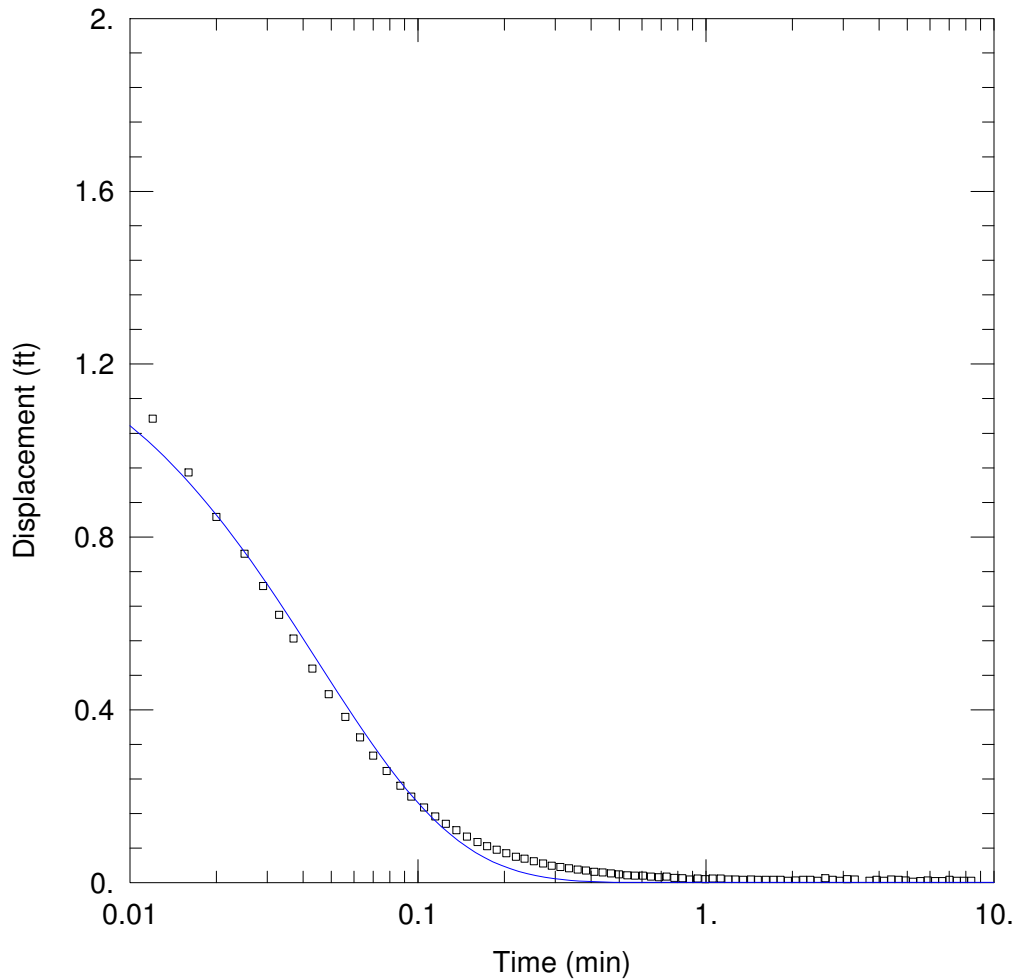
Initial Displacement: 1.37 ft
 Total Well Penetration Depth: 19.08 ft
 Casing Radius: 0.083 ft

Static Water Column Height: 19.08 ft
 Screen Length: 10. ft
 Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Unconfined
 K = 30.46 ft/day

Solution Method: Bouwer-Rice
 y0 = 1.021 ft



WELL TEST ANALYSIS

Data Set: H:\...\PZ24 SLUG_SJS_KGS_rev.aqt

Date: 07/11/19

Time: 11:19:06

PROJECT INFORMATION

Company: TTL, INC.

Client: TWIN PINES

Test Well: PZ16 BAIL

Test Date: 10-11-18

AQUIFER DATA

Saturated Thickness: 107. ft

WELL DATA (PZ24 SLUG)

Initial Displacement: 1.37 ft

Total Well Penetration Depth: 19.08 ft

Casing Radius: 0.083 ft

Static Water Column Height: 19.08 ft

Screen Length: 10. ft

Well Radius: 0.25 ft

SOLUTION

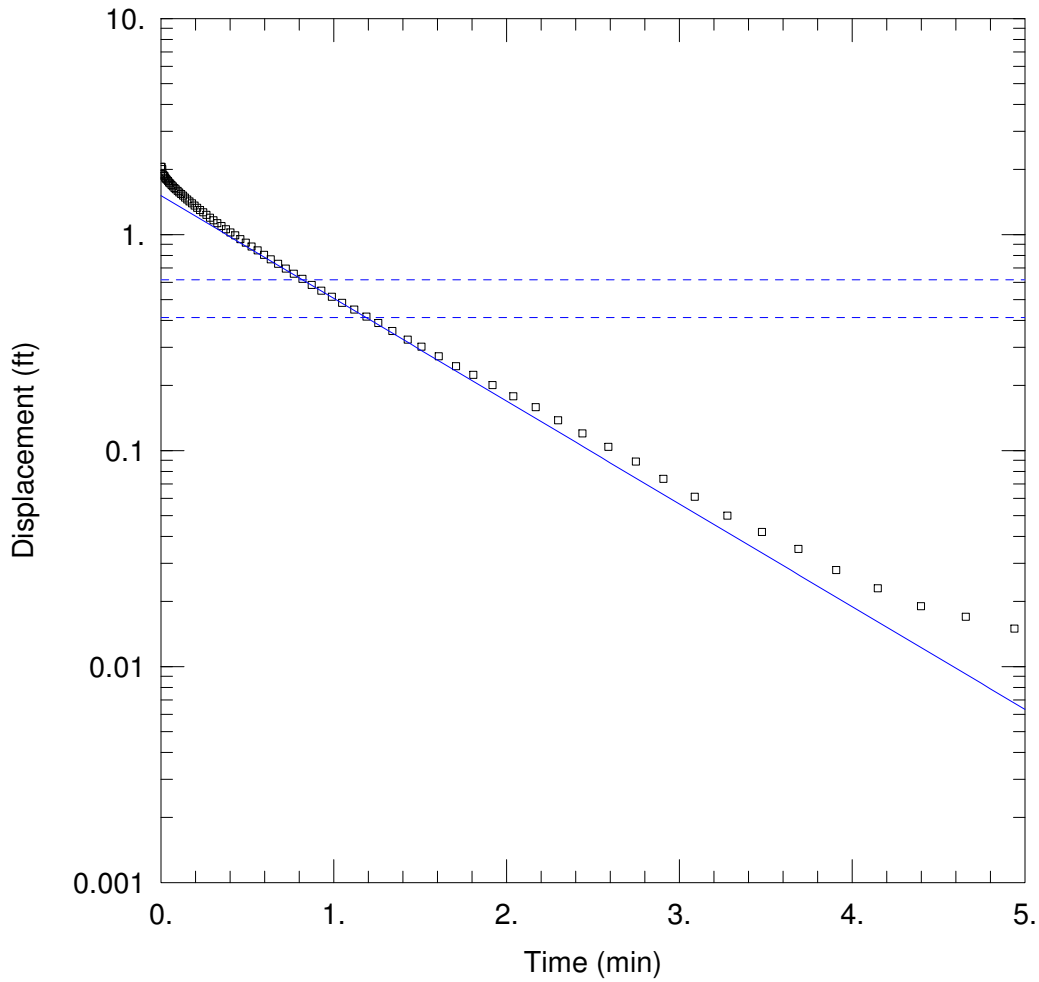
Aquifer Model: Unconfined

Kr = 44.03 ft/day

Kz/Kr = 0.1

Solution Method: KGS Model

Ss = 3.191E-6 ft⁻¹



WELL TEST ANALYSIS

Data Set: H:\...\PZ28D BAIL_SJS_BR_rev.aqt
 Date: 07/10/19

Time: 13:07:26

PROJECT INFORMATION

Company: TTL, INC.
 Client: TWIN PINES
 Test Well: PZ28D BAIL
 Test Date: 10-10-18

AQUIFER DATA

Saturated Thickness: 121. ft

Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (PZ28 BAIL)

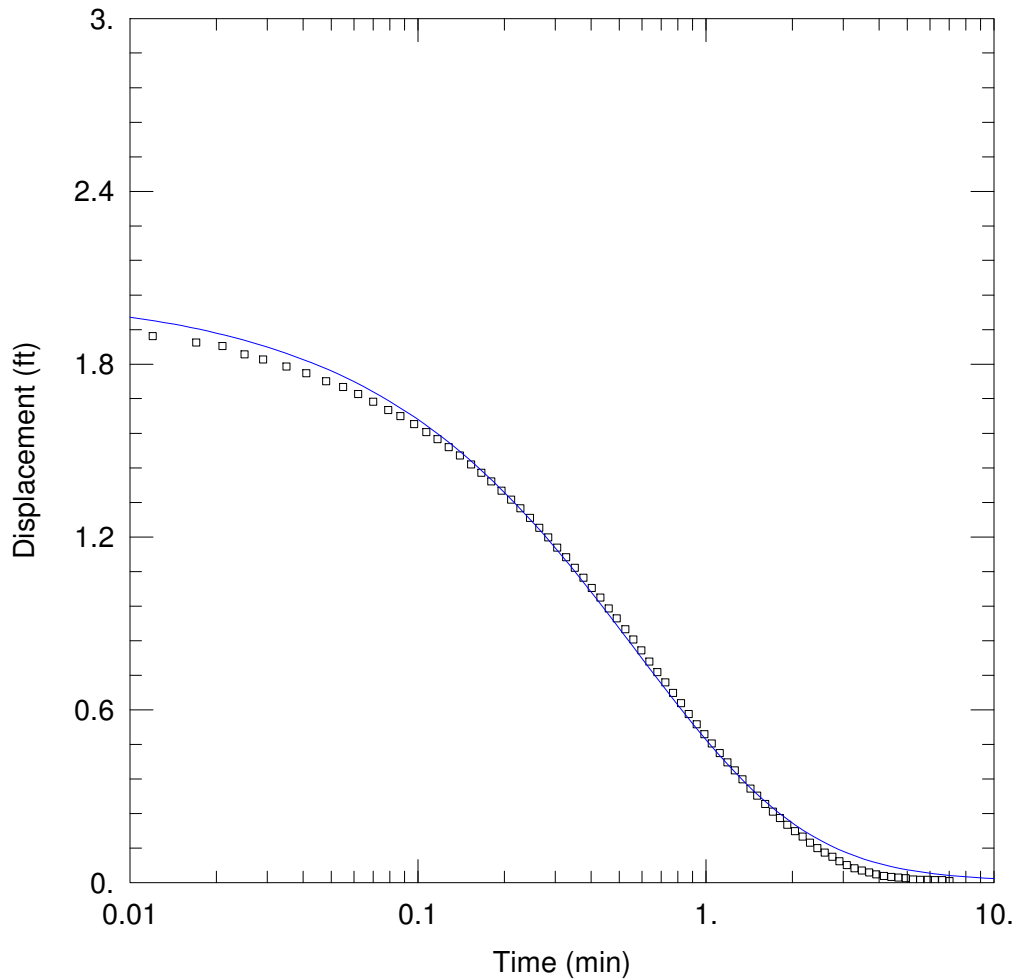
Initial Displacement: 2.06 ft
 Total Well Penetration Depth: 28.03 ft
 Casing Radius: 0.083 ft

Static Water Column Height: 28.03 ft
 Screen Length: 10. ft
 Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Unconfined
 K = 2.038 ft/day

Solution Method: Bouwer-Rice
 y0 = 1.513 ft



WELL TEST ANALYSIS

Data Set: H:\...\PZ28D BAIL_SJS_KGS_rev.aqt

Date: 07/10/19

Time: 13:07:41

PROJECT INFORMATION

Company: TTL, INC.

Client: TWIN PINES

Test Well: PZ28D BAIL

Test Date: 10-10-18

AQUIFER DATA

Saturated Thickness: 121. ft

WELL DATA (PZ28 BAIL)

Initial Displacement: 2.06 ft

Total Well Penetration Depth: 28.03 ft

Casing Radius: 0.083 ft

Static Water Column Height: 28.03 ft

Screen Length: 10. ft

Well Radius: 0.25 ft

SOLUTION

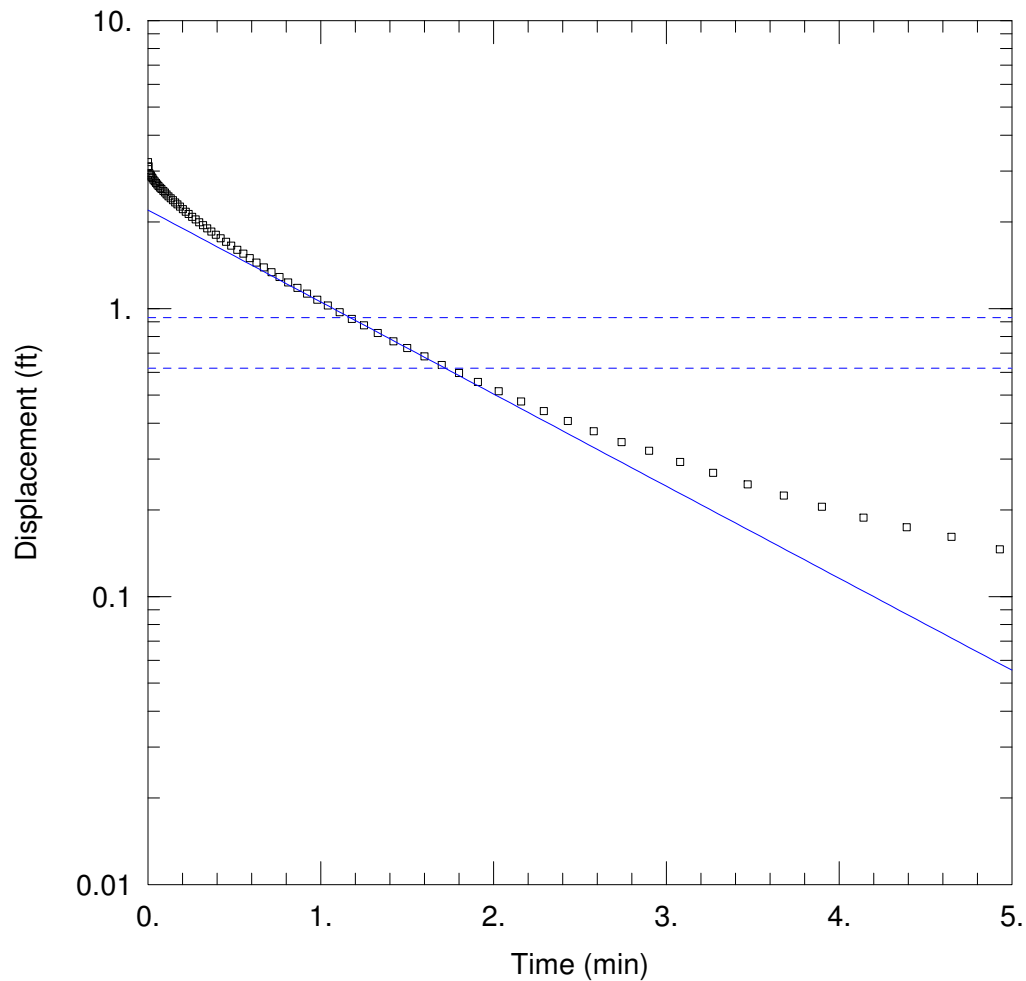
Aquifer Model: Unconfined

Kr = 2.34 ft/day

Kz/Kr = 0.1

Solution Method: KGS Model

Ss = 6.988E-5 ft⁻¹



TWIN PINES - PZ29D BAIL TEST

Data Set: H:\2018033.10 TTL Twin Pines Add Testing\addl_slug\SJS_aqtesolve\PZ29D Bail_BR_SJS.aqt
 Date: 06/03/19 Time: 14:22:17

PROJECT INFORMATION

Company: TTL, Inc.
 Client: Twin Pines LLC
 Project: 000180200804.00
 Location: St. George, GA
 Test Well: PZ29D Bail
 Test Date: 5-16-19

AQUIFER DATA

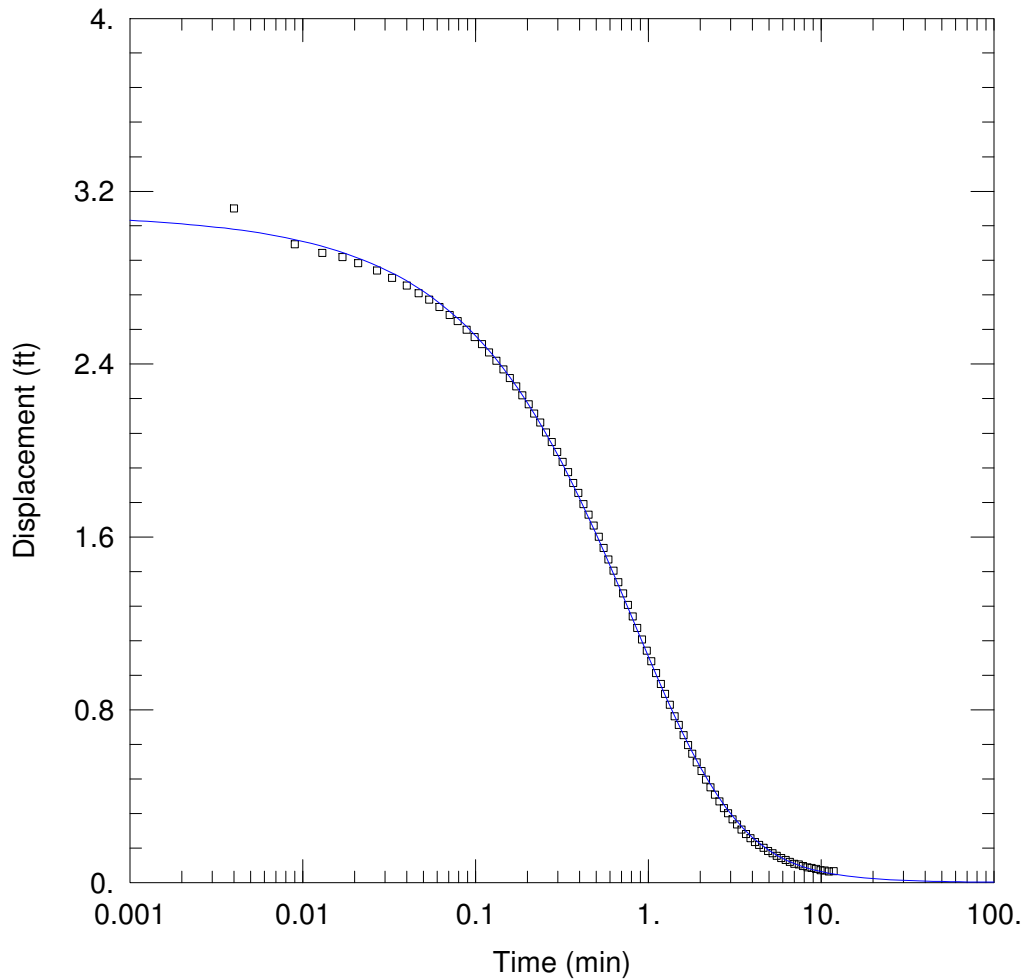
Saturated Thickness: 85. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (PZ29D Bail)

Initial Displacement: 3.1 ft Static Water Column Height: 46.66 ft
 Total Well Penetration Depth: 46.66 ft Screen Length: 10. ft
 Casing Radius: 0.083 ft Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice
 K = 1.451 ft/day $y_0 =$ 2.199 ft



TWIN PINES - PZ29D BAIL TEST

Data Set: H:\2018033.10 TTL Twin Pines Add Testing\add_slug\SJS_aqtesolve\PZ29D Bail_KGS_SJS.aqt
 Date: 06/03/19 Time: 14:23:57

PROJECT INFORMATION

Company: TTL, Inc.
 Client: Twin Pines LLC
 Project: 000180200804.00
 Location: St. George, GA
 Test Well: PZ29D Bail
 Test Date: 5-16-19

AQUIFER DATA

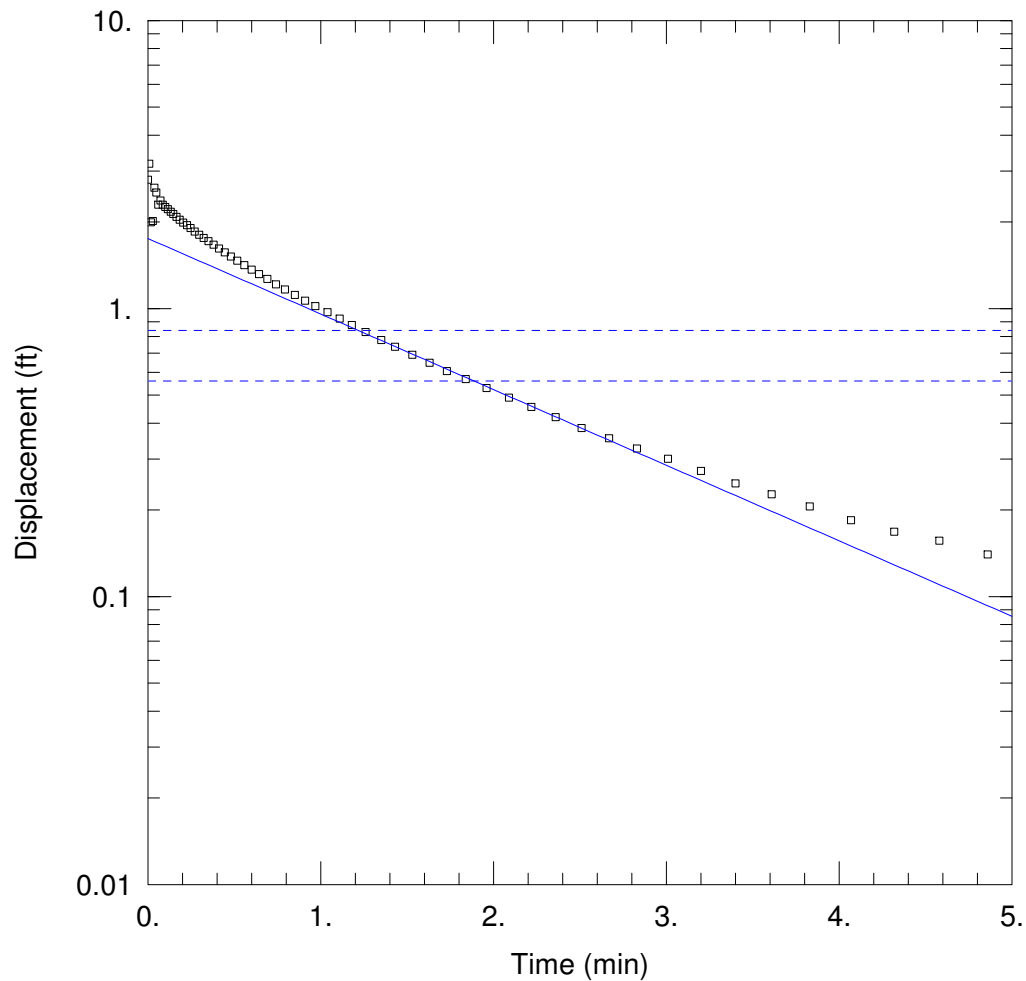
Saturated Thickness: 85. ft

WELL DATA (PZ29D Bail)

| | |
|---|---|
| Initial Displacement: <u>3.1 ft</u> | Static Water Column Height: <u>46.66 ft</u> |
| Total Well Penetration Depth: <u>46.66 ft</u> | Screen Length: <u>10. ft</u> |
| Casing Radius: <u>0.083 ft</u> | Well Radius: <u>0.25 ft</u> |

SOLUTION

| | |
|----------------------------------|---------------------------------------|
| Aquifer Model: <u>Unconfined</u> | Solution Method: <u>KGS Model</u> |
| Kr = <u>1.451 ft/day</u> | Ss = <u>0.0001322 ft⁻¹</u> |
| Kz/Kr = <u>0.1</u> | |



TWIN PINES - PZ29D SLUGTEST

Data Set: H:\...\PZ29D Slug_BR_SJS_revdispl.aqt

Date: 06/03/19

Time: 14:28:24

PROJECT INFORMATION

Company: TTL, Inc.

Client: Twin Pines LLC

Project: 000180200804.00

Location: St. George, GA

Test Well: PZ29D Slug

Test Date: 5-16-19

AQUIFER DATA

Saturated Thickness: 85. ft

Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (PZ29D Slug)

Initial Displacement: 2.8 ft

Static Water Column Height: 46.11 ft

Total Well Penetration Depth: 46.11 ft

Screen Length: 10. ft

Casing Radius: 0.083 ft

Well Radius: 0.25 ft

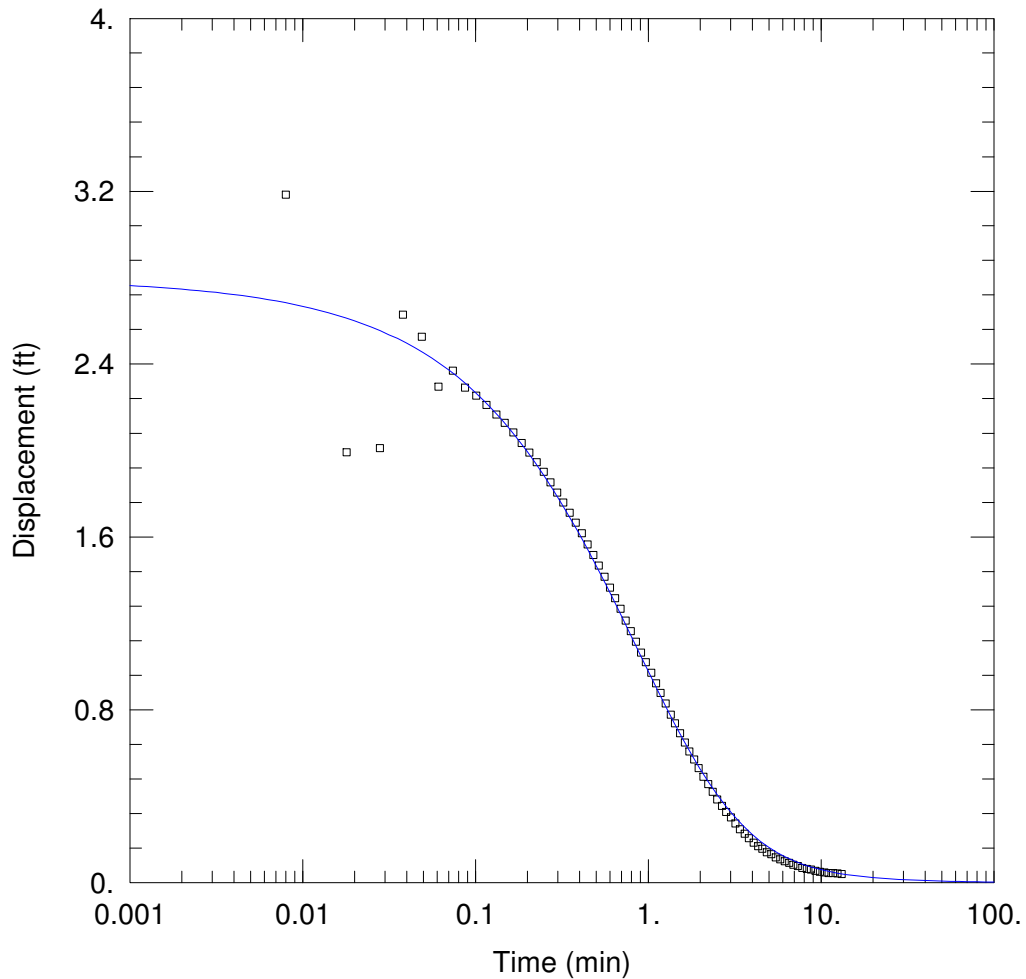
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 1.19 ft/day

y0 = 1.75 ft



TWIN PINES - PZ29D SLUGTEST

Data Set: H:\...\PZ29D Slug_KGS_SJS_revdispl.aqt

Date: 06/03/19

Time: 14:28:52

PROJECT INFORMATION

Company: TTL, Inc.

Client: Twin Pines LLC

Project: 000180200804.00

Location: St. George, GA

Test Well: PZ29D Slug

Test Date: 5-16-19

AQUIFER DATA

Saturated Thickness: 85. ft

WELL DATA (PZ29D Slug)

Initial Displacement: 2.8 ft

Static Water Column Height: 46.11 ft

Total Well Penetration Depth: 46.11 ft

Screen Length: 10. ft

Casing Radius: 0.083 ft

Well Radius: 0.25 ft

SOLUTION

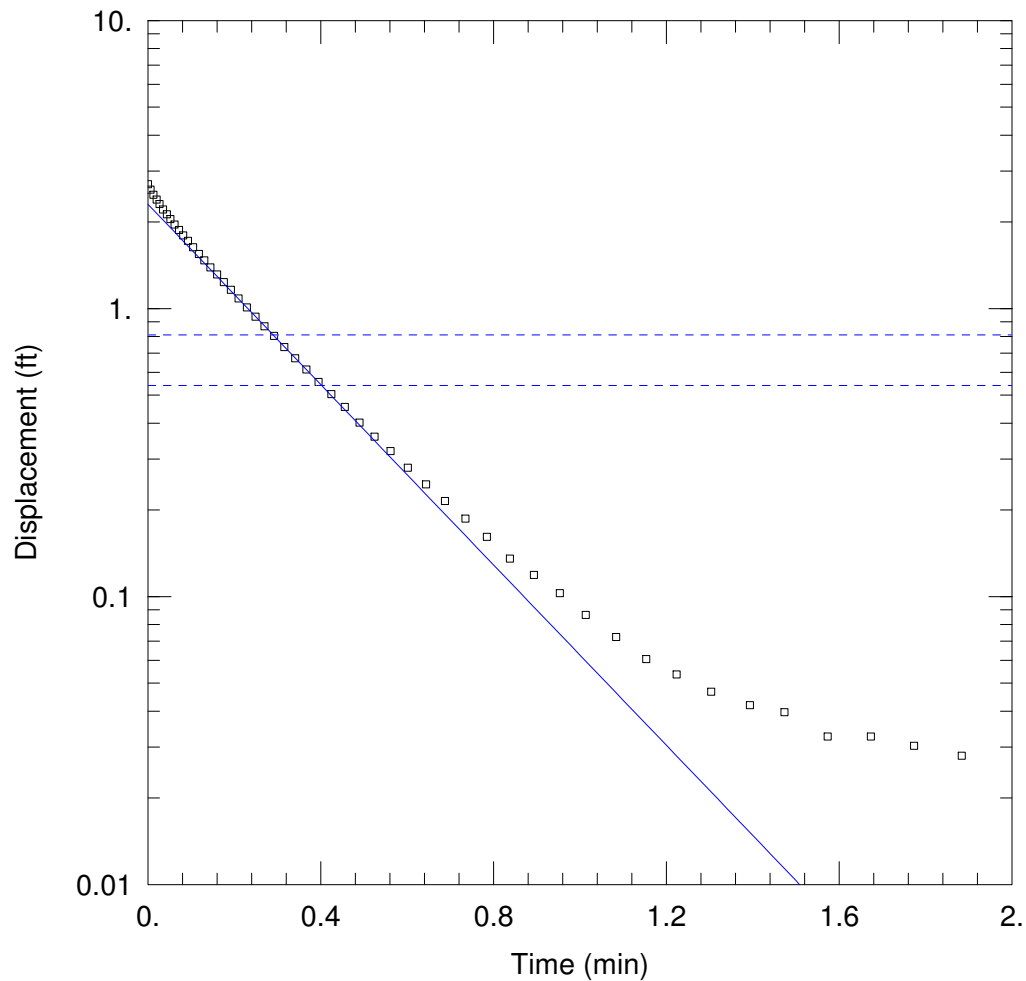
Aquifer Model: Unconfined

Solution Method: KGS Model

Kr = 1.246 ft/day

Ss = 0.0002284 ft⁻¹

Kz/Kr = 0.1



TWIN PINES - PZ29S BAIL TEST

Data Set: H:\...\PZ29S Bail_BR_SJS_revdispl.aqt

Date: 06/03/19

Time: 14:29:29

PROJECT INFORMATION

Company: TTL, Inc.

Client: Twin Pines LLC

Project: 000180200804.00

Location: St. George, GA

Test Well: PZ29S Bail

Test Date: 5-16-19

AQUIFER DATA

Saturated Thickness: 85. ft

Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (PZ29S Bail)

Initial Displacement: 2.7 ft

Static Water Column Height: 15.89 ft

Total Well Penetration Depth: 15.89 ft

Screen Length: 10. ft

Casing Radius: 0.083 ft

Well Radius: 0.25 ft

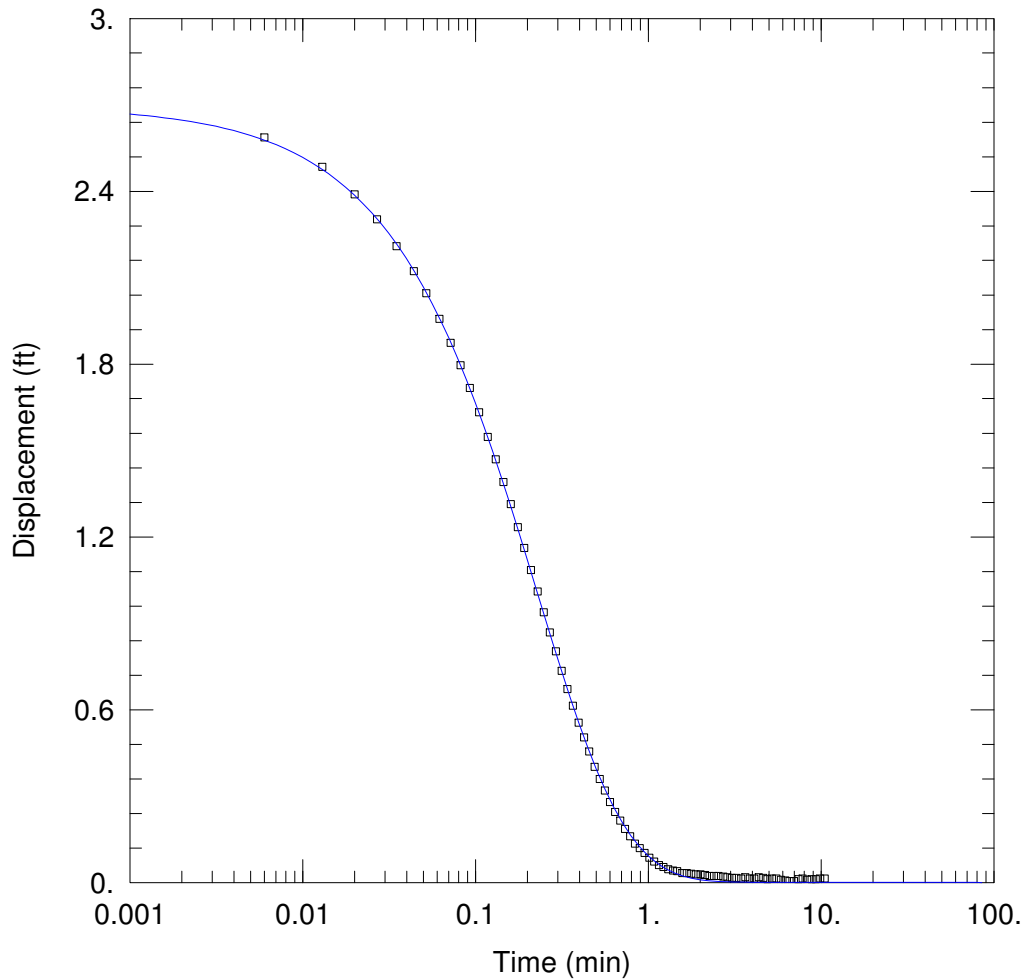
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 6.24 ft/day

y0 = 2.3 ft



TWIN PINES - PZ29S BAIL TEST

Data Set: H:\...\PZ29S Bail_KGS_SJS_revdispl.aqt

Date: 06/03/19

Time: 14:31:05

PROJECT INFORMATION

Company: TTL, Inc.

Client: Twin Pines LLC

Project: 000180200804.00

Location: St. George, GA

Test Well: PZ29S Bail

Test Date: 5-16-19

AQUIFER DATA

Saturated Thickness: 85. ft

WELL DATA (PZ29S Bail)

Initial Displacement: 2.7 ft

Static Water Column Height: 15.89 ft

Total Well Penetration Depth: 15.89 ft

Screen Length: 10. ft

Casing Radius: 0.083 ft

Well Radius: 0.25 ft

SOLUTION

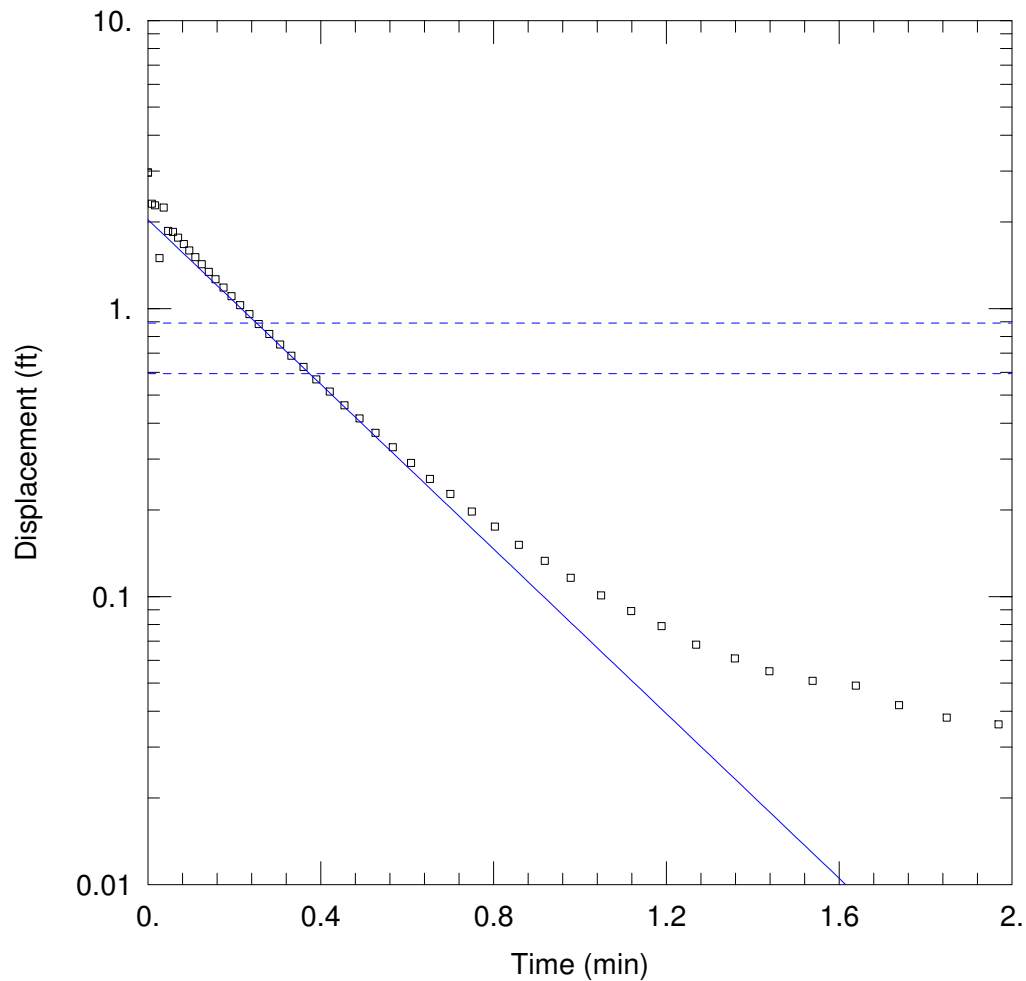
Aquifer Model: Unconfined

Solution Method: KGS Model

Kr = 8.226 ft/day

Ss = 7.007E-6 ft⁻¹

Kz/Kr = 0.1



TWIN PINES - PZ29S SLUGTEST

Data Set: H:\2018033.10 TTL Twin Pines Add Testing\addl_slug\SJS_aqtesolve\PZ29S Slug_BR_SJS.aqt
 Date: 06/03/19 Time: 14:32:02

PROJECT INFORMATION

Company: TTL, Inc.
 Client: Twin Pines LLC
 Project: 000180200804.00
 Location: St. George, GA
 Test Well: PZ29S Slug
 Test Date: 5-16-19

AQUIFER DATA

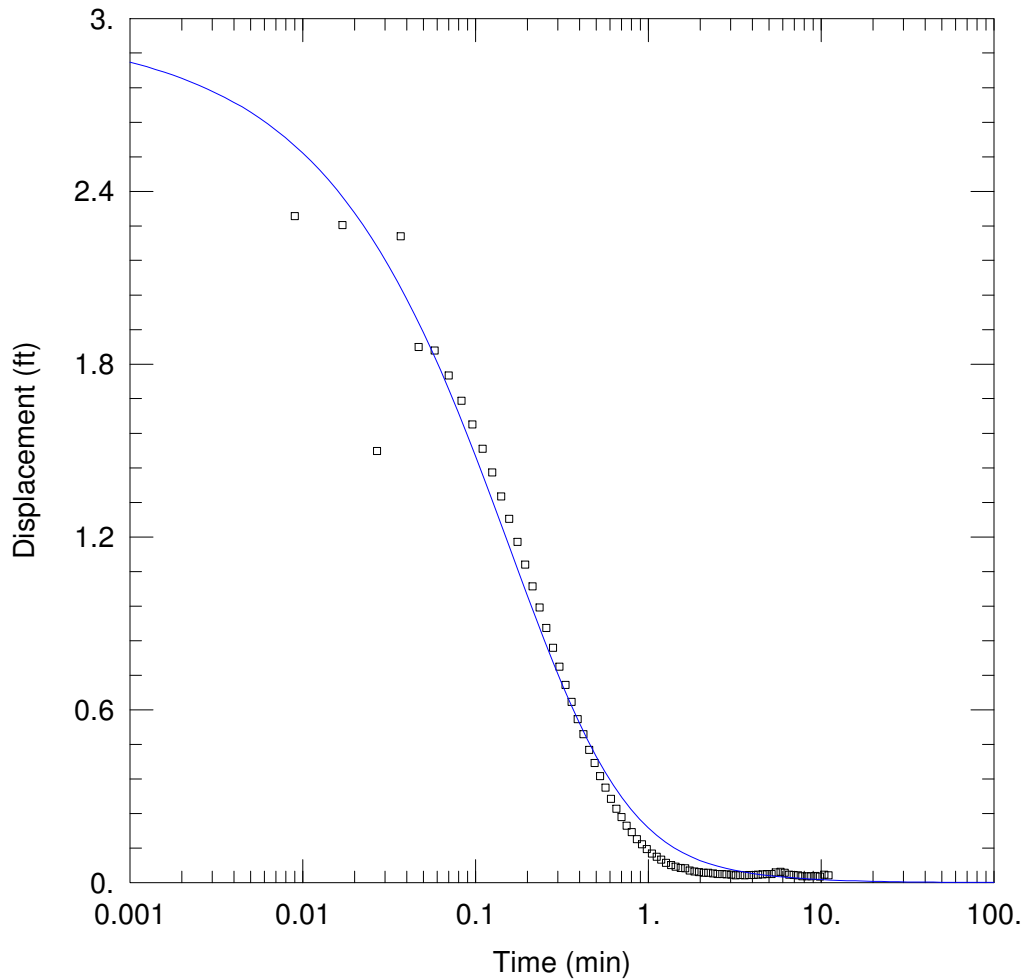
Saturated Thickness: 85. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (PZ29S Slug)

Initial Displacement: 2.97 ft Static Water Column Height: 15.87 ft
 Total Well Penetration Depth: 15.87 ft Screen Length: 10. ft
 Casing Radius: 0.083 ft Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice
 K = 5.697 ft/day $y_0 =$ 2.035 ft



TWIN PINES - PZ29S SLUGTEST

Data Set: H:\2018033.10 TTL Twin Pines Add Testing\addl_slug\SJS_aqtesolve\PZ29S Slug_KGS_SJS.aqt
 Date: 06/03/19 Time: 14:32:28

PROJECT INFORMATION

Company: TTL, Inc.
 Client: Twin Pines LLC
 Project: 000180200804.00
 Location: St. George, GA
 Test Well: PZ29S Slug
 Test Date: 5-16-19

AQUIFER DATA

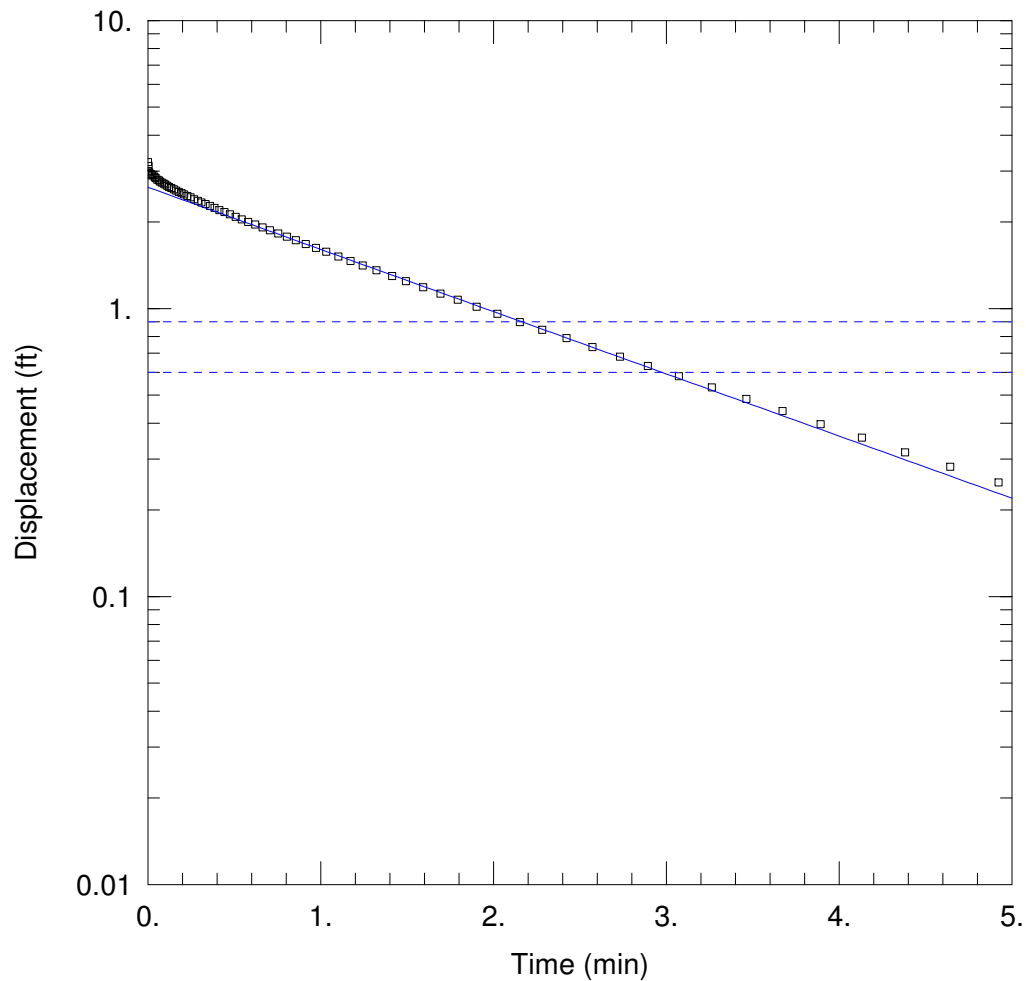
Saturated Thickness: 85. ft

WELL DATA (PZ29S Slug)

| | |
|---|---|
| Initial Displacement: <u>2.97 ft</u> | Static Water Column Height: <u>15.87 ft</u> |
| Total Well Penetration Depth: <u>15.87 ft</u> | Screen Length: <u>10. ft</u> |
| Casing Radius: <u>0.083 ft</u> | Well Radius: <u>0.25 ft</u> |

SOLUTION

| | |
|----------------------------------|---------------------------------------|
| Aquifer Model: <u>Unconfined</u> | Solution Method: <u>KGS Model</u> |
| Kr = <u>5.441 ft/day</u> | Ss = <u>0.0005129 ft⁻¹</u> |
| Kz/Kr = <u>0.1</u> | |



TWIN PINES - PZ30D BAIL TEST

Data Set: H:\2018033.10 TTL Twin Pines Add Testing\addl_slug\SJS_aqtesolve\PZ30D Bail_BR_SJS.aqt
 Date: 06/03/19 Time: 14:33:01

PROJECT INFORMATION

Company: TTL, Inc.
 Client: Twin Pines LLC
 Project: 000180200804.00
 Location: St. George, GA
 Test Well: PZ30D Bail
 Test Date: 5-16-19

AQUIFER DATA

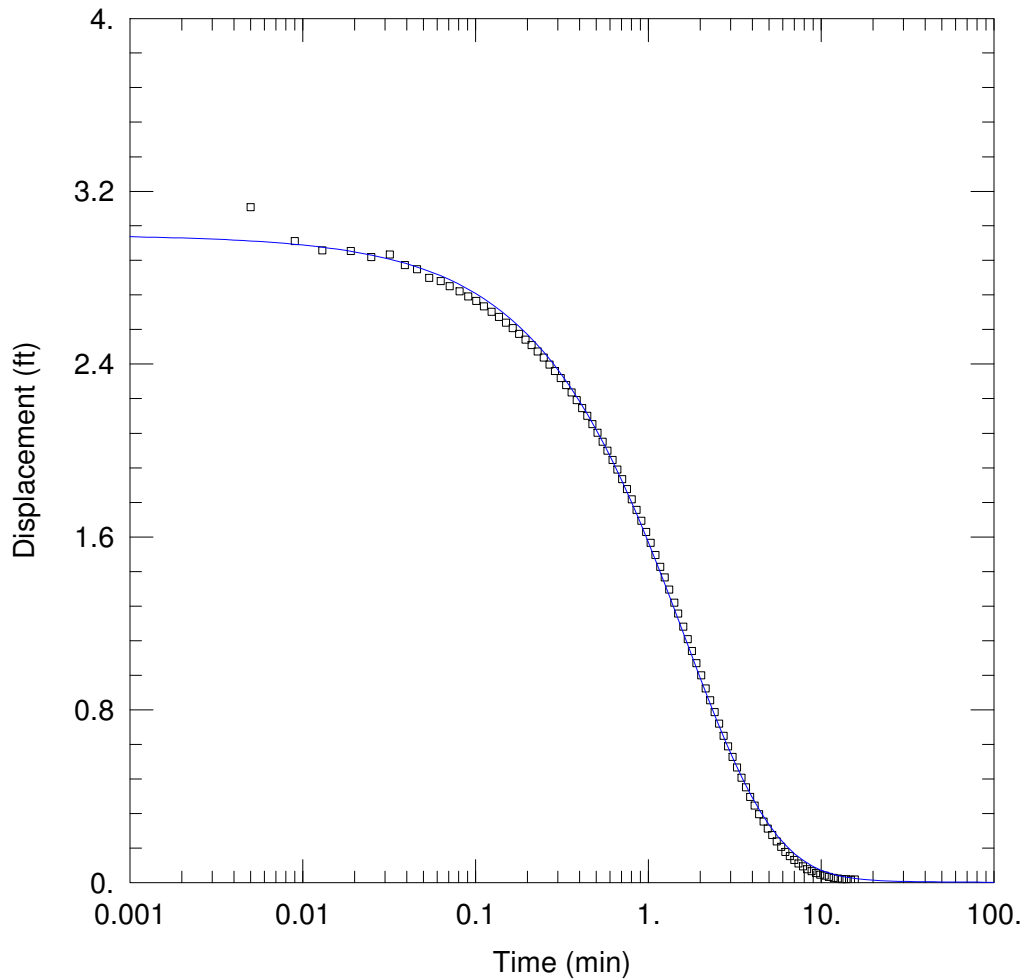
Saturated Thickness: 68. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (PZ30D Bail)

Initial Displacement: 3. ft Static Water Column Height: 46.22 ft
 Total Well Penetration Depth: 46.22 ft Screen Length: 10. ft
 Casing Radius: 0.083 ft Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice
 K = 0.9893 ft/day $y_0 =$ 2.635 ft



TWIN PINES - PZ30D BAIL TEST

Data Set: H:\2018033.10 TTL Twin Pines Add Testing\addl_slug\SJS_aqtesolve\PZ30D Bail_KGS_SJS.aqt
 Date: 06/03/19 Time: 14:33:56

PROJECT INFORMATION

Company: TTL, Inc.
 Client: Twin Pines LLC
 Project: 000180200804.00
 Location: St. George, GA
 Test Well: PZ30D Bail
 Test Date: 5-16-19

AQUIFER DATA

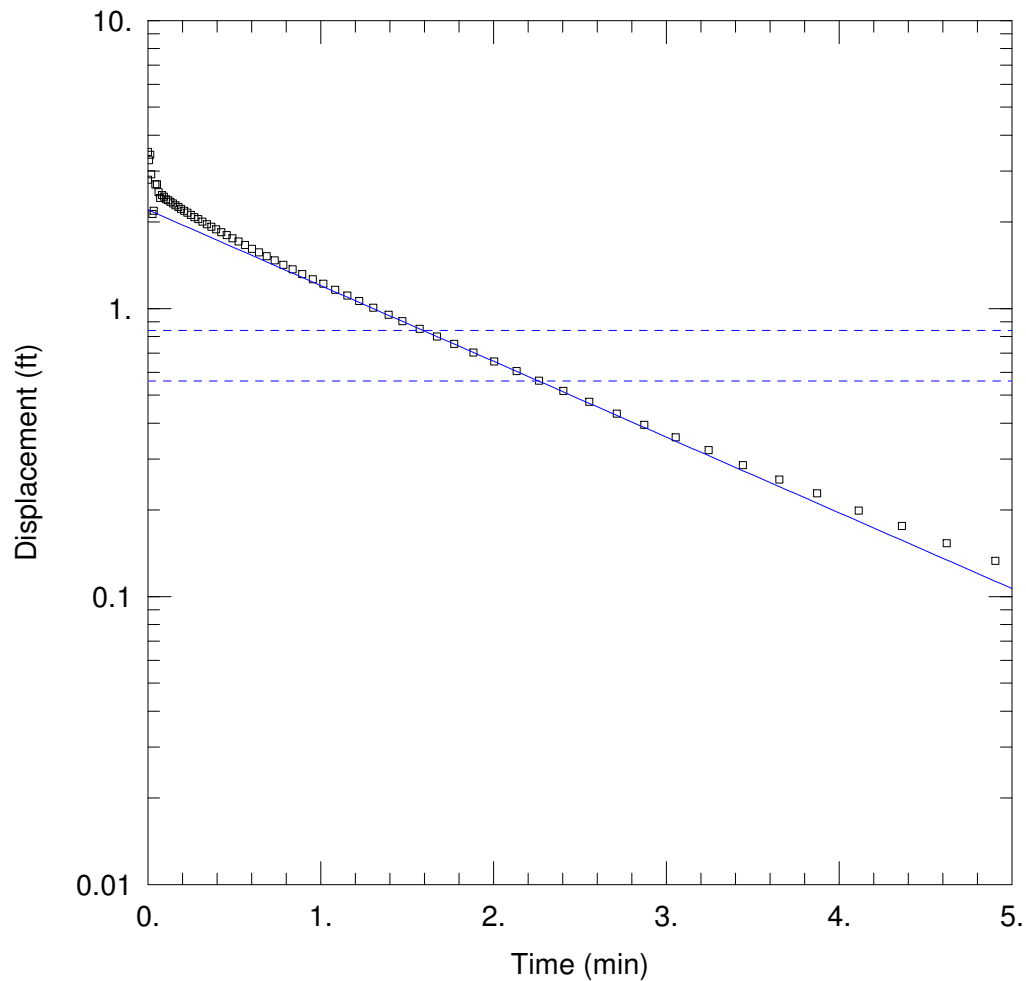
Saturated Thickness: 68. ft

WELL DATA (PZ30D Bail)

| | |
|---|---|
| Initial Displacement: <u>3. ft</u> | Static Water Column Height: <u>46.22 ft</u> |
| Total Well Penetration Depth: <u>46.22 ft</u> | Screen Length: <u>10. ft</u> |
| Casing Radius: <u>0.083 ft</u> | Well Radius: <u>0.25 ft</u> |

SOLUTION

| | |
|----------------------------------|--------------------------------------|
| Aquifer Model: <u>Unconfined</u> | Solution Method: <u>KGS Model</u> |
| Kr = <u>1.085 ft/day</u> | Ss = <u>1.142E-5 ft⁻¹</u> |
| Kz/Kr = <u>0.1</u> | |



TWIN PINES - PZ30D SLUGTEST

Data Set: H:\2018033.10 TTL Twin Pines Add Testing\addl_slug\SJS_aqtesolve\PZ30D Slug_BR_SJS.aqt
 Date: 06/03/19 Time: 14:34:55

PROJECT INFORMATION

Company: TTL, Inc.
 Client: Twin Pines LLC
 Project: 000180200804.00
 Location: St. George, GA
 Test Well: PZ30D Slug
 Test Date: 5-16-19

AQUIFER DATA

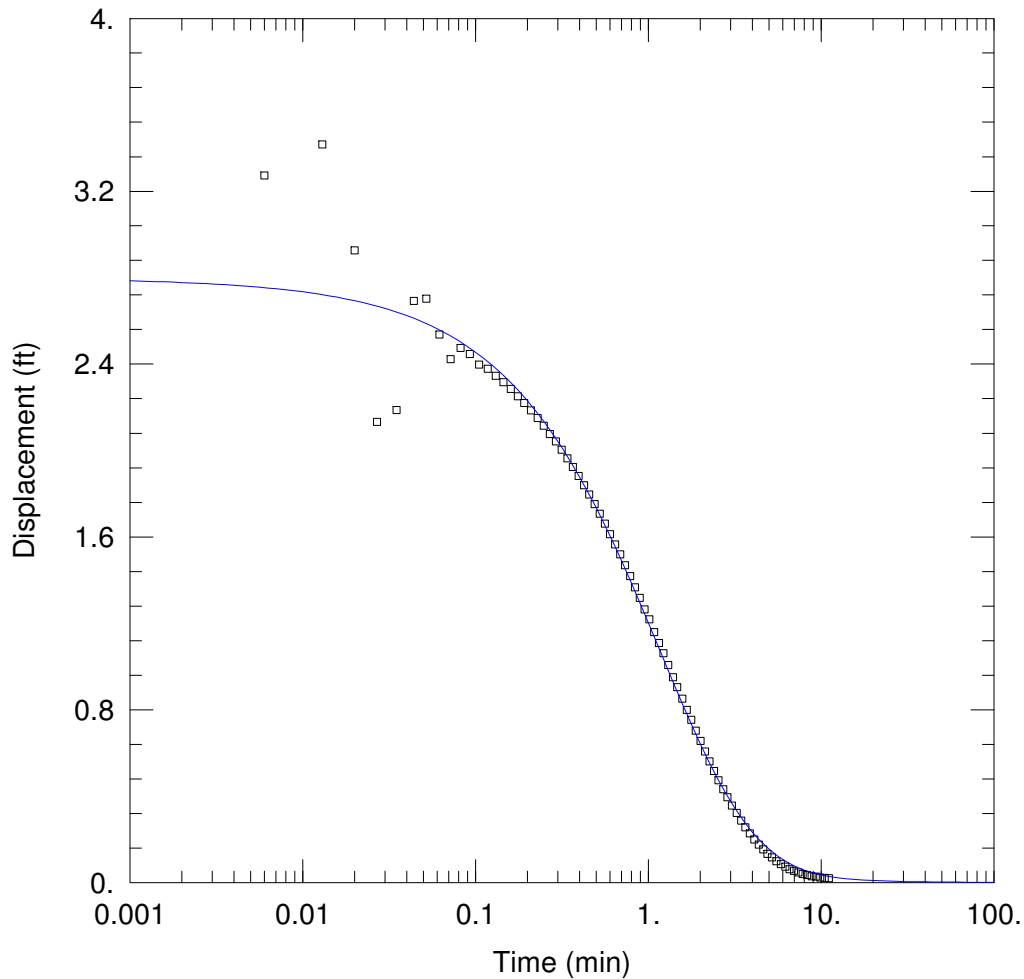
Saturated Thickness: 68. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (PZ30D Slug)

Initial Displacement: 2.8 ft Static Water Column Height: 46.2 ft
 Total Well Penetration Depth: 46.2 ft Screen Length: 10. ft
 Casing Radius: 0.083 ft Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice
 K = 1.205 ft/day y0 = 2.2 ft



TWIN PINES - PZ30D SLUGTEST

Data Set: H:\2018033.10 TTL Twin Pines Add Testing\addl_slug\SJS_aqtesolve\PZ30D Slug_KGS_SJS.aqt
 Date: 06/03/19 Time: 14:36:23

PROJECT INFORMATION

Company: TTL, Inc.
 Client: Twin Pines LLC
 Project: 000180200804.00
 Location: St. George, GA
 Test Well: PZ30D Slug
 Test Date: 5-16-19

AQUIFER DATA

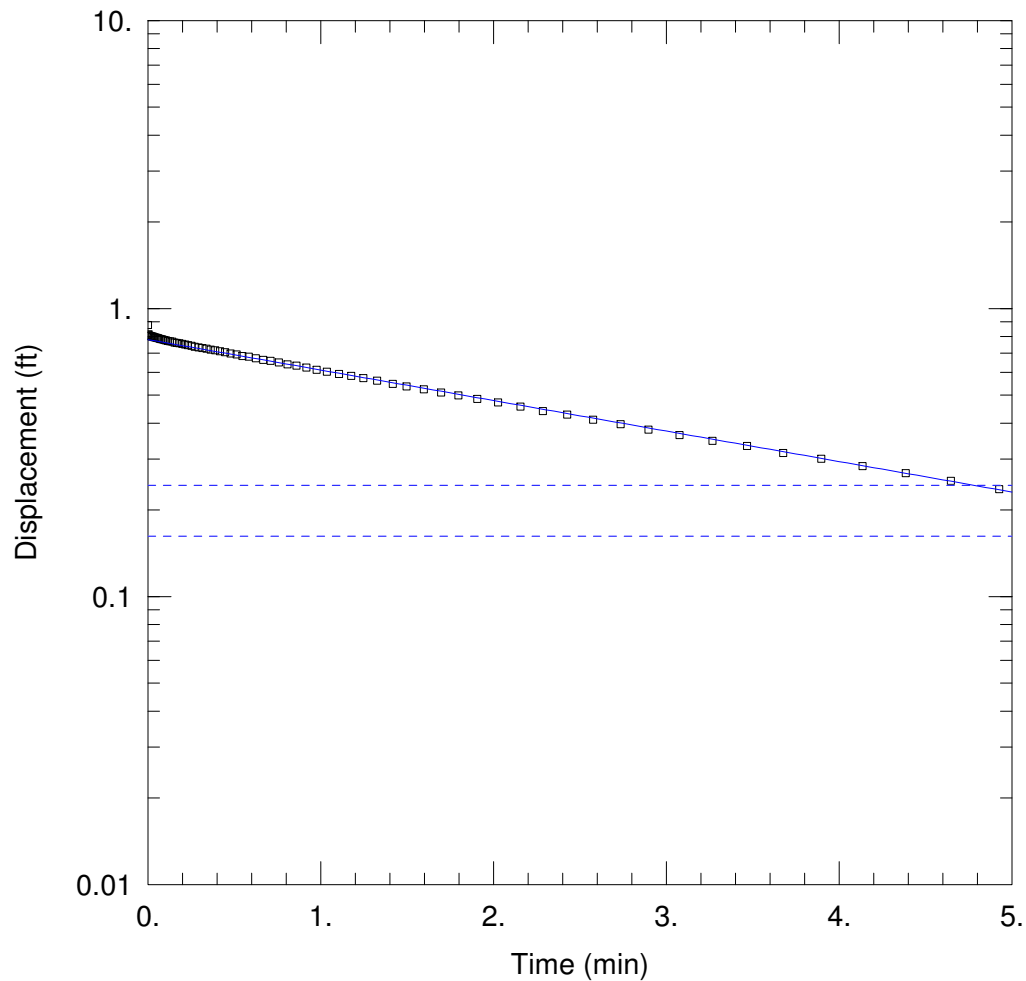
Saturated Thickness: 68. ft

WELL DATA (PZ30D Slug)

| | |
|--|--|
| Initial Displacement: <u>2.8 ft</u> | Static Water Column Height: <u>46.2 ft</u> |
| Total Well Penetration Depth: <u>46.2 ft</u> | Screen Length: <u>10. ft</u> |
| Casing Radius: <u>0.083 ft</u> | Well Radius: <u>0.25 ft</u> |

SOLUTION

| | |
|----------------------------------|--------------------------------------|
| Aquifer Model: <u>Unconfined</u> | Solution Method: <u>KGS Model</u> |
| Kr = <u>1.383 ft/day</u> | Ss = <u>2.232E-5 ft⁻¹</u> |
| Kz/Kr = <u>0.1</u> | |



TWIN PINES - PZ30S BAIL TEST

Data Set: H:\2018033.10 TTL Twin Pines Add Testing\addl_slug\SJS_aqtesolve\PZ30S Bail_BR_SJS.aqt
 Date: 06/03/19 Time: 15:09:49

PROJECT INFORMATION

Company: TTL, Inc.
 Client: Twin Pines LLC
 Project: 000180200804.00
 Location: St. George, GA
 Test Well: PZ30S Bail
 Test Date: 5-16-19

AQUIFER DATA

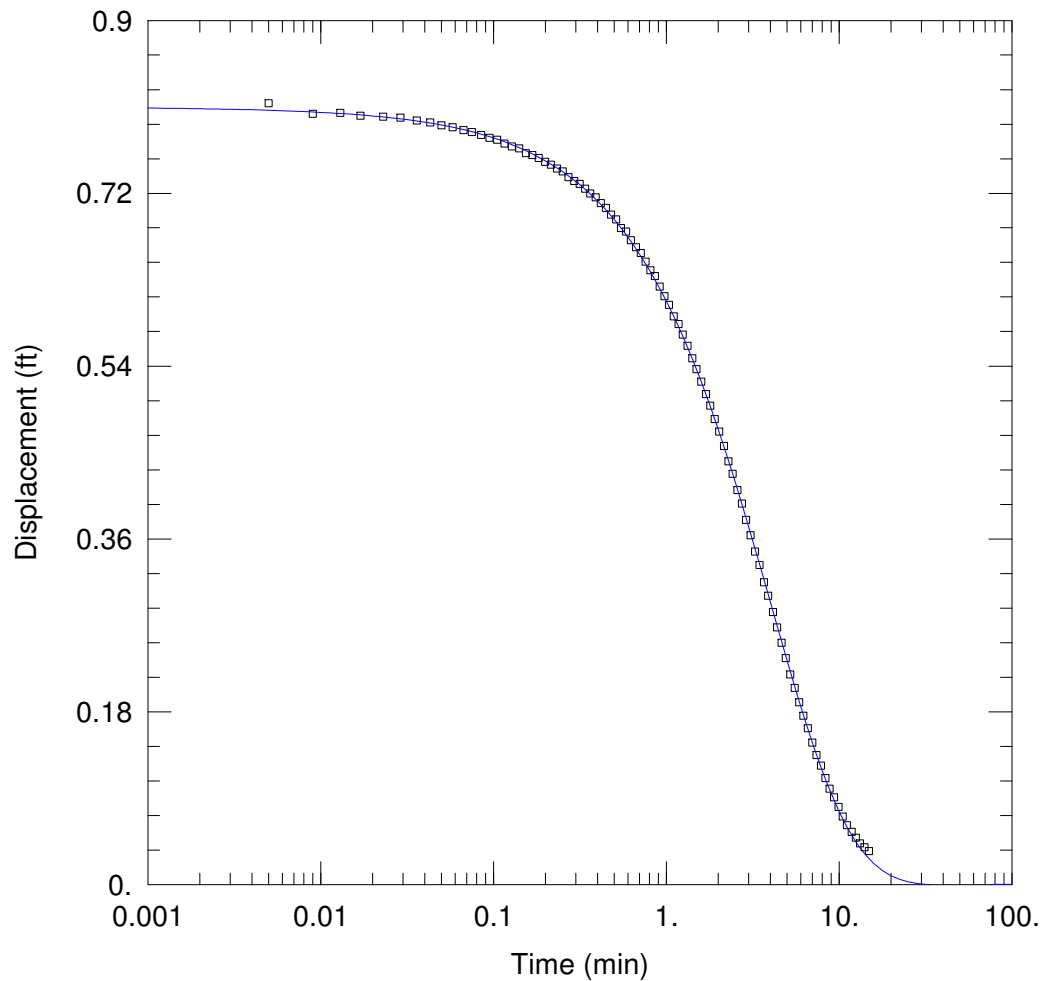
Saturated Thickness: 68. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (PZ30S Bail)

Initial Displacement: 0.81 ft Static Water Column Height: 7.06 ft
 Total Well Penetration Depth: 7.06 ft Screen Length: 5. ft
 Casing Radius: 0.083 ft Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice
 K = 0.6862 ft/day y0 = 0.7802 ft



TWIN PINES - PZ30S BAIL TEST

Data Set: H:\2018033.10 TTL Twin Pines Add Testing\addl_slug\SJS_aqtesolve\PZ30S Bail_KGS_SJS.aqt
 Date: 06/03/19 Time: 15:10:33

PROJECT INFORMATION

Company: TTL, Inc.
 Client: Twin Pines LLC
 Project: 000180200804.00
 Location: St. George, GA
 Test Well: PZ30S Bail
 Test Date: 5-16-19

AQUIFER DATA

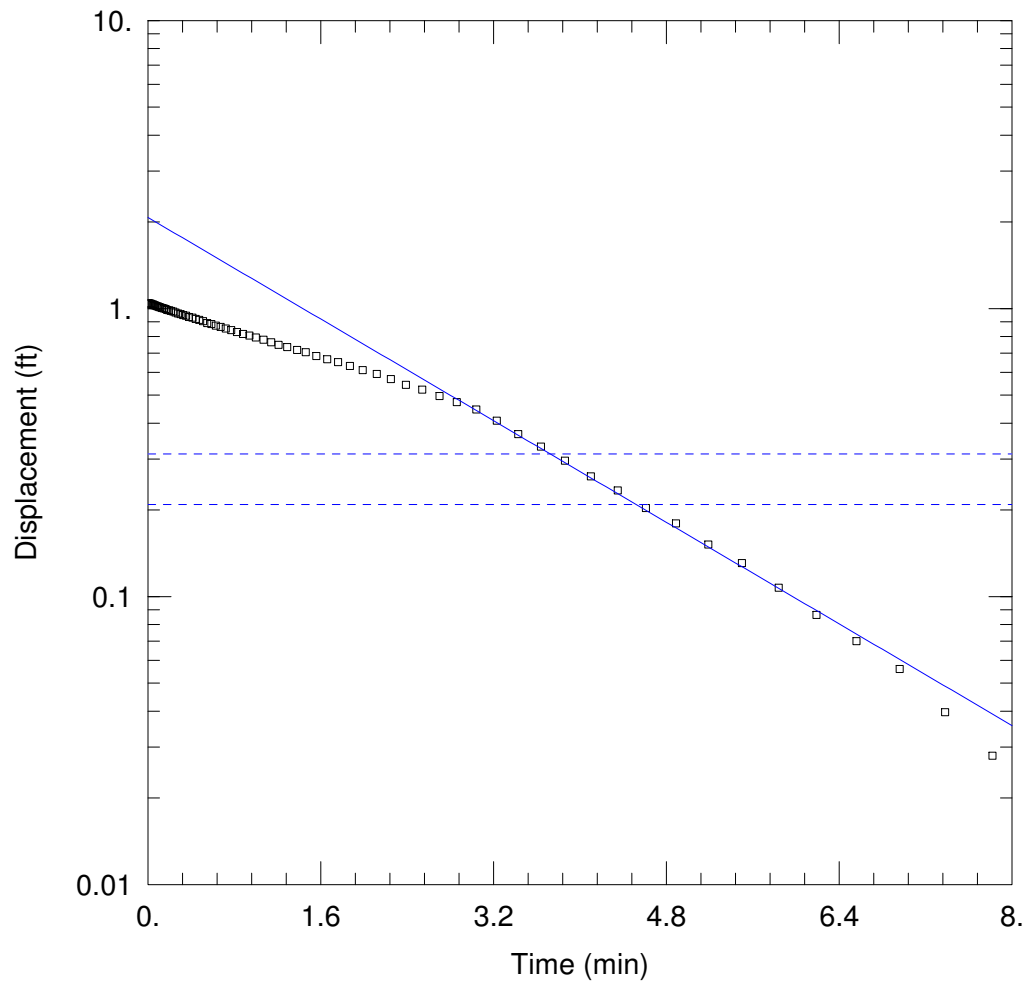
Saturated Thickness: 68. ft

WELL DATA (PZ30S Bail)

| | |
|--|--|
| Initial Displacement: <u>0.81 ft</u> | Static Water Column Height: <u>7.06 ft</u> |
| Total Well Penetration Depth: <u>7.06 ft</u> | Screen Length: <u>5. ft</u> |
| Casing Radius: <u>0.083 ft</u> | Well Radius: <u>0.25 ft</u> |

SOLUTION

| | |
|----------------------------------|--------------------------------------|
| Aquifer Model: <u>Unconfined</u> | Solution Method: <u>KGS Model</u> |
| Kr = <u>0.8683 ft/day</u> | Ss = <u>1.065E-5 ft⁻¹</u> |
| Kz/Kr = <u>0.1</u> | |



TWIN PINES - PZ30S SLUGTEST

Data Set: H:\...\PZ30S Slug_BR_SJS_revdispl.aqt

Date: 06/03/19

Time: 14:22:53

PROJECT INFORMATION

Company: TTL, Inc.

Client: Twin Pines LLC

Project: 000180200804.00

Location: St. George, GA

Test Well: PZ30S Slug

Test Date: 5-16-19

AQUIFER DATA

Saturated Thickness: 68. ft

Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (PZ30S Slug)

Initial Displacement: 1.043 ft

Static Water Column Height: 7.08 ft

Total Well Penetration Depth: 7.08 ft

Screen Length: 5. ft

Casing Radius: 0.083 ft

Well Radius: 0.25 ft

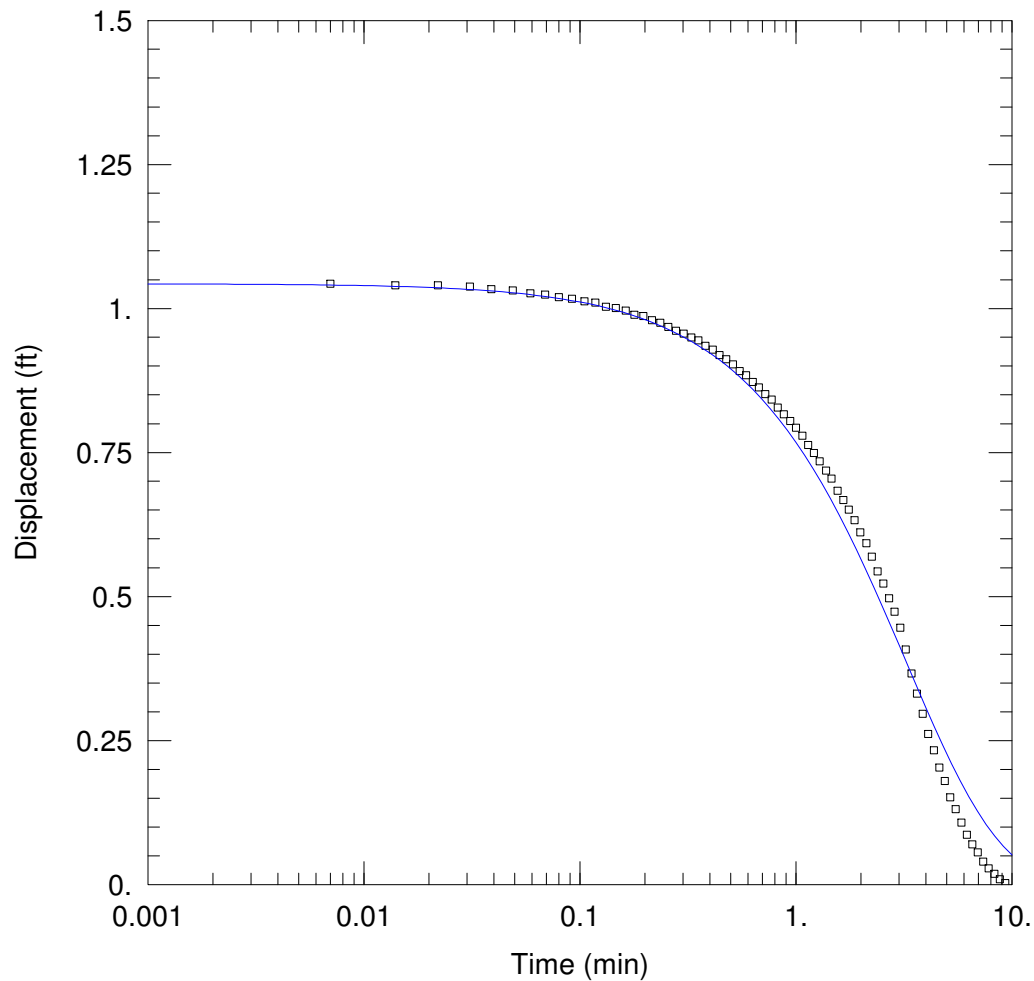
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 1.43 ft/day

y0 = 2.071 ft



TWIN PINES - PZ30S SLUGTEST

Data Set: H:\...\PZ30S Slug_KGS_SJS_revdispl.aqt

Date: 06/03/19

Time: 14:23:25

PROJECT INFORMATION

Company: TTL, Inc.

Client: Twin Pines LLC

Project: 000180200804.00

Location: St. George, GA

Test Well: PZ30S Slug

Test Date: 5-16-19

AQUIFER DATA

Saturated Thickness: 68. ft

WELL DATA (PZ30S Slug)

Initial Displacement: 1.043 ft

Static Water Column Height: 7.08 ft

Total Well Penetration Depth: 7.08 ft

Screen Length: 5. ft

Casing Radius: 0.083 ft

Well Radius: 0.25 ft

SOLUTION

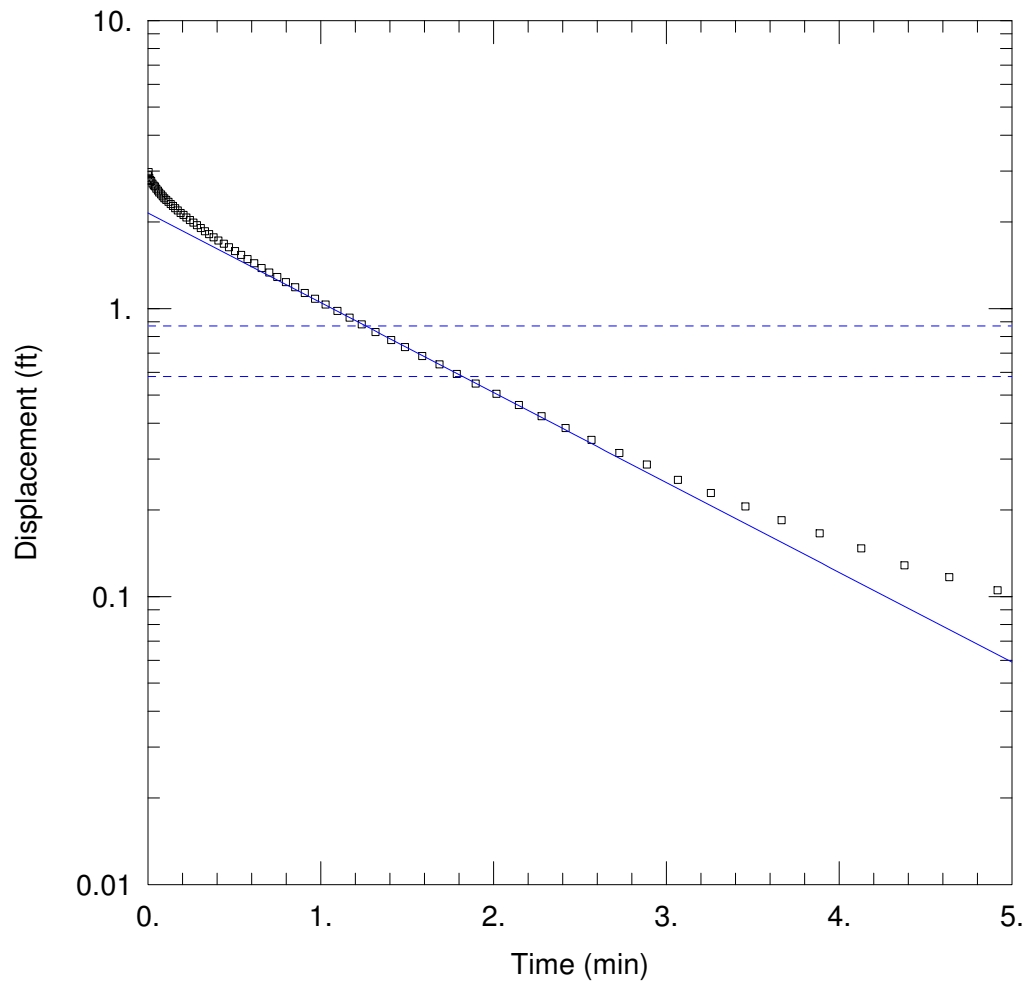
Aquifer Model: Unconfined

Solution Method: KGS Model

Kr = 1.085 ft/day

Ss = 1.967E-16 ft⁻¹

Kz/Kr = 0.1



TWIN PINES - PZ31D BAIL TEST

Data Set: H:\...\PZ31D Bail_BR_SJS_revdispl.aqt

Date: 06/03/19

Time: 14:39:19

PROJECT INFORMATION

Company: TTL, Inc.

Client: Twin Pines LLC

Project: 000180200804.00

Location: St. George, GA

Test Well: PZ31D Bail

Test Date: 5-16-19

AQUIFER DATA

Saturated Thickness: 50. ft

Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (PZ31D Bail)

Initial Displacement: 2.9 ft

Static Water Column Height: 46.1 ft

Total Well Penetration Depth: 46.1 ft

Screen Length: 10. ft

Casing Radius: 0.083 ft

Well Radius: 0.25 ft

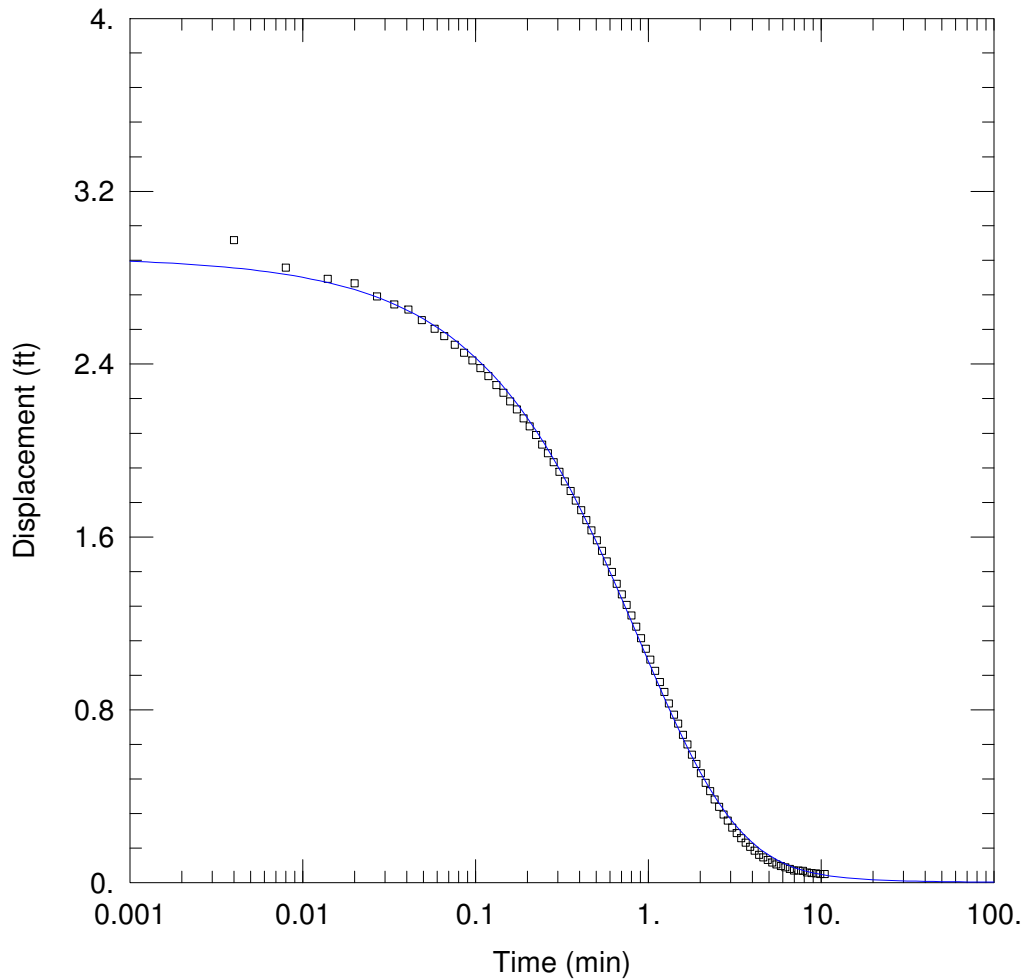
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 1.498 ft/day

y0 = 2.149 ft



TWIN PINES - PZ31D BAIL TEST

Data Set: H:\...\PZ31D Bail_KGS_SJS_revdispl.aqt

Date: 06/03/19

Time: 14:39:54

PROJECT INFORMATION

Company: TTL, Inc.

Client: Twin Pines LLC

Project: 000180200804.00

Location: St. George, GA

Test Well: PZ31D Bail

Test Date: 5-16-19

AQUIFER DATA

Saturated Thickness: 50. ft

WELL DATA (PZ31D Bail)

Initial Displacement: 2.9 ft

Static Water Column Height: 46.1 ft

Total Well Penetration Depth: 46.1 ft

Screen Length: 10. ft

Casing Radius: 0.083 ft

Well Radius: 0.25 ft

SOLUTION

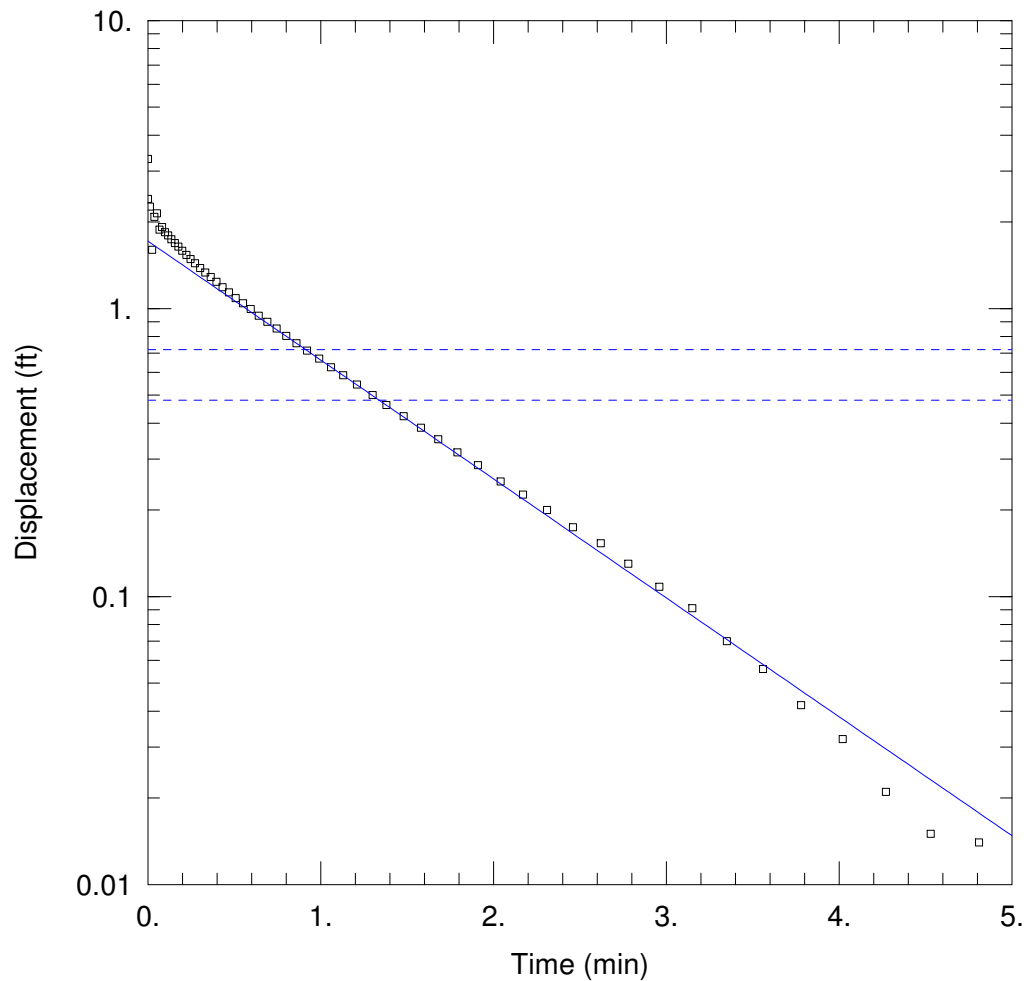
Aquifer Model: Unconfined

Solution Method: KGS Model

Kr = 1.568 ft/day

Ss = 5.938E-5 ft⁻¹

Kz/Kr = 0.1



TWIN PINES - PZ31D SLUGTEST

Data Set: H:\2018033.10 TTL Twin Pines Add Testing\addl_slug\SJS_aqtesolve\PZ31D Slug_BR_SJS.aqt
 Date: 06/03/19 Time: 15:11:20

PROJECT INFORMATION

Company: TTL, Inc.
 Client: Twin Pines LLC
 Project: 000180200804.00
 Location: St. George, GA
 Test Well: PZ31D Slug
 Test Date: 5-16-19

AQUIFER DATA

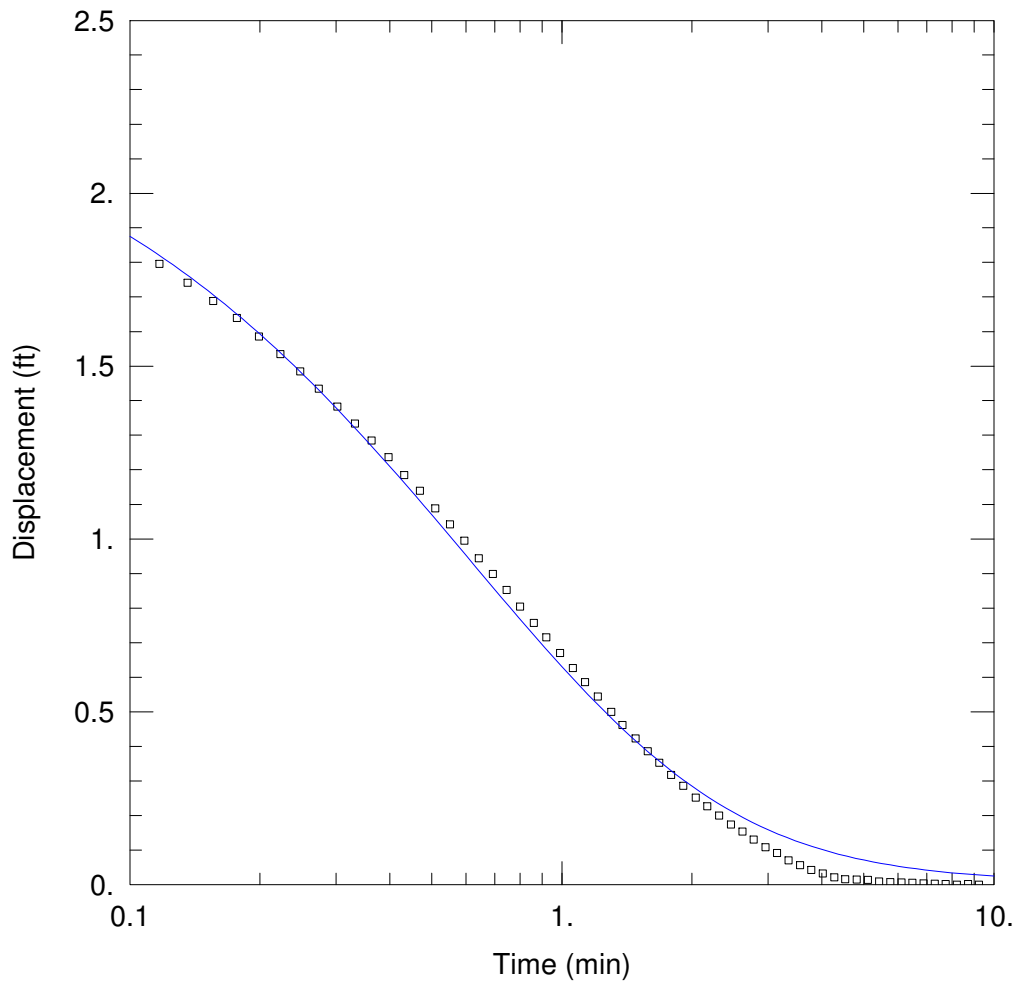
Saturated Thickness: 50. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (PZ31D Slug)

Initial Displacement: 2.4 ft Static Water Column Height: 46.06 ft
 Total Well Penetration Depth: 46.06 ft Screen Length: 10. ft
 Casing Radius: 0.083 ft Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice
 K = 1.981 ft/day $y_0 =$ 1.713 ft



TWIN PINES - PZ31D SLUGTEST

Data Set: H:\2018033.10 TTL Twin Pines Add Testing\addl_slug\SJS_aqtesolve\PZ31D Slug_KGS_SJS.aqt
 Date: 06/03/19 Time: 15:11:49

PROJECT INFORMATION

Company: TTL, Inc.
 Client: Twin Pines LLC
 Project: 000180200804.00
 Location: St. George, GA
 Test Well: PZ31D Slug
 Test Date: 5-16-19

AQUIFER DATA

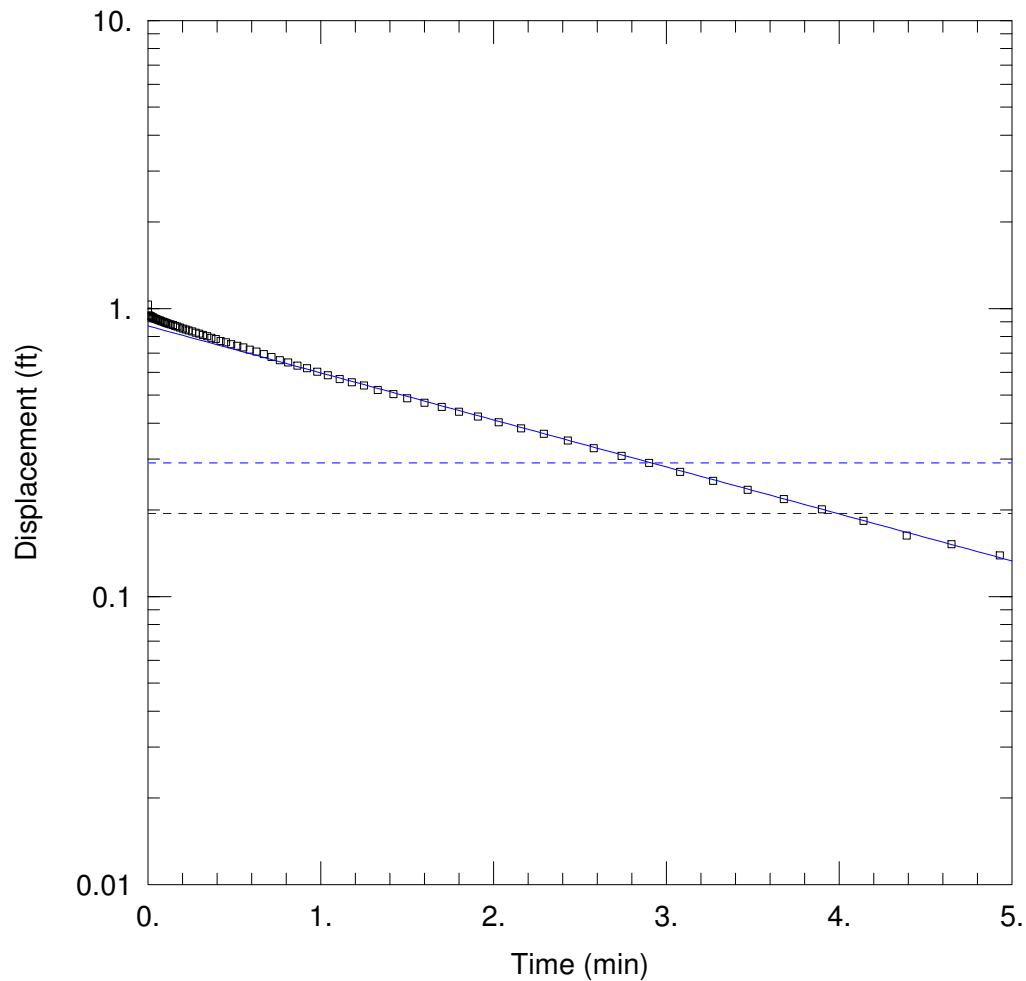
Saturated Thickness: 50. ft

WELL DATA (PZ31D Slug)

| | |
|---|---|
| Initial Displacement: <u>2.4 ft</u> | Static Water Column Height: <u>46.06 ft</u> |
| Total Well Penetration Depth: <u>46.06 ft</u> | Screen Length: <u>10. ft</u> |
| Casing Radius: <u>0.083 ft</u> | Well Radius: <u>0.25 ft</u> |

SOLUTION

| | |
|----------------------------------|---------------------------------------|
| Aquifer Model: <u>Unconfined</u> | Solution Method: <u>KGS Model</u> |
| Kr = <u>1.981 ft/day</u> | Ss = <u>0.0001215 ft⁻¹</u> |
| Kz/Kr = <u>0.1</u> | |



TWIN PINES - PZ31S BAIL TEST

Data Set: H:\2018033.10 TTL Twin Pines Add Testing\addl_slug\SJS_aqtesolve\PZ31S Bail_BR_SJS.aqt
 Date: 06/03/19 Time: 14:40:27

PROJECT INFORMATION

Company: TTL, Inc.
 Client: Twin Pines LLC
 Project: 000180200804.00
 Location: St. George, GA
 Test Well: PZ31S Bail
 Test Date: 5-16-19

AQUIFER DATA

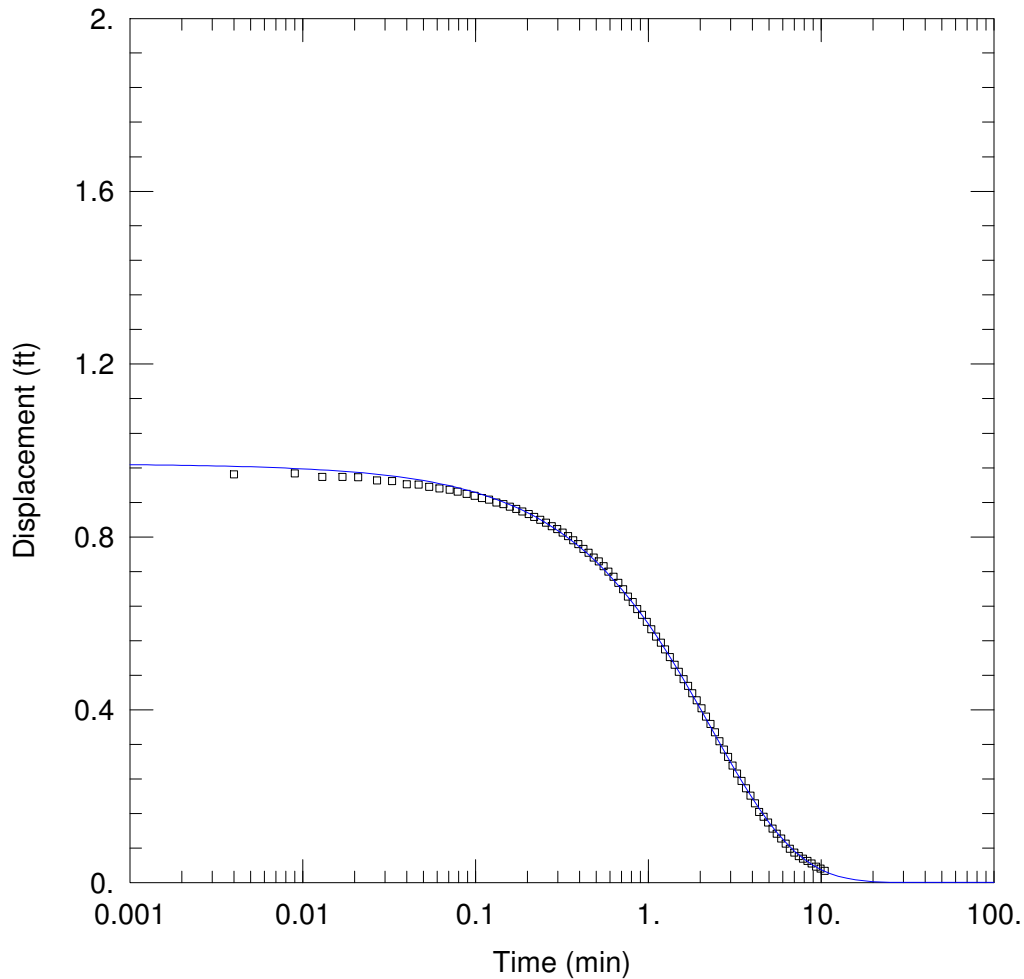
Saturated Thickness: 50. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (PZ31S Bail)

Initial Displacement: 0.97 ft Static Water Column Height: 8. ft
 Total Well Penetration Depth: 8. ft Screen Length: 5. ft
 Casing Radius: 0.083 ft Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice
 K = 1.078 ft/day y0 = 0.87 ft



TWIN PINES - PZ31S BAIL TEST

Data Set: H:\2018033.10 TTL Twin Pines Add Testing\addl_slug\SJS_aqtesolve\PZ31S Bail_KGS_SJS.aqt
 Date: 06/03/19 Time: 14:40:53

PROJECT INFORMATION

Company: TTL, Inc.
 Client: Twin Pines LLC
 Project: 000180200804.00
 Location: St. George, GA
 Test Well: PZ31S Bail
 Test Date: 5-16-19

AQUIFER DATA

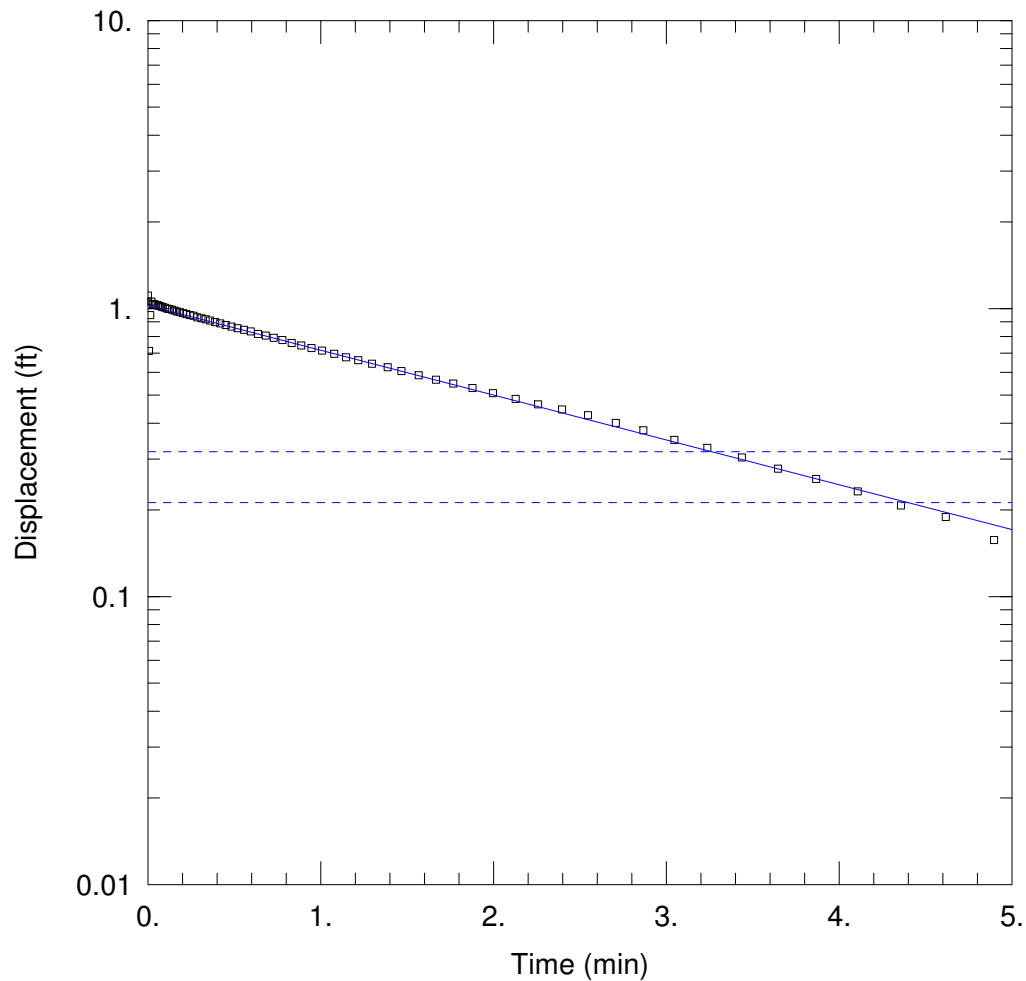
Saturated Thickness: 50. ft

WELL DATA (PZ31S Bail)

| | |
|--|--|
| Initial Displacement: <u>0.97 ft</u> | Static Water Column Height: <u>8. ft</u> |
| Total Well Penetration Depth: <u>8. ft</u> | Screen Length: <u>5. ft</u> |
| Casing Radius: <u>0.083 ft</u> | Well Radius: <u>0.25 ft</u> |

SOLUTION

| | |
|----------------------------------|--------------------------------------|
| Aquifer Model: <u>Unconfined</u> | Solution Method: <u>KGS Model</u> |
| Kr = <u>1.421 ft/day</u> | Ss = <u>2.693E-5 ft⁻¹</u> |
| Kz/Kr = <u>0.1</u> | |



TWIN PINES - PZ31S SLUGTEST

Data Set: H:\2018033.10 TTL Twin Pines Add Testing\addl_slug\SJS_aqtesolve\PZ31S Slug_BR_SJS.aqt
 Date: 06/03/19 Time: 15:21:45

PROJECT INFORMATION

Company: TTL, Inc.
 Client: Twin Pines LLC
 Project: 000180200804.00
 Location: St. George, GA
 Test Well: PZ31S Slug
 Test Date: 5-16-19

AQUIFER DATA

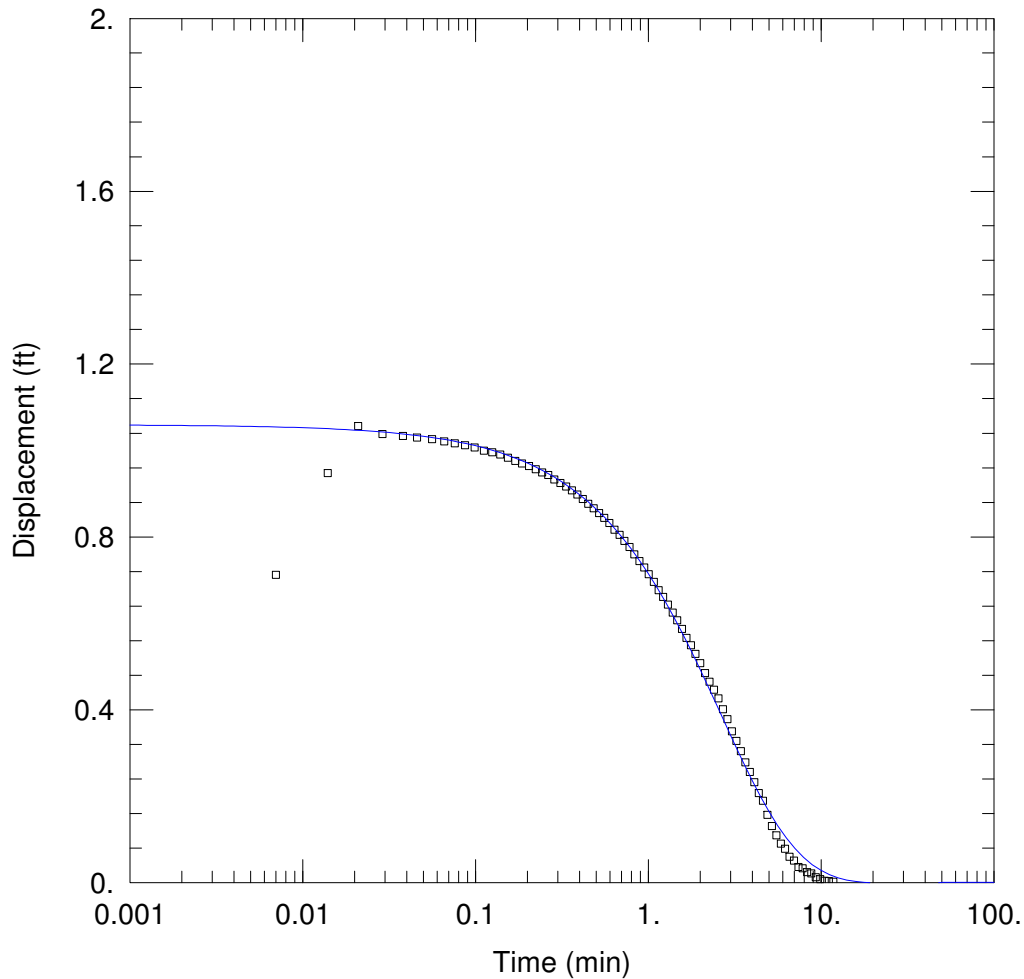
Saturated Thickness: 50. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (PZ31S Slug)

Initial Displacement: 1.06 ft Static Water Column Height: 8. ft
 Total Well Penetration Depth: 8. ft Screen Length: 5. ft
 Casing Radius: 0.083 ft Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice
 K = 1.028 ft/day y0 = 1.024 ft



TWIN PINES - PZ31S SLUGTEST

Data Set: H:\2018033.10 TTL Twin Pines Add Testing\addl_slug\SJS_aqtesolve\PZ31S Slug_KGS_SJS.aqt
 Date: 06/04/19 Time: 16:03:03

PROJECT INFORMATION

Company: TTL, Inc.
 Client: Twin Pines LLC
 Project: 000180200804.00
 Location: St. George, GA
 Test Well: PZ31S Slug
 Test Date: 5-16-19

AQUIFER DATA

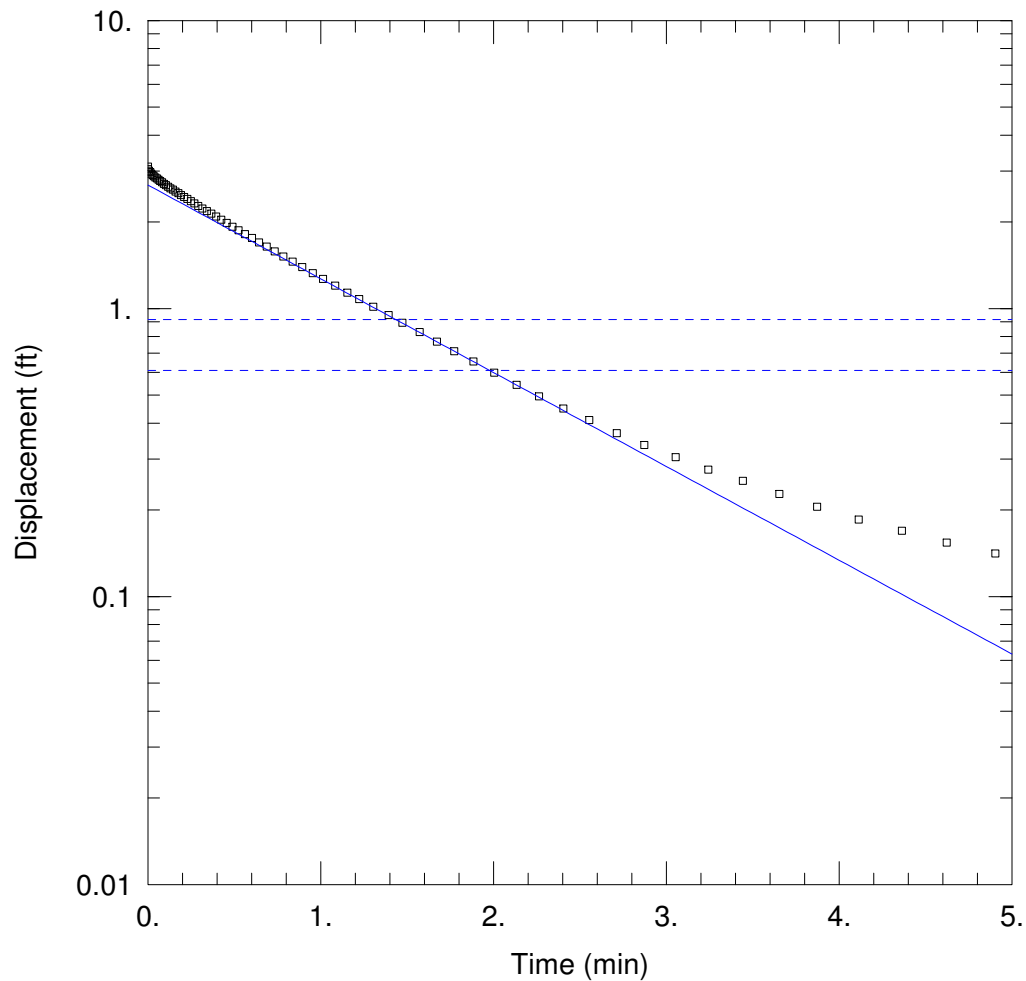
Saturated Thickness: 50. ft

WELL DATA (PZ31S Slug)

| | |
|--|--|
| Initial Displacement: <u>1.06 ft</u> | Static Water Column Height: <u>8. ft</u> |
| Total Well Penetration Depth: <u>8. ft</u> | Screen Length: <u>5. ft</u> |
| Casing Radius: <u>0.083 ft</u> | Well Radius: <u>0.25 ft</u> |

SOLUTION

| | |
|----------------------------------|--------------------------------------|
| Aquifer Model: <u>Unconfined</u> | Solution Method: <u>KGS Model</u> |
| Kr = <u>1.355 ft/day</u> | Ss = <u>2.335E-6 ft⁻¹</u> |
| Kz/Kr = <u>0.1</u> | |



TWIN PINES - PZ33D BAIL TEST

Data Set: H:\2018033.10 TTL Twin Pines Add Testing\addl_slug\SJS_aqtesolve\PZ33D Bail_BR_SJS.aqt
 Date: 06/03/19 Time: 14:41:26

PROJECT INFORMATION

Company: TTL, Inc.
 Client: Twin Pines LLC
 Project: 000180200804.00
 Location: St. George, GA
 Test Well: PZ33D Bail
 Test Date: 5-16-19

AQUIFER DATA

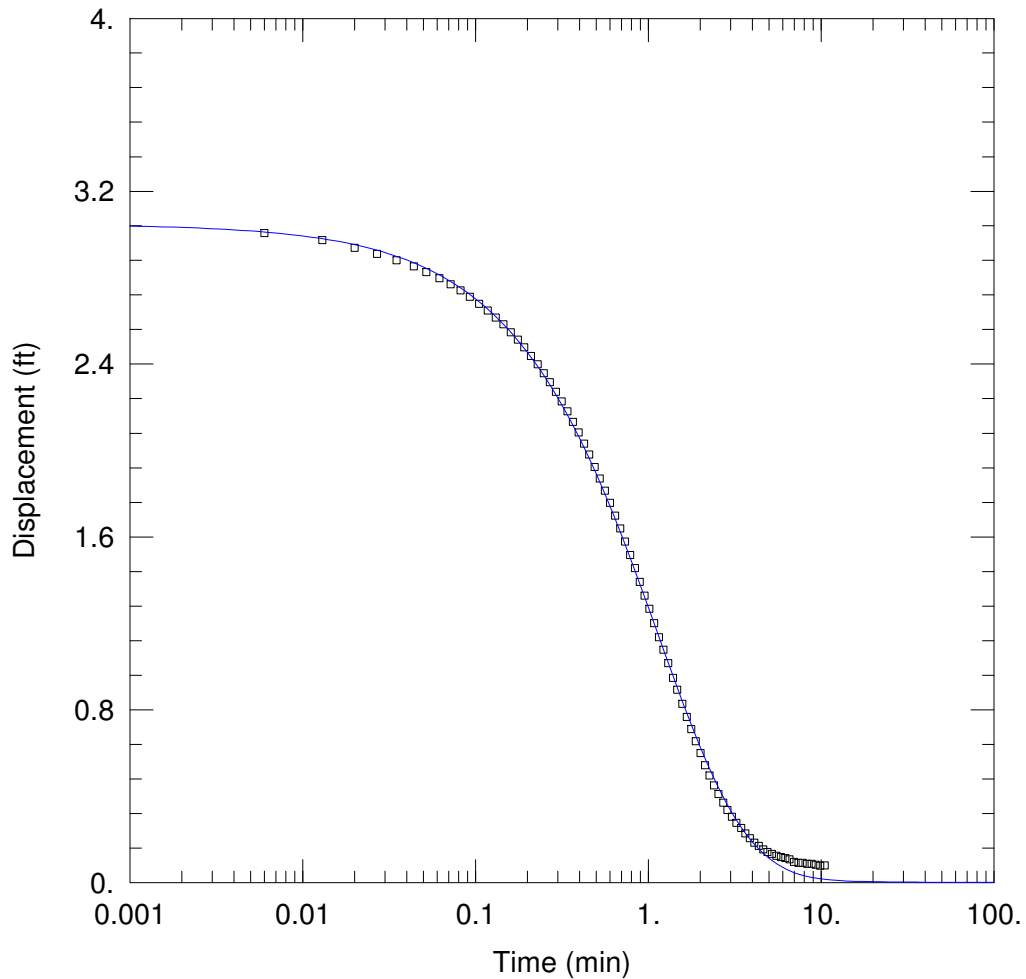
Saturated Thickness: 44. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (PZ33D Bail)

Initial Displacement: 3.05 ft Static Water Column Height: 46.99 ft
 Total Well Penetration Depth: 46.99 ft Screen Length: 10. ft
 Casing Radius: 0.083 ft Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice
 K = 1.748 ft/day $y_0 =$ 2.683 ft



TWIN PINES - PZ33D BAIL TEST

Data Set: H:\2018033.10 TTL Twin Pines Add Testing\addl_slug\SJS_aqtesolve\PZ33D Bail_KGS_SJS.aqt
 Date: 06/03/19 Time: 14:41:50

PROJECT INFORMATION

Company: TTL, Inc.
 Client: Twin Pines LLC
 Project: 000180200804.00
 Location: St. George, GA
 Test Well: PZ33D Bail
 Test Date: 5-16-19

AQUIFER DATA

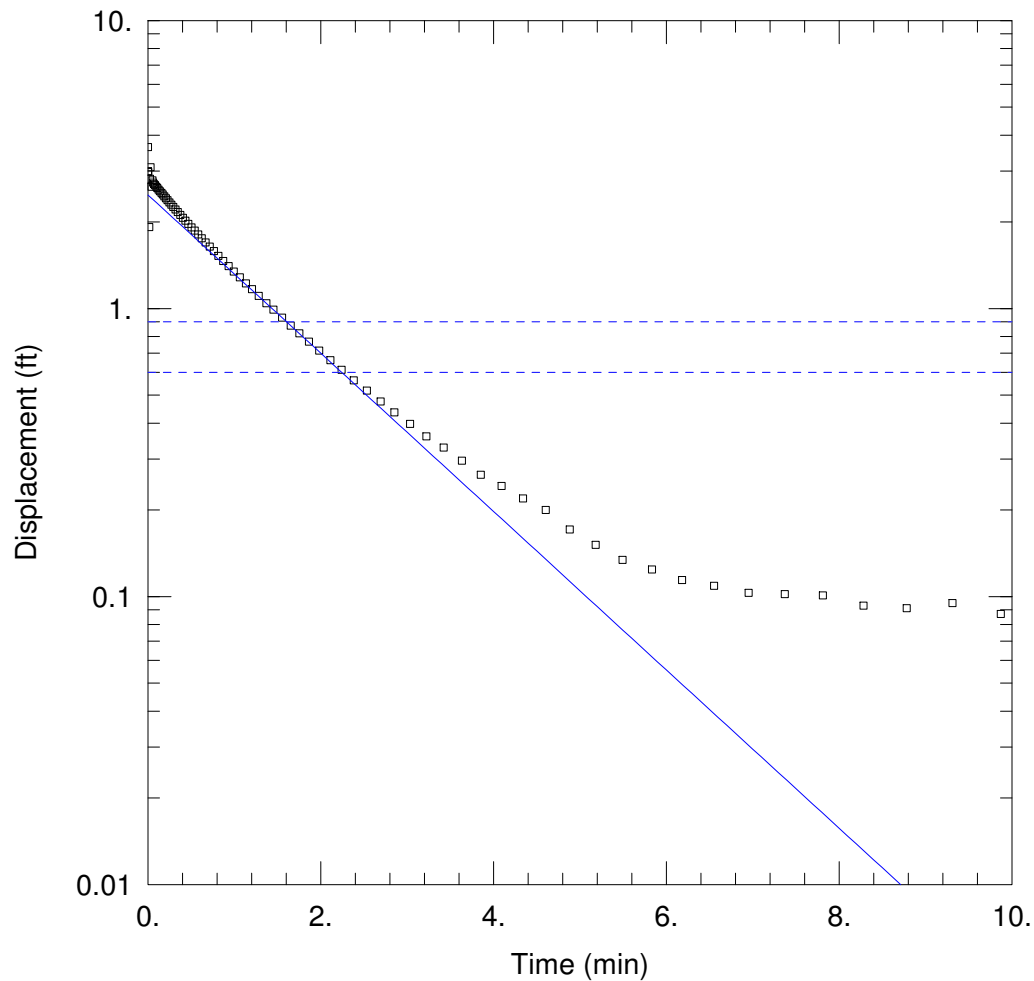
Saturated Thickness: 44. ft

WELL DATA (PZ33D Bail)

| | |
|---|---|
| Initial Displacement: <u>3.05 ft</u> | Static Water Column Height: <u>46.99 ft</u> |
| Total Well Penetration Depth: <u>46.99 ft</u> | Screen Length: <u>10. ft</u> |
| Casing Radius: <u>0.083 ft</u> | Well Radius: <u>0.25 ft</u> |

SOLUTION

| | |
|----------------------------------|--------------------------------------|
| Aquifer Model: <u>Unconfined</u> | Solution Method: <u>KGS Model</u> |
| Kr = <u>2.771 ft/day</u> | Ss = <u>8.216E-6 ft⁻¹</u> |
| Kz/Kr = <u>0.1</u> | |



TWIN PINES - PZ33D SLUGTEST

Data Set: H:\2018033.10 TTL Twin Pines Add Testing\addl_slug\SJS_aqtesolve\PZ33D Slug_BR_SJS.aqt
 Date: 06/03/19 Time: 14:42:30

PROJECT INFORMATION

Company: TTL, Inc.
 Client: Twin Pines LLC
 Project: 000180200804.00
 Location: St. George, GA
 Test Well: PZ33D Slug
 Test Date: 5-16-19

AQUIFER DATA

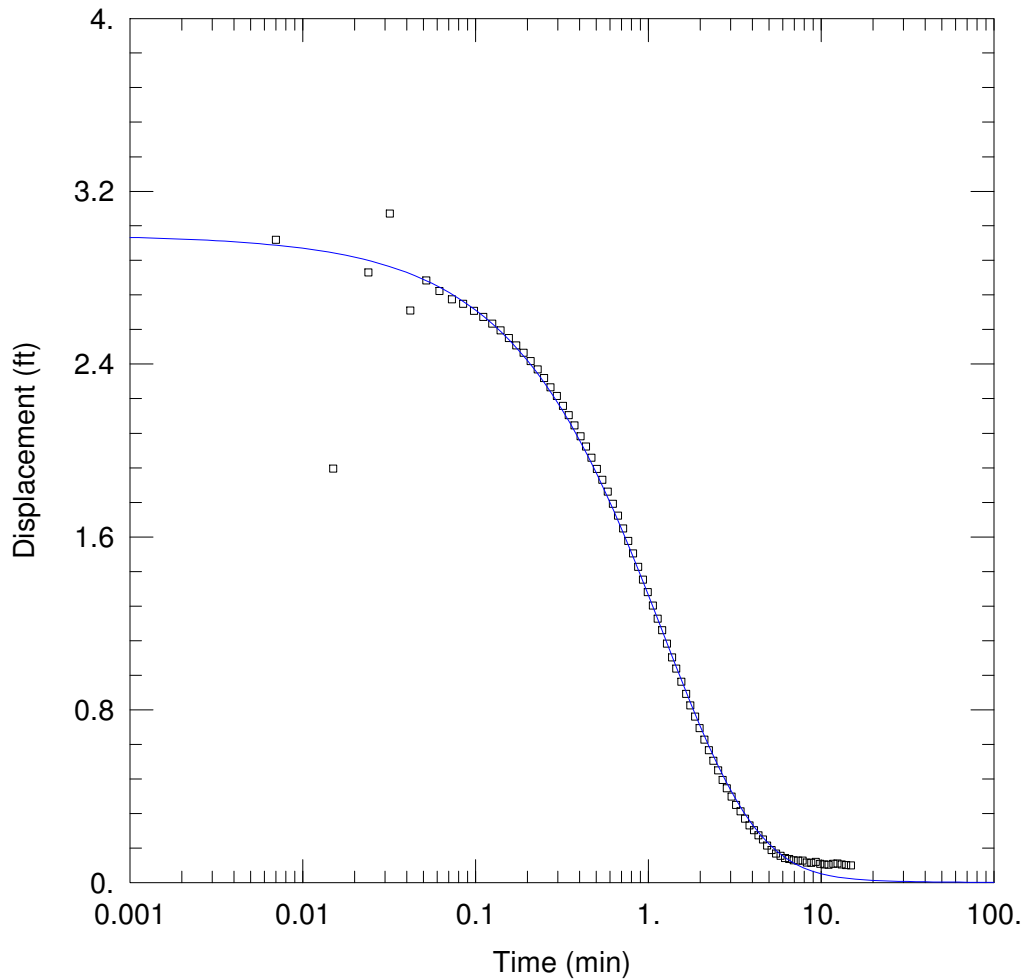
Saturated Thickness: 44. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (PZ33D Slug)

Initial Displacement: 3. ft Static Water Column Height: 46.91 ft
 Total Well Penetration Depth: 46.91 ft Screen Length: 10. ft
 Casing Radius: 0.083 ft Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice
 K = 1.475 ft/day y0 = 2.48 ft



TWIN PINES - PZ33D SLUGTEST

Data Set: H:\2018033.10 TTL Twin Pines Add Testing\addl_slug\SJS_aqtesolve\PZ33D Slug_KGS_SJS.aqt
 Date: 06/03/19 Time: 14:43:05

PROJECT INFORMATION

Company: TTL, Inc.
 Client: Twin Pines LLC
 Project: 000180200804.00
 Location: St. George, GA
 Test Well: PZ33D Slug
 Test Date: 5-16-19

AQUIFER DATA

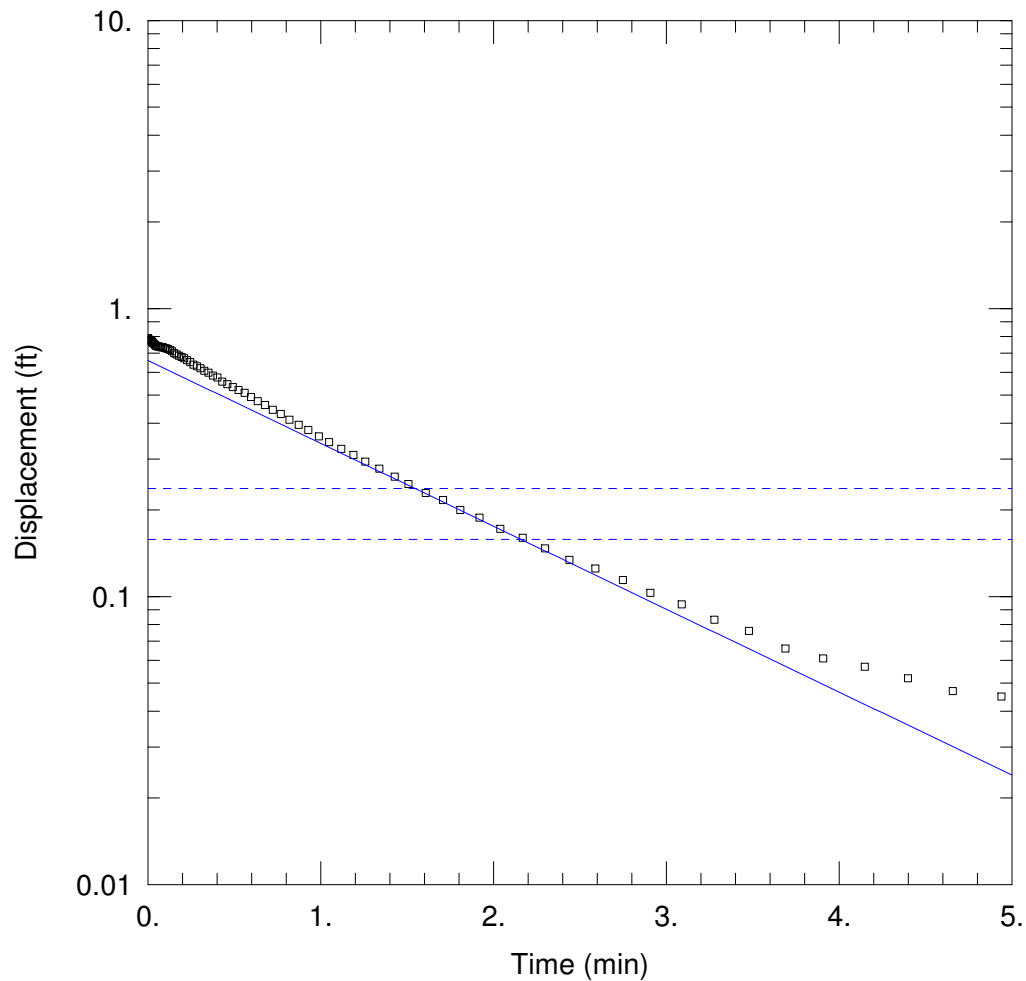
Saturated Thickness: 44. ft

WELL DATA (PZ33D Slug)

| | |
|---|---|
| Initial Displacement: <u>3. ft</u> | Static Water Column Height: <u>46.91 ft</u> |
| Total Well Penetration Depth: <u>46.91 ft</u> | Screen Length: <u>10. ft</u> |
| Casing Radius: <u>0.083 ft</u> | Well Radius: <u>0.25 ft</u> |

SOLUTION

| | |
|----------------------------------|--------------------------------------|
| Aquifer Model: <u>Unconfined</u> | Solution Method: <u>KGS Model</u> |
| Kr = <u>2.233 ft/day</u> | Ss = <u>2.553E-5 ft⁻¹</u> |
| Kz/Kr = <u>0.1</u> | |



TWIN PINES - PZ33S BAIL TEST

Data Set: H:\2018033.10 TTL Twin Pines Add Testing\addl_slug\SJS_aqtesolve\PZ33S Bail_BR_SJS.aqt
 Date: 06/03/19 Time: 14:43:32

PROJECT INFORMATION

Company: TTL, Inc.
 Client: Twin Pines LLC
 Project: 000180200804.00
 Location: St. George, GA
 Test Well: PZ33S Bail
 Test Date: 5-16-19

AQUIFER DATA

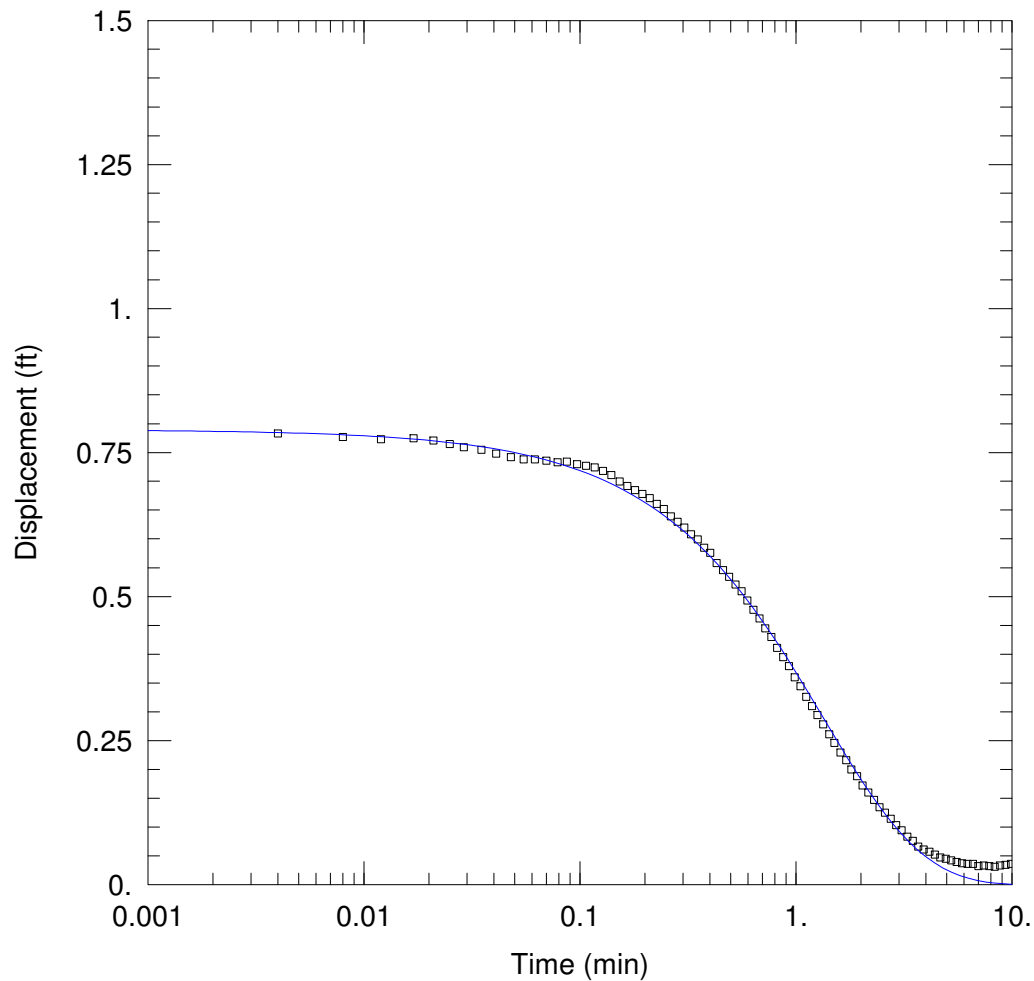
Saturated Thickness: 44. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (PZ33S Bail)

Initial Displacement: 0.79 ft Static Water Column Height: 8.74 ft
 Total Well Penetration Depth: 8.74 ft Screen Length: 5. ft
 Casing Radius: 0.083 ft Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice
 K = 1.926 ft/day y0 = 0.66 ft



TWIN PINES - PZ33S BAIL TEST

Data Set: H:\2018033.10 TTL Twin Pines Add Testing\addl_slug\SJS_aqtesolve\PZ33S Bail_KGS_SJS.aqt
 Date: 06/03/19 Time: 14:44:10

PROJECT INFORMATION

Company: TTL, Inc.
 Client: Twin Pines LLC
 Project: 000180200804.00
 Location: St. George, GA
 Test Well: PZ33S Bail
 Test Date: 5-16-19

AQUIFER DATA

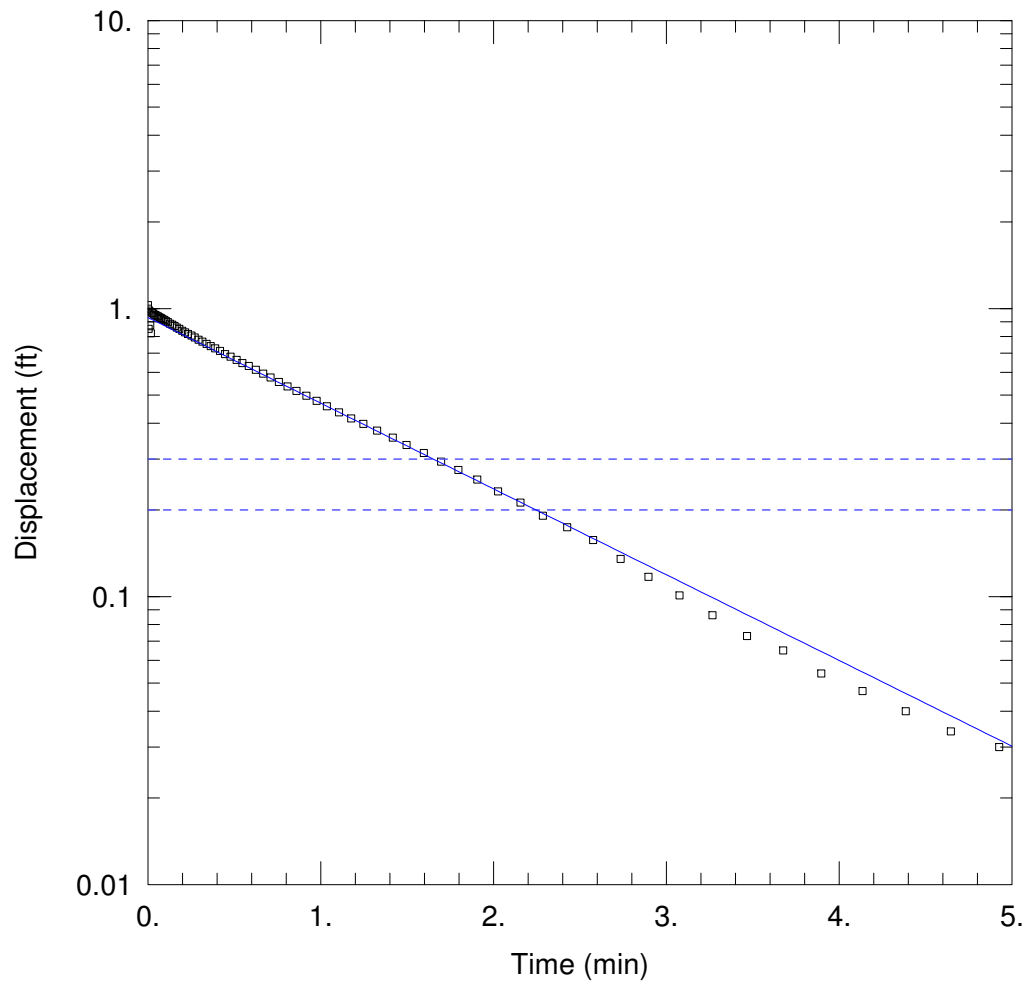
Saturated Thickness: 44. ft

WELL DATA (PZ33S Bail)

| | |
|--|--|
| Initial Displacement: <u>0.79 ft</u> | Static Water Column Height: <u>8.74 ft</u> |
| Total Well Penetration Depth: <u>8.74 ft</u> | Screen Length: <u>5. ft</u> |
| Casing Radius: <u>0.083 ft</u> | Well Radius: <u>0.25 ft</u> |

SOLUTION

| | |
|----------------------------------|--------------------------------------|
| Aquifer Model: <u>Unconfined</u> | Solution Method: <u>KGS Model</u> |
| Kr = <u>2.659 ft/day</u> | Ss = <u>5.852E-6 ft⁻¹</u> |
| Kz/Kr = <u>0.1</u> | |



TWIN PINES - PZ33S SLUGTEST

Data Set: H:\2018033.10 TTL Twin Pines Add Testing\addl_slug\SJS_aqtesolve\PZ33S Slug_BR_SJS.aqt
 Date: 06/03/19 Time: 14:44:39

PROJECT INFORMATION

Company: TTL, Inc.
 Client: Twin Pines LLC
 Project: 000180200804.00
 Location: St. George, GA
 Test Well: PZ33S Slug
 Test Date: 5-16-19

AQUIFER DATA

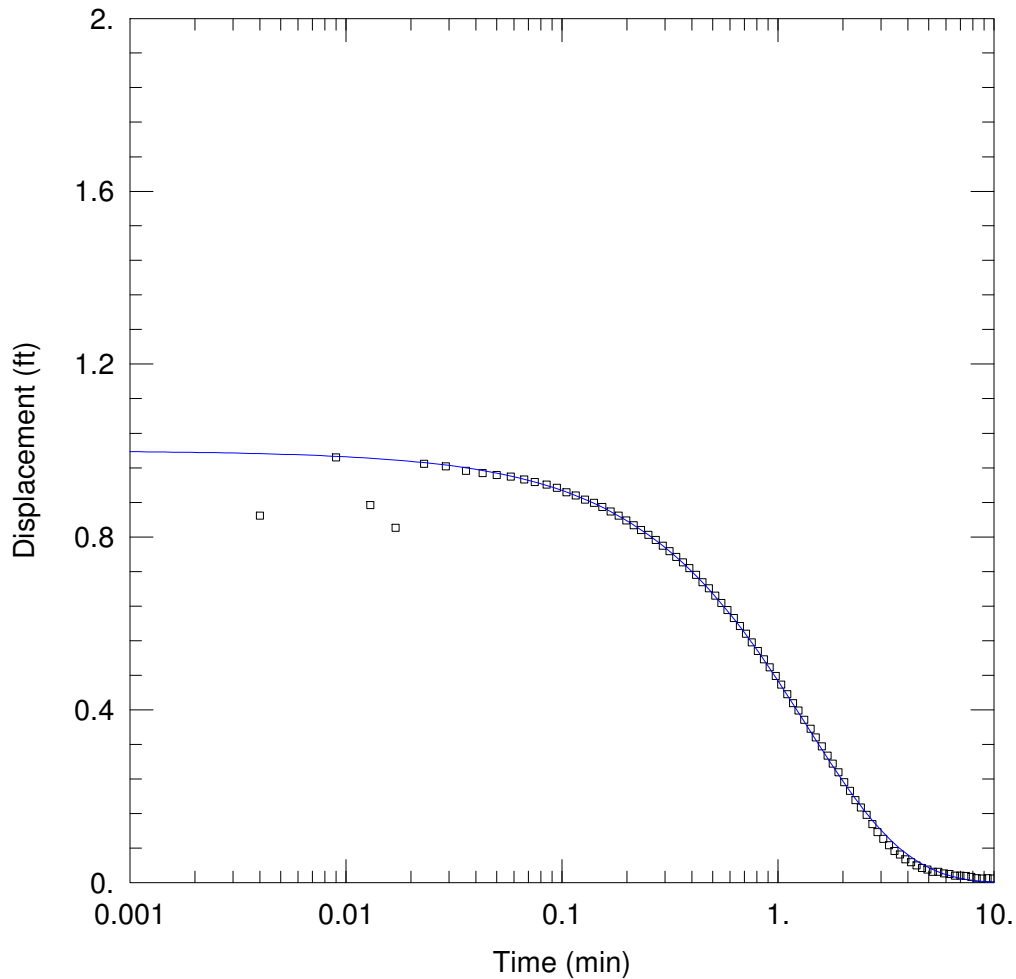
Saturated Thickness: 44. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (PZ33S Slug)

Initial Displacement: 1. ft Static Water Column Height: 8.71 ft
 Total Well Penetration Depth: 8.71 ft Screen Length: 5. ft
 Casing Radius: 0.083 ft Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice
 K = 1.991 ft/day y0 = 0.9305 ft



TWIN PINES - PZ33S SLUGTEST

Data Set: H:\2018033.10 TTL Twin Pines Add Testing\addl_slug\SJS_aqtesolve\PZ33S Slug_KGS_SJS.aqt
 Date: 06/03/19 Time: 14:45:05

PROJECT INFORMATION

Company: TTL, Inc.
 Client: Twin Pines LLC
 Project: 000180200804.00
 Location: St. George, GA
 Test Well: PZ33S Slug
 Test Date: 5-16-19

AQUIFER DATA

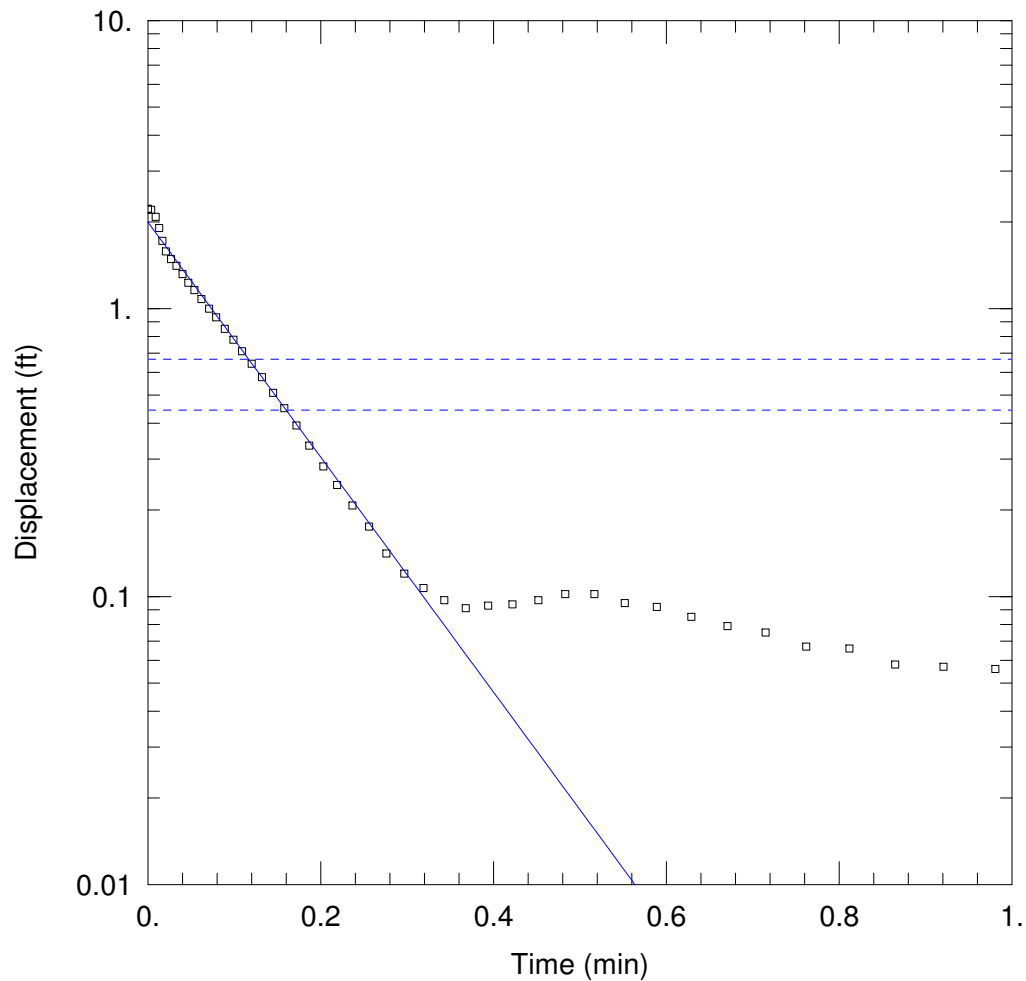
Saturated Thickness: 44. ft

WELL DATA (PZ33S Slug)

| | |
|--|--|
| Initial Displacement: <u>1. ft</u> | Static Water Column Height: <u>8.71 ft</u> |
| Total Well Penetration Depth: <u>8.71 ft</u> | Screen Length: <u>5. ft</u> |
| Casing Radius: <u>0.083 ft</u> | Well Radius: <u>0.25 ft</u> |

SOLUTION

| | |
|----------------------------------|--------------------------------------|
| Aquifer Model: <u>Unconfined</u> | Solution Method: <u>KGS Model</u> |
| Kr = <u>2.625 ft/day</u> | Ss = <u>7.716E-6 ft⁻¹</u> |
| Kz/Kr = <u>0.1</u> | |



TWIN PINES - PZ55D BAIL TEST

Data Set: H:\2018033.10 TTL Twin Pines Add Testing\addl_slug\SJS_aqtesolve\PZ55D Bail_BR_SJS.aqt
 Date: 06/03/19 Time: 14:45:42

PROJECT INFORMATION

Company: TTL, Inc.
 Client: Twin Pines LLC
 Project: 000180200804.00
 Location: St. George, GA
 Test Well: PZ55D Bail
 Test Date: 5-16-19

AQUIFER DATA

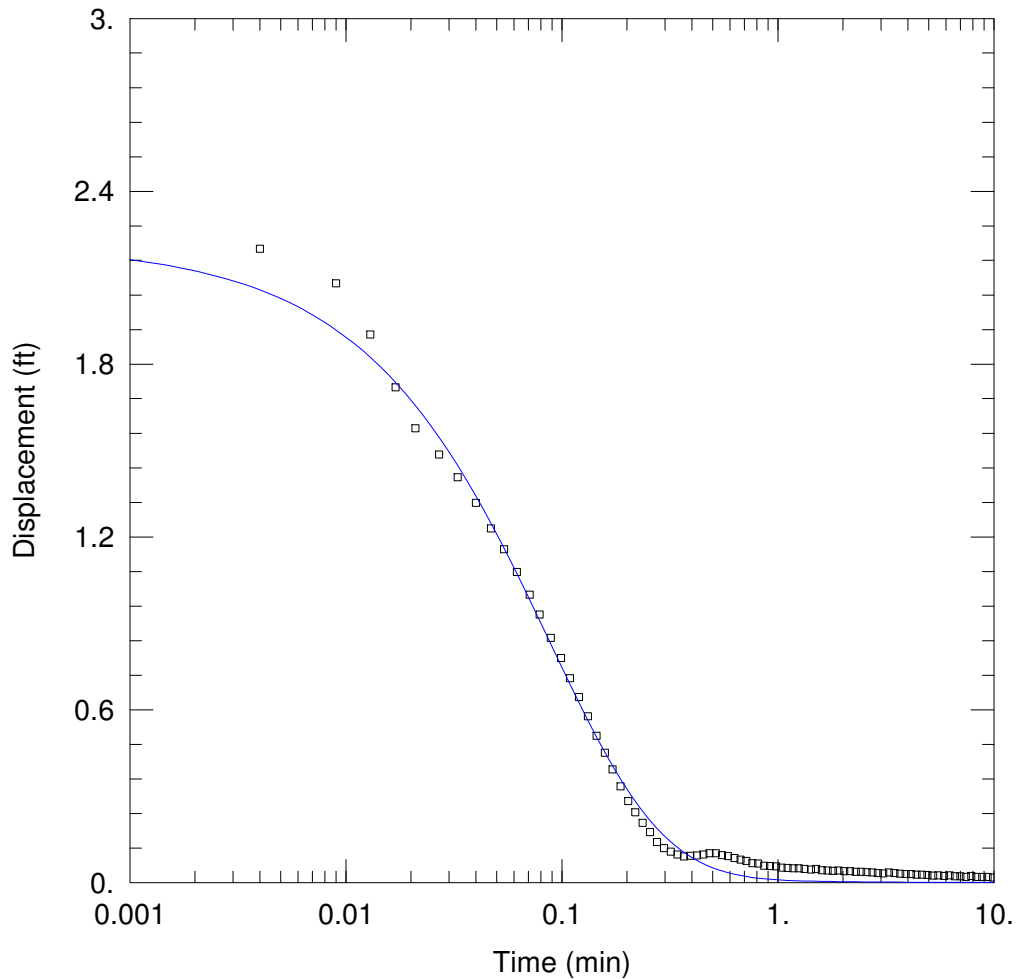
Saturated Thickness: 117.5 ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (PZ55D Bail)

Initial Displacement: 2.22 ft Static Water Column Height: 45.68 ft
 Total Well Penetration Depth: 45.68 ft Screen Length: 10. ft
 Casing Radius: 0.083 ft Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice
 K = 18.49 ft/day y_0 = 1.993 ft



TWIN PINES - PZ55D BAIL TEST

Data Set: H:\2018033.10 TTL Twin Pines Add Testing\addl_slug\SJS_aqtesolve\PZ55D Bail_KGS_SJS.aqt
 Date: 06/03/19 Time: 14:46:53

PROJECT INFORMATION

Company: TTL, Inc.
 Client: Twin Pines LLC
 Project: 000180200804.00
 Location: St. George, GA
 Test Well: PZ55D Bail
 Test Date: 5-16-19

AQUIFER DATA

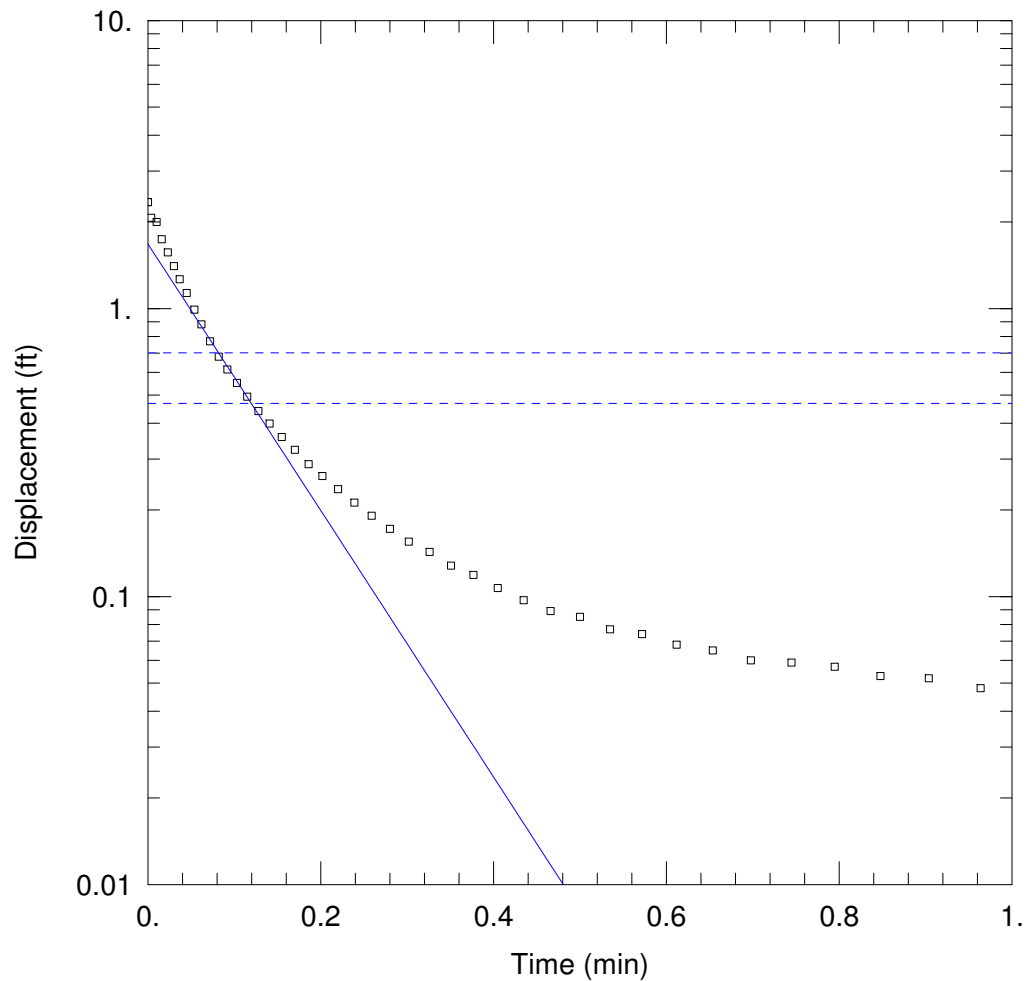
Saturated Thickness: 117.5 ft

WELL DATA (PZ55D Bail)

| | |
|---|---|
| Initial Displacement: <u>2.22 ft</u> | Static Water Column Height: <u>45.68 ft</u> |
| Total Well Penetration Depth: <u>45.68 ft</u> | Screen Length: <u>10. ft</u> |
| Casing Radius: <u>0.083 ft</u> | Well Radius: <u>0.25 ft</u> |

SOLUTION

| | |
|----------------------------------|--------------------------------------|
| Aquifer Model: <u>Unconfined</u> | Solution Method: <u>KGS Model</u> |
| Kr = <u>20.27 ft/day</u> | Ss = <u>1.162E-5 ft⁻¹</u> |
| Kz/Kr = <u>0.1</u> | |



TWIN PINES - PZ55D SLUGTEST

Data Set: H:\2018033.10 TTL Twin Pines Add Testing\addl_slug\SJS_aqtesolve\PZ55D Slug_BR_SJS.aqt
 Date: 06/03/19 Time: 15:22:28

PROJECT INFORMATION

Company: TTL, Inc.
 Client: Twin Pines LLC
 Project: 000180200804.00
 Location: St. George, GA
 Test Well: PZ55D Slug
 Test Date: 5-16-19

AQUIFER DATA

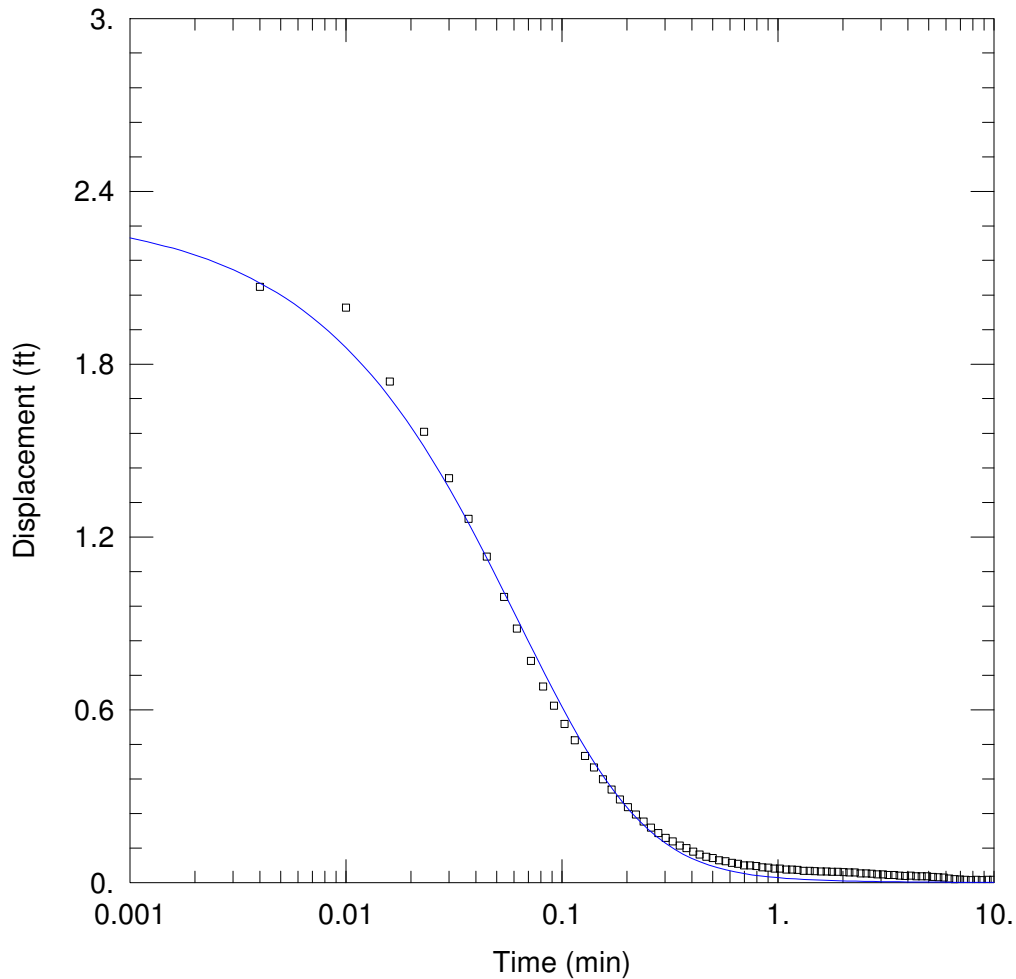
Saturated Thickness: 117.5 ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (PZ55D Slug)

Initial Displacement: 2.34 ft Static Water Column Height: 45.67 ft
 Total Well Penetration Depth: 45.67 ft Screen Length: 10. ft
 Casing Radius: 0.083 ft Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice
 K = 20.97 ft/day y0 = 1.675 ft



TWIN PINES - PZ55D SLUGTEST

Data Set: H:\2018033.10 TTL Twin Pines Add Testing\addl_slug\SJS_aqtesolve\PZ55D Slug_KGS_SJS.aqt
 Date: 06/03/19 Time: 15:22:47

PROJECT INFORMATION

Company: TTL, Inc.
 Client: Twin Pines LLC
 Project: 000180200804.00
 Location: St. George, GA
 Test Well: PZ55D Slug
 Test Date: 5-16-19

AQUIFER DATA

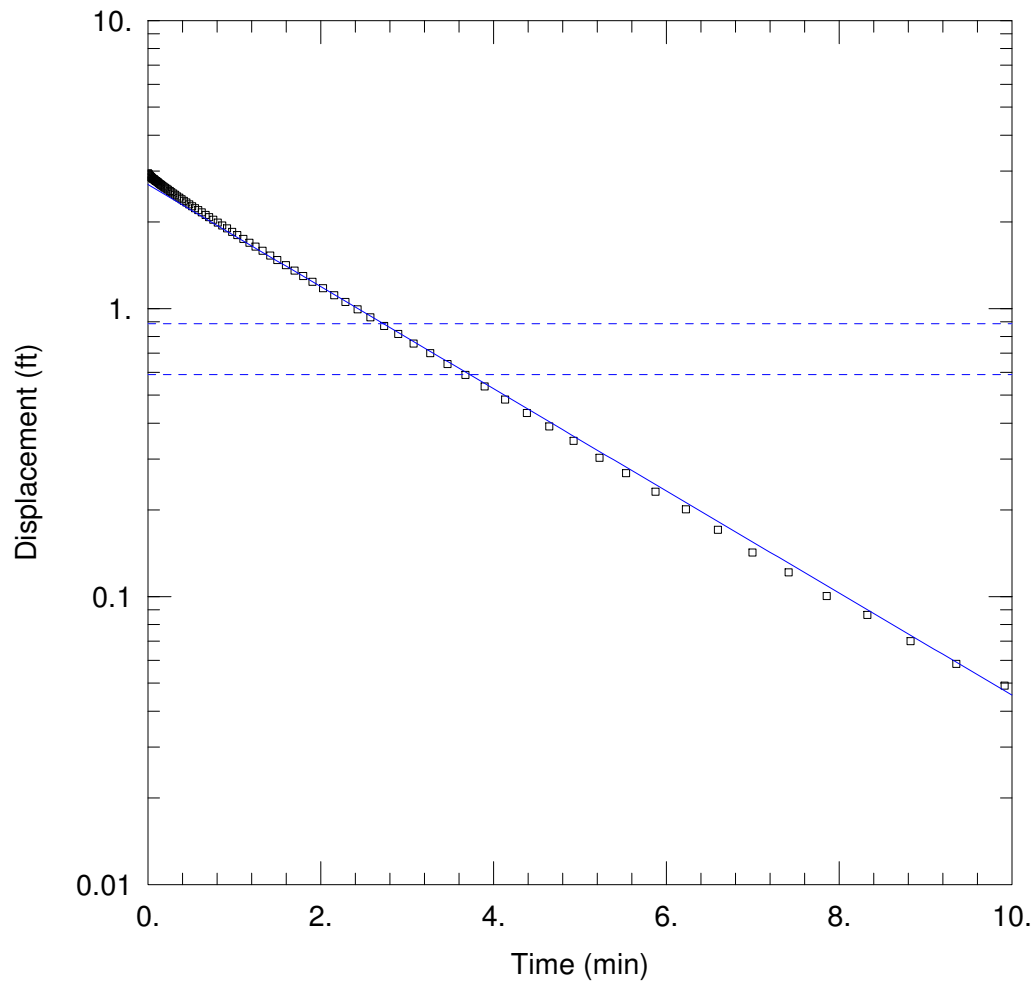
Saturated Thickness: 117.5 ft

WELL DATA (PZ55D Slug)

| | |
|---|---|
| Initial Displacement: <u>2.34 ft</u> | Static Water Column Height: <u>45.67 ft</u> |
| Total Well Penetration Depth: <u>45.67 ft</u> | Screen Length: <u>10. ft</u> |
| Casing Radius: <u>0.083 ft</u> | Well Radius: <u>0.25 ft</u> |

SOLUTION

| | |
|----------------------------------|--------------------------------------|
| Aquifer Model: <u>Unconfined</u> | Solution Method: <u>KGS Model</u> |
| Kr = <u>21.96 ft/day</u> | Ss = <u>6.225E-5 ft⁻¹</u> |
| Kz/Kr = <u>0.1</u> | |



TWIN PINES - PZ55S BAIL TEST

Data Set: H:\...\PZ55S Bail_BR_SJS_revdispl.aqt

Date: 06/03/19

Time: 14:25:20

PROJECT INFORMATION

Company: TTL, Inc.

Client: Twin Pines LLC

Project: 000180200804.00

Location: St. George, GA

Test Well: PZ55S Bail

Test Date: 5-16-19

AQUIFER DATA

Saturated Thickness: 119. ft

Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (PZ55S Bail)

Initial Displacement: 2.95 ft

Static Water Column Height: 17.85 ft

Total Well Penetration Depth: 17.85 ft

Screen Length: 10. ft

Casing Radius: 0.083 ft

Well Radius: 0.25 ft

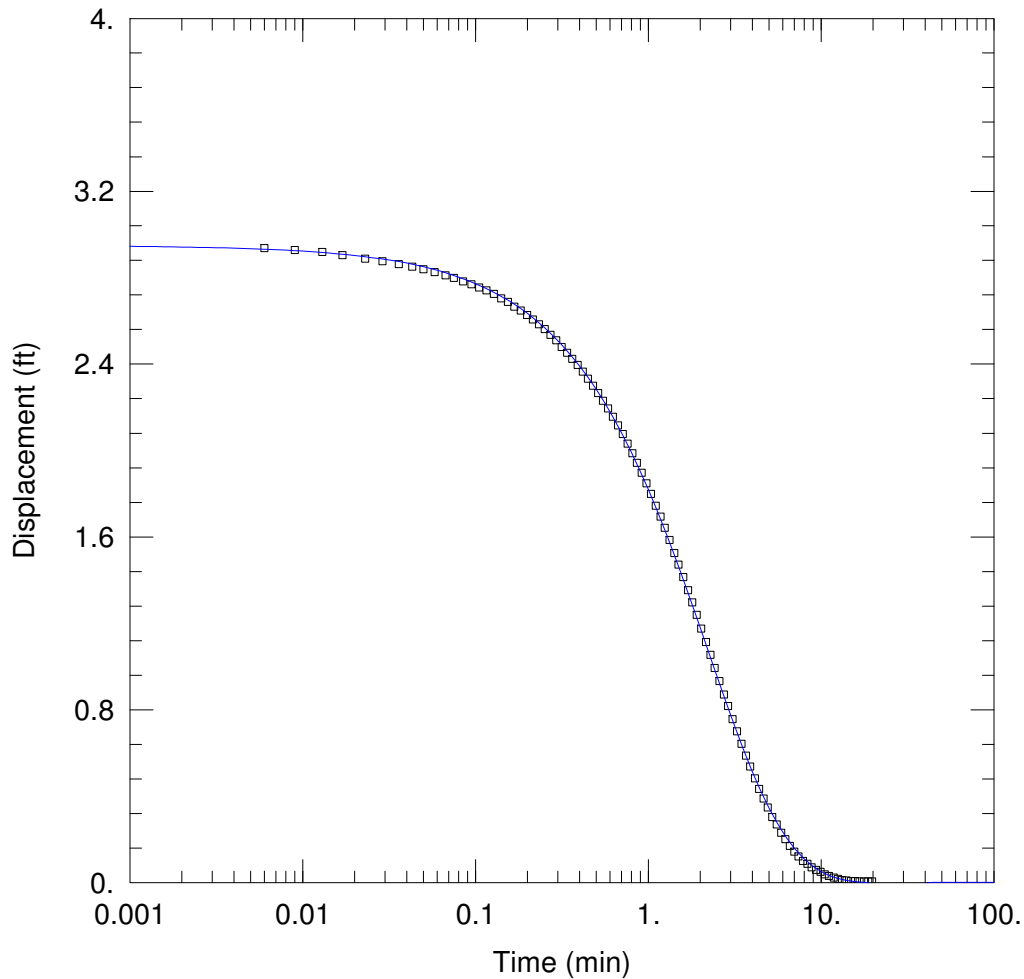
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.7175 ft/day

y0 = 2.693 ft



TWIN PINES - PZ55S BAIL TEST

Data Set: H:\...\PZ55S Bail_KGS_SJS_revdispl.aqt

Date: 06/03/19

Time: 14:25:40

PROJECT INFORMATION

Company: TTL, Inc.

Client: Twin Pines LLC

Project: 000180200804.00

Location: St. George, GA

Test Well: PZ55S Bail

Test Date: 5-16-19

AQUIFER DATA

Saturated Thickness: 119. ft

WELL DATA (PZ55S Bail)

Initial Displacement: 2.95 ft

Static Water Column Height: 17.85 ft

Total Well Penetration Depth: 17.85 ft

Screen Length: 10. ft

Casing Radius: 0.083 ft

Well Radius: 0.25 ft

SOLUTION

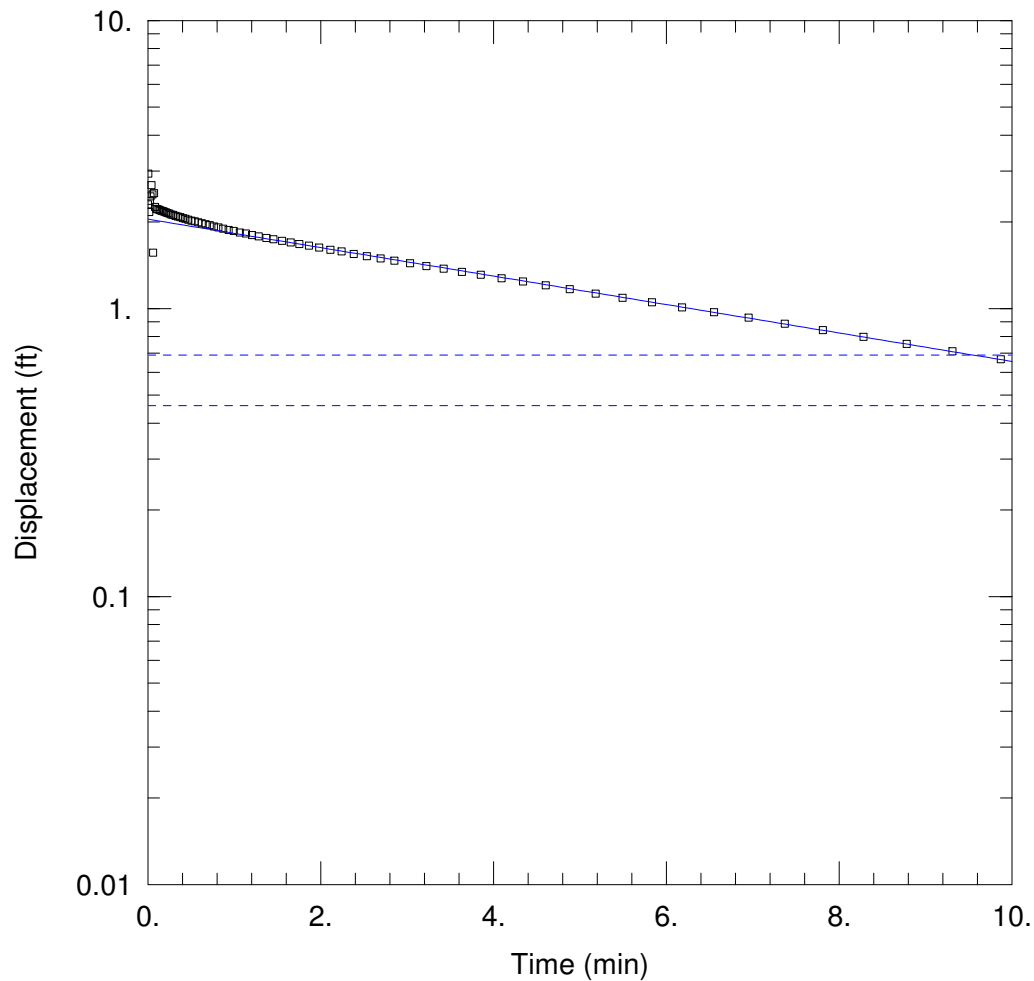
Aquifer Model: Unconfined

Solution Method: KGS Model

Kr = 0.9459 ft/day

Ss = 1.398E-6 ft⁻¹

Kz/Kr = 0.1



TWIN PINES - PZ55S SLUGTEST

Data Set: H:\2018033.10 TTL Twin Pines Add Testing\addl_slug\SJS_aqtesolve\PZ55S Slug_BR_SJS.aqt
 Date: 06/10/19 Time: 12:31:37

PROJECT INFORMATION

Company: TTL, Inc.
 Client: Twin Pines LLC
 Project: 000180200804.00
 Location: St. George, GA
 Test Well: PZ55S Bail
 Test Date: 5-16-19

AQUIFER DATA

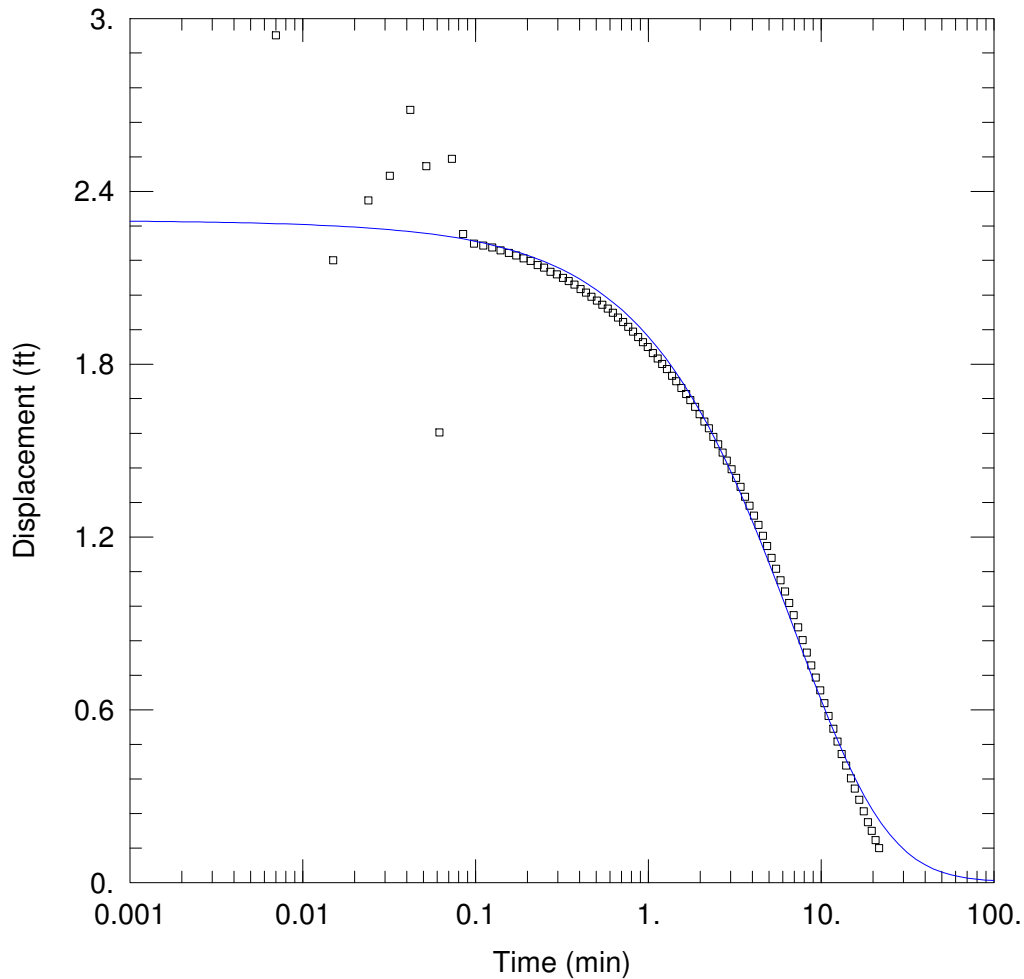
Saturated Thickness: 119. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (PZ55S Slug)

Initial Displacement: 2.3 ft Static Water Column Height: 17.85 ft
 Total Well Penetration Depth: 17.85 ft Screen Length: 10. ft
 Casing Radius: 0.083 ft Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice
 K = 0.1999 ft/day $y_0 =$ 2.043 ft



TWIN PINES - PZ55S SLUG TEST

Data Set: H:\2018033.10 TTL Twin Pines Add Testing\addl_slug\SJS_aqtesolve\PZ55S Slug_KGS_SJS.aqt
 Date: 06/10/19 Time: 12:32:34

PROJECT INFORMATION

Company: TTL, Inc.
 Client: Twin Pines LLC
 Project: 000180200804.00
 Location: St. George, GA
 Test Well: PZ55S Bail
 Test Date: 5-16-19

AQUIFER DATA

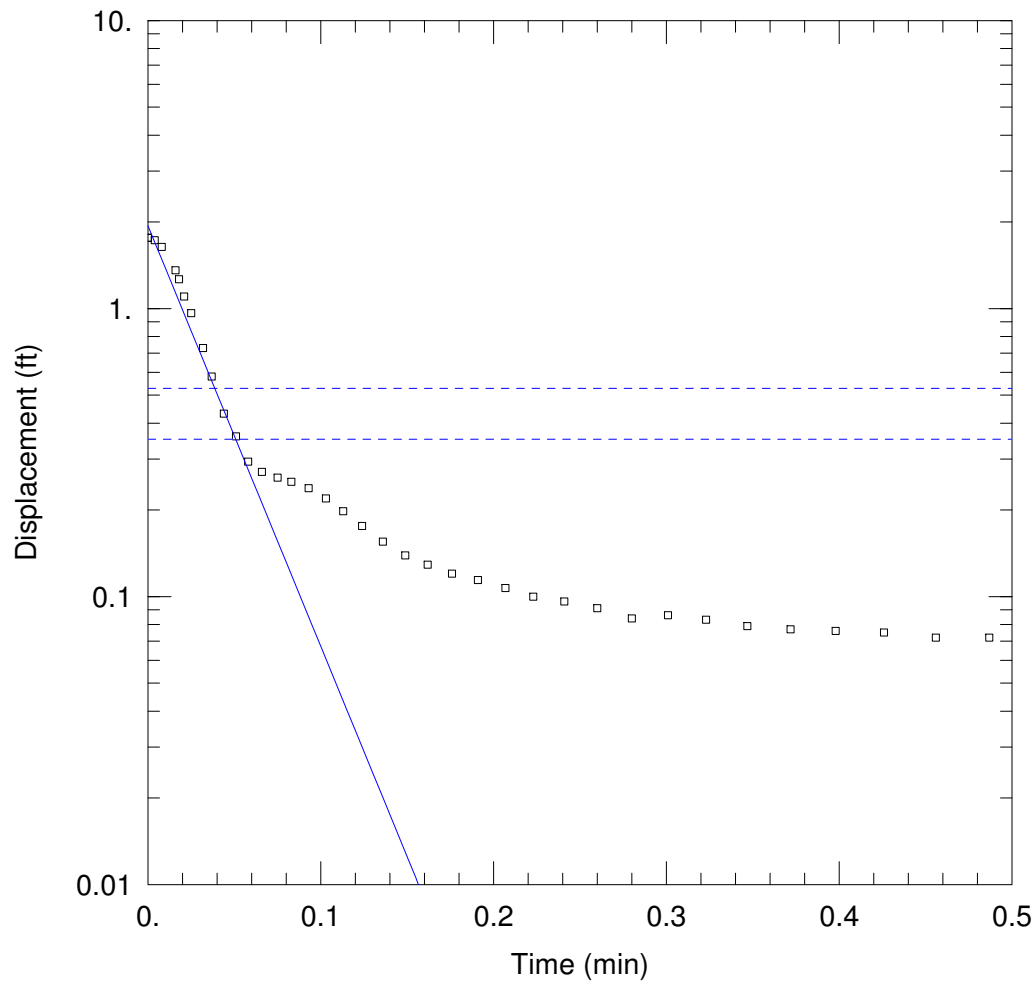
Saturated Thickness: 119. ft

WELL DATA (PZ55S Slug)

| | |
|---|---|
| Initial Displacement: <u>2.3 ft</u> | Static Water Column Height: <u>17.85 ft</u> |
| Total Well Penetration Depth: <u>17.85 ft</u> | Screen Length: <u>10. ft</u> |
| Casing Radius: <u>0.083 ft</u> | Well Radius: <u>0.25 ft</u> |

SOLUTION

| | |
|----------------------------------|--------------------------------------|
| Aquifer Model: <u>Unconfined</u> | Solution Method: <u>KGS Model</u> |
| Kr = <u>0.2404 ft/day</u> | Ss = <u>1.633E-5 ft⁻¹</u> |
| Kz/Kr = <u>0.1</u> | |



TWIN PINES - PZ57D BAIL TEST

Data Set: H:\2018033.10 TTL Twin Pines Add Testing\addl_slug\SJS_aqtesolve\PZ57D Bail_BR_SJS.aqt
 Date: 06/10/19 Time: 12:37:39

PROJECT INFORMATION

Company: TTL, Inc.
 Client: Twin Pines LLC
 Project: 000180200804.00
 Location: St. George, GA
 Test Well: PZ58D Bail
 Test Date: 5-16-19

AQUIFER DATA

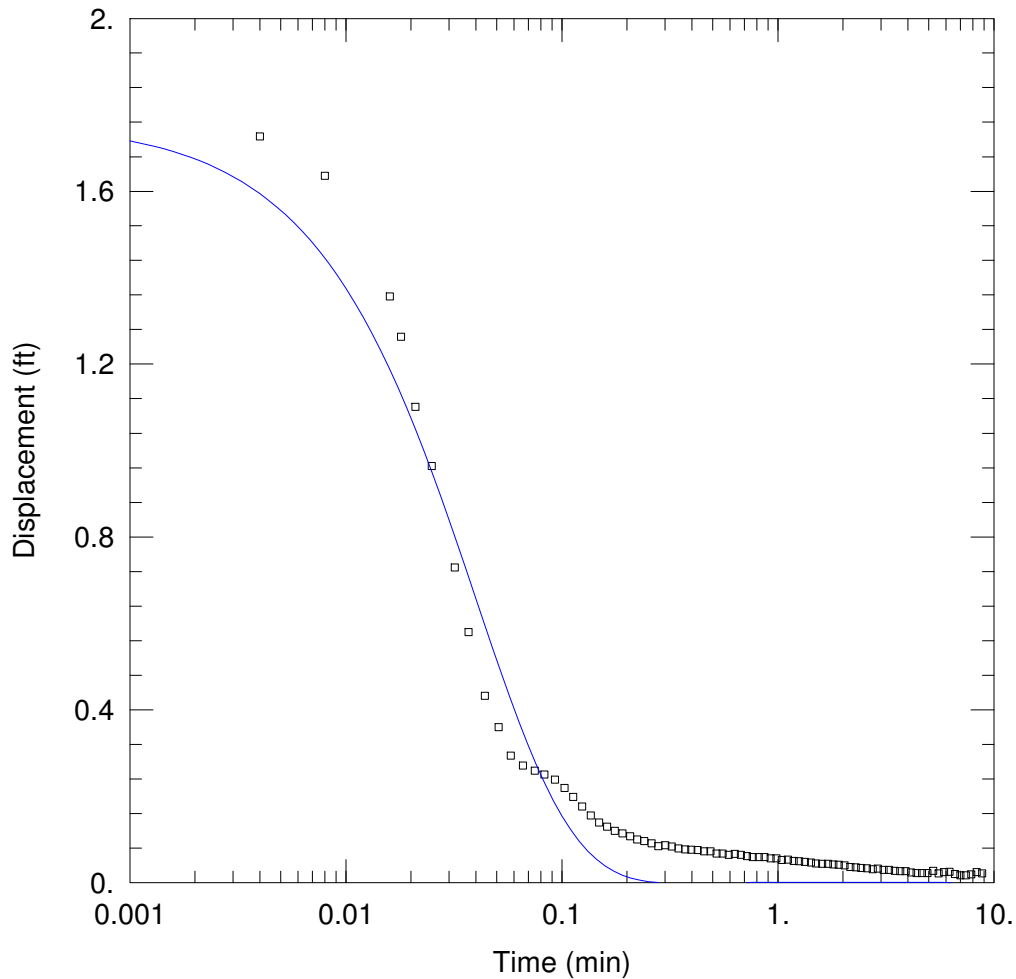
Saturated Thickness: 104. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (PZ57D Bail)

Initial Displacement: 1.76 ft Static Water Column Height: 43.19 ft
 Total Well Penetration Depth: 43.19 ft Screen Length: 10. ft
 Casing Radius: 0.083 ft Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice
 K = 65.77 ft/day $y_0 =$ 1.937 ft



TWIN PINES - PZ57D BAIL TEST

Data Set: H:\2018033.10 TTL Twin Pines Add Testing\addl_slug\SJS_aqtesolve\PZ57D Bail_KGS_SJS.aqt
 Date: 06/10/19 Time: 12:40:24

PROJECT INFORMATION

Company: TTL, Inc.
 Client: Twin Pines LLC
 Project: 000180200804.00
 Location: St. George, GA
 Test Well: PZ58D Bail
 Test Date: 5-16-19

AQUIFER DATA

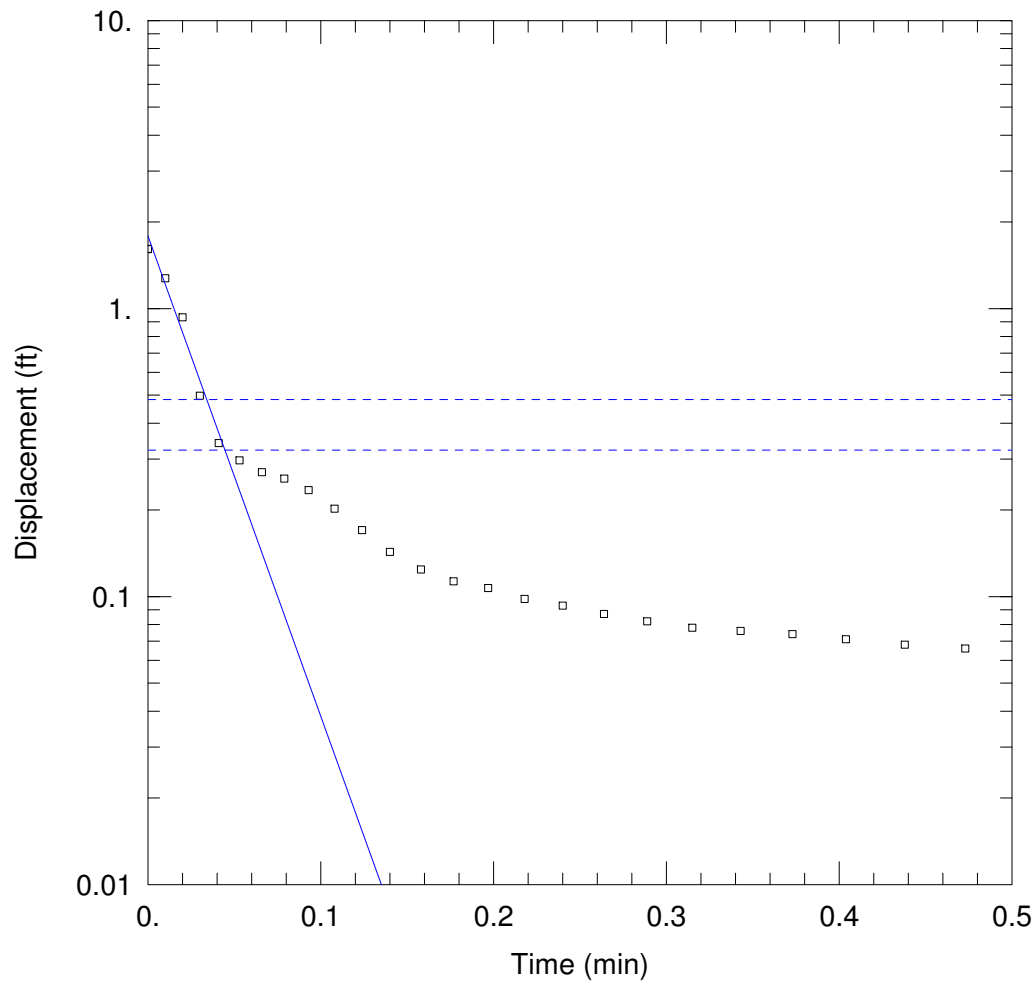
Saturated Thickness: 104. ft

WELL DATA (PZ57D Bail)

| | |
|---|---|
| Initial Displacement: <u>1.76 ft</u> | Static Water Column Height: <u>43.19 ft</u> |
| Total Well Penetration Depth: <u>43.19 ft</u> | Screen Length: <u>10. ft</u> |
| Casing Radius: <u>0.083 ft</u> | Well Radius: <u>0.25 ft</u> |

SOLUTION

| | |
|----------------------------------|--------------------------------------|
| Aquifer Model: <u>Unconfined</u> | Solution Method: <u>KGS Model</u> |
| Kr = <u>54.71 ft/day</u> | Ss = <u>3.79E-20 ft⁻¹</u> |
| Kz/Kr = <u>0.1</u> | |



TWIN PINES - PZ57D SLUG EST

Data Set: H:\2018033.10 TTL Twin Pines Add Testing\addl_slug\SJS_aqtesolve\PZ57D Slug_BR_SJS.aqt
 Date: 06/10/19 Time: 12:42:58

PROJECT INFORMATION

Company: TTL, Inc.
 Client: Twin Pines LLC
 Project: 000180200804.00
 Location: St. George, GA
 Test Well: PZ58D Slug
 Test Date: 5-16-19

AQUIFER DATA

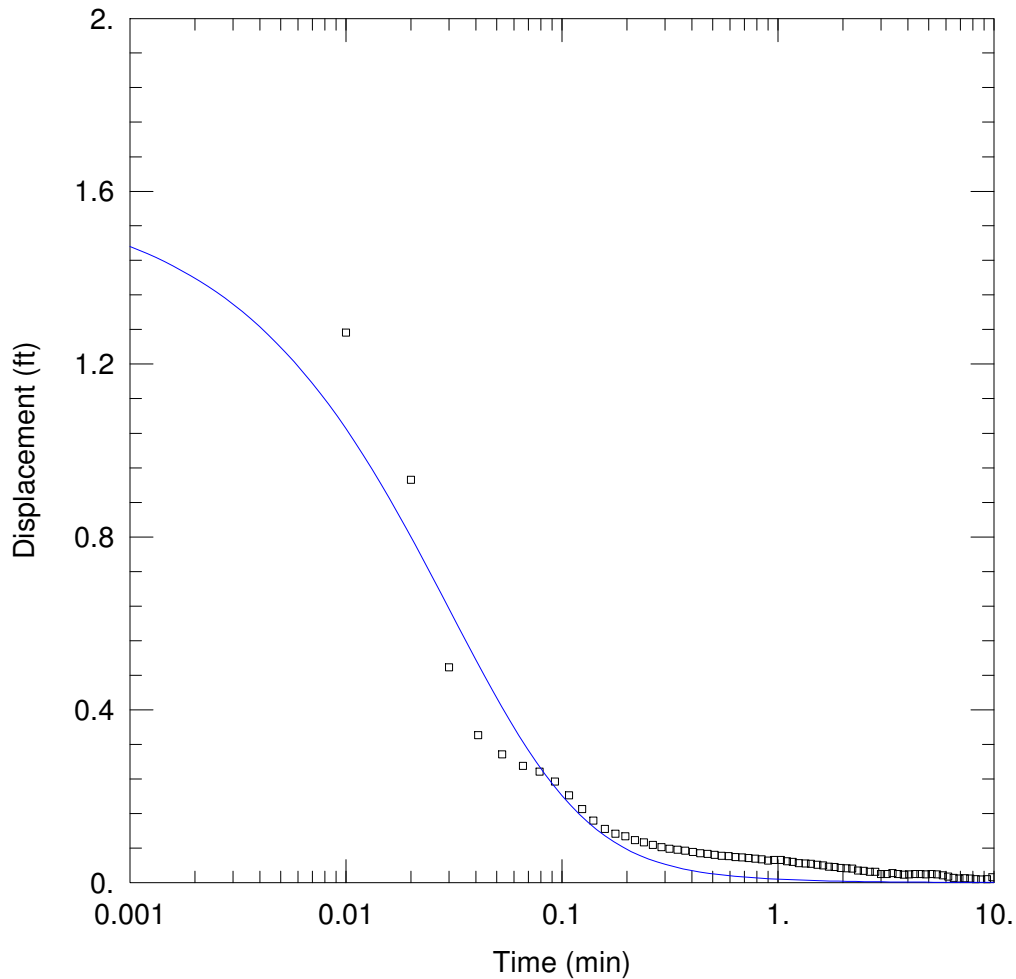
Saturated Thickness: 104. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (PZ57D Slug)

Initial Displacement: 1.61 ft Static Water Column Height: 43.18 ft
 Total Well Penetration Depth: 43.18 ft Screen Length: 10. ft
 Casing Radius: 0.083 ft Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice
 K = 75.09 ft/day y0 = 1.783 ft



TWIN PINES - PZ57D SLUG EST

Data Set: H:\2018033.10 TTL Twin Pines Add Testing\addl_slug\SJS_aqtesolve\PZ57D Slug_KGS_SJS.aqt
 Date: 06/10/19 Time: 12:38:38

PROJECT INFORMATION

Company: TTL, Inc.
 Client: Twin Pines LLC
 Project: 000180200804.00
 Location: St. George, GA
 Test Well: PZ58D Slug
 Test Date: 5-16-19

AQUIFER DATA

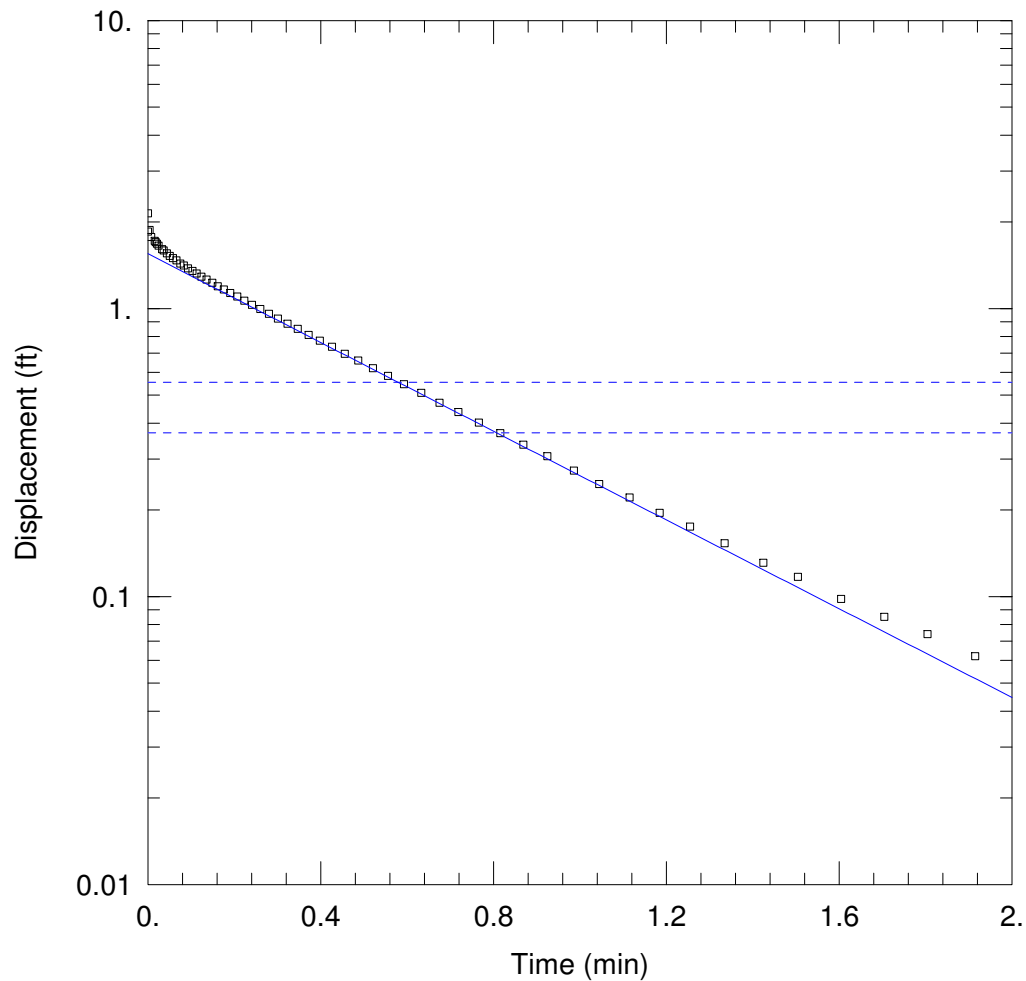
Saturated Thickness: 104. ft

WELL DATA (PZ57D Slug)

| | |
|---|---|
| Initial Displacement: <u>1.61 ft</u> | Static Water Column Height: <u>43.18 ft</u> |
| Total Well Penetration Depth: <u>43.18 ft</u> | Screen Length: <u>10. ft</u> |
| Casing Radius: <u>0.083 ft</u> | Well Radius: <u>0.25 ft</u> |

SOLUTION

| | |
|----------------------------------|---------------------------------------|
| Aquifer Model: <u>Unconfined</u> | Solution Method: <u>KGS Model</u> |
| Kr = <u>35.94 ft/day</u> | Ss = <u>0.0002028 ft⁻¹</u> |
| Kz/Kr = <u>0.1</u> | |



TWIN PINES - PZ57S BAIL TEST

Data Set: H:\2018033.10 TTL Twin Pines Add Testing\addl_slug\SJS_aqtesolve\PZ57S Bail_BR_SJS.aqt
 Date: 06/10/19 Time: 12:45:19

PROJECT INFORMATION

Company: TTL, Inc.
 Client: Twin Pines LLC
 Project: 000180200804.00
 Location: St. George, GA
 Test Well: PZ58S Bail
 Test Date: 5-16-19

AQUIFER DATA

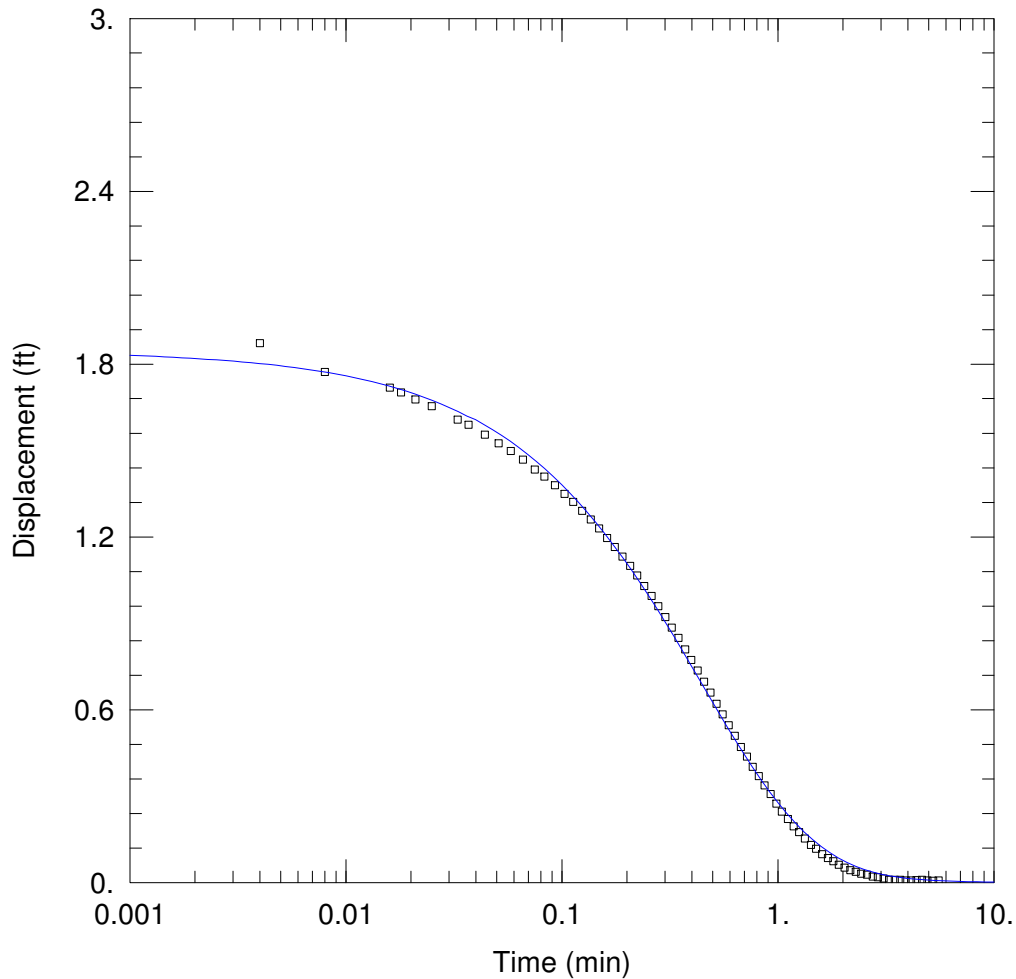
Saturated Thickness: 108. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (PZ57S Bail)

Initial Displacement: 1.85 ft Static Water Column Height: 11.85 ft
 Total Well Penetration Depth: 11.85 ft Screen Length: 5. ft
 Casing Radius: 0.083 ft Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice
 K = 5.38 ft/day $y_0 =$ 1.549 ft



TWIN PINES - PZ57S BAIL TEST

Data Set: H:\2018033.10 TTL Twin Pines Add Testing\addl_slug\SJS_aqtesolve\PZ57S Bail_KGS_SJS.aqt
 Date: 06/10/19 Time: 12:46:11

PROJECT INFORMATION

Company: TTL, Inc.
 Client: Twin Pines LLC
 Project: 000180200804.00
 Location: St. George, GA
 Test Well: PZ58S Bail
 Test Date: 5-16-19

AQUIFER DATA

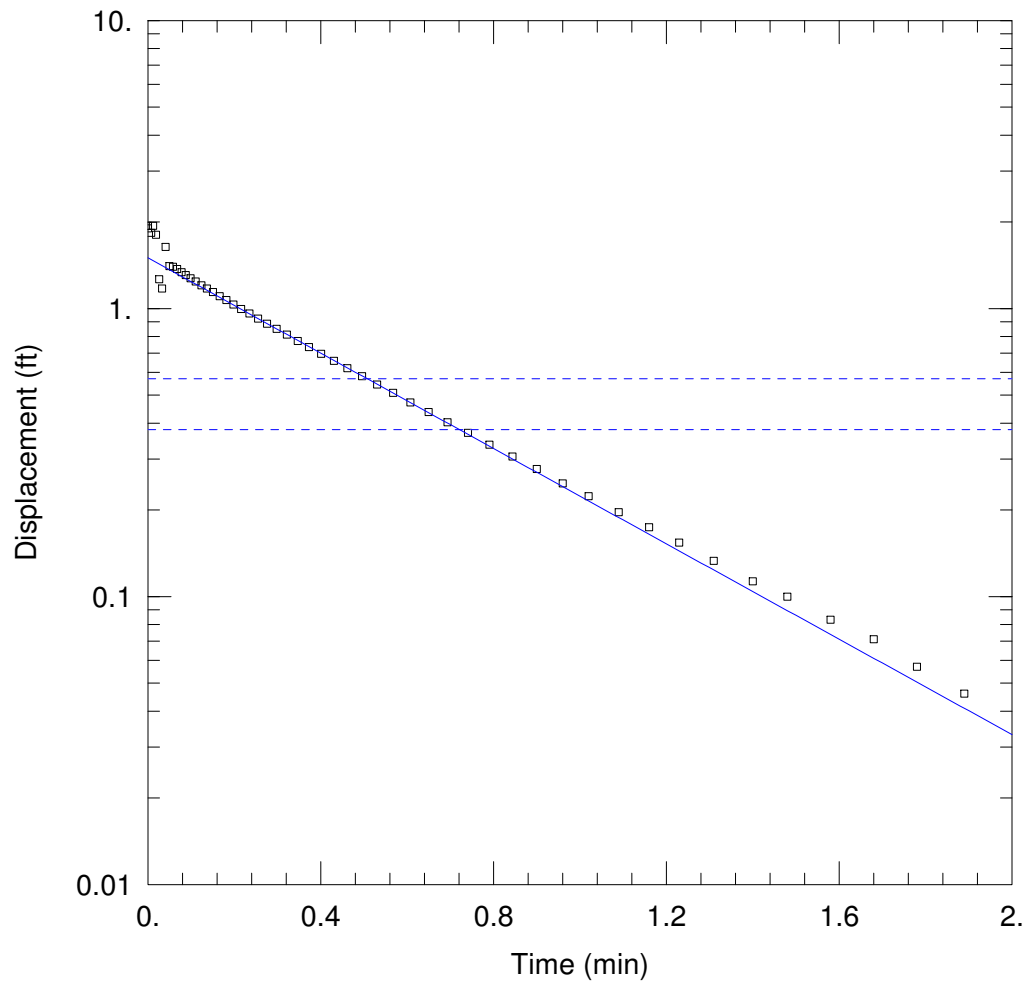
Saturated Thickness: 108. ft

WELL DATA (PZ57S Bail)

| | |
|---|---|
| Initial Displacement: <u>1.85 ft</u> | Static Water Column Height: <u>11.85 ft</u> |
| Total Well Penetration Depth: <u>11.85 ft</u> | Screen Length: <u>5. ft</u> |
| Casing Radius: <u>0.083 ft</u> | Well Radius: <u>0.25 ft</u> |

SOLUTION

| | |
|----------------------------------|--------------------------------------|
| Aquifer Model: <u>Unconfined</u> | Solution Method: <u>KGS Model</u> |
| Kr = <u>6.774 ft/day</u> | Ss = <u>6.372E-5 ft⁻¹</u> |
| Kz/Kr = <u>0.1</u> | |



TWIN PINES - PZ57S SLUG EST

Data Set: H:\2018033.10 TTL Twin Pines Add Testing\addl_slug\SJS_aqtesolve\PZ57S Slug_BR_SJS.aqt
 Date: 06/10/19 Time: 12:47:18

PROJECT INFORMATION

Company: TTL, Inc.
 Client: Twin Pines LLC
 Project: 000180200804.00
 Location: St. George, GA
 Test Well: PZ58S Slug
 Test Date: 5-16-19

AQUIFER DATA

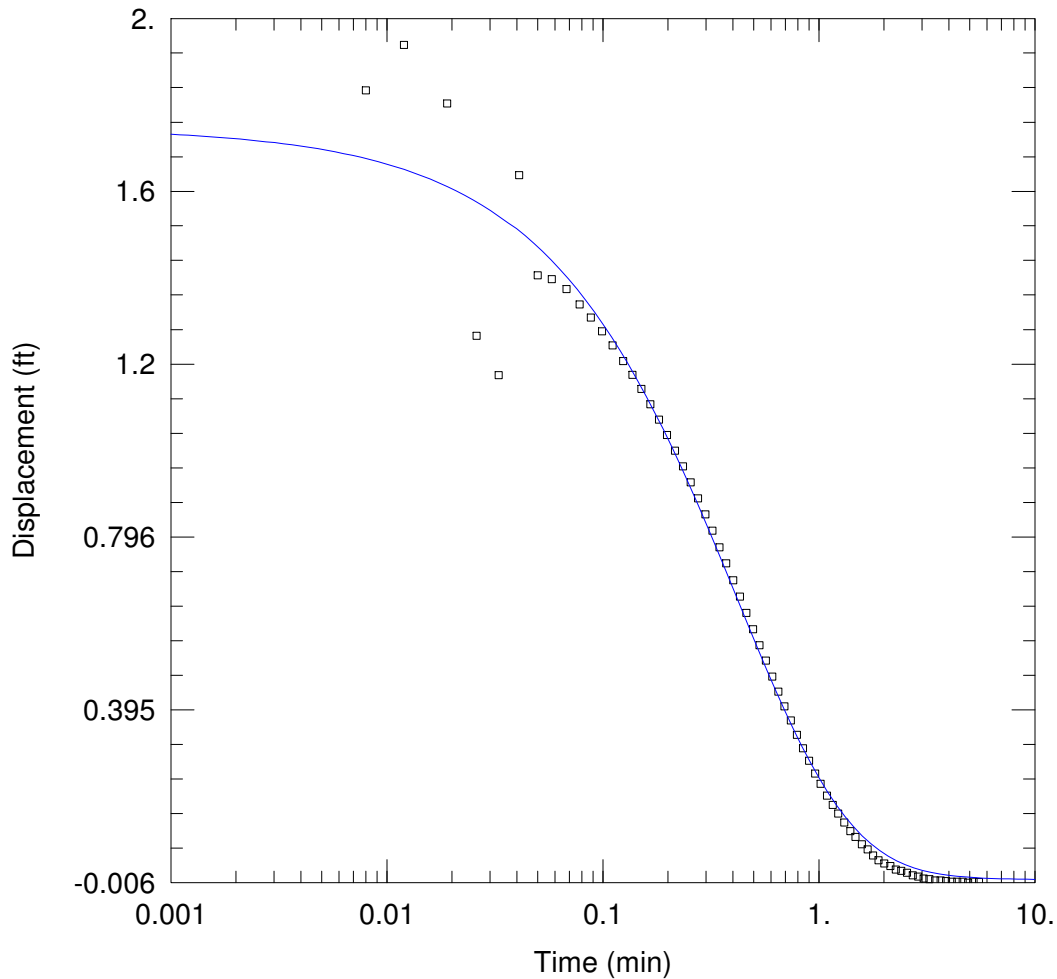
Saturated Thickness: 108. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (PZ57S Slug)

Initial Displacement: 1.9 ft Static Water Column Height: 11.85 ft
 Total Well Penetration Depth: 11.85 ft Screen Length: 5. ft
 Casing Radius: 0.083 ft Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice
 K = 5.782 ft/day $y_0 =$ 1.5 ft



TWIN PINES - PZ57S SLUG EST

Data Set: H:\2018033.10 TTL Twin Pines Add Testing\addl_slug\SJS_aqtesolve\PZ57S Slug_KGS_SJS.aqt
 Date: 06/10/19 Time: 12:48:11

PROJECT INFORMATION

Company: TTL, Inc.
 Client: Twin Pines LLC
 Project: 000180200804.00
 Location: St. George, GA
 Test Well: PZ58S Slug
 Test Date: 5-16-19

AQUIFER DATA

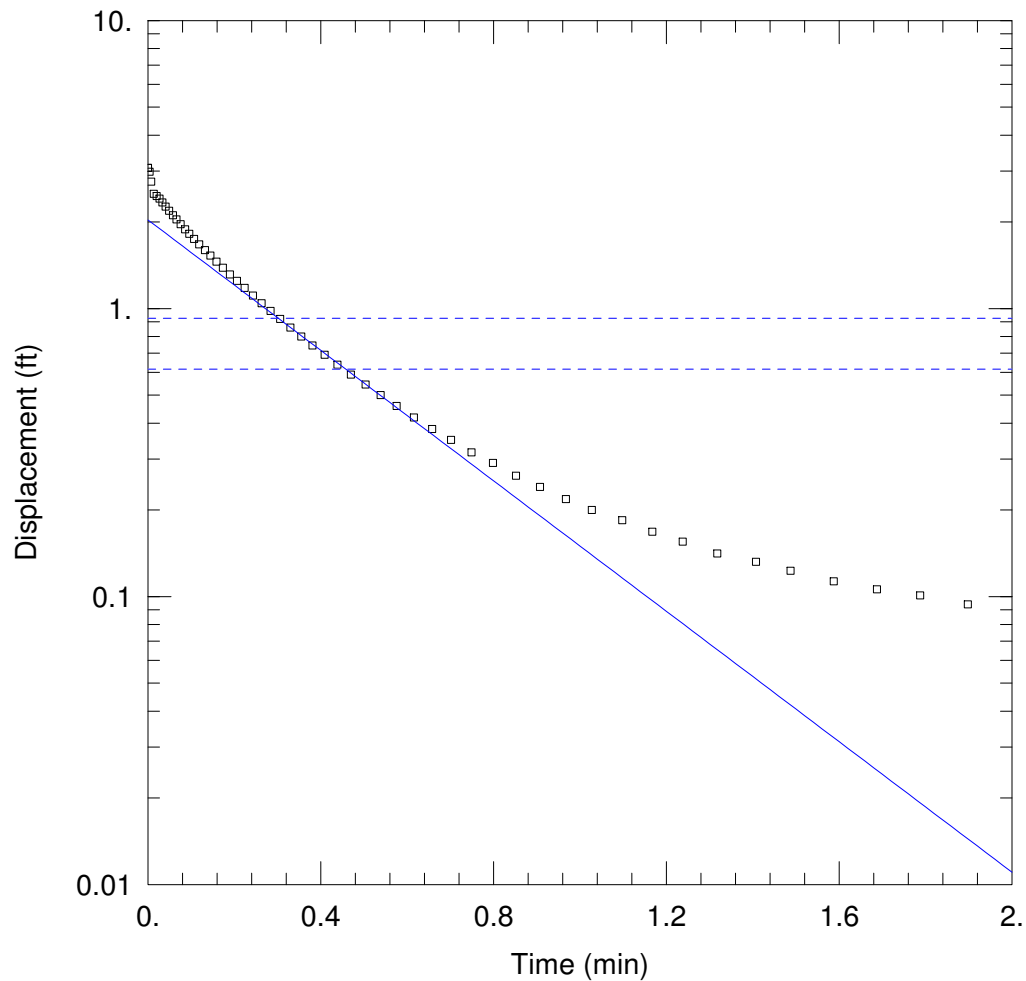
Saturated Thickness: 108. ft

WELL DATA (PZ57S Slug)

Initial Displacement: 1.75 ft Static Water Column Height: 11.85 ft
 Total Well Penetration Depth: 11.85 ft Screen Length: 5. ft
 Casing Radius: 0.083 ft Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: KGS Model
 $K_r = 7.262 \text{ ft/day}$ $S_s = 5.753E-5 \text{ ft}^{-1}$
 $K_z/K_r = 0.1$



TWIN PINES - PZ58D BAIL TEST

Data Set: H:\2018033.10 TTL Twin Pines Add Testing\addl_slug\SJS_aqtesolve\PZ58D Bail_BR_SJS.aqt
 Date: 06/03/19 Time: 15:00:09

PROJECT INFORMATION

Company: TTL, Inc.
 Client: Twin Pines LLC
 Project: 000180200804.00
 Location: St. George, GA
 Test Well: PZ58D Bail
 Test Date: 5-16-19

AQUIFER DATA

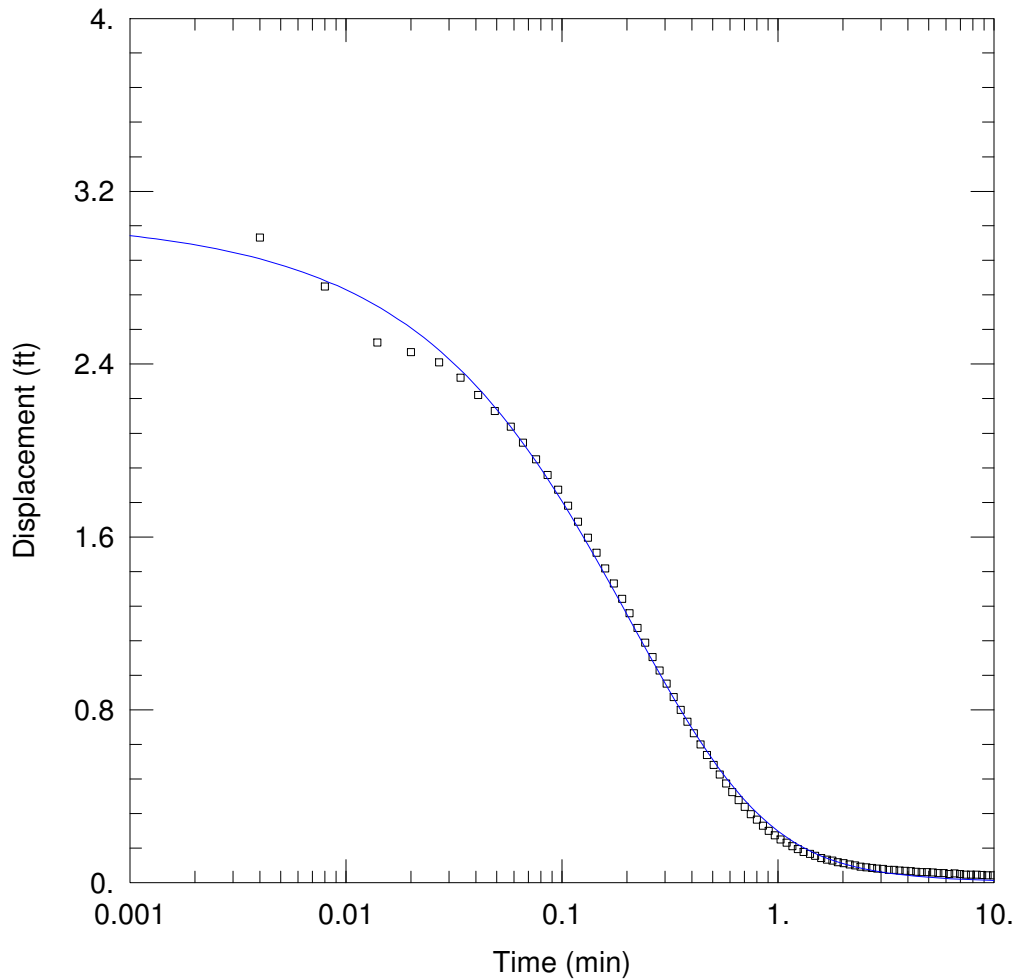
Saturated Thickness: 91.99 ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (PZ58D Bail)

Initial Displacement: 3.08 ft Static Water Column Height: 42.99 ft
 Total Well Penetration Depth: 42.99 ft Screen Length: 10. ft
 Casing Radius: 0.083 ft Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice
 K = 5.098 ft/day $y_0 =$ 2.031 ft



TWIN PINES - PZ58D BAIL TEST

Data Set: H:\2018033.10 TTL Twin Pines Add Testing\addl_slug\SJS_aqtesolve\PZ58D Bail_KGS_SJS.aqt
 Date: 06/03/19 Time: 15:00:37

PROJECT INFORMATION

Company: TTL, Inc.
 Client: Twin Pines LLC
 Project: 000180200804.00
 Location: St. George, GA
 Test Well: PZ58D Bail
 Test Date: 5-16-19

AQUIFER DATA

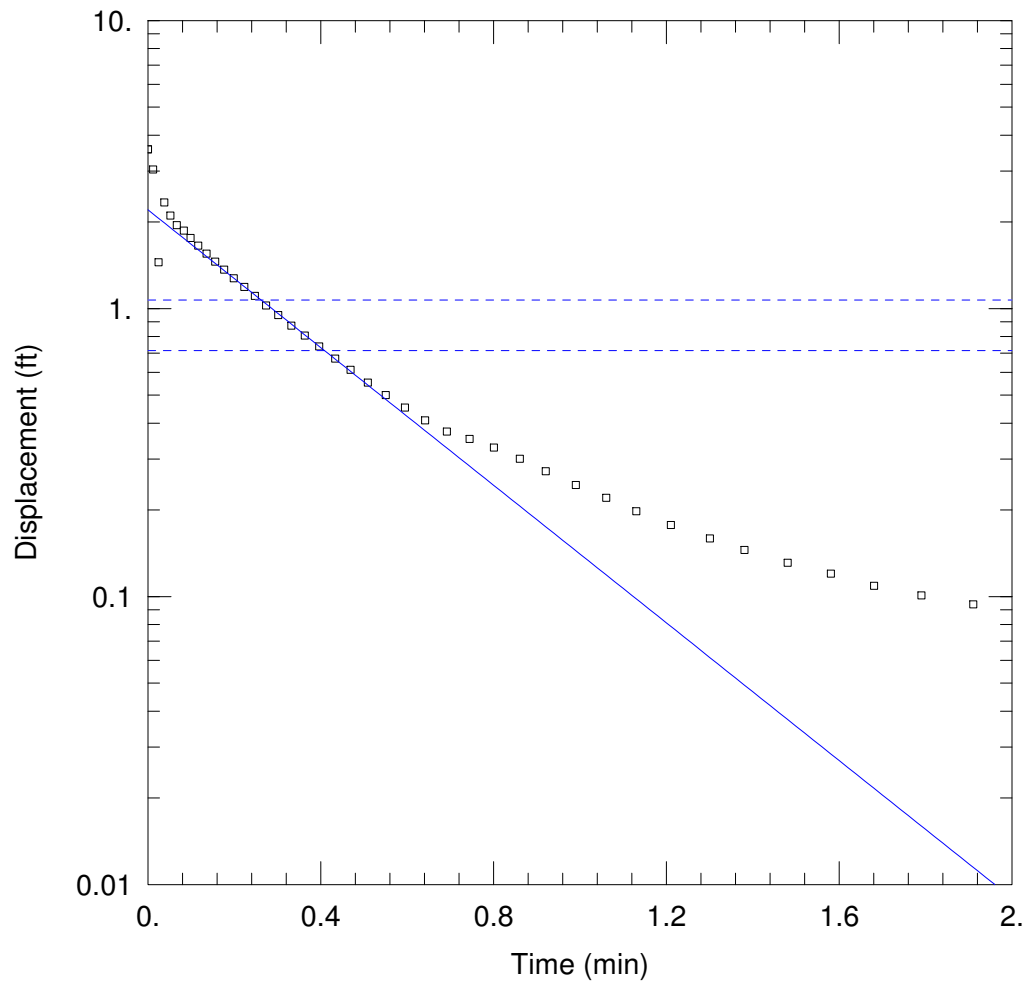
Saturated Thickness: 91.99 ft

WELL DATA (PZ58D Bail)

| | |
|---|---|
| Initial Displacement: <u>3.08 ft</u> | Static Water Column Height: <u>42.99 ft</u> |
| Total Well Penetration Depth: <u>42.99 ft</u> | Screen Length: <u>10. ft</u> |
| Casing Radius: <u>0.083 ft</u> | Well Radius: <u>0.25 ft</u> |

SOLUTION

| | |
|----------------------------------|---------------------------------------|
| Aquifer Model: <u>Unconfined</u> | Solution Method: <u>KGS Model</u> |
| Kr = <u>5.098 ft/day</u> | Ss = <u>0.0002214 ft⁻¹</u> |
| Kz/Kr = <u>0.1</u> | |



TWIN PINES - PZ58D SLUGTEST

Data Set: H:\2018033.10 TTL Twin Pines Add Testing\addl_slug\SJS_aqtesolve\PZ58D Slug_BR_SJS.aqt
 Date: 06/03/19 Time: 15:24:56

PROJECT INFORMATION

Company: TTL, Inc.
 Client: Twin Pines LLC
 Project: 000180200804.00
 Location: St. George, GA
 Test Well: PZ58D Slug
 Test Date: 5-16-19

AQUIFER DATA

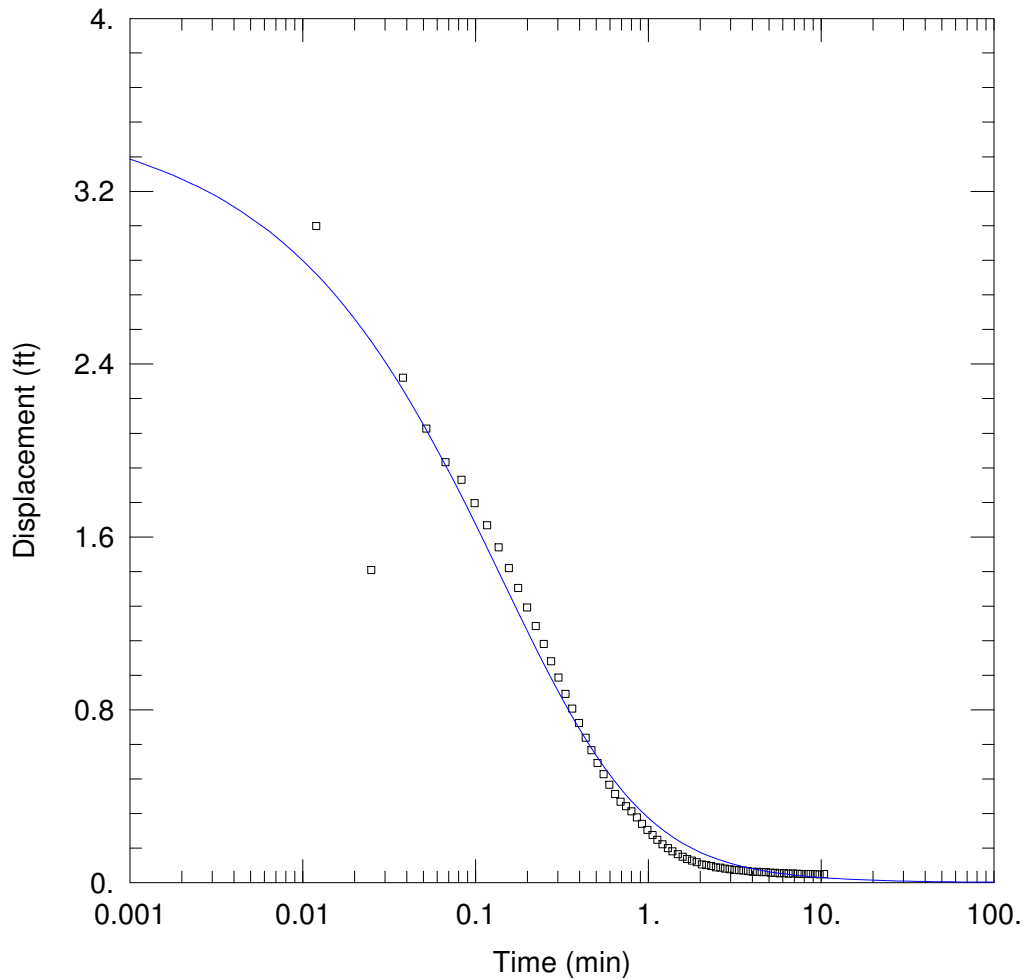
Saturated Thickness: 91.99 ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (PZ58D Slug)

Initial Displacement: 3.57 ft Static Water Column Height: 42.95 ft
 Total Well Penetration Depth: 42.95 ft Screen Length: 10. ft
 Casing Radius: 0.083 ft Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice
 K = 5.379 ft/day $y_0 =$ 2.2 ft



TWIN PINES - PZ58D SLUGTEST

Data Set: H:\2018033.10 TTL Twin Pines Add Testing\addl_slug\SJS_aqtesolve\PZ58D Slug_KGS_SJS.aqt
 Date: 06/03/19 Time: 15:25:18

PROJECT INFORMATION

Company: TTL, Inc.
 Client: Twin Pines LLC
 Project: 000180200804.00
 Location: St. George, GA
 Test Well: PZ58D Slug
 Test Date: 5-16-19

AQUIFER DATA

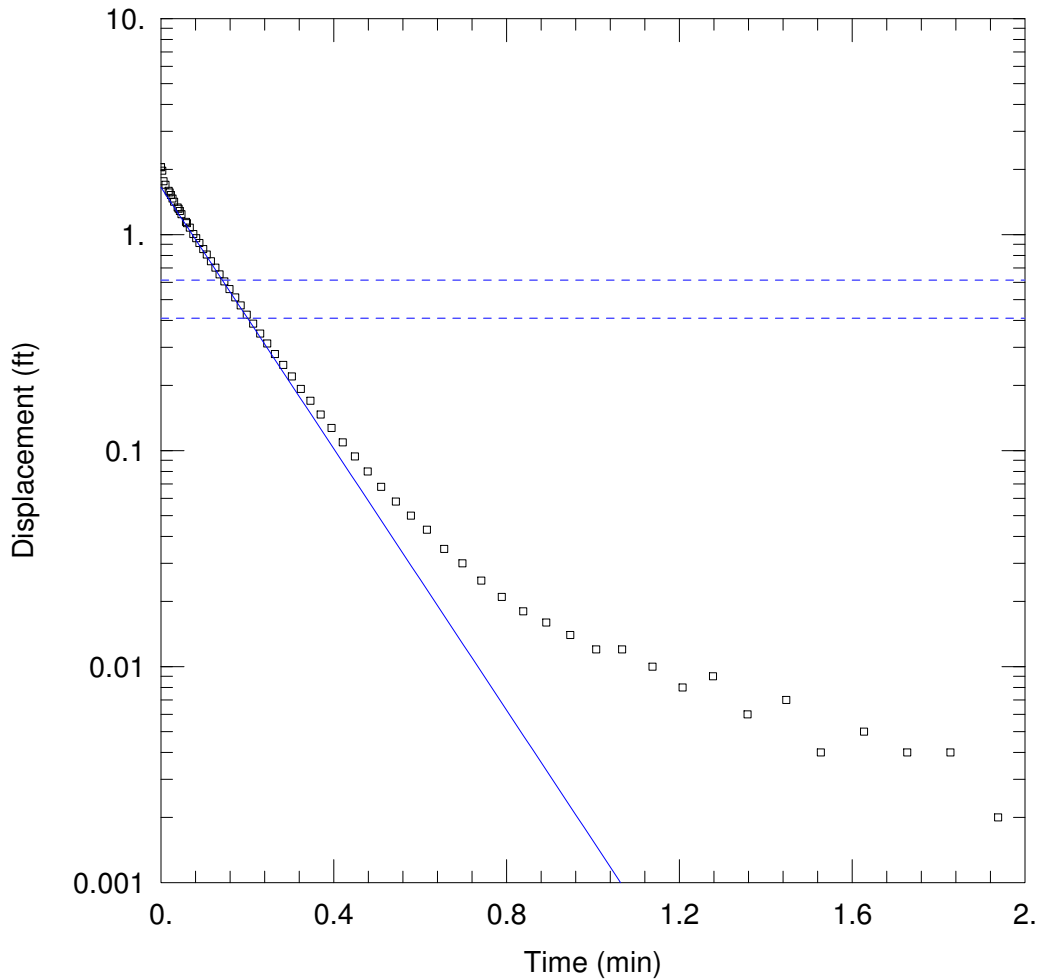
Saturated Thickness: 91.99 ft

WELL DATA (PZ58D Slug)

| | |
|---|---|
| Initial Displacement: <u>3.57 ft</u> | Static Water Column Height: <u>42.95 ft</u> |
| Total Well Penetration Depth: <u>42.95 ft</u> | Screen Length: <u>10. ft</u> |
| Casing Radius: <u>0.083 ft</u> | Well Radius: <u>0.25 ft</u> |

SOLUTION

| | |
|----------------------------------|--------------------------------------|
| Aquifer Model: <u>Unconfined</u> | Solution Method: <u>KGS Model</u> |
| Kr = <u>3.554 ft/day</u> | Ss = <u>0.002183 ft⁻¹</u> |
| Kz/Kr = <u>0.1</u> | |



TWIN PINES - PZ58S BAILTEST

Data Set: H:\2018033.10 TTL Twin Pines Add Testing\addl_slug\SJS_aqtesolve\PZ58S Bail_BR_SJS.aqt
 Date: 06/03/19 Time: 15:26:13

PROJECT INFORMATION

Company: TTL, Inc.
 Client: Twin Pines LLC
 Project: 000180200804.00
 Location: St. George, GA
 Test Well: PZ58S bail
 Test Date: 5-16-19

AQUIFER DATA

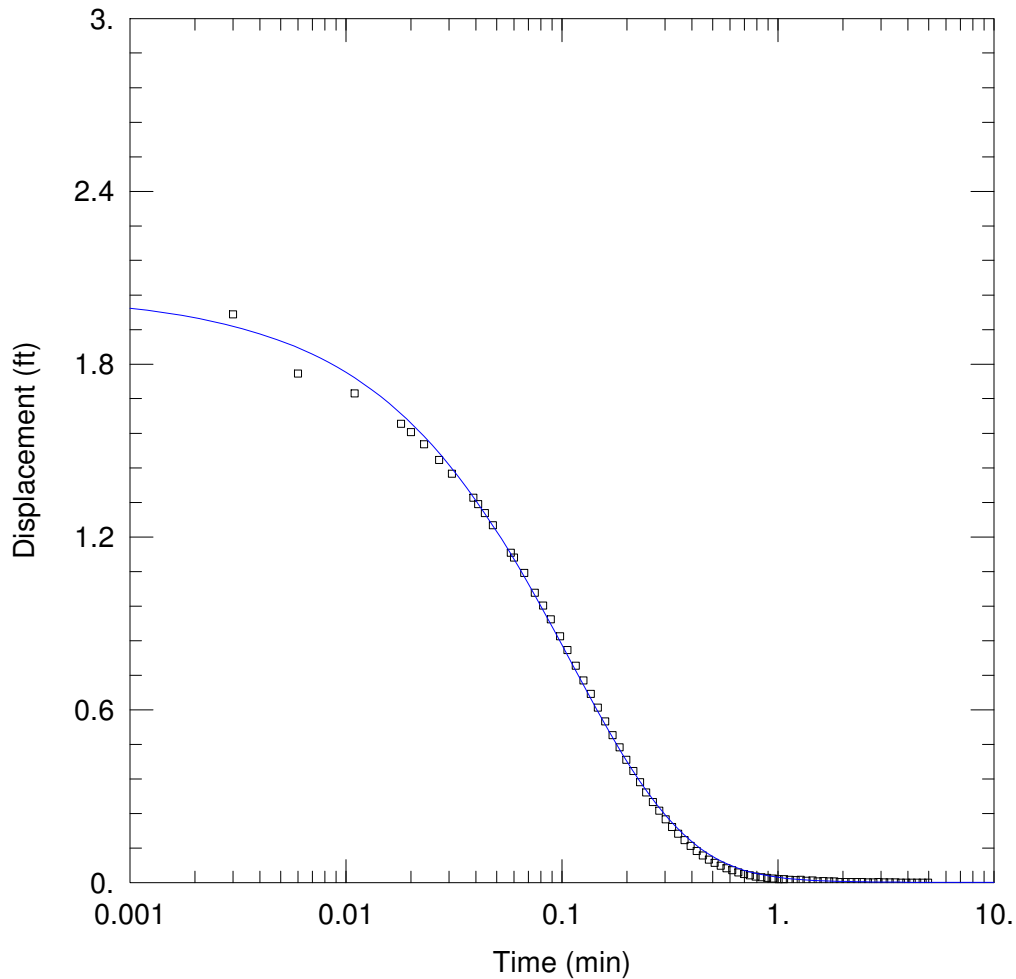
Saturated Thickness: 95.85 ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (PZ58S Bail)

Initial Displacement: 2.05 ft Static Water Column Height: 11.85 ft
 Total Well Penetration Depth: 11.85 ft Screen Length: 5. ft
 Casing Radius: 0.083 ft Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice
 K = 21.14 ft/day y_0 = 1.654 ft



TWIN PINES - PZ58S BAILTEST

Data Set: H:\2018033.10 TTL Twin Pines Add Testing\addl_slug\SJS_aqtesolve\PZ58S Bail_KGS_SJS.aqt
 Date: 06/03/19 Time: 15:27:13

PROJECT INFORMATION

Company: TTL, Inc.
 Client: Twin Pines LLC
 Project: 000180200804.00
 Location: St. George, GA
 Test Well: PZ58S bail
 Test Date: 5-16-19

AQUIFER DATA

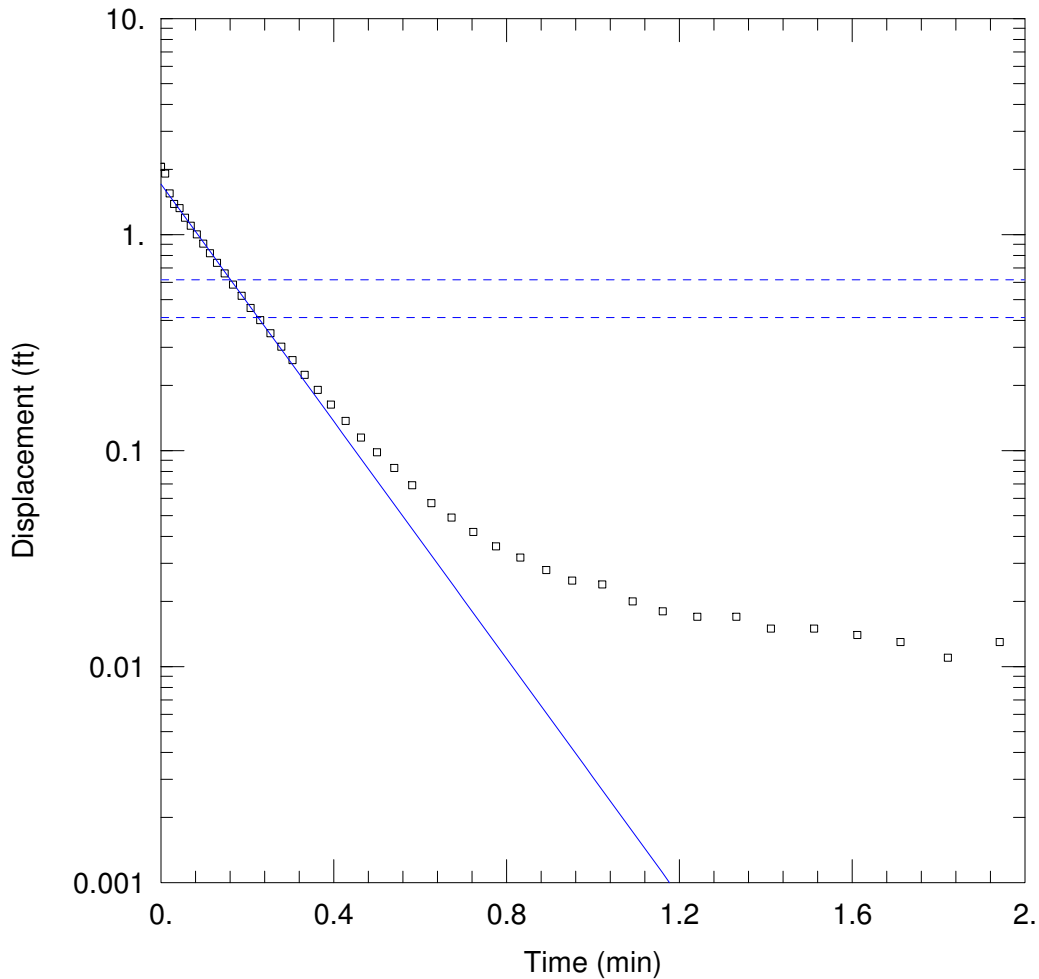
Saturated Thickness: 95.85 ft

WELL DATA (PZ58S Bail)

| | |
|---|---|
| Initial Displacement: <u>2.05 ft</u> | Static Water Column Height: <u>11.85 ft</u> |
| Total Well Penetration Depth: <u>11.85 ft</u> | Screen Length: <u>5 ft</u> |
| Casing Radius: <u>0.083 ft</u> | Well Radius: <u>0.25 ft</u> |

SOLUTION

| | |
|----------------------------------|--------------------------------------|
| Aquifer Model: <u>Unconfined</u> | Solution Method: <u>KGS Model</u> |
| Kr = <u>26.61 ft/day</u> | Ss = <u>7.872E-5 ft⁻¹</u> |
| Kz/Kr = <u>0.1</u> | |



TWIN PINES - PZ58S SLUG TEST

Data Set: H:\2018033.10 TTL Twin Pines Add Testing\addl_slug\SJS_aqtesolve\PZ58S Slug_BR_SJS.aqt
 Date: 06/03/19 Time: 15:01:39

PROJECT INFORMATION

Company: TTL, Inc.
 Client: Twin Pines LLC
 Project: 000180200804.00
 Location: St. George, GA
 Test Well: PZ58S slug
 Test Date: 5-16-19

AQUIFER DATA

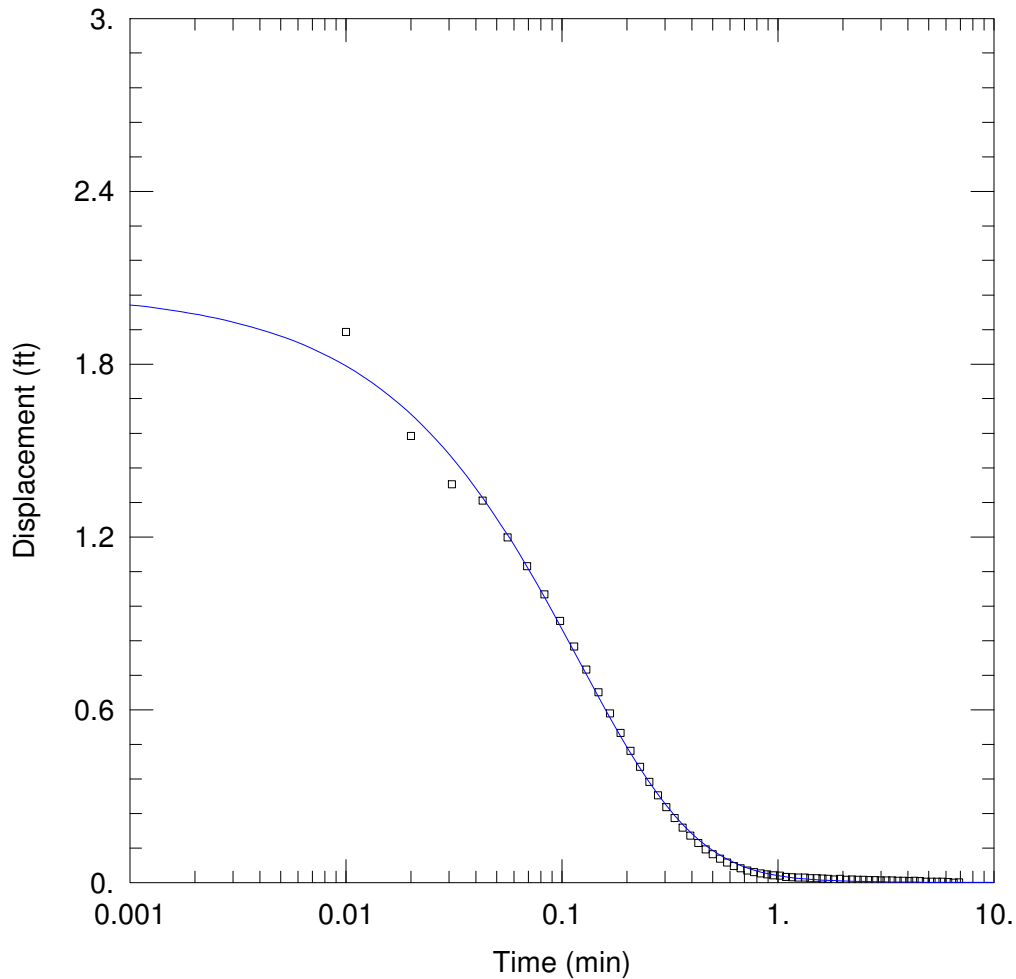
Saturated Thickness: 95.85 ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (PZ58S Slug)

Initial Displacement: 2.06 ft Static Water Column Height: 11.85 ft
 Total Well Penetration Depth: 11.85 ft Screen Length: 5 ft
 Casing Radius: 0.083 ft Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice
 K = 19.18 ft/day y_0 = 1.711 ft



TWIN PINES - PZ58S SLUG TEST

Data Set: H:\2018033.10 TTL Twin Pines Add Testing\addl_slug\SJS_aqtesolve\PZ58S Slug_KGS_SJS.aqt
 Date: 06/03/19 Time: 15:26:39

PROJECT INFORMATION

Company: TTL, Inc.
 Client: Twin Pines LLC
 Project: 000180200804.00
 Location: St. George, GA
 Test Well: PZ58S slug
 Test Date: 5-16-19

AQUIFER DATA

Saturated Thickness: 95.85 ft

WELL DATA (PZ58S Slug)

| | |
|---|---|
| Initial Displacement: <u>2.06 ft</u> | Static Water Column Height: <u>11.85 ft</u> |
| Total Well Penetration Depth: <u>11.85 ft</u> | Screen Length: <u>5 ft</u> |
| Casing Radius: <u>0.083 ft</u> | Well Radius: <u>0.25 ft</u> |

SOLUTION

| | |
|----------------------------------|-------------------------------------|
| Aquifer Model: <u>Unconfined</u> | Solution Method: <u>KGS Model</u> |
| Kr = <u>24.15 ft/day</u> | Ss = <u>8.67E-5 ft⁻¹</u> |
| Kz/Kr = <u>0.1</u> | |